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Charles P. Howard Terminal Extension

ENVIRONMENTAL IMPACT REPORT

Port of Oakland

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Draft EIR

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Charles P. Howard Terminal Extension
Environmental Impact Report
TABLE OF CONTENTS

■ ■ ■

List of Figures

List of Tables

Chapter I
INTRODUCTION

■ ■ ■

A. Preface

This report describes the environmental consequences of approving the proposed wharf extension at the Port of Oakland's Charles P. Howard Terminal. This assessment is designed to fully inform the Port decision makers, responsible agencies, and the general public, of the proposed action and possible effects of its approval. This assessment also examines various alternatives to the proposed project and recommends a set of mitigation measures to reduce or avoid potentially significant impacts. This is a project Environmental Impact Report (EIR) prepared in compliance with the California Environmental Quality Act (CEQA) Guidelines Section 15161. This EIR will be reviewed by Port staff planners and considered for certification by Port officials prior to any approvals being made on the Howard Terminal wharf extension.

B. Proposed Action

The Port of Oakland proposes to extend the length of Berths 67 and 68 from 1,642 lineal feet to 1,948 feet to accommodate two large container ships simultaneously. The project would increase the area of the Howard Terminal wharf and yard by 48,240 square feet. Berth 69, which is 558 feet long, would cease to function as a useable berth. The terminal storage yard would also be enlarged as part of the wharf extension, thus increasing the yard area for stacking and storing cargo containers, and improving truck circulation. A transit shed built in 1929 would be demolished in order to expand the container storage yard and the berth area adjacent to the wharf would be dredged to -42 feet (13,600 cubic yards) to create the new berth area and accommodate the larger ships. Solid fill placed in the Inner Harbor would cover 46,500 square feet of bottom. Much of this fill would derive from deepening berths already at 42 feet to provide a needed safety factor for the deeper draft ships calling on the Port.

The project site is located within a developed maritime industrial area and just west of the Jack London Square commercial and office center. Vehicular access to the site is from Market Street and Martin Luther King Jr. Way, off the Embarcadero. Ship access from the San Francisco Bay is via the Oakland Estuary, which consists of the Oakland Middle and Inner Harbor.

Several components of the project would take place off-site. The Port would build a rehandling facility on Berth 10 in which to dewater dredge materials before disposing of them in landfills. Wharf and piling would be removed at the Sherex and Pacific Drydock sites to meet permit requirements regarding Bay fill. Public access would be improved along a portion of the shoreline at Jack London Square. Outer and inner harbor berths (22, 23, 24, 30, 67 and 68) would be deepened to provide *suitable fill for* the wharf and yard extension.

C. Use of the EIR

This assessment is designed to fully inform the Port Board of Commissioners, responsible agencies, and the public at large of the proposed actions and possible effects of their approval. This assessment also examines two alternatives to the proposed project and recommends a set of mitigation measures to reduce or avoid potentially significant impacts. This document is a Project EIR for the proposed Howard Terminal Extension, consistent with *CEQA Guidelines* Section 15161. Table 1 shows permit requirements.

The Board of Port Commissioners will use this report as part of its review and approval of the project. Other affected departments and agencies, such as the San Francisco Bay Conservation and Development Commission (BCDC), San Francisco Bay Regional Water Quality Control Board (RWQCB), the U.S. Army Corps of Engineers (Corps), the State Office of Historic Preservation, the City of Oakland, and State and federal resources agencies will also use the document to review the proposed project and issue any necessary permits or approvals as Responsible Agencies. No further environmental review of the Howard Terminal Extension project is contemplated for subsequent approvals. Table 1 shows permit and review requirements. Berths 22, 23, 24, 30, 67 and 68 would be deepened to a depth of 44 feet plus two feet overdredge, to provide fill for the project and a needed safety margin of depth for the berths. Dredging to a depth of 42 feet plus two feet overdredge is covered by the Port's maintenance dredging permits, as shown in Appendix A.[1] Maintenance

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[1] U.S. Army Corps of Engineers Permit No. 18921E35 and San Francisco Bay Conservation and Development District Permit No. M92-41.

Table 1
PERMIT AND REVIEW REQUIREMENTS

Agency	Permit	Review
San Francisco Bay Conservation and Development Commission	For fill, dredging and construction in shoreline band	Review conformity to McAteer-Petris Act and San Francisco Bay Plan
U.S. Army Corps of Engineers	Clean Water Act Section 404 for discharging dredged material, placing fill and pilings; River and Harbors Act Section 10 for construction in navigable waters	Environmental Assessment for National Environmental Policy Act (NEPA)
U.S. Environmental Protection Agency	Project Review	NEPA Oversight Comments, Section 404 and Air Quality
National Marine Fisheries Service		NEPA Comments Corps permit process
U.S. Fish and Wildlife Service		NEPA Comments Corps permit process
California Department of Fish and Game		Fish and wildlife impacts, CEQA and Section 404
U.S. Coast Guard		Navigational hazards
San Francisco Bay Regional Water Quality Control Board	Water quality certification, NPDES permit, waste discharge requirements	Porter-Cologne Act, Clean Water Act Title 23
State Office of Historic Preservation	U.S. Army Corps of Engineers Environmental Assessment	National Historic Preservation Act Section 106
City of Oakland	Building and demolition	CEQA review

dredging involves recent Bay mud on top of Merritt sands. The recent Bay mud is tested for contaminants and disposed of according to the regulations of the U.S. Army Corps of Engineers (COE), the San Francisco Bay Regional Water Quality Control Board (RWQCB), the U.S. Environmental Protection Agency (EPA), and the San Francisco Bay Conservation and Development Commission (BCDC). The Merritt sands are extremely hard-packed and cohesive, and have never been exposed to man-made contaminants.[2] Therefore, the EPA and COE have stated that Merritt sands do not need to be tested prior to ocean disposal. For this project, the portion of the

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[2] U.S. Army Corps of Engineers, 1992. *Environmental Assessment, Oakland Inner Harbor 38-Foot Separable Element of the Oakland Harbor Navigation Improvement Project.* U.S. Army Corps of Engineers, San Francisco.

deepening down to the depths specified in the maintenance permits would be tested and disposed as described in those permits. The portion below the depths specified in the maintenance permits would all be in Merritt sands; therefore, no testing would be required before the dredged sands are used for fill in constructing the Howard Terminal extension. In the unlikely event that holes have been dug in the Merritt sands, recent Bay muds would have filled in these holes. If recent Bay muds are encountered in the deep Merritt sands, they will be treated and disposed of according to agency regulations, in the same manner as specified in the maintenance dredging permits.

D. EIR Scope: Significant Issues and Concerns

As required by CEQA Guidelines, the focus of this EIR is limited to those specific issues and concerns identified as *potentially significant* by the Port of Oakland in the initial study (Appendix B) prepared for the project. In addition, an issues memo was prepared which provided more technical information about the environmental impacts of the project. These issues and concerns are identified below.

1. Local and Regional Plans and Policies

Policy consistency with local land use plans including the Port of Oakland Land Use Plan and the City of Oakland's Comprehensive Plan and with regional land use plans, including the San Francisco Bay Conservation and Development Commission's (BCDC) San Francisco Bay Plan and the BCDC/Metropolitan Transportation Commission's (MTC) Seaport Plan.

2. Historic Resources

Historic significance of the structures at the Howard Terminal and potential impacts due to the transit shed's proposed removal.

3. Socio-Economics

The potential socio-economic impacts of the proposed project on the Port of Oakland's Howard Terminal, including its employment and its effect to the local and regional economy.

4. Land Use

Compatibility of the proposed action with existing and proposed land uses in the vicinity.

5. Transportation

Impacts to local and major surface streets, freeways and railways from increased truck trip generation due to increased shipping potential and cargo container handling.

6. Noise

The potential effects to ambient noise levels related to operational noise, increased traffic noise, and temporary construction phase noise.

7. Air Quality

Potential short-term and regional-scale impacts to air quality. Potential impacts due to short-term construction emissions from demolition; heavy construction equipment and vehicles; fugitive dust; and evaporation of hydrocarbons from curing asphalt, drying paints, solvents, and adhesives. Potential regional-scale impacts due to increased operational activity from vehicular and truck traffic; ships and tugboats; and trains.

8. Geology, Seismicity and Soils

Potential geologic and seismic constraints from active faults, liquefaction, and differential settlement due to underlying bay mud and proposed fill.

9. Hazardous Materials

Possible hazardous material impacts to bay waters and sensitive receptors (i.e., construction workers, port employees, general public) from the demolition of the transit shed and removal of existing wharf piers and pilings; during the construction phase from diesel oil and grease, construction materials, and debris; and during operation from crane equipment, ships, and transport trucks.

10. Sediment Quality

Potential sediment impacts due to proposed dredging and disposal of dredge materials in bay waters and/or landfills.

11. Water Quality

Potential effects to water quality from the disturbance to bay sediments during construction and increased runoff from impervious surface area after the wharf extension.

12. Biologic Resources

Potential impacts to special-status species and habitats of benthic organisms, fish, plantlife, and wildlife due to construction, dredging and disposal of dredge materials.

13. Public Services and Utilities

Effects on the provision of water and sewer services, fire and police protection, and vessel wastes as a direct result of the wharf extension project.

14. Public Access and Recreation

Effects of the proposed project on existing and planned public access and passive and active recreation opportunities.

15. Visual Resources

Potential impacts to on-site and off-site views due to removal of the existing transit shed and development of the expanded terminal.

E. Report Organization

The EIR is divided into the following major sections:

<u>Chapter I - Introduction</u> provides a summary of the proposed action, identifies potentially significant issues and concerns, discusses the overall purpose, use, and organization of the EIR.

<u>Chapter II - Summary</u> provides a summary of the significant impacts that would result from implementation of the proposed project and describes the mitigation measures to reduce or avoid significant impacts.

<u>Chapter III - Project Description</u> provides a description of the project site location, existing conditions, and the proposed project.

Chapter IV - Context Within Local and Regional Plans and Policies provides descriptions of relevant planning documents and policies. It cites the relevant policies and discusses the proposed project's consistency and/or inconsistencies with them.

Chapter V - Environmental Setting, Impacts, and Mitigation Measures describes for each environmental technical topic the existing conditions (setting), potential environmental impacts and their level of significance, mitigation measures recommended to mitigate identified impacts, and other recommended measures to improve the project. The discussion of environmental impacts includes a code to convey information regarding the significance of impacts. The codes and their meanings are as follows: (S) = a significant impact; (PS) = a potentially significant impact, used when there is not enough information known such as preliminary nature of project design or policies that have not yet been determined; (LS) = a less than significant impact or insignificant impact; and (B) = a beneficial impact, used when the project plans are credited for providing self mitigating measures.

Chapter VI - Project Alternatives analyzes alternatives to the proposed project, including a no project alternative, and an on-site project alternative, and determines the environmentally superior alternative other than the no project as required by CEQA.

Chapter VII - CEQA-Required Overview provides the required analysis of the overall impacts of the proposed project, including the relationship between short-term uses of the environment and the enhancement of long-term productivity, significant irreversible and unavoidable changes, growth inducing impacts, and cumulative impacts for the environmental issues found to have significant cumulative effects.

Chapter VIII - Organizations and Persons Consulted identifies all federal, state, or local agencies, other organizations, and private individuals consulted in the preparation of the EIR and identifies the firms and individuals that prepared the EIR.

Chapter IX - References and Literature Cited identifies the reference documents, publications, and literature reviewed and cited, and where these references are available for review.

Chapter X - Appendices includes the technical support documentation for the EIRs environmental topics.

F. Other Reports

This report was prepared using site visits, original data, and existing published and unpublished data and information, including the Technical Reports prepared for the proposed project.

G. Related Actions Assessed in Other Environmental Documents

Several actions related to the proposed project have been assessed in other environmental documents.

A Categorical Exemption for maintenance dredging in the Port area dated July 17, 1992 was filed with the County Clerk of Alameda County on July 17, 1992.

The federal channel adjacent to Berth 68 will be deepened by the U.S. Army Corps of Engineers to 42 feet as part of the Oakland Harbor Deep-Draft navigation Improvements project. A Supplemental EIR/EIS is being prepared presently on the Oakland 42-foot project.

Operation of the landfills that would be used for disposal of dredged sediments, demolition/construction debris and piles is assessed in the environmental impact reports for the landfills. These include:

- Vasco Road Sanitary Landfill Area "Y" Expansion EIR, State Clearinghouse Number (SCH #) 87022420, proposed by Alameda County in February 1994,
- Redwood Landfill Solid Waste Facilities Permit Expansion Project EIR, SCH # 91033042, prepared for Marin County in February 1994 by Woodward-Clyde,
- Keller Canyon Landfill EIR, SCH # 89040415, prepared for Contra Costa County in January 1990, and
- Forward, Inc. Landfill Use Permit Modifications EIR, SCH # 92032013, prepared for San Joaquin County In March 1993 by LSA Associates, Inc.

Chapter II
SUMMARY OF FINDINGS

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The potential impacts and mitigation measures are summarized by environmental issue in Table 2. The table provides an overview of the analysis contained in Chapter V. It includes identification of the significant impacts, summarization of the recommended mitigation measures, and the impacts' level of significance after implementation of appropriate mitigations. Please refer to the text of this Draft EIR for a full discussion of each issue.

Table 2
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Significance Prior to Mitigation[a]	Mitigation Measures for Significant Impacts	Potential Significance with Mitigation[a]
A. HISTORIC RESOURCES			
HIST-1: The proposed project would require the demolition of the Grove Street Pier. No portion of the building would remain standing. All character-defining features would be destroyed. Demolition would constitute a significant unavoidable impact.	S	HIST-1: Prior to demolition, HABS documentation of the Grove Street Pier should be completed at an appropriate level, to be determined in consultation with the Advisory Council on Historic Preservation, the Army Corps of Engineers, the State Historic Preservation Office, and the Port of Oakland, and set forth in a Memorandum of Agreement. Copies of the HABS documentation should be made available to the Oakland Public Library. In addition, the Port of Oakland should assemble an archive of Port materials and publish a book-length, illustrated history of the Port. Demolition of the Grove Street Pier is a significant unavoidable impact; these mitigation measures would not reduce the effect to a less-than-significant level.	SU
B. SOCIO-ECONOMICS			
ECON-1: The proposed project would increase the capacity of the Port of Oakland by one new-generation container vessel per week. This would increase peak direct employment on the terminal by 40 people. The increase in cargo handling would lead to an increase in business revenues, direct (port-dependent) employment, induced (indirect) employment and related employment in Oakland and the Bay Area.	B	No mitigation measures are necessary.	B
C. LAND USE			
No significant land use impacts were identified.			

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[a] S = Significant, PS = Potentially Significant, LS = Less than Significant, SU = Significant Unavoidable, B = Beneficial.

Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
D. TRANSPORTATION			
TRAN-1: The heavy right turn movement from the intersection of Market Street southbound into Third Street would cause this intersection to operate with long delays (LOS "F") to the stopped Market Street approaches, potentially delaying trucks and other vehicles into and out of Howard Terminal. This is a cumulative impact that would occur regardless of whether the project is built, assuming that traffic volumes do increase to the projected levels by the year 2000. However, if the Union Pacific Railroad abandons the use of Third Street, another lane could be created, possibly resulting in an acceptable level of service.	S	TRAN-1: If the railroad track on Third Street is not abandoned by the time the expanded wharf is occupied, a traffic signal could be warranted at Third and Market Streets, both to provide for safe movement of vehicles and to reduce delays. With a signal, this intersection would operate at level of service "B" (volume-to-capacity ratio of 0.61), which is a less-than-significant impact. The signal should be interconnected with appropriate adjacent intersections along Market Street (such as 5th/Market) to provide a smooth progression of traffic. However, the need for this improvement is not created by the Howard Terminal project.	LS
E. NOISE			
NOISE-1: The short-term noise impacts from pile driving would be sufficiently high to cause speech interference and annoyance.	S	NOISE-1: The following measures are recommended to mitigate construction noise impacts 1 and 2 upon sensitive receptors in the area: (1) Construction using equipment powered by internal combustion engine should occur between the hours of 7 a.m. and 7 p.m., Monday through Friday (non-holidays), unless unforseen delays require Saturday work or work until 10:00 p.m. to maintain the schedule. If it is necessary to operate such equipment (other than pile drivers) between 10:00 p.m. and 7:00 a.m., the Port should rent the rooms on the side of the Waterfront Plaza Hotel facing the construction for those nights.	LS

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Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
(NOISE-1 continued)		(2) Best available control technology should be used during the pile driving phase. All available techniques to minimize the number of blows required to seat each pile should be utilized. (3) Pile driving should be scheduled to have the least impact on sensitive receptors in the area. Pile driving activities should be restricted to the daytime hours. Late afternoon, evening and weekend pile driving would minimize impacts to adjacent office buildings, shops and some hotel functions, but would disturb sleep in many hotel rooms. (4) All internal combustion engine driven equipment utilized in the demolition, dredging, filling, and concrete construction activities should be fitted with mufflers which are in good condition. (5) A disturbance coordinator responsible for responding to noise complaints should be designated, whose name and telephone number would be clearly posted at the construction site. This person would determine the cause and implement measures to mitigate the noise impact. Examples include enforcing the allowable hours of construction, identifying poorly muffled equipment and requiring its repair or replacement, and recommending temporary construction noise barriers.	
<u>NOISE-2</u>: Construction noise at night, if work occurred then, would exceed the sleep disturbance criterion of 35 dBA.	S	Same as Mitigation Measure NOISE-1.	LS

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Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
F. AIR			
AIR-1: Construction activities could increase dust levels in the project vicinity.	S	AIR-1. To minimize construction dust impacts, the Port should specify dust control requirements in construction contracts. These requirements should include: • watering all exposed or disturbed soil surfaces as necessary to eliminate visible dust plumes; • watering or covering stockpiles of debris, soil, sand or other materials that can be blown by the wind; • suspending any earthmoving or other dust-producing activities during periods of high winds (15 mph or more) when watering cannot eliminate visible dust plumes; • sweeping paved portions of the construction area and adjacent streets of all mud and debris, since this material can be pulverized and later resuspended by vehicle traffic; • limiting the speed of all construction vehicles to 15 miles per hour while on-site; and • covering trucks hauling debris, construction materials or earth.	LS

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[a] S = Significant, PS = Potentially Significant, LS = Less than Significant, SU = Significant Unavoidable, B = Beneficial.

Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
AIR-2: The proposed project would affect regional air *quality.*	S	AIR-2: Transportation sources are regulated by local, state and *federal agencies,* so the Port's ability to impose emission controls on these sources is extremely limited. The following are programs that the Port could implement to partially offset increased regional emissions. These measures are consistent with the Alameda County Congestion Management Program. • Include Howard Terminal employees in the Port's trip reduction program. • Establish a preference and policy for use of trucking companies that haul with late-model trucks, or that equip their trucks with effective emission controls.	SU
G. GEOLOGY, SEISMICITY AND SOILS			
GEO-1. The fill placed for the project is subject to ground *motion and ground failure from liquefaction*, lurching, and/or differential settlement.	S	GEO-1. Site specific engineering geology, soils, and foundation investigation reports should be prepared and provide detailed guidelines and recommendations regarding grading, fill placement and compaction, surface and subsurface drainage control, and seismic safety. All mitigation measures recommended in the reports should be implemented. All geotechnical engineering design work should be prepared by and construction work monitored by a certified geotechnical or soil engineer.	LS

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[a] S = Significant, PS = Potentially Significant, LS = Less than Significant, SU = Significant Unavoidable, B = Beneficial.

Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
H. HAZARDOUS MATERIALS			
HAZ-1: Demolition of the transit shed, which is close to Bay waters, and removal of the timber wharf, debris and wastes, could result in wastes entering the Bay.	S	HAZ-1: The Port should require the contractor to develop and adhere to a debris containment and demolition pollution control plan for building demolition and removal of the wharf. If demolition takes place during the wet season, the Port should require the contractor to prepare a Storm Water Pollution Prevention Plan (SWPPP) as discussed in Mitigation Measure WATER-1. The construction SWPPP should be integrated and compatible with the Port's SWPPP. The debris containment and demolition pollution control plan should include the following components: (1) specific measures to control demolition debris. This may include a boom around the construction area to allow retrieval of floating materials which enter the water and protection for storm drains (2) measures to control liquid spills, including the provision of on-site spill cleanup kits (3) worker training concerning the importance of protecting Bay waters and specific response activities (4) assignment of responsibility (5) independent oversight controls including visual monitoring of the water surfaces and work areas.	LS

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Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
HAZ-2: Demolition of the transit shed and wharf would result in release of lead-based paint.	S	HAZ-2: The Port should insert a contract clause to require the site contractor to comply with the Lead in Construction Standard (29 CFR Parts 1910, 1915, 1917, and 1918) for the demolition of the transit shed. The contract should require the contractor to complete a plan demonstrating the following: (1) dust from lead-base paint will not be released into the environment at concentrations greater than the OSHA standard, (2) collected dust (e.g., from HEPA vacuum engineering controls) will be disposed of as hazardous wastes, (3) construction debris containing lead-based paint will be disposed of as required by the California Health and Safety Code, Chapter 6.5, and (4) other controls will be implemented as necessary to prevent the environmental release of lead.	LS
HAZ-3: The demolition of the transit shed could result in the discharge of hidden wastes. The grated sump area or drain running the length of the building may contain the residue of previous spills. During demolition, and during disposal of debris, it could be difficult to control the wastes in this area and prevent them from either entering the water or from being disposed of improperly.	S	HAZ-3: The Port should require the demolition contractor or tenant to complete a pre-demolition assessment and cleanup of the sump area in the transit shed and any other major spill areas. The assessment and cleanup plan should consist of the following: (1) sampling to determine characteristics of the wastes, (2) assessment of the volume and characteristics of the waste material, (3) cleanup, and (4) disposal in compliance with California law.	LS
HAZ-4: Demolition of the transit shed could involve discharge of accumulated wastes.	PS	HAZ-4: The Port or current tenant should provide for the removal and disposal of any discarded waste liquids or related materials in the building prior its demolition.	LS

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Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
HAZ-5: The transit shed's fluorescent and mercury vapor light fixtures could result in release of hazardous waste during demolition.	S	HAZ-5: The fluorescent light tube fixtures should be collected prior to the demolition. If functional, they should be reused. If not, and if the number exceeds 25, they must be handled as hazardous wastes. Mercury vapor light fixtures, if present, should be similarly collected and disposed of.	LS
HAZ-6: The demolition of the transit shed and wharf could discharge hidden wastes that were uninspected.	PS	HAZ-6: The Port should complete a pre-demolition inspection of the entire building to identify any potential hazardous materials or other substances presenting an environmental risk and as appropriate should identify and implement control measures.	LS
HAZ-7: The removal of the wharf pilings would create a disposal hazard of creosote-treated pilings.	PS	HAZ-7: The Port should ensure that all pilings, parts of pilings, and related decking are disposed of at a site permitted by the State to accept these materials.	LS
HAZ-8: The demolition of the transit shed, if improperly conducted, could release asbestos.	PS	HAZ-8: The National Emissions Standard for Hazardous Air Pollutants (40 Code of Federal Regulations 61) and other Federal and State regulations (29 CFR 1926, 8 California Code of Regulations 1529) separate non-friable asbestos-containing materials into two categories. Category I includes floor tile, asphaltic roof coverings, and gaskets. Category II includes transit cement pipe and board, plaster, stucco, ceiling tiles, fire doors, and drywall mudding tape and compounds. Category I materials are not required to be removed prior to demolition unless they are significantly damaged. Category II materials must be removed prior to demolition, but may be disposed of as non-hazardous construction debris if there is no potential for damage during transportation and disposal activities.	LS

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Table 2 *continued*

Impacts	Significance Prior to Mitigation[a]	Mitigation Measures for Significant Impacts	Potential Significance with Mitigation[a]
HAZ-9: Construction would generate construction debris and wastes.	PS	HAZ-9: The Port should require the contractor to develop a debris containment and construction pollution control plan for the *renovation. This plan should* present measures to ensure that debris and other pollutants do not enter the water during the construction phase. If construction takes place during the wet season, the Port should require the contractor to prepare a Storm Water Pollution Prevention Plan (SWPPP) as discussed in Section J. Water Quality. The construction SWPPP should be integrated and compatible with the Port's Storm Water Pollution Prevention Plan (which is applicable to general industrial activities and exclusive of specific construction projects). The debris containment and construction pollution control plan should include the following components: (1) specific measures to control construction debris (wood scraps, other wastes). This may include a boom around the construction area to allow retrieval of floating materials which enter the water (2) measures to control liquid spills, including the provision of on-site spill cleanup kits (3) worker training concerning the importance of protecting Bay waters and specific control measures and response (4) assignment of responsibility (5) independent oversight controls including visual monitoring of the water surfaces and work areas (6) procedures to insure that construction vehicle maintenance is consistent with Port requirements and the NPDES permit conditions (best management practices).	LS

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Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
HAZ-10: The renovation of the wharf could require the relocation of materials that could be sources of pollution, which are stored on-site for Port use.	PS	HAZ-10: The Port should assure that the tenant complies with state regulatory standards on the storage and handling of potential sources of pollutants.	LS
I. SEDIMENT QUALITY			
No significant sediment quality impacts were identified.			
J. WATER QUALITY			
WATER-1: Demolition and construction could generate pollutants that could pollute storm water runoff or be discharged directly into the Bay.	S	WATER-1: The contractor should prepare, and the Port should review, a construction Stormwater Pollution Prevention Plan (SWPPP) following the guidelines in the State's General Construction Activity Storm Water Permit. The Port should require the general contractor and the subcontractors, via contract language, to abide by the construction SWPPP.	LS
WATER-2: The removal of the wood piles could release creosote; however, removing the wood piles would eliminate a continuing source of pollution from the exposed creosote surfaces of the piles and result in an overall net environmental benefit.	B	No mitigation is required.	B
WATER-3: The project would result in a net decrease in piling of 664 cubic yards and the substitution of creosote-treated piling with concrete and recycled plastic piling. Therefore, the impacts to water quality from creosote-treated piles would be reduced by the proposed project.	B	No mitigation is required.	B
WATER-4: The removal of creosote-treated piles at the Pacific Dry Dock and Sherex sites would reduce creosote in Bay waters.	B	No mitigation is required.	B

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Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
WATER-5: During removal of the timber wharf at the Pacific Dry Dock and Sherex sites, debris and wastes would be close to Bay waters. Even a minor accident or spill could result in these wastes entering the Bay.	S	Measure WATER-5: Implement Mitigation Measure HAZ-1, debris containment and demolition pollution control plan, during wharf removal at the Pacific Drydock and Sherex sites as well as during demolition and construction at Howard Terminal.	LS
WATER-6: The removal of 820 cubic yards of piles at the Pacific Drydock and Sherex sites could release some creosote; however, the removal of piling would eliminate a continuing source of pollution from the exposed creosote surfaces of the piles and result in an overall net environmental benefit.	B	No mitigation is required.	B
K. BIOLOGICAL RESOURCES			
BIO-1. Pacific Herring spawning within a half mile of the activity could be adversely affected by dredging.	PS	BIO-1: Dredging activities should be scheduled to avoid the period from December to March when the Pacific Herring spawning is anticipated.	LS
BIO-2. Increased noise and vibration from pile driving would affect Pacific herring spawning within a half mile of the site, and would temporarily disturb benthic habitat and fish food. Dissolved oxygen levels would decrease and available nutrients would increase.	PS	BIO-2. Pile driving should be scheduled to avoid the period from December to March to avoid disruptions to Pacific herring spawning and other biological resources.	LS

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Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
BIO-3. In order to meet the permit requirements of the San Francisco Bay Area Conservation and Development Commission and the U.S. Army Corps of Engineers, the Port of Oakland proposes to remove 33,000 square feet of wharf (pile supported fill) at Pacific Dry Dock located at Embarcadero at Channel Estuary Park and 13,590 square feet at the former Sherex Site adjacent to the American Presidents Line (APL) Terminal. These actions would improve biological resources within the Middle and Inner Harbors.	B	No mitigation is required.	B
L. PUBLIC SERVICES AND UTILITIES			
No significant public services and utilities impacts were identified.			
M. PUBLIC ACCESS AND RECREATION			
ACCESS-1: BCDC's preference is for on-site public access; however, because security and functional considerations make on-site public access infeasible, the best options for off-site public access have been incorporated into the project. Visual access to the proposed expanded maritime activities would be provided as part of public access provisions.	B	No mitigation is required.	B

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[a] S = Significant, PS = Potentially Significant, LS = Less than Significant, SU = Significant Unavoidable, B = Beneficial.

Table 2 *continued*

Impacts	**Significance Prior to Mitigation**[a]	**Mitigation Measures for Significant Impacts**	**Potential Significance with Mitigation**[a]
N. VISUAL RESOURCES			
VIS-1: Removal of the transit shed, an aesthetically pleasing architectural terminus for the pedestrian access along the shore, would be a significant impact on views from FDR Pier. The current view would be replaced by a more industrial view of Howard Terminal operations.	S	VIS-1: The Port should provide an all-weather educational exhibit on the FDR Pier that includes photos of the transit shed and explains evolving activities at the terminal.	LS
VIS-2: Removal of the transit shed would replace aesthetically pleasing architectural views of the transit shed from the public area in front of the Port Building, the Waterfront Plaza Hotel and the water's edge at Jack London Square with industrial views of Howard Terminal operations.	S	VIS-2: No mitigation is available for this impact.	SU

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[a] S = Significant, PS = Potentially Significant, LS = Less than Significant, SU = Significant Unavoidable, B = Beneficial.

Chapter III
PROJECT DESCRIPTION

■ ■ ■

A. Location

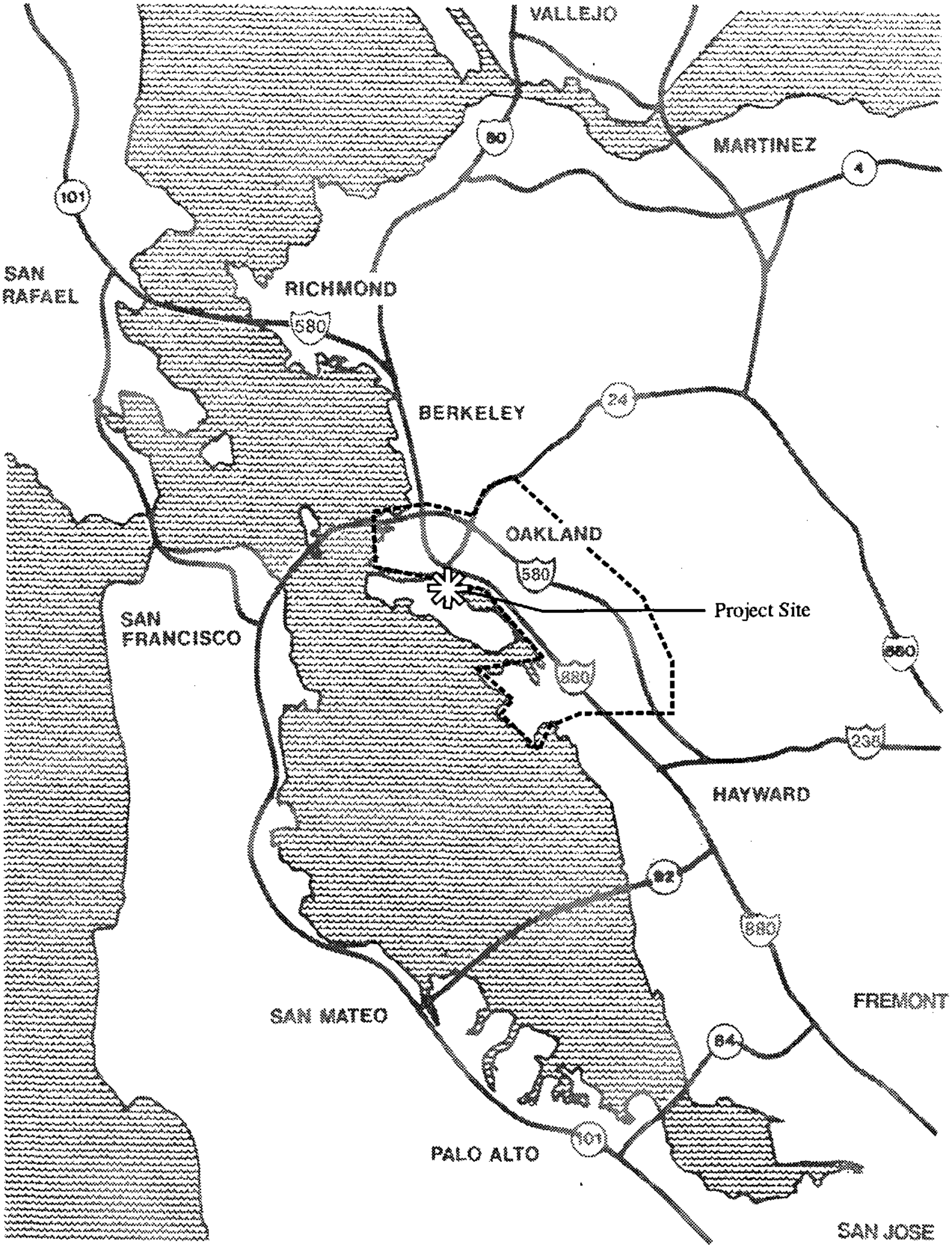
The Charles P. Howard Terminal is located in the Middle Harbor of the Oakland Estuary in Oakland, California, as shown in Figure 1. The terminal is part of the Port of Oakland, and is just west of Jack London Square, as shown in Figure 2. Ground transportation access is from I-880; the truck entrances and exits to the terminal are at Market Street and the foot of Martin Luther King, Jr. Way, off the Embarcadero, just north of the terminal. A City of Oakland fire station and the Franklin D. Roosevelt (FDR) Pier are east of the terminal, and Schitzer Steel is west of the terminal. Ship access to the terminal from the San Francisco Bay is via the Oakland Estuary, which consists of the Oakland Middle and Inner Harbors.

B. Purpose of the Project

The purpose of the project is to provide a second berth for new-generation container vessels and an efficient terminal space for handling cargo from two vessels at once. Howard Terminal is one of the last of the Port of Oakland's 12 container terminals to be renovated for new-generation container vessels.

The Seaport Plan (prepared by the Bay Conservation and Development Commission and the Metropolitan Transportation Commission) recognizes the need for new terminals in the Bay Area, including this site at the Port of Oakland. Most of the other sites identified in the Seaport Plan have been developed, except for the military sites.

Renovation of the terminal requires demolishing an existing building on the site, lengthening an existing berth to accommodate longer container vessels, deepening the channel adjacent to the new wharf, and enlarging the container storage area to accommodate the greater number of containers which would be transported by the larger ships.



Source: Brady and Associates, 1994

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Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

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FIGURE 1

Regional Location

The area now known as the Howard Terminal was originally built to operate as a break-bulk terminal. Break-bulk cargoes are transported on pallets and need the shelter and security provided by transit sheds adjacent to wharves to store the cargo while they are waiting to be transferred to a ship, train or truck. Ships that carry break-bulk cargo are older, of different configuration and smaller, and need shallower water to navigate.

Modern container terminals have very different functional requirements than break-bulk terminals. Container terminals utilize immense dockside cranes and expanses of pavement for the stacking of containers and the circulation of loading vehicles and trucks. When Howard Terminal was built in 1982, cellular container ships of the second and third generation were in use. These ships had lengths ranging from 700 to 850 feet and drafts up to 33 feet. As built in 1982, Howard Terminal could adequately accommodate two vessels. However, fourth-generation vessels, which are now the shipping industry standard, are approximately 900 to 1,000 feet in length and require wharf space of approximately 1,200 feet. These ships also require channels of approximately 41 to 43 feet of depth.

Existing conditions at Howard Terminal are shown in Figure 3.

C. Proposed Project

The proposed project consists of the wharf extension (including demolition of the existing transit shed and dredging and filling), dewatering and disposal of dredged sediments, construction and improvement of public access areas, and removal of wharf area at two other sites. These components of the project are described below.

1. Wharf Extension

The Port proposes to extend the wharf 306 lineal feet (48,240 square feet) to the east, so that Berth 68 at Howard Terminal can accommodate new-generation container vessels (Figure 4). This would make the wharf adequate to accommodate two new-generation container vessels simultaneously. The Project would also increase surface area which can be used to stack and store containers and improve truck circulation. As a result of increased efficiency, the capacity of the terminal would increase. Plan views of filling and dredging required to carry out the project are shown in Figure 5.

The wharf extension portion of the proposed project consists of the following actions:

Demolition and Wharf Removal

- Demolishing the transit shed (Building E-407A).
- Removing 80,350 square feet of wharf.
- Removing 1,100 piles, including 700 concrete piles and 400 creosote-treated wooden piles (2,520 square feet, 1,200 cubic yards of piles).

Dredging

- Dredging unstable mud underlying the dike footprint (30,000 cubic yards).
- Dredging Berths 67 and 68 to -44 feet MLLW (mean lower low water), and extending Berth 68 (39,000 square feet, 13,600 cubic yards)[1].
- Deepening Berths 22 through 24 and 30 from 42 feet plus two feet overdredge to 44 feet plus two feet overdredge to provide fill for the project as well as provide needed depth at the berths.

Filling

- Building a new dike and filling behind it to support the wharf extension (covering a 150,300 square foot area and using 144,000 cubic yards of fill from the on-going and permitted dredging projects and crushed concrete from concrete pile removal).
- Surcharging behind the dike by rapidly heaping fill on top of mud to compact the mud.
- Installing wicks behind the dike three feet apart to draw off moisture and stabilize the fill.
- Loss of Berth 69 as an active tugboat berthing area.

Building Wharf and Backland

- Driving piles through the new dike and constructing a 100-foot wide strip of pile-supported wharf for the crane rails (495 square feet, 536 cubic yards of new piles). The depth of the piles would be approximately 126 feet below mean sea level.
- Excavating behind the existing dike and replacing excavated soils with stronger engineered soils.
- Creating a backland on solid fill for maximum operational efficiency and capability in container transport and storage.

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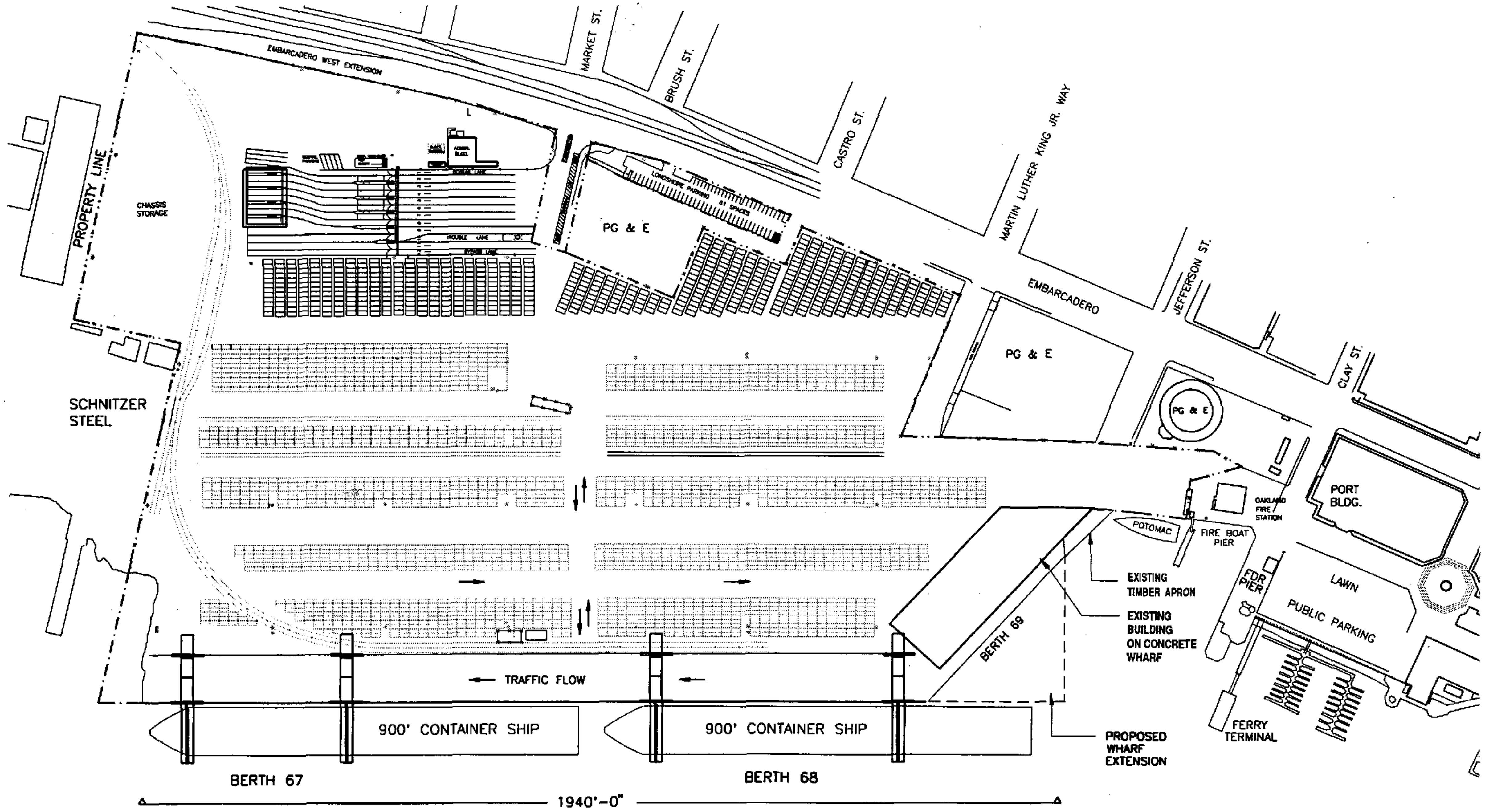
[1] Moffatt & Nichol, 1994. Berth 68 extension = 306 feet x 125 feet = 38,250, plus access from channel. Depth from existing surface to -44 feet.

Figure 3

Existing Conditions at Howard Terminal



Source: Port of Oakland, 1994

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Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

0' 125' 250' 500'

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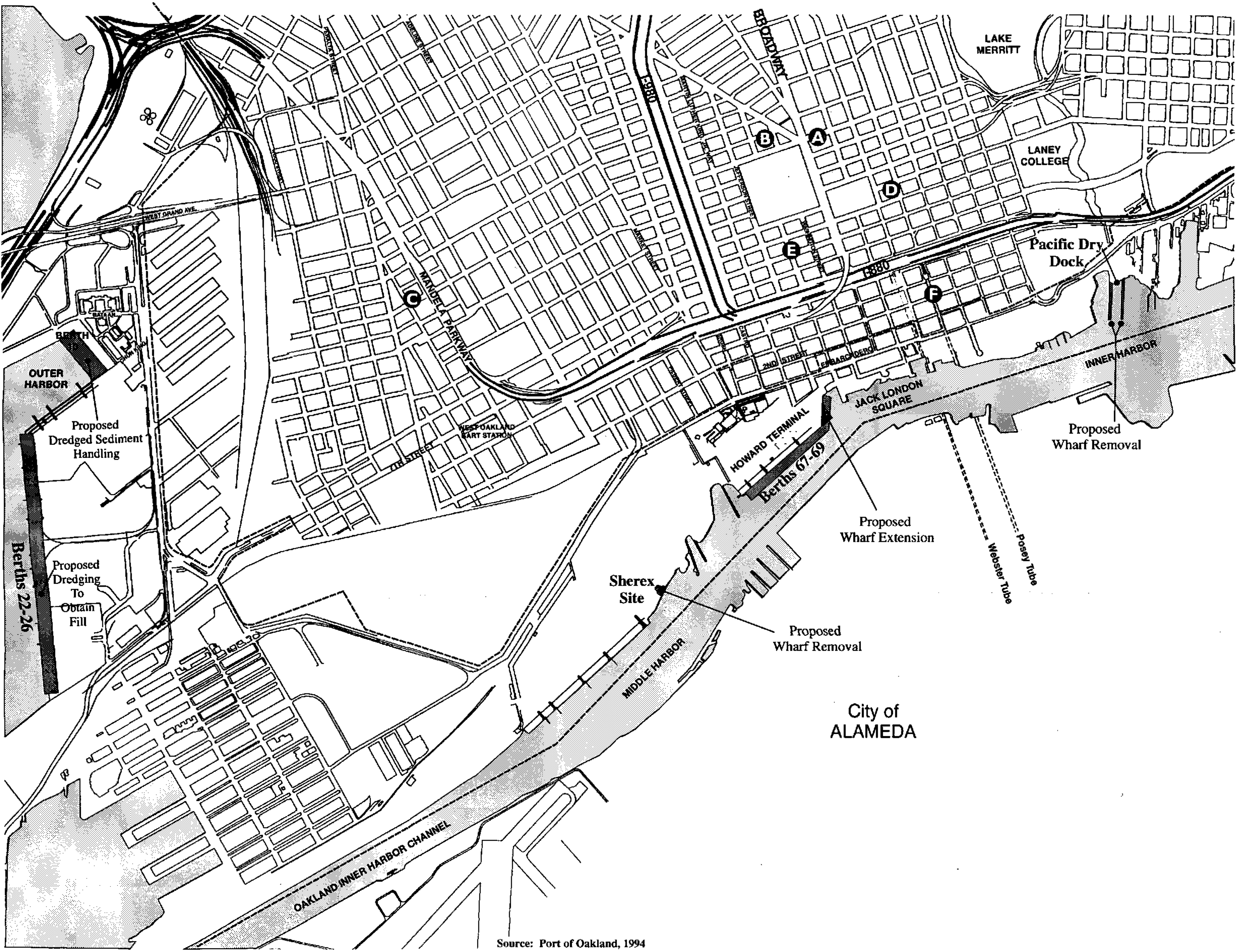

Source: Port of Oakland, 1994

Figure 2

Project Vicinity

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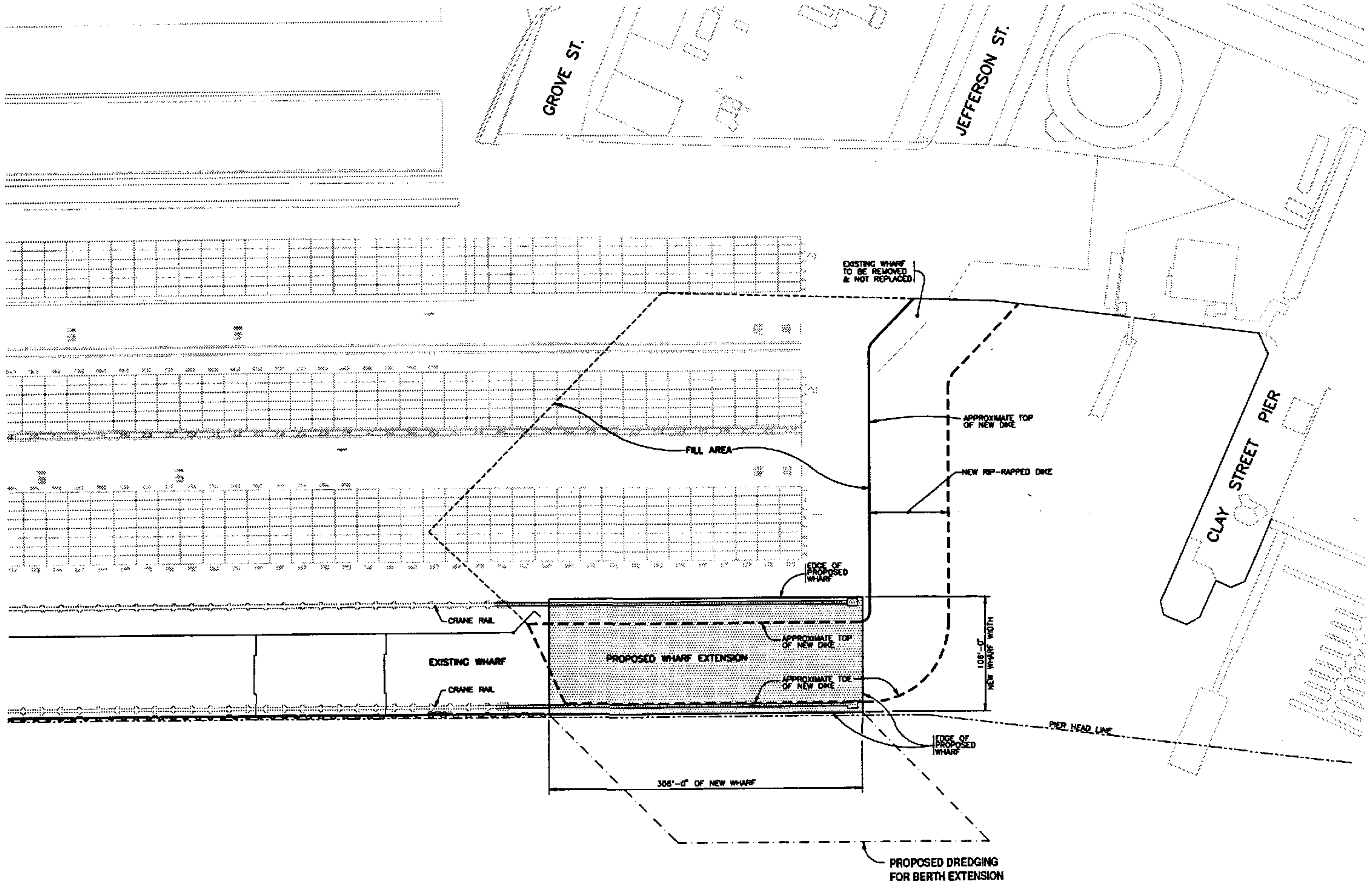
Figure 4

Proposed Project



Source: Port of Oakland, 1994

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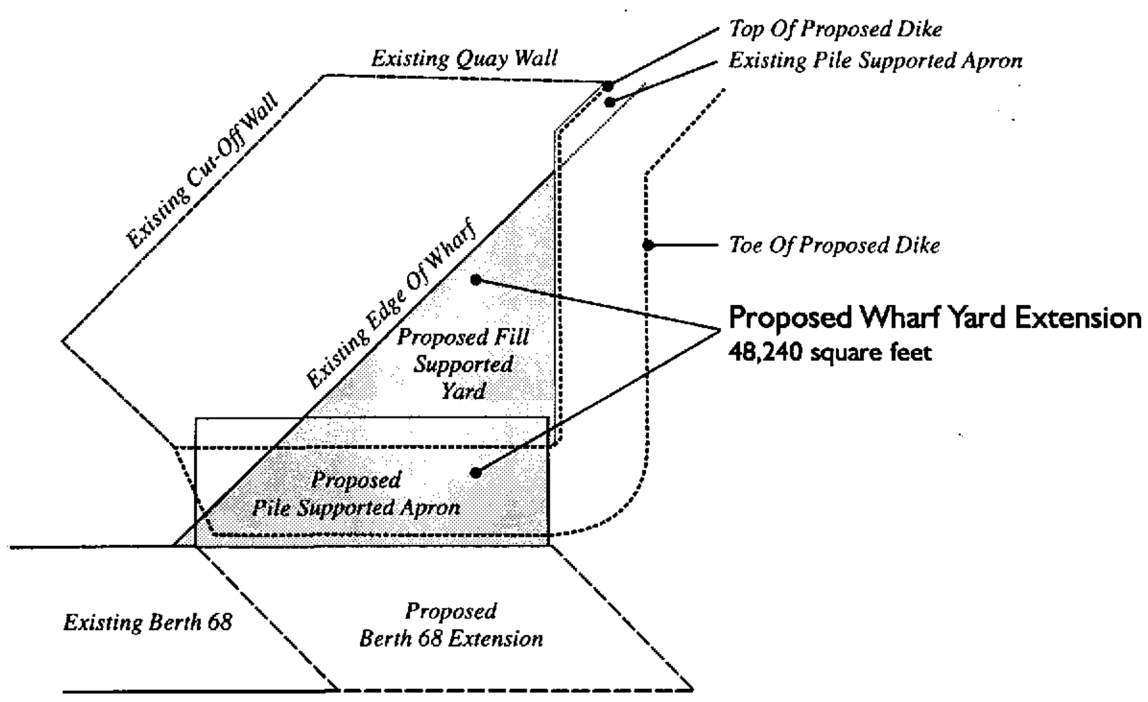
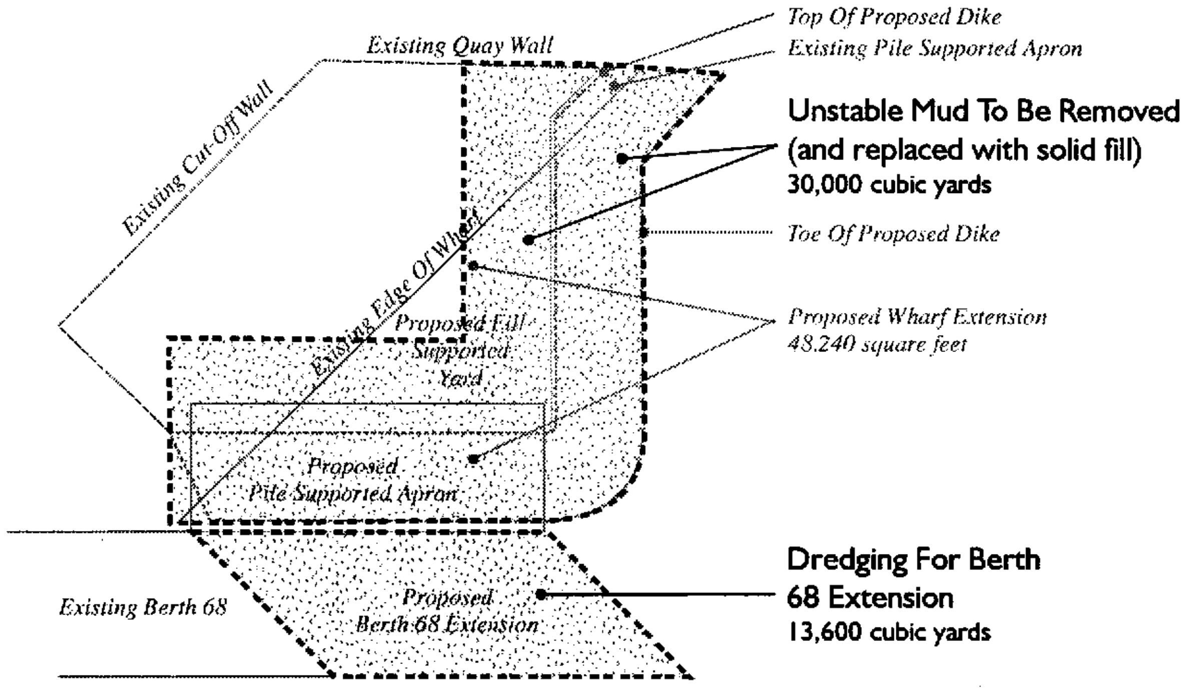
Figure 5

Proposed Fill and Dredging - Plan Views

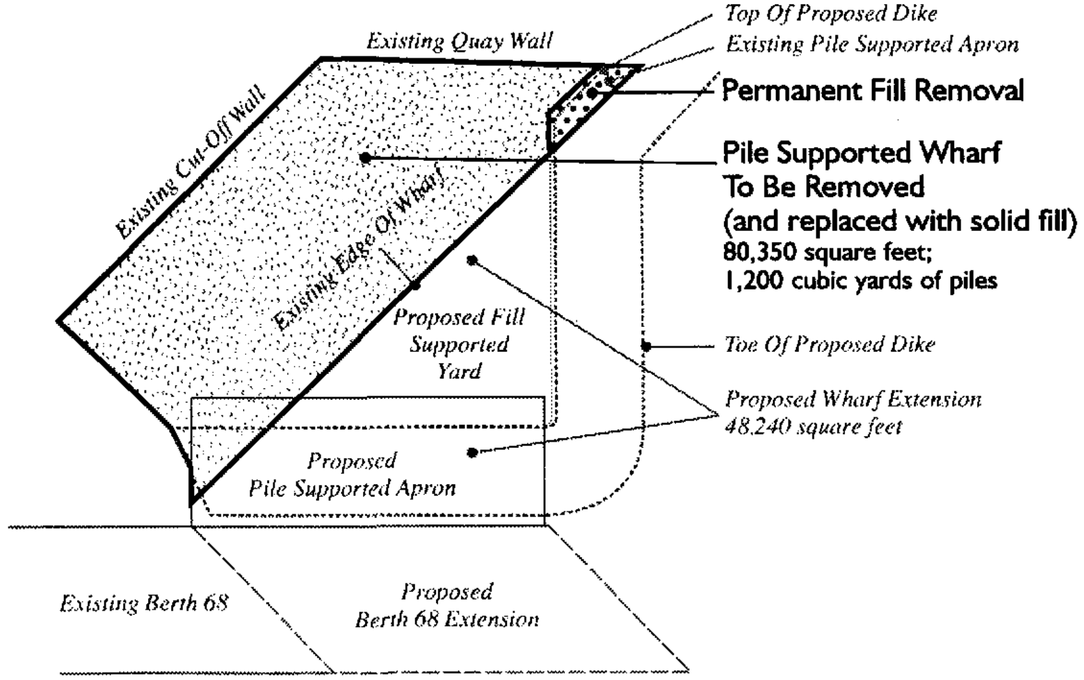
Wharf Extension Details



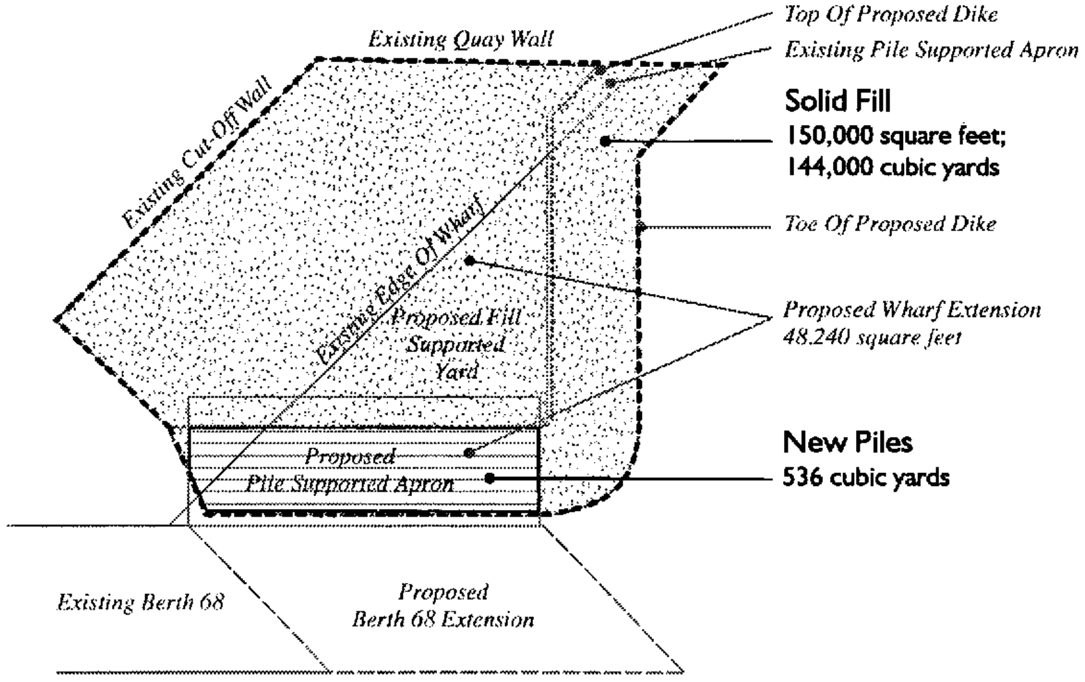
Areas To Be Dredged



Structures To Be Removed



Area To Be Filled



0' 100' 200' 400'

Source: Brady and Associates, 1994

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- Grading, paving, lighting and striping the wharf and upland area for terminal use.

Tables 3 and 4 summarize dredging and filling at Howard Terminal, and wharf removal at the Sherex and Pacific Drydock sites.

A clamshell dredging machine would be used for the dredging. (A clamshell is a bucket with two hinged jaws.) The dredged mud would be placed on barges and transported to an upland handling facility, as described below under "Dewatering and Disposal of Dredged Sediments." After the rehandling facility is filled, dredging would stop and other construction tasks would be completed while the dredged sediments are dewatered and hauled to landfills.

The project is anticipated to take a total of approximately eight to nine months. It is anticipated that the setup and demolition would take eight weeks, dredging two weeks and filling four weeks. The pile driving would then last up to three to five weeks. Construction of the concrete wharf would take about three months.

Piles would be driven with a 160,000-foot pound diesel hammer. It would typically operate from 7:00 a.m. to 3:30 p.m. Monday through Friday, but may operate during other hours if it becomes necessary to meet the construction schedule. Pile driving is expected to take up to six weeks.

During construction there would be 20 to 50 construction workers on the site per day. Workers would normally enter the site between 6:30 and 7:00 a.m. and would leave the site between 3:30 and 4:00 p.m. Some dirt would be hauled for on-site fill, aggregate base, asphalt, etc. Construction debris would be disposed of at Vasco Road, Redwood, Keller Canyon or Forward Landfill.

The wharf extension would increase the number of vessel calls at Howard Terminal by an average of one vessel per week. This would increase loading and unloading activity. The terminal has 12 lanes for processing trucks (8 lanes in-bound and 4 out-bound, with two reversible). At peak in-bound hours, 8 lanes are set up for trucks going into the terminal. Peak activity would be 120 transactions per hour (65 out, 55 in). Activity levels would peak in September through November and on Wednesday through Saturday. Employment at the terminal would be 82 when one vessel is in port, and 122 when two are in port.

Table 3
VOLUME OF DREDGING AND PILE REMOVAL

Project Component	**Dredging or Pile Removal (cubic yards)**	**Fill Placement (cubic yards)**	**Net Change (cubic yards)**
Dredging for new wharf	30,000		
Dredging to extend Berth 68	13,600		
Total dredging at Howard Terminal	43,600		
Filling to support new wharf		144,000	
Removing old piles from under Howard Terminal	1,200		
Placing new piles under portion of wharf extension		536	
Net Changes at Howard Terminal	**42,400**	**144,536**	**+102,136**
Removing piles at Sherex Site	127		
Removing piles at Pacific Dry Dock	693		
Off-Site Pile Removal	**820**		**- 820**
Total Net Change	**43,220**	**144,536**	**+101,316**

Table 4
AREA OF DREDGING, FILL AND WHARF REMOVAL

Project Component	**Dredging or Wharf Removal (square feet)**	**Fill Placement (square feet)**	**Net Change (square feet)**
Filling to support wharf extension		150,300	
Removing pile-supported wharf	80,350		
Net Changes at Howard Terminal	**80,350**	**150,300**	**+ 63,650**
Removing wharf at Sherex Site	13,590		
Removing wharf at Pacific Drydock	33,000		
Net Changes Off-Site	**46,590**		**- 46,590**
Total Net Change	**126,940**	**150,300**	**+ 17,060**

2. Transporting, Dewatering and Disposal of Dredged Sediment

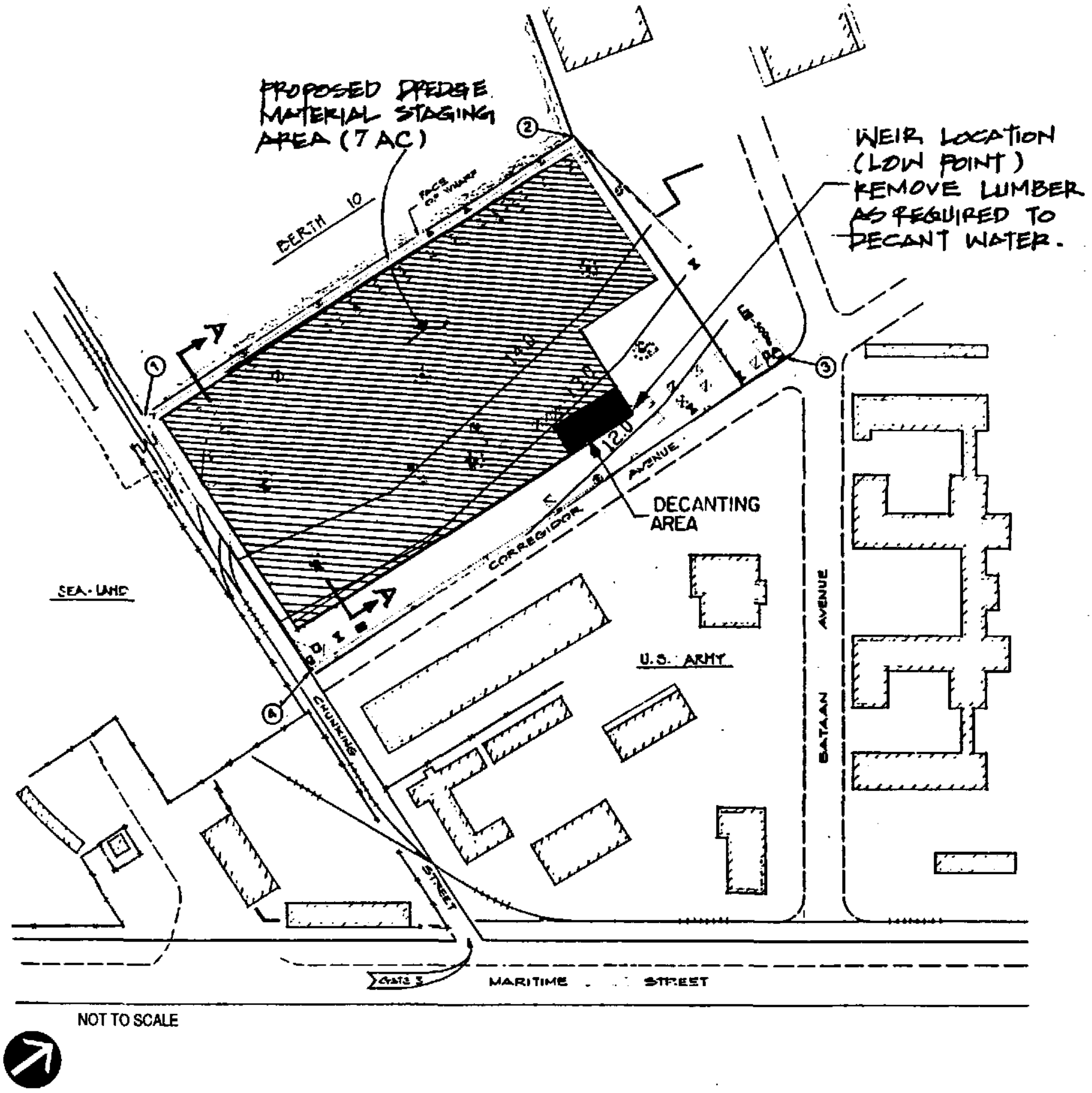
a. Transporting Dredged Material to the Handling Facility. Three barges would operate at once to transport dredged mud to the handling facility, which is described below. Each barge would have a capacity of 2,000 cubic yards. A tug boat would push each filled barge from Howard Terminal to the handling facility at Berth 10, where the barge crane would unload the dredged material. The tug boat would then return the empty barge to Howard Terminal to be refilled. An on-site front loader would distribute the material on the site.

b. Construction and Operation of the Handling Facility. The Port proposes to build a handling facility on seven acres of wharf and upland, at Berth 10 (Figure 6). The dewatering area would cover about half of Berth 10. About half of this area would be on pile-supported concrete wharf, and half would be on asphalt-covered land. The facility would have a capacity of 31,500 cubic yards of wet dredged material (about 50 percent water), which would be 21,000 cubic yards of dewatered sediments.

The Port would build a perimeter berm four feet high, composed of either a geotextile tube filled with dredge material or a three-foot modified concrete K-rail with a 12-inch by 2-inch board attached to the top. The type of berm used would depend on the preference of the Regional Water Quality Control Board (RWQCB), cost, and ease of operation.

The asphalt would be sealed, and a pit would be excavated for backhoe operation. Storm drains in the dewatering area would be covered, and low wiers would be built around those near the site. A barge-mounted crane would remove dredge material from scows and place it into the drying yard. A tractor would distribute material in the yard. Solids would be worked toward the unloading area.

Two weirs would be built at the low portion of the site. Water would pool behind the weirs, then spill over them and through geotextile screens. The water that has passed over and through the wiers would be tested, and treated if necessary, before being discharged into the Bay. If the water cannot be adequately treated on-site, it will be hauled to a Bay Area wastewater treatment facility that is permitted for this type of wastewater.



Source: Port of Oakland, 1994

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Terminal Extension
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Port of Oakland

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FIGURE 6
Proposed Upland Rehandling Facility for Dewatering Dredged Sentiments

3. Public Access

Due to safety concerns, it is not possible to provide public access on Howard Terminal. Therefore, as part of the wharf extension project, the Port proposes to provide new and improved off-site public access areas. The new public access would be a public walkway around the harbor side of Shenanigan's restaurant at Jack London Village connecting existing public access walkways on both sides. Public access would be improved along the existing path from Alice Street south to Estuary Park. Educational exhibits would be placed on the FDR Pier to facilitate viewing of activities on Howard Terminal. These improvements are illustrated and further described in Chapter V, Section M, Public Access and Recreation.

4. Wharf Removal

As an environmental enhancement, the Port proposes to remove the two long finger piers totalling 33,000 square feet of wharf area at the Pacific Drydock site, and to remove all the wharf area totalling approximately 13,600 square feet of wharf at the Sherex site, and about 2,000 square feet at the project site that will be removed and not replaced (Figure 5). This action is not required to mitigate biotic impacts of the proposed project, as explained in Chapter V, Section K of this report. However, it is required to meet permit requirements of the San Francisco Bay Conservation and Development District (BCDC) and the U.S. Army Corps of Engineers.

D. Background

The Howard Terminal was extensively reconstructed in the 1980s to convert it from a break-bulk terminal (cargo shipped on pallets or as bulk commodities) to a container terminal. At that time, the shoreline of the terminal was straightened using fill material, some structures were removed to clear a large space for a container yard, the container yard was paved, and two shipping cranes for containers were installed. There are now four cranes on the terminal. The Howard Terminal consists of three berths: Berths 67 and 68 which have a combined wharf length of about 1,640 feet and Berth 69 which is about 560 feet long. Presently, Berths 67 and 68 can accommodate two ships. Berth 67 can accommodate one new generation container ship up to 900 feet long and Berth 68 can accommodate one smaller ship up to 600 feet long. Berth 69 is being used for tugboat mooring. New generation vessels call frequently at the terminal, and when schedules for two such vessels overlap, the second vessel stands by in the Bay until the appropriate wharfage is available. Berths 67 and 68 are currently maintained at a depth of -42 feet Mean Lower Low Water (MLLW) plus 2 feet of over-dredge.

The transit shed at Howard Terminal was constructed circa 1929 as a "state-of-the-art" break bulk facility with split-level floors of offices to house the newly formed Port of Oakland Commission. Port offices were relocated in the 1960s and the space was never reused as access is restricted to maintain terminal security. The containerization of the shipping industry has left the transit shed vacant most of the time. The western corner of the shed is used as a maintenance shop, and this function will be relocated as a related project. The building may be eligible for listing on the National Register of Historic Buildings, as described in the Historic Resources, Section A of Chapter V.

The shoreline under the building and between the building and the Franklin Delano Roosevelt Pier (FDR Pier) at the foot of Clay Street to the east is made up of a quay wall. The quay wall also provides the primary support for the front wall of the building structure. The quay wall, a large concrete "gravity type" retaining wall, extending east from Myrtle Street to Clay Street, has functioned as the land/water interface since it was constructed circa 1910. Little was known of the condition of the quay wall until explorations after the Loma Prieta Earthquake in 1989 revealed extensive cracking and settling at the front wall of the building.

The pilings under the building and wharf aprons east and south of the building were damaged in the Loma Prieta earthquake. The building itself sustained minor visible damage; however, the piling supports and the quay wall have responded independently, severely cracking the quay wall and causing the Port Engineer to designate the building "unsafe". The Federal Emergency Management Act (FEMA) funded the pile repair project. The funding did not provide for an upgrade to modern construction or seismic standards, but only to support the original design load of the wharf of 600 pounds per square foot. Since marine terminal operations today routinely require a loading capacity of 1,000 pounds per square foot, work must be undertaken to improve all areas which would be used for stacking and storage.

Chapter IV
CONTEXT OF LOCAL AND REGIONAL PLANS AND POLICIES

■ ■ ■

A. Background

Public policy regarding land use in the Port of Oakland is expressed in adopted plans and other official documents. In this section the proposed project's consistency with a number of land use planning policies and regulations is evaluated. The following documents are discussed:

- Port of Oakland Business and Policy Plan
- Oakland Comprehensive Policy Plan
- Alameda County Airport Land Use Plan
- San Francisco Bay Conservation and Development Commission (BCDC) San Francisco Bay Plan and Amendments
- BCDC/Metropolitan Transportation Commission (MTC) Seaport Plan

The proposed project raises a number of policy issues; of these the most significant include the following:

- Bay fill and dredging;
- Visual quality and public access;
- Preservation of cultural resources; and
- Consistency with local and regional plans, policies and regulations.

B. Local and Regional Planning Documents

1. Port of Oakland Business and Policy Plan

The City of Oakland has operated a public harbor since the City was incorporated in 1851. Exclusive control and management of the Port were delegated to the Board of Port Commissioners in 1927 by an amendment to the City Charter. The Board consists of seven members appointed for four-year staggered terms by the City Council upon nomination by the Mayor, as provided in the Charter.

Under the Charter, the Port is an independent department of the City. The Board has exclusive control and management of the Port area, all Port facilities and property, real and personal, all income and revenues of the Port, and proceeds of all bond sales initiated by it for harbor or airport improvements or for any other purposes. The Board also has exclusive land use authority over all lands under Port jurisdiction as shown in Figure 2. The Charter establishes the general land uses appropriate to the Port area. These uses include maritime, commercial, and airport uses. Prior to the approval of any project, the Board reviews its consistency with the overall provisions of the Charter. In addition, the Port reviews and approves all construction in the Port area prior to City issuance of any Building Permit. On land it owns, the Port further specifies uses and conditions in leases. The Port generally approves only uses related to aviation and maritime activities and commercial development, except in its business park and certain other commercial areas.

In 1968, a Master Development Plan commonly referred to as the Shore Plan was prepared for the Port of Oakland. The plan was not adopted by the Board, but many of the policies were reflected in the Oakland Comprehensive Plan. The Port publishes and updates a Business Plan, which includes goals and objectives and strategies to achieve those goals. The Port's 1993-94 Business Plan includes a summary of the Maritime Capital Improvement Program (CIP) planned projects. The largest category is Expansion or New Capacity projects. Projects in this category expand the physical plant of the Port to provide additional cargo capacity or improve existing cargo operations. The Howard Terminal Extension project is consistent with this goal and objective.

2. Oakland Comprehensive Policy Plan

The City of Oakland Comprehensive Plan serves as the City's General Plan. It was adopted in 1972 and updated in 1980 when the Land Use Element was adopted. The City is currently in the process of updating the Comprehensive Plan, including an historic preservation element.

The Oakland Policy Plan, the major component of the City's Comprehensive Plan, is the City Council's comprehensive statement of basic goals and policies. The Policy Plan expresses the City Council's intentions and guides its decisions on specific projects and actions. It also guides the actions and programs of City departments and agencies and assists citizens in participating in the policy-making process. The Policy Plan gathers together in a single document all the policies contained in the functional elements of the Comprehensive Plan.

a. Land Use Designations. The City Comprehensive Plan includes a land use map that shows designations for allowable use of all land within the City. It designates land in the Howard Terminal and Berth 10 areas for industrial use, as shown in Figure 7.

b. Comprehensive Plan Policies. Comprehensive Plan policies help set the direction for Comprehensive Plan land use designations and zoning districts, and for development standards.

According to the Plan policies, Comprehensive Plan land use designations and zoning districts are to accommodate industry, a variety of housing densities, and adequate schools, parks, recreation, transit and shopping for residents. Land use designations are to provide for protection of Bay marshes, and recreational use of the waterfront.

The Comprehensive Plan provides guidance for the locations of land uses. Land is to be provided for uses related to the Port. The plan states that the circulation system must provide for the efficient shipping of goods and that marine terminal capacity should be developed consistent with City, regional and statewide benefits.

The Comprehensive Plan Land Use and Historic Preservation Elements contain newly adopted policies regarding preservation of older buildings relevant to the proposed project. The intent is that older structures should not be torn down simply because they are old. The relevant policies are as follows:

(1) Land Use Element, Policies of Urban Design and Preservation.

Policy 4: Every effort should be made to preserve those older buildings, other physical features, sites, and areas which have significant historical, architectural, or other special interest value.

The proposed project would be inconsistent with this policy because the project plans include demolition of the transit shed built in 1929.

(2) Historic Preservation Element.

Policy 3.6: City-Sponsored or Assisted Projects. To the extent consistent with other Oakland General Plan provisions, City-sponsored or assisted projects *involving an existing or Potential Designated Historic Property, except small-scale projects will: (a) be selected and designed to avoid or minimize adverse effects on these properties and to promote their preservation and enhancement; (b) incorporate preservation efforts based in part on the importance of each property; and (c) be considered to have no adverse effects on these properties if they conform with the Secretary of the Interior's Standards for the Treatment of Historic Properties.*

The proposed project would be inconsistent with this policy because the project plans include demolition of the transit shed, which has an "A" (Highest Importance) rating with eligibility for the National Register of Historical Places as a "Landmark" and as a "Heritage Property". Historic Preservation for City sponsored projects is encouraged. Although measures to implement the Historic Preservation Element policies are in transition, every effort should be made to be consistent with these newly adopted (March 1994) public policies.[1] The Port would be required to make Findings of Overriding Considerations (CEQA, Section 15091) for the proposed project due to its inconsistencies with relevant historic preservation policies and the level "A" rating of the transit shed.

The Comprehensive Plan Land Use Element also includes policies regarding bay fill and public access to the shoreline relevant to the proposed project as follows:

(3) Policies Relating to the Natural Setting.

Policy 6: Bay fill should be undertaken only upon clear and convincing evidence that its benefits will outweigh its resulting environmental and other costs.

The proposed project is consistent with this policy. The project includes filling and dredging for the benefit of expanding Port operations, increasing its economic viability, and providing jobs. The Port proposes to offset adverse environmental effects by uncovering approximately 47,853 square feet of existing wharf and pilings from the Pacific Drydock and Sherex sites.

Policy 7: In the development of shoreline areas, every reasonable effort should be made to provide attractive public access to the waters edge.

The proposed project would be consistent with this policy. The Port is proposing improved public access along the Oakland shoreline.

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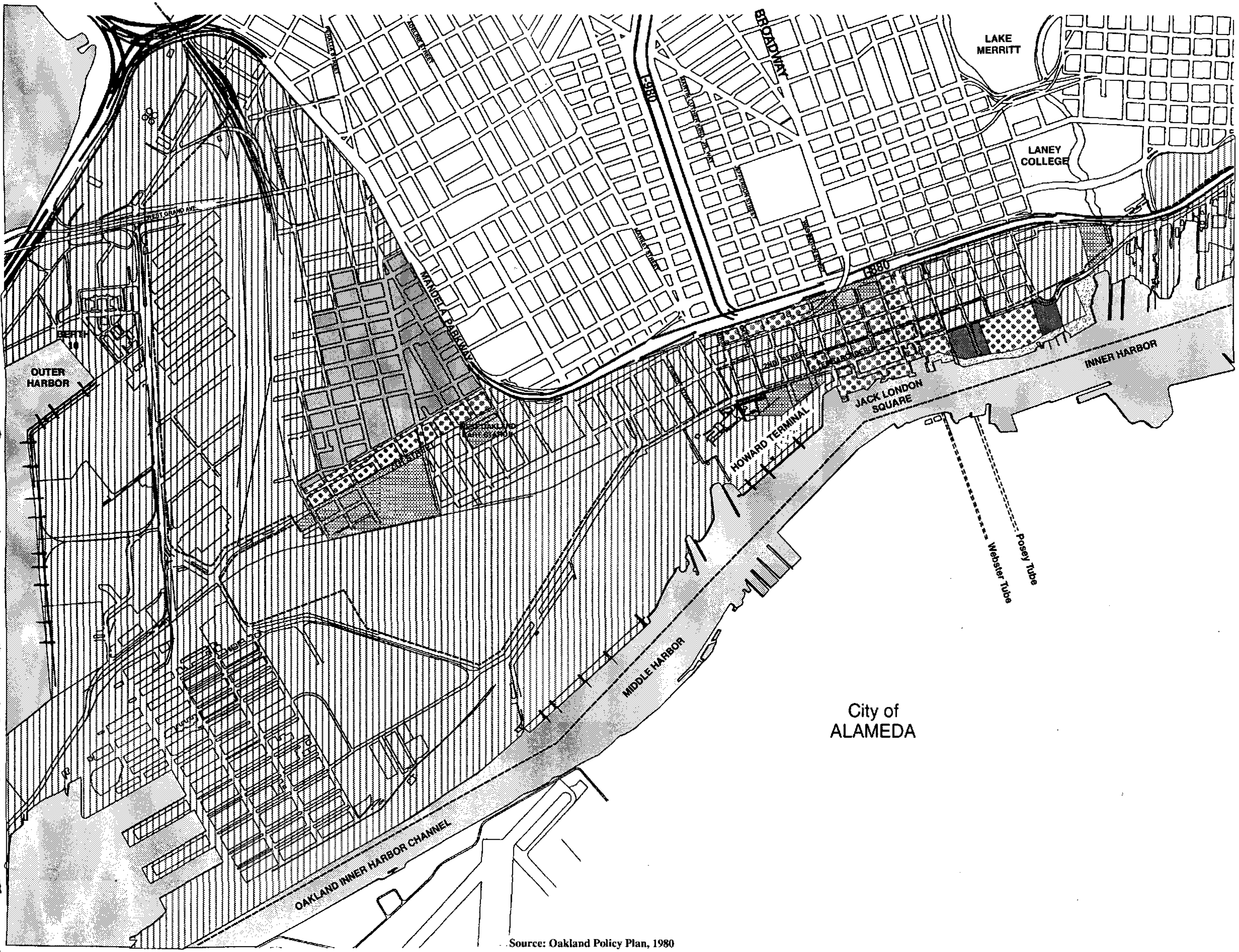
[1] Christopher Buckley, City of Oakland Planning Department, April 8, 1994.

Figure 7

City of Oakland General Plan Designations



Source: Oakland Policy Plan, 1980

LEGEND

▩	High Density Residential
▨	Low-Medium Density Residential
▦	Commercial
░	Park, Recreation or Natural Area
▥	Manufacturing or Wholesaling
▤	Instutional or Governmental

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Terminal Extension
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Port of Oakland

0' 450' 900' 1800'

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Finally, the Comprehensive Plan Land Use Element includes policies regarding industrial use. The policy relevant to the proposed project is as follows:

(4) Policies on Industrial Areas.

Policy 5: Marine and air-terminal capacity should be developed consistent with city, regional and state-wide benefits.

The proposed project is consistent with this policy. The project would be providing benefits on a local and regional economic level by providing expanded operations.

3. Alameda County Airport Land Use Plan

The Alameda County Airport Land Use Commission (ALUC) adopted the Airport Land Use Plan in July 1986. The intent of the Airport Land Use Plan is to assure compatible uses within the ALUC planning boundaries. Howard Terminal is located on the boundary of the outer portion of the ALUC Safety Zone for the Alameda Naval Air Station, which is scheduled for closure. The industrial use is a compatible land use under the plan; however, an issue of concern is crane height. The wharf extension would require existing cranes to move further down the wharf and be raised in height within the proposed extension area in order to load the larger ships docking at Berth 68. The wharf and the cranes appear to be located just outside the safety zone boundary and thus, consistency with the ALUC policies is not an issue. The Naval Air Station and the Federal Aeronautics Administration have approved the moving and enlarging of the cranes.

4. San Francisco Bay Plan

BCDC's San Francisco Bay Plan[2] designates the Howard Terminal site for Port priority use. One of the major objectives of BCDC is to ensure that all filling of the Bay is limited to the six high-priority, water-oriented uses identified in the McAteer-Petris Act, one of which is ports. In order to provide sufficient shoreline sites to accommodate these high-priority uses with the minimum fill necessary, the San Francisco Bay Plan provides that shoreline sites especially well-suited for these priority uses be reserved for such uses.

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[2] Adopted in January 1969, revised and amended through 1992.

The San Francisco Bay Plan includes a map note which states that the Outer, Middle and Inner Harbors within the Oakland-Alameda Port Area should be redeveloped for modern marine terminals. The San Francisco Bay Plan encourages the expansion of the Port of Oakland's maritime, water-related industrial, water-oriented recreation and public access uses. These uses include deepening the shipping channel; keeping and reserving land for water-related industry; providing new shoreline parks, beaches, marinas, fishing piers, scenic drives and hiking or biking paths; maintaining and adding wildlife refuges; and encouraging private investment in shoreline development.

a. Bay Fill Policies. Although the proposed fill is for a water-oriented use and would be located within a designated priority use area, BCDC law still requires that the fill proposed meet several additional tests. The fill must be "the minimum fill necessary." Further, there must be no alternative upland location for the use proposed on fill and the public benefits of the fill must outweigh its public detriments. The fill placed must also be safe from a seismic safety standpoint.

The project is consistent with BCDC fill policies. The fill proposed would be used to square off an existing wharf. The project would involve 144,000 cubic yards of fill plus 536 cubic yards of piling, but would include 43,600 cubic yards of dredging and 1,200 cubic yards of piling removal (Table 3). Thus, the net change at Howard Terminal would be 102,136 cubic yards of fill. This is the minimum fill necessary to support the wharf extension. A pile-supported wharf would lead to differential settlement, causing safety hazards and efficiency problems in terminal operations, as discussed in Chapter IV, Project Alternatives. The Port proposes to remove 820 cubic yards of piling at the Sherex and Pacific Drydock sites, for a net change to the Bay of 101,316 cubic yards of fill. In terms of area, fill would cover 150,300 square feet at Howard Terminal, but 46,590 square feet of wharf would be removed at Sherex and Pacific Drydock, for a net change to the Bay of 17,600 square feet of fill coverage.

In addition, the Port does not control any property at an alternative location to accommodate a new container berth. Chapter V, Section G, Geology, Seismicity and Soils discusses the seismic safety engineering criteria proposed by the Port.

b. Dredging Policies. On May 21, 1992, BCDC amended the Bay Plan dredging policies. The amended policies that are relevant to the proposed project are as follows:

Policy 1: Dredging should be authorized when BCDC can find: (a) the applicant has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose, (b) the materials to be dredged meet the water quality requirements of the San Francisco Bay Regional Water Quality Control Board, (c) important fisheries and Bay natural resources would be protected, and (d) disposal of dredged materials should be encouraged in non-tidal areas where the materials can be used beneficially, or in the ocean.

Policy 2: Disposal in tidal areas of the Bay should be authorized when the Commission can find that: (a) the applicant has demonstrated that non-tidal and ocean disposal is infeasible because there are no alternative sites available or likely to be available for use in a reasonable period, or the cost of disposal at alternate sites is prohibitively expensive; (b) disposal would be at a site designated by the Commission; (c) the quality and volume of the material to be disposed is consistent with the advice of the San Francisco Bay Regional Water Quality Control Board; and (d) the period of disposal is consistent with the advice of the Department of Fish and Game and the National Marine Fisheries Service.

Policy 3: When the annual amount of dredged material proposed to be disposed in tidal areas of the Bay exceeds the disposal volume targets, BCDC is guided by all relevant factors concerning the proposed projects, (including the need for the dredging and the dredging project, regional economic impact, environmental impact, and other regional effects of the project, and the economic feasibility of using alternate disposal sites) in determining which projects to authorize.

Policy 4: Disposal projects should maximize use of dredged material as a resource, such as creating, enhancing, or restoring tidal and managed wetlands, creating and maintaining levees and dikes, providing cover and sealing material for sanitary landfills, and filling at approved construction projects.

Policy 5: Once non-tidal or ocean disposal sites have been secured or designated, the maximum feasible amount of dredged material should be disposed of at non-tidal sites or in the ocean. Until non-tidal upland disposal sites are secured and ocean disposal sites designated, aquatic disposal in the Bay should be authorized at sites designated by the U.S. Army Corps of Engineers and BCDC. Dredged materials disposed of aquatically in the Bay, particularly at the Alcatraz Island disposal site, should be carefully managed to ensure that the amount and timing of disposal does not create navigational hazards, adversely affect Bay currents or natural resources of the Bay, or foreclose the use of the disposal site by projects critical to the economy of the Bay Area.

Policy 8: To protect underground fresh water aquifers: (a) all proposals for dredging or construction of work that could penetrate the mud "cover" should be reviewed by the Regional Water Quality Control Board and the State Department of Water Resources, and (b) dredging or construction work should not be *permitted that might reasonably be expected to damage an underground water reservoir.*

The proposed project could be viewed as consistent with these dredging policies. The project requires dredging of approximately 43,600 cubic yards, where 30,000 cubic yards is from dredging for the new wharf and 13,600 cubic yards is from dredging at the new berth. This dredging would enhance Port operations and provide efficient services to the shipping industry along the waterfront. The dredge sediments are proposed to be disposed of at an authorized landfill site. The project also includes deepening Berths 22, 23, 30 and 67 to two feet below the currently permitted maintenance depth, to provide Merritt sand fill for the project and provide a needed safety margin of depth at the berths. The current permit on depth is -42 feet plus two feet of overdredge; the project would dredge these berths to -44 feet plus two feet of overdredge. To offset the dredging and fill effects, the Port proposes uncovering a total of approximately 46,590 square feet of existing wharf and piling areas from the Sherex and Pacific Dry Dock sites.

c. <u>Safety of Fills Policies</u>. The Bay Plan includes policies regarding the placement of fill in compliance with specific safety provisions due to the potential for earthquakes.

Policy 1: The Commission has appointed the Engineering Criteria Review Board consisting of geologists, civil engineers specializing in soils engineering, structural engineers, and architects competent to and adequately empowered to: (a) establish and revise safety criteria for Bay fills and structures thereon; (b) review all except minor projects for the adequacy of their specific safety provisions, and make recommendations concerning these provisions; (c) prescribe an inspection system to assure placement of fill according to approved designs; and (d) gather, and make available, performance data developed from specific projects. These activities would complement the functions of local building departments and local planning departments, none of which are presently staffed to provide soils inspections.

The proposed project would be consistent with this policy. The Port proposes approximately 144,000 cubic yards of solid fill, along with on-site and off-site pile removal reducing the net fill to 101,316 cubic yards. The Port will submit plans to BCDC's Engineering Criteria Review Board to review and approve the proposed placement of fill in the wharf extension area.

d. Port Policies. The Bay Plan includes policies regarding ports located along the Bay's shoreline. The port policies relevant to the proposed project are as follows:

Policy 1: Port planning and development should be governed by the policies of the Seaport Plan and other applicable policies of the Bay Plan. The Seaport Plan provides for:

> *(a) Expansion and/or redevelopment of Port facilities at Alameda, Benicia, Oakland, Redwood City, Richmond, San Francisco, and Selby;*
>
> *(b) Further deepening of ship channels needed to accommodate expected growth in ship size and improve terminal productivity;*
>
> *(c) The maintenance of up-to-date cargo forecasts and existing cargo handling capability estimates to guide the permitting of Port terminals; and*
>
> *(d) Development of Port facilities with the least potential adverse environmental impacts while still providing for reasonable terminal development.*

Policy 2: Filling and dredging will be required to provide for necessary Port expansion, but any permitted fill or dredging should be in accord with the Seaport Plan for assuring policy consistency.

Policy 3: Port priority use areas should be protected for marine terminals and directly-related ancillary activities such as container freight stations, transit sheds and other temporary storage, ship repairing, support transportation uses including trucking and railroad yards, freight forwarders, government offices related to the Port activity, chandlers and marine services. Other uses, especially public access and public and commercial recreational development, should also be permissible uses provided they do not significantly impair the efficient utilization of the Port area.

The proposed project would be consistent with these Port policies. The Port proposes the wharf expansion in order to meet the existing and projected needs of Howard Terminal and also to accommodate new generation ship size and provide additional cargo storage area.

e. Public Access Policies. The Bay Plan also includes policies regarding public access to the Bay. The public access policies relevant to the proposed project are as follows:

Policy 1: The maximum feasible access to and along the waterfront and on any permitted fills should be provided in and through every new development in the Bay or on the shoreline, whether it be for housing, industry, port, airport, public facility, or other use, except in cases where public access is clearly inconsistent with the project because of public safety considerations or significant use conflicts. In these cases, access at other locations, preferably near the project, should be provided whenever feasible.

The proposed project would be consistent with this policy. The Port proposes to provide improved public access along the Oakland shoreline near Alice Street because access into the operating terminal is unsafe.

f. Appearance, Design and Scenic View Policies. The Bay Plan also includes policies regarding appearance, design and scenic views of development around the Bay. The design policies relevant to the proposed project are as follows:

Policy 1: To enhance the visual quality of development around the Bay and to take maximum advantage of the attractive setting it provides, the Plan recommends that the shores of the Bay be developed in accordance with BCDC's Public Access Design Guidelines, 1986.

Policy 5: To enhance the maritime atmosphere of the Bay Area, ports should be designed, whenever feasible, to permit public access and viewing of Port activities by means of: (a) view points (e.g. piers, platforms, or towers), restaurants, etc., that would not interfere with port operations, and (b) openings between buildings and other site designs that permit views from nearby roads.

The proposed project would be consistent with these policies. The Port proposes to provide improved public access along the Oakland shoreline and provide improved viewing opportunity of the maritime activities and daily Port operations from the FDR Pier and surrounding area because of the removal of the transit shed.

5. BCDC/MTC Seaport Plan for the San Francisco Bay Area, 1982, revised 1989

The San Francisco Bay Plan adopted in 1969 included a policy calling for the preparation of a regional port plan. The Seaport Plan for the San Francisco

Bay Area is the result of a joint cooperative effort of the Metropolitan Transportation Commission (MTC) and BCDC. The Seaport Plan responds to State law requiring a maritime element to MTC's Regional Transportation Plan and to BCDC's 1969 Bay Plan policy that called for a regional port development plan. The Seaport Plan focuses specifically on marine terminals where the transfer of cargo is the primary activity of the business entity operating on the shore.

Under the policies of the Seaport Plan, BCDC and MTC, with the assistance of the Seaport Planning Advisory Committee, must periodically update the Seaport Plan to reflect new information obtained since the last major review. In 1988, revisions were drafted by the Seaport Planning Advisory Committee and referred to both commissions for review and adoption. After public hearings, both commissions adopted the proposed revisions. BCDC and MTC are currently in the process of updating the Seaport Plan;[3] however, the proposed changes have not been drafted and are unlikely to impact this project.

The Seaport Plan classifies proposed projects as either "major" or "minor marine terminal developments." Major marine terminal developments are conversions of non-container marine terminals to container marine terminals, significant major additions to capacity of any marine terminal or port priority use area, or developments involving more than a small amount of Bay fill.

Major marine terminal development must occur at those sites classified as near-term and active by the Plan. The long-term development sites and sites not designated in the Plan may be considered for development only after all the near-term sites have been permitted for use and those active, non-container terminals that can be converted to container terminals have been developed for container use.

The Seaport Plan found that channel deepening up to 45 feet is economically feasible for the Oakland Inner Harbor (west of the Webster Street Tube). The most cost-effective depth would be determined by the Army Corps of Engineers depending on the prevailing operating and market conditions at the time of the evaluation.

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[3] BCDC/MTC Seaport Plan: Prepared 1982; Revised 1988; Approved 1/4/89 & 3/16/89.

a. Marine Terminal Policies. The Seaport Plan includes policies regarding marine terminal use. The marine terminal policies that are relevant to the proposed project are as follows:

Policy 1: The need for a major development must be demonstrated in one of the following ways:

- *The development of new container terminal berths must be consistent with the baseline demand estimates using a lead time of six years measured from the filing of a BCDC permit application.*
- *The need for development of other types of marine terminal berths must be demonstrated by the project proponent, using the cargo forecasts, the demand estimates and other evidence as necessary. Lead time for such terminals shall be the time for project construction.*

Policy 6: To avoid unnecessary Bay fill and other adverse environmental effects, and to encourage prompt construction and full use of authorized facilities:

- *Ports are encouraged to cooperate, through agreements among themselves, to avoid facilities being proposed that duplicate needed capacity. If, however, two or more applications for marine terminals of the same type are being considered at the same time, and the need for all of them cannot be demonstrated, only those projects with the least adverse environmental effect on the Bay and that are needed may be authorized.*
- *All permits for marine terminals must contain a schedule that establishes: (a) a date prior to the commencement of construction by which the project sponsor must demonstrate the ability to finance the project; and (b) a reasonable timetable for project construction, including specific milestones.*
- *Whenever existing terminals remain unused or little used for a significant period of time following adoption of the Seaport Plan and whenever BCDC, in consultation with MTC, has determined that this indicates that a reevaluation of the cargo forecasts and region's capacity is necessary, no major new terminal development of the same type may be considered until the Seaport Plan has been promptly reviewed and, if necessary, revised in a timely manner to reflect the results of the reevaluation.*

Policy 9: To use existing terminals fully and to lessen the cost and adverse environmental effects associated with development to meet the growth of waterborne cargoes, the Seaport Plan states that:

- *channels that otherwise would limit the productivity of marine terminals should be deepened when economically feasible and environmentally acceptable;*
- *local governments should adopt and implement land use policies that facilitate terminal development on existing dry land;*
- *ports and terminal operators should acquire property that permits necessary terminal development on existing dry land;*
- *terminal operators should, where economically feasible, increase terminal productivity; and*
- *ports and terminal operators should rehabilitate or modernize existing container terminals that can be converted to container use before developing new container terminals.*

b. Deepwater Channel Policies. The Seaport Plan includes policies regarding deepwater channels of the Bay. The deepwater channel policies relevant to the proposed project are as follows:

Policy 10: Deepening or widening of San Francisco Bay Channels, including the San Francisco Bar Channel, should proceed only if economically justified or if needed for national defense, and if such deepening or widening conforms to State and national environmental law and policies. The interior channels of San Francisco Bay should only be deepened as consistent with the depth of the San Francisco Bar Channel.

Policy 11: Dredging projects must also be performed consistent with BCDC's Bay Plan policies on dredging and dredge material disposal.

The proposed project would be consistent with these Seaport Plan policies. The Port proposes the wharf expansion in order to meet the existing and projected needs of Howard Terminal and also to accommodate new generation ship size and provide additional cargo storage area. The Port will also submit dredging and fill plans to BCDC for review and approval.

C. Summary and Conclusions of Plans and Policies

1. Summary

According to the *CEQA Guidelines*[4], "a project will normally have a significant impact if it would conflict with adopted environmental plans and goals of the community where it is located." This would include the Port of Oakland policies, Oakland Comprehensive Plan, Alameda County Airport Land Use Plan, BCDC San Francisco Bay Plan, and BCDC/MTC Seaport Plan policies and regulations, as discussed above.

a. Port of Oakland Policies. The proposed project is consistent with the intent of the Port of Oakland policies and meets the Business Plan goal to "maintain the current level of business while existing facilities are upgraded and additional facilities are constructed for more efficient, productive and expanding operations by existing and new customers."[5]

b. Oakland Comprehensive Plan Conformity. The proposed project would be consistent with the current industrial land use designation of the site. It would be generally compatible with relevant goals and policies in the Plan. Project compatibility with other relevant sections of the Comprehensive Plan is discussed below.

(1) Preservation of Historic Structures. Under the *Land Use Element Policies of Urban Design and Preservation, Policy 4 and the Historic Preservation Element City-Sponsored or Assisted Projects, Policy 3.6,* the City is directed to make every effort to preserve older buildings and sites which have significant historical value. The demolition of the transit shed building would destroy a visible and tangible reminder of the historical development of the Port of Oakland. The first permanent offices of the newly formed Board of Port Commissioners were located within the upper floors of this shed and in those portions which were partially demolished in the early 1980s. In June of 1983, the remaining portion of the building was studied by City of Oakland staff and consultants as part of the Oakland Cultural Heritage Survey, at the direction of the State of California Resources Agency. As a result of the survey, the building was placed on the City of Oakland landmark preservation study list (with an "A" rating) because of the building's association with the economic and industrial past of Oakland, its architectural significance, and its association with local governmental history.

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[4] CEQA, Appendix G(a), Significant Effects.

[5] Port of Oakland. June 1993. Maritime Division Business Plan 1993-94, p 6-1.

The National Historic Preservation Act of 1966, through accountability of federal agencies in granting assistance to local agencies, and through the activities of the State Historic Preservation Officer (SHPO), seeks to preserve known historic buildings and places, whether on the national, State or local level. The federal project evaluation process (Section 106 of the Historic Preservation Act) will be required and a determination will be made by the U.S. Army Corps of Engineers. SHPO will still have to rule on the historical status of the building because of its inclusion on the City of Oakland landmark preservation study list, and will provide recommendations for mitigations as necessary.

Although the site and buildings are not listed on the National Register of Historic Places, the transit shed building appears to be eligible for inclusion in the Register. As discussed in Chapter V, Section A, Historic Resources, the site and buildings are considered to be historically significant. If the structure is found to have historical significance, SHPO is responsible for assisting the local agency in finding and/or adopting feasible measures to eliminate or mitigate the adverse effects. Section A of Chapter V includes recommended mitigation measures.

(2) Bay Fill. Under the *Policies Relating to the Natural Setting, Policy 6*, the Comprehensive Plan states that "fill should be undertaken only upon clear and convincing evidence that its benefits will outweigh its resulting environmental and other costs." The project is consistent with this policy. The economic costs and benefits of the project are described in Chapter V, Section B, Socio-Economics. The environmental impacts of the project and all setting and mitigation measures are described throughout this report.

(3) Public Access. Under the *Policies Relating to the Natural Setting, Policy 7*, the City is directed to make "every reasonable effort to provide attractive public access to the water-edge." Refer to the BCDC San Francisco Bay Plan discussion below.

(4) City, Regional and State-wide Benefits. Under the *Policies on Industrial Areas, Policy 5*, the project will provide benefits on a local and regional economic level by providing expanded operations. The economic costs and benefits of the project are described in detail in Section B, Socio-Economics.

c. Alameda County Airport Land Use Plan. The proposed project's extension of industrial use is a compatible land use under the plan; however, an issue of concern is crane heights. The wharf extension would require the existing crane to move further down the wharf within the proposed extension area in order to load ships docked at Berth 68. The wharf and the cranes are located just outside the safety zone boundary of Alameda Naval Air Station, which is on the base closure list. As the cranes move east, in the direction of the wharf extension, the distance to the base of the height restriction increases; therefore, with respect to air clearance, the facility is safer with the cranes further east.

d. San Francisco Bay Plan.

(1) Bay Fill Policies. San Francisco Bay Conservation and Development Commission (BCDC) policies require that the fill proposed be "the minimum fill necessary." The Port is considering the proposed project and one alternative. The proposed project involves removing a wharf area covering 80,350 square feet and 1,100 pilings. The proposed project would fill 144,000 cubic yards and dredge approximately 43,600 cubic yards. The pile-supported wharf alternative involves constructing the extension as a pile-supported concrete wharf.

The proposed project could be viewed as inconsistent with BCDC's policy requiring the minimum fill necessary because the pile-supported wharf alternative involves less fill. However, as discussed in Chapter VI, Project Alternatives, the pile-supported wharf alternative presents seismic safety issues. Any adverse effects of fill in the Bay would be mitigated by the removal of existing unused or under-utilized wharf structures in or over bay waters. The removal of the old pilings (cutting at mud line) will eliminate a continuing source of contamination from the exposed creosote surfaces of the piles.

The specific impacts of fill are a reduction in the volume of water in the Bay, covering of benthic (bottom) organisms, and changes in water circulation. The removal of existing unused or under-utilized wharf structures in or over bay waters would provide a mitigation for the impact on water volume. The impact and mitigation regarding benthic organisms is discussed in Chapter V, Section K, Biologic Resources. The effect on water circulation is described in Chapter V, Section J, Water Quality.

(2) Dredging Policies. Under the proposed project, 43,600 cubic yards of material would be dredged. Dredge material would be placed in an upland disposal site. The project is thus consistent with the dredging policies. One result of dredging is to increase the volume of water in the Bay by increasing the depth of the channel. Other impacts of dredging and mitigation are discussed in Chapter V, Section I, Sediment Quality.

(3) Public Access Policies. Public access would be improved at the end of Alice Street and thus the project is consistent with the Bay Plan policies regarding public access. The provision of public access at Howard Terminal is not appropriate due to the nature of the heavy equipment in use on the site and the hazardous conditions to the unwary visitor that result from normal operations at a container terminal. Public access issues are addressed in Chapter V, Section M, Public Access and Recreation.

(4) Appearance, Design and Scenic View Policies. The proposed project will require review by the BCDC Design Review Board (DRB), because of *Appearance, Design and Scenic Views, Policy 12*: *In order to achieve a high level of design quality, the Commission's Design Review Board, composed of design and planning professionals, should review, evaluate and advise the Commission on the proposed design of developments that affect the appearance of the Bay in accordance with the Bay Plan Findings and Policies on Public Access; Appearance, Design and Scenic Views; the General Development Guide; and the Public Access Design Guidelines. City, county, regional, state and federal agencies should be guided in their evaluation of Bayfront projects by the above guidelines.*[6] The DRB's relationship to the Commission is an advisory level where the DRB makes recommendations regarding bayfront projects within BCDC's jurisdiction. In order to achieve a high level of design quality, the DRB will review and evaluate the proposed design of the project in accordance with the Bay Plan findings and policies on Public Access; on Appearance, Design, and Scenic Views; and the Public Access Design Guidelines. The visual impacts of the proposed project are described in Chapter V, Section N, Visual Resources.

e. Seaport Plan for the San Francisco Bay Area. The proposed project is also consistent with relevant policies of the Seaport Plan. The project involves a minimum amount of fill to create a new container terminal. The need for the terminal is demonstrated by the fact it has been leased to a terminal operator and it is consistent with the baseline demand estimates.

2. Conclusions

The proposed project is consistent with all public policy to the extent possible with the exception of the Historic Preservation policies.

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[6] BCDC, San Francisco Bay Plan, Policy 12, p 30.

Chapter V
SETTINGS, IMPACTS AND MITIGATION MEASURES

■ ■ ■

A. Historic Resources

1. Setting

Maritime uses along the Oakland waterfront have evolved over the past century, from piers serving break-bulk cargo to modern container terminals. The proposed wharf extension is part of the continuing evolution of Howard Terminal.

a. Historic Context of the Grove Street Pier. The remnant of the Grove Street Pier comprises the eastern end of Howard Terminal. This pier, including the transit shed, was part of a large concrete pier built in 1926-28 by the Port of Oakland for use as a break-bulk terminal. The Port demolished portions of the pier and shed in 1980-81 when Howard Terminal was constructed.

The primary historic context for assessing the significance of the Grove Street Pier is the development of municipal port facilities in Oakland in the early 20th century. Secondary contexts include general shipping and port activities on San Francisco Bay. Oakland's most intensive periods of port development occurred between the years of 1910 and 1941 and after 1962.

(1) Overview of Port Development on San Francisco Bay. San Francisco's rise as a port began with the Gold Rush. Major construction projects included the Ferry Building (1895-1903) and several dozen piers and transit sheds (1908-1936). The first transcontinental railroad line was built into Oakland in 1869. By 1910, Oakland was served by two transcontinental lines and a branch line of a transcontinental line terminating in Richmond. Oakland, Richmond and other cities began port development in anticipation of the completion of the Panama Canal in 1914. By the 1930s, Oakland was a cargo port second only to San Francisco.

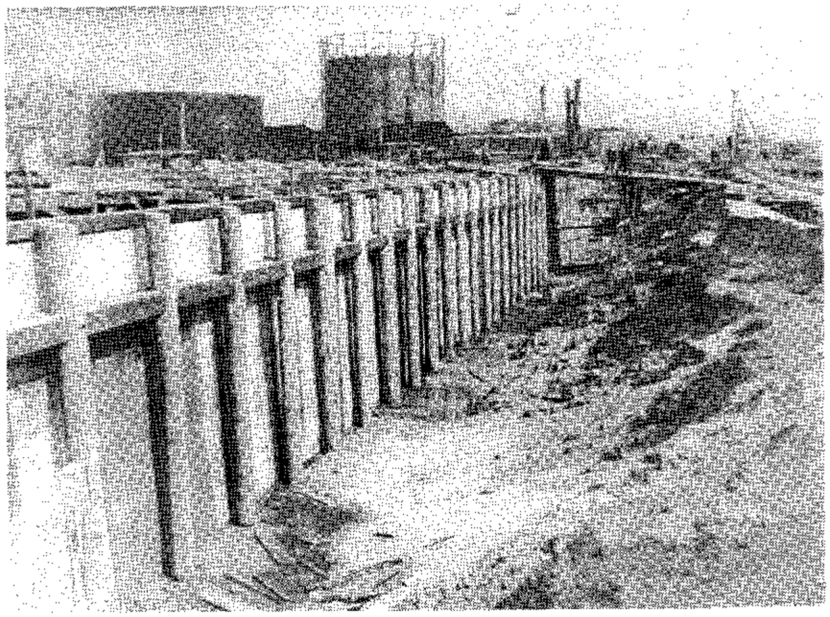
(2) The Era of Monopoly: 1852-1909. Horace W. Carpentier and the Carpentier partnership with Central Pacific Railroad and its successor Southern Pacific, controlled Oakland's early waterfront development. Carpentier acquired the townsite, and secured legislation in 1852 incorporating the Town of Oakland and giving Carpentier the exclusive right to build wharves, docks and piers in the town. In 1854, Carpentier helped to have the town reincorporated as a city and became its first mayor. During the 1850s, Carpentier built wharves at the foot of Broadway, Webster and Washington Street.

In 1868, Carpentier formed the Oakland Waterfront Company in partnership with the Central Pacific Railroad and transferred his waterfront land to the new company. Transcontinental rail service began in 1869 along Seventh Street. In 1870 a freight line opened along First Street and the Seventh Street line was used for passengers. Central Pacific built the Long Wharf in 1870-71. With the arrival of railroads, Oakland began exporting agricultural and timber products to many parts of the world.

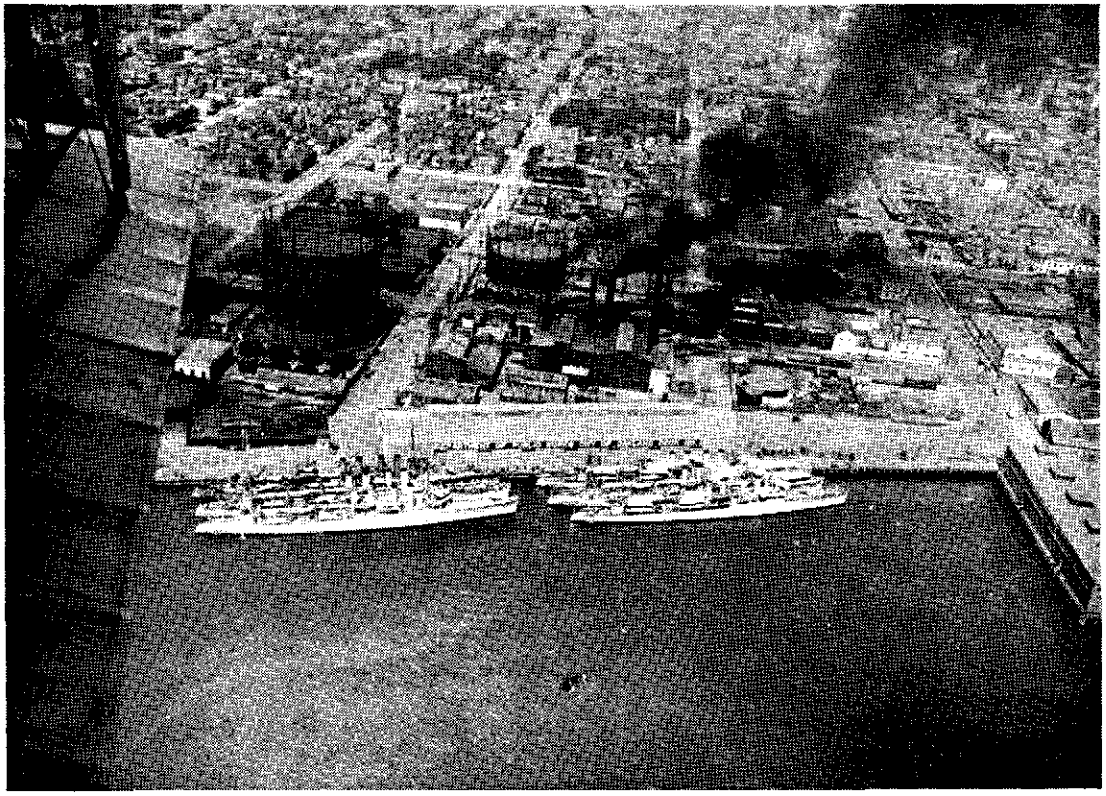
In the 1870s, federal harbor improvements including jetties and channels were made, and the first city-owned wharf was built between Franklin and Webster Streets. Lumber yards and fuel-feed depots, many equipped with wharves, proliferated along the Estuary, lining the waterfront from Market Street to the Lake Merritt slough by 1900.

(3) The First Phase of Municipal Control: 1910-1925. By 1910, Oakland was served by three transcontinental rail lines (Southern Pacific, Santa Fe, and Western Pacific). The waterfront underwent intensive industrialization during World War I and the 1920s as Oakland became a major exporter of manufactured goods and processed foods. From 1905 to 1931, Oakland undertook an ambitious public improvement program including the beginnings of a municipal port. After the 1906 earthquake, many vessels were diverted from San Francisco to Oakland. Between 1909 and 1911, the City took control of the waterfront through litigation, negotiation, annexation and conveyance. By the mid-1920s, city-owned port facilities included wharves on the western waterfront, and piers, transit sheds and a quay wall on the Estuary.

The first two projects were the Livingston Street Pier, a reinforced-concrete pier, and a bulkhead with wharves on the western waterfront. The most costly project was the quay wall (Figure 8, Photo 1), a concrete seawall/dock on the Estuary waterfront between Filbert and Clay streets. The sediments from dredging a shipping channel were used to create land behind the quay wall, and a transit shed was built along the quay wall between Grove and Jefferson



1. View of quay wall (1910-14) under construction, looking east from vicinity of Market Street, c. 1911.



2. Aerial view showing eastern end of quay wall and Municipal Dock No. 1, c. 1918. The transit shed extends between Grove and Jefferson streets. This site was redeveloped in the 1920s as the Grove Street Pier.

Source: Port of Oakland.

FIGURE 8

Quay Wall, 1911 and 1918

Streets in 1915. This facility was known as Municipal Dock No. 1 (Figure 8, Photo 2). A wharf and transit shed were built at the foot of Clay Street in 1917-18, and the Market Street Pier with a large transit shed was built in 1923-24 (Figure 9, Photo 1).

The City leased Market Street Pier facilities to the V.O. Lawrence Company for general cargo, City Wharf No. 1 to Albers Milling Company (which became a Carnation subsidiary in 1929) for grain distribution, a new wharf and concrete-reinforced transit shed to the Parr Terminal Company for oil tankers, and a facility at the foot of Filbert Street to the Howard Company for coal and later general cargo. Albers built a reinforced-concrete mill building with an attached wood frame warehouse (Figure 9, Photo 2).

(4) The Port of Oakland: 1926-1961. The 1920s saw a doubling of shipping in San Francisco, and many vessels were diverted to ports in the East Bay. Between 1915 and 1925, the number of vessels arriving on the Oakland waterfront increased fivefold. In 1924 the city appointed a board of engineers to formulate a long-rang plan for port development. The *Report on Port of Oakland*, completed in 1925, recommended a long quay wharf with transit shed at the end of Fourteenth Street, two wide piers with U-shaped transit sheds at the foot of Grove/Jefferson Streets (now part of the present Howard Terminal) and Clay/Washington Streets, and a large pier with a U-shaped transit shed at the foot of Thirteenth/Fourteenth avenues. The report also recommended that port management be vested in a board or commission.

The Board of Port Commissioners, composed of five city businessmen, took office in 1925 and became permanent under a charter amendment in 1926. The board's jurisdiction, known as the Port of Oakland, was an independent arm of the city with the power to build, equip, maintain and operate port facilities. Revenues generated by the Port were under the control of the board.

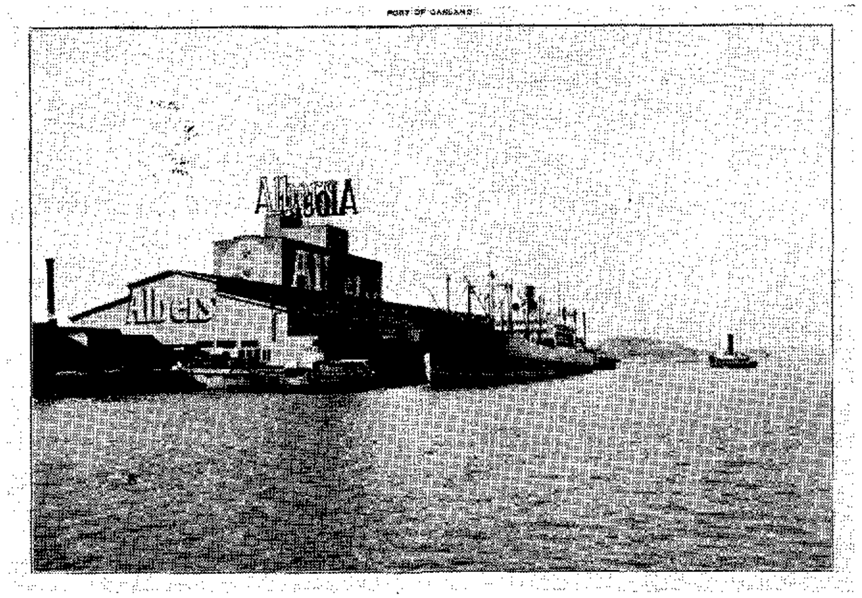
Between 1926 and 1931, the Port of Oakland built most of the improvements recommended in the report, along with the Ninth Avenue Pier and transit shed, the Oakland Airport, and other facilities (Figure 10). The wharves and piers had reinforced-concrete decks with perimeter wood aprons, and were supported by reinforced concrete, concrete-jacketed and creosoted timber piles. The transit sheds were steel frame and reinforced concrete (except the Inland Waterways Terminal, which had corrugated iron siding). The transit sheds had dignified, carefully composed fronts closely resembling one another.

For its first 30 years, the Port operated most of its cargo handling facilities but leased out most of its warehouses. Two such leases were to a dried fruit

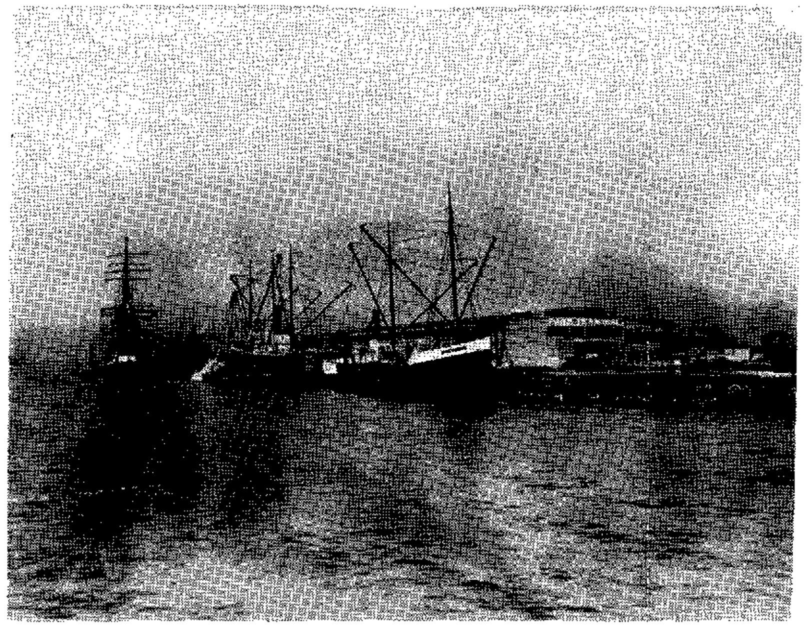
Figure 9

Municipal Port Facilities 1910 - 1950s

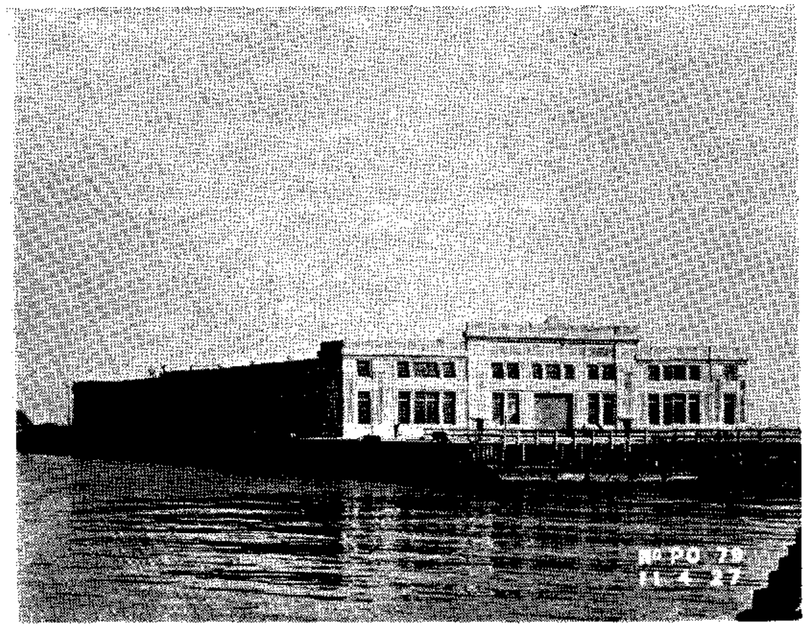
1. Market Street Pier, 1923-24. Demolished 1979-80. View looking southwest, April 1928.



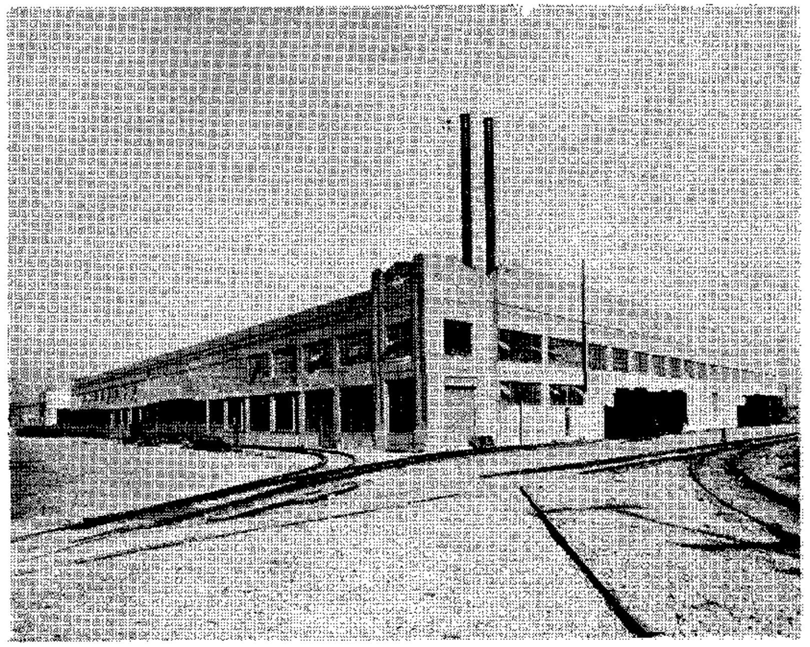
2. Albers Milling Company Mill and Warehouse, 1916-18. Demolished 1988. View looking west, 1922.



3. Parr Terminal, 1918-20. Demolished 1975. View looking north, 1922.



4. Wharf and Transit Shed No. 1, Fourteenth Street Unit, Outer Harbor Terminal, 1926-27. Demolished 1976. View looking north, November 1927.



5. Wharehouse "A," Fourteenth Street Unit, Outer Harbor Terminal, 1928-29. Demolished Circa 1978. View looking northeast, Circa 1929.

6. Inland Waterways Terminal, 1931. Demolished Circa 1959. View looking south, 1950's. (Courtesy of Oakland History Room; Oakland Public Library.)

Source: Port of Oakland, except where noted.

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ENVIRONMENTAL IMPACT REPORT
Port of Oakland

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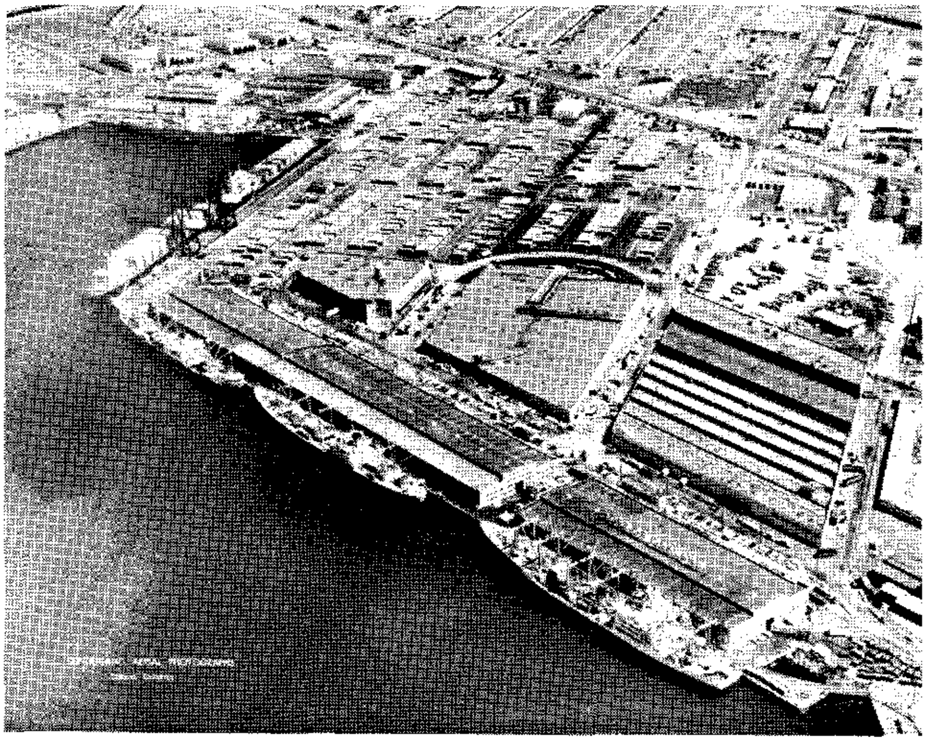
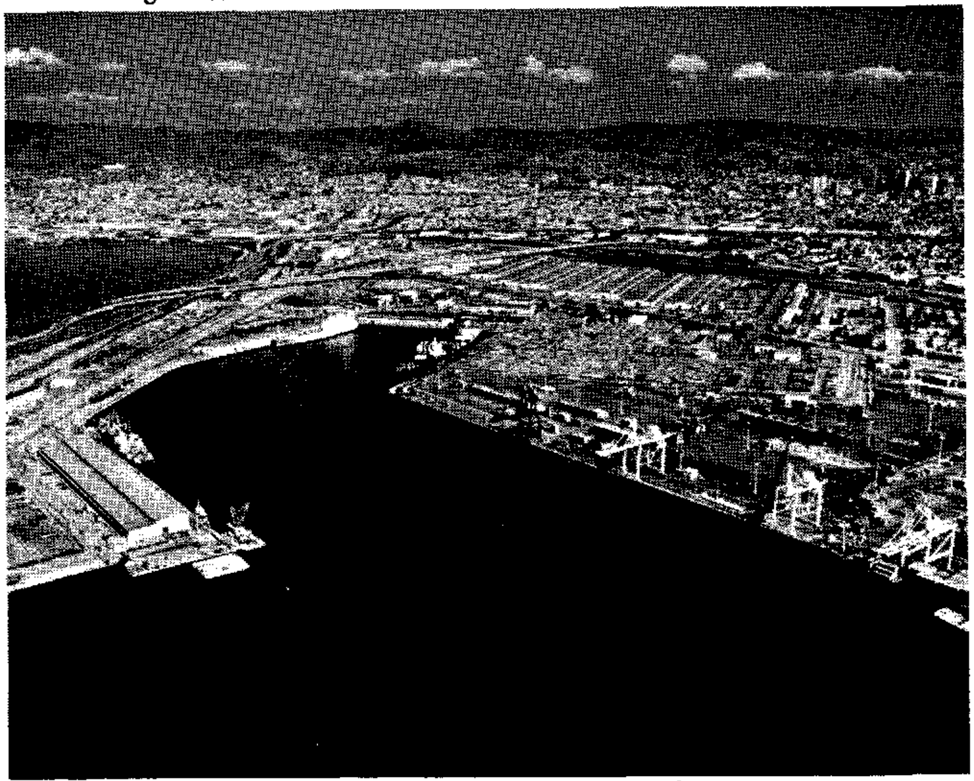


1. c. 1967: Sea-Land's two-crane container terminal wraps around Fourteenth Street Unit on east and north. Oakland Army Base in background.



2. 1981: Fourteenth Street Unit has been totally demolished for expansion of Sea-Land Terminal; additional container facilities extend to south.

Source: Port of Oakland

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT

Port of Oakland

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PLANNERS AND LANDSCAPE ARCHITECTS

FIGURE 10

Fourteenth Street Unit, Outer Harbor Terminal, 1967 and 1981

shipper, Rosenberg Bros. & Co., and a canned goods shipper, Libby, McNeill & Libby.

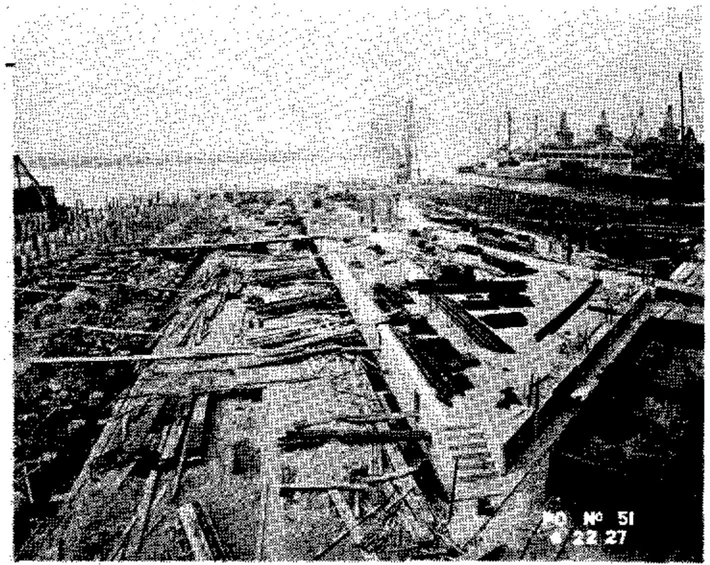
The Port of Oakland received an increasing volume of business in its early years. The Estuary was made accessible to large ocean-going steamships by 1928. In 1929, the U.S. Treasury Department designated Oakland as a full port of entry and established customs service. In 1932, a double fee charged to pilots bringing vessels to Oakland was eliminated, and in 1934 Oakland became a port of call for ships traveling to and from the Far East. During the Depression, Port tonnage more than tripled. During World War II, most Port facilities were taken over by the Military. After the war, tonnage grew slowly while the Port concentrated on developing Jack London Square (dedicated in 1951), an industrial park bordering San Leandro Bay (begun in 1957), and an airport expansion (completed in 1962).

(5) Containerization: 1962-1994. The container shipping system, in which sealed steel containers are carried unopened by ship, truck and rail, was developed in the 1950s. Cranes reduced ship unloading time from up to three weeks to less than a day. Between 1962 and 1982, the Port of Oakland opened ten container terminals and operating revenues grew tenfold.

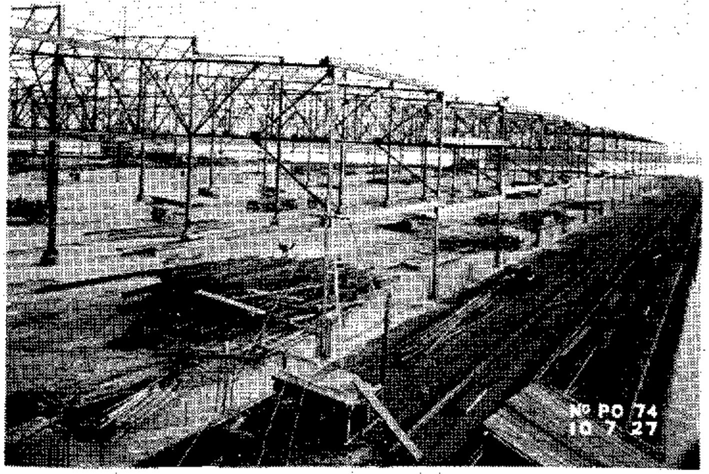
Containerization resulted in the demolition of most of the break-bulk transit sheds. Other than part of the Grove Street Pier on Howard Terminal, the facilities remaining from 1910-1914 are the Livingston Street Pier, a fragment of the quay wall, and Ninth Avenue Terminal. The Livingston Street Pier is tenant-operated as a commercial fisherman's pier. The remnant of the quay wall, which is just east of Howard Terminal, serves as a display berth for the presidential yacht *Potomac*. The Ninth Avenue Terminal is lightly used as a tenant-operated break-bulk facility.

b. Site-Specific History of the Grove Street Pier. (See Figures 11, 12 and 13 for this section.) The waterfront in the vicinity of the Grove Street Pier has been used for municipal port activities since the construction of the quay wall and municipal docks in the 1910s. Municipal Dock No. 1, with its large transit shed, adjoined the site of the Grove Street Pier. As early as the 1890s, a lumber yard with wharf occupied the shoreline site between Jefferson and Grove Streets. In 1888, the area immediately inland from the site to Second Street was occupied by the gas storage tanks and power plant of the Oakland Gaslight and Heat Company. By 1912, PG&E had taken over these facilities.

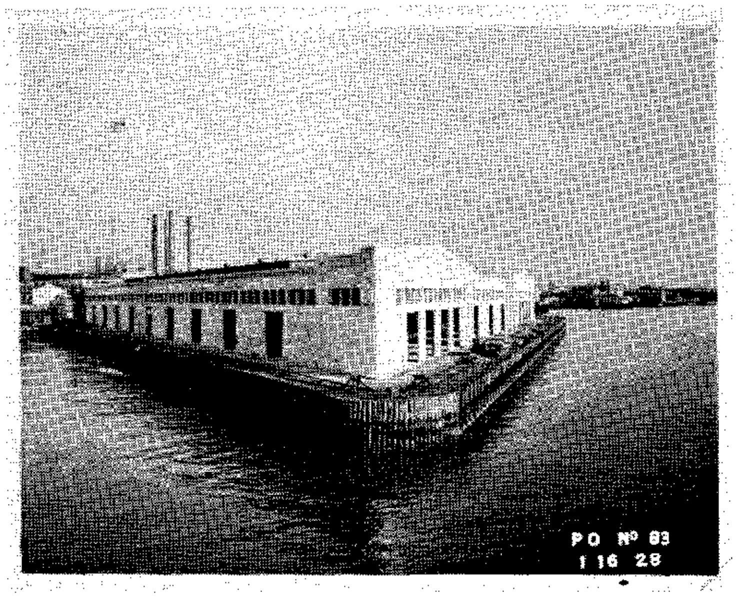
The Grove Street Pier was the second project undertaken by the Port of Oakland; construction took place in 1927 and 1928. The Port of Oakland moved its administrative offices to the Grove Street Pier transit shed in 1931,



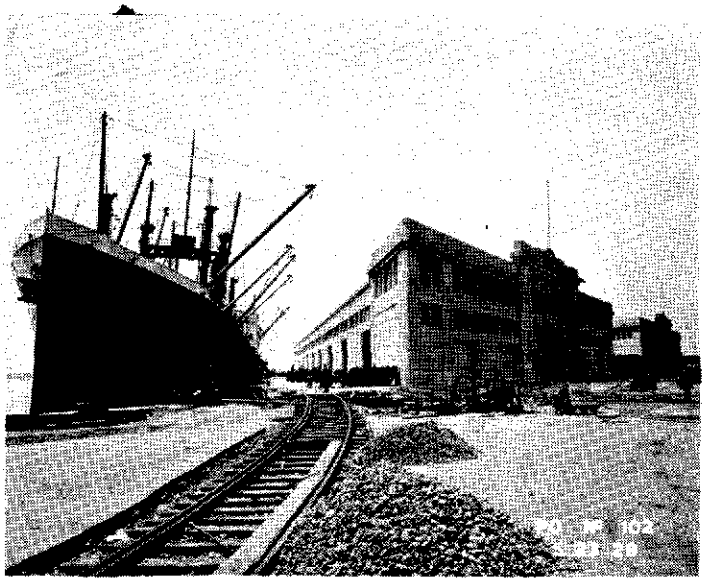
1. Grove Street Pier (Howard Terminal), west half of pier nearing completion, east half started. View looking southwest, 22 June1927.



2. Grove Street Pier (Howard Terminal), structural steel in place for west transit shed (Section "B"). View looking south, 7 October 1927.



3. Grove Street Pier (Howard Terminal), nearing completion. View looking northeast, 16 January 1928.



4. Grove Street Pier (Howard Terminal), ship moored, railroad tracks under construction. View looking southwest, 23 May 1928.

Source: Port of Oakland

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

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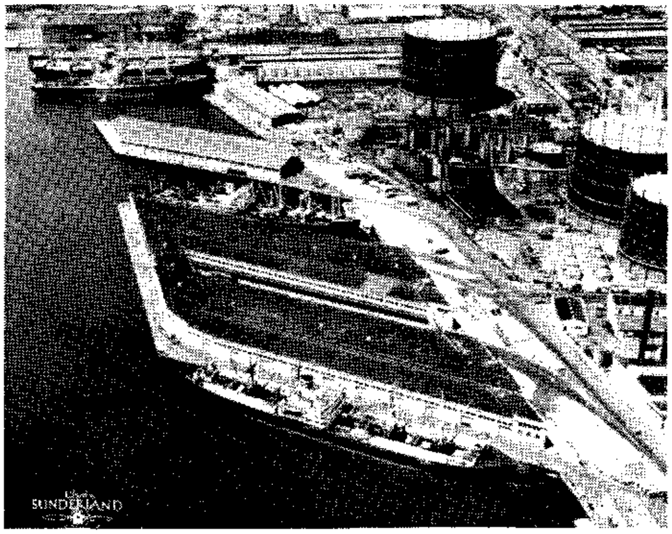
FIGURE 11

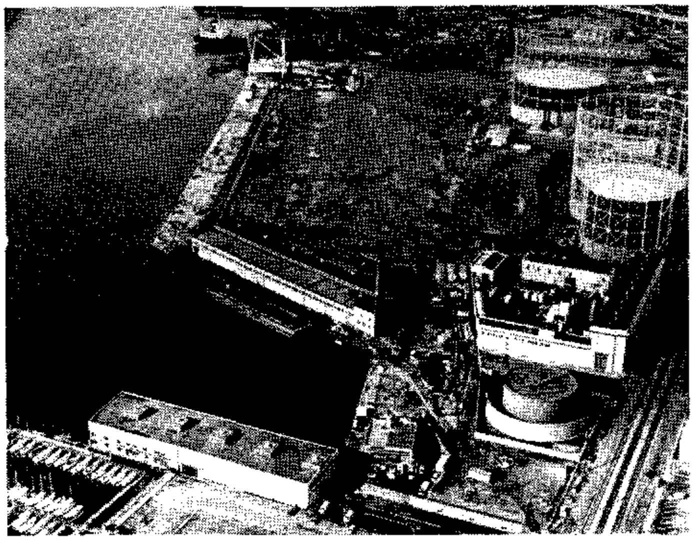
Grove Street Pier (Howard Terminal) 1927 - 1928

1. Grove Street Pier, interior of east transit shed (Section "A"), showing typical break-bulk operations. View looking south, 1930s.

2. Grove Street Pier, meeting room of Board of Harbor Commissioners, west transit shed (Section "B"). View looking southwest, c. 1930s.



3. Grove Street Pier. Aerial view looking west, c. 1950. (Courtesy of Oakland History Room; Oakland Public Library.)



4. Charles P. Howard Terminal under construction, with remnant of Grove Street Pier at near end of new terminal. Aerial view looking west, 1982.

Source: Port of Oakland, except where noted.

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT

Port of Oakland

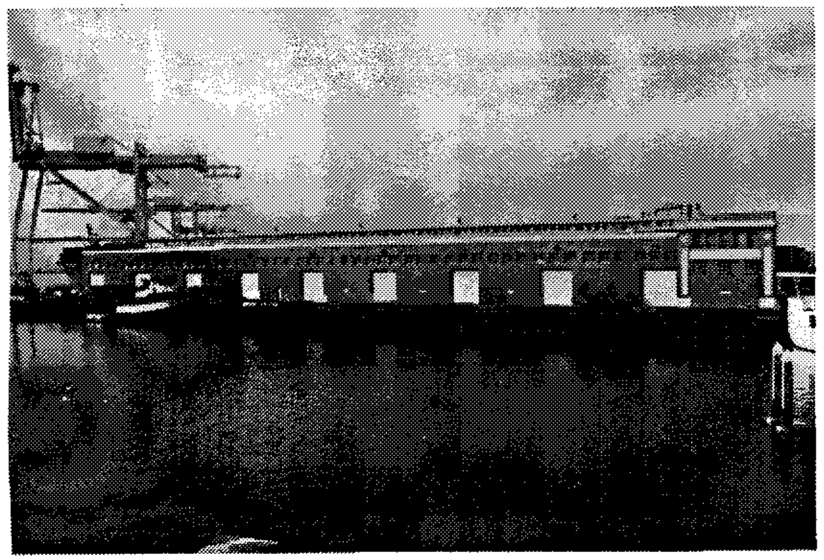
BRADY AND ASSOCIATES
PLANNERS AND LANDSCAPE ARCHITECTS

FIGURE 12

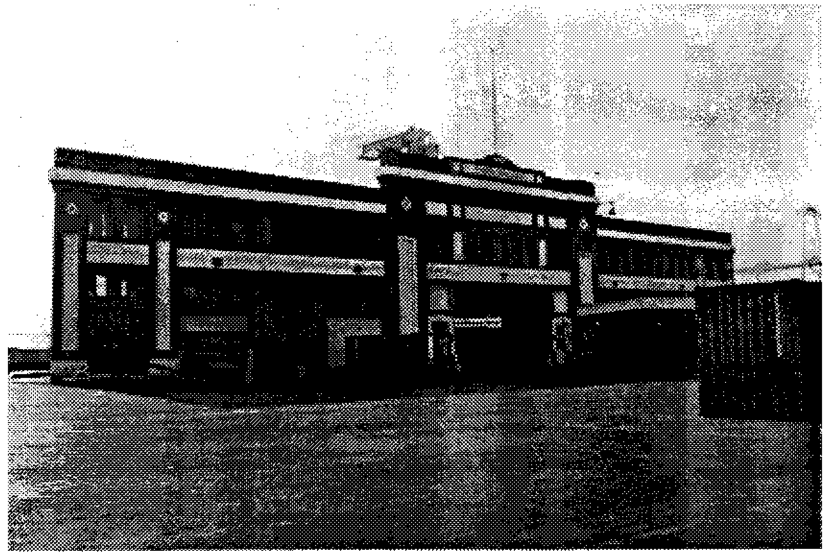
Grove Street Pier and Howard Terminal, 1930s - 1982

Figure 13

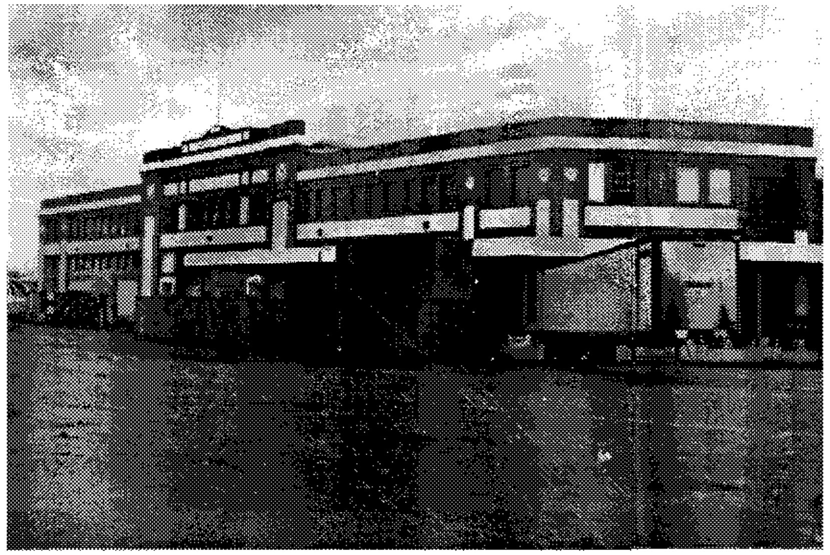
Howard Terminal Transit Shed 1994



1. East side of pier and transit shed, looking west from Franklin D. Roosevelt Pier.



2. Front of transit shed, looking south from Jefferson Street.



3. Front of transit shed, looking southeast.

4. West side and rear of transit shed, looking northeast.

5. Detail of front of transit shed, looking south.

6. Interior of transit shed, looking north from back to front.

Brady and Associates photographs; January, 1994

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

BRADY AND ASSOCIATES, INC.
PLANNERS AND LANDSCAPE ARCHITECTS

and they remained there until they were moved to Jack London Square in 1961. (The Port occupied its new building in 1990.) As early as 1935, the Grove Street Pier, Market Street Pier, Clay Street Wharf and quay wall were operated as a single unit known as the Grove Street Terminal. During World War II when the military took over most of the port, the Grove Street Terminal was the only facility to remain under Port control. In 1956 when the Port began leasing out its facilities, Howard Terminal began managing the terminal. Howard remained there throughout the late 1970s, operating the terminal in conjunction with its terminal at the foot of Myrtle Street immediately to the west.

In 1978 the Port purchased Howard Terminal for a planned expansion of its container facilities. The Charles P. Howard Terminal entailed the demolition of the historic Howard Terminal complex, the Market Street Pier and most of the Grove Street Pier, and partial demolition and burial of most of the quay wall. Most of the piers, transit sheds and warehouses, along with the Market Street Pier, were demolished in 1979 and 1980. Most of Grove Street Pier and two sections of the U-shaped transit shed were demolished in 1980-81. The container yard and a concrete wharf were filled in 1981. The 49-acre Charles P. Howard Terminal was dedicated in October 1982. The terminal combined container and break-bulk operations. A succession of tenants used the transit shed for break-bulk cargo in the 1980s. It is now lightly used as a storage and maintenance facility for container operations.

c. Description of the Grove Street Pier. As built in 1926-28, the Grove Street Pier consisted of a three-berth pier and a U-shaped transit shed adjoining the quay wall. The deck was of reinforced concrete, supported by concrete piles and wood piles with concrete jackets. The central portion of the pier was underlain with dredged fill held in place by a riprap rock berm. A timber apron wharf supported by creosoted wood piles ran around the perimeter of the concrete deck. The demolition of 1980-81 left standing the northeast portion of the pier adjoining the quay wall; this section now comprises a portion of the east end of the Charles P. Howard Terminal.

The original transit shed was composed of an 536-foot-long east shed, a 561-foot-long west shed and a 60-foot-long connecting wing. Each shed had a high central bay with shallow-pitch gable roof, flanked by lower sections with shed roofs. The height to the eaves was about 30 feet, and to the center about 44 feet. The shore ends of the east and west shed contained an upper story for offices. The transit shed was a reinforced-concrete (except the front portion of each shed which was entirely concrete) and steel-frame structure with concrete foundation, exterior walls and office floors. Exterior walls were finished in cement stucco, and windows were wire-glass and multi-paned with steel sash.

The partial demolition of 1980-81 resulted in the removal of the west shed, the transverse wing, the roofed-over central area, and five structural bays from the south end of the east shed. The remnant of the east shed is 448 feet long on its east side and 313 feet long on its west side, comprising about 70 percent of the original east shed.

d. Designers of the Grove Street Pier. The Grove Street Pier was designed by Port of Oakland staff engineers, particularly Joseph G. Bastow, under the direction of Port Manager/Chief Engineer Gustave B. Hegardt and Assistant Port Manger Arthur H. Abel. Hegardt and Abel carried out the Port's first major phase of construction between 1926 and 1931, and Abel oversaw developments between 1932 and 1952.

Gustave B. Hegardt (1859-1942) was a native of Sweden who came to the United States as a young boy and graduated from various technical and engineering colleges. He began his career with the U.S. Army Engineering Corps, where he oversaw the construction of locks on the Illinois and Columbia rivers. He entered private practice in Portland, Oregon at the turn of the century and was appointed chief engineer of the Port of Portland in 1910. He was one of the authors of the 1925 *Report of Port of Oakland*, and was hired as the first manager and chief engineer of the Port. Upon his death, *Pacific Marine Review* described him as one of the West's most outstanding port engineers.

Arthur H. Abel (1882-1961) was born in Washington and received a civil engineering degree from Washington State College. After working as a surveyor for railroads, he entered private practice with Hegardt in Portland. He served as Hegardt's assistant at the ports of Portland and Oakland, and succeeded Hegardt as chief engineer of the Port of Oakland. In 1950 he served a term as president of the American Association of Port Authorities.

Joseph G. Bastow (1892-1960), a native of Utah, received a degree in civil engineering from the University of California in 1923. The Port of Oakland hired him as a structural designer in 1926. He was assistant port manager from 1935 until his retirement in 1959. When he retired, the *Oakland Tribune* credited him with supervising the design of many of the piers and warehouses of the Port, specifically the Fourteenth Street and Ninth Avenue Piers.

e. Berth 10. No historic resources are located on Berth 10.

2. Register and Landmark Status

a. National Register Eligibility Criteria. The criteria for listing a structure on the National Register of Historic Places are found in 36 CFR Section 60.4, as follows:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that

> *(a) are associated with events that have made a significant contribution to the broad patterns of our history; or*
>
> *(b) that are associated with the lives of persons significant in our past; or*
>
> *(c) that embody the distinctive characteristics of a type, period, or method of construction or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction; or*
>
> *(d) that have yielded or may be likely to yield information important in history or prehistory.*

b. California Register of Historical Resources. Properties listed in the National Register of Historic Places, State Historic Landmarks, and State Points of Historical Interest are automatically listed in the California Register of Historical Resources. Many other categories of California properties are potentially eligible for listing, including properties that have been inventoried in local surveys and rated as eligible for the National Register. The Grove Street Pier is thus eligible for listing in the California Register.

c. State Historic Landmark. A State Historic Landmark must meet the criteria of the National Register of Historic Places at the state level of significance. The Grove Street Pier appears to be eligible for the National Register only at the local level, and thus does not appear to qualify as a State Historic Landmark.

d. Oakland City Landmark. The designation of an Oakland City Landmark is a three-tiered process involving the Landmarks Preservation Advisory Board (LPAB), the Planning Commission, and the City Council. If the Planning Commission accepts the recommendation of the LPAB, the recommendation is passed on to the City Council for final action. The LPAB has not recommended City Landmark designation, and no such action is pending.

e. Cultural Resources in the Area of Potential Effect (APE). An APE has not been designated for this project. If necessary, this could occur during the Army Corps of Engineers' permitting process.

3. Impacts and Mitigation Measures

The Port proposes to demolish the Grove Street Pier in order to expand its wharf and terminal yard. The impacts of that action are discussed below.

a. Significance Criteria. The California Environmental Quality Act (CEQA) mandates that all action necessary be taken to protect the state's historic and cultural resources. CEQA Guidelines state that a project will normally have a "significant effect" on the environment if it will:

- Disrupt or adversely affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.

When a significant effect is identified, project alternatives and mitigation measures must be considered to decrease the effect to a less than significant level.

The criteria used to evaluate whether the project or the alternatives will have a significant impact on the Grove Street Pier are the 1983 *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. The intent of the *Standards* is the preservation of historic and cultural resources through the preservation of historic materials and features. The *Standards* apply to the exterior and interior of buildings; related landscape features and sites; and related new construction.

In order to determine if the project will violate the *Secretary of Interior's Standards*, and thus will have a significant effect, one must first identify the character-defining features of the historic or cultural resource, and then determine if the project will have a significant effect on these features.

b. Eligibility for National Register. The Grove Street Pier appears to be eligible for National Register under criterion A, because it served as the Port's headquarters for nearly 30 years, and under criterion C, because it embodies the distinctive architecture of the period. The building's character-defining features apply to both criteria; that is, they form an integral whole. The embellished front facade, for example, makes sense as an example of civic "beautification" only in relation to the utilitarian side elevations. Similarly, the building's dual function as a transit shed and office building is conveyed by the entirety of the interior, with its spacious warehouse section and office floor. The significance of the structure lies both in its use as a transit shed and office and in its architectural importance. Because its significance derives not only from its style but also from its associations with port history, partial demolition — leaving a portion of the building standing, in situ or on a new site — would violate the *Standards,* and therefore would not mitigate impacts to historic resources.

The Grove Street Pier is a composite structure consisting of three separate but related elements: quay wall, pier, and transit shed. The character of the transit shed is defined by the following features:

- the exterior of the building (excluding the reconstructed south end)
- the interior of the building (excluding the reconstructed south end).

The following features are not considered character-defining: the reconstructed south end of the building, the loading dock/canopy at the building's northwest front corner, the remnant of the original pier (platform and piles) under and around the building, and the remnant of the quay wall under the building. (The visible remnant of the quay wall which extends between the Grove Street Pier and the FDR Pier is significant but outside the project area.)

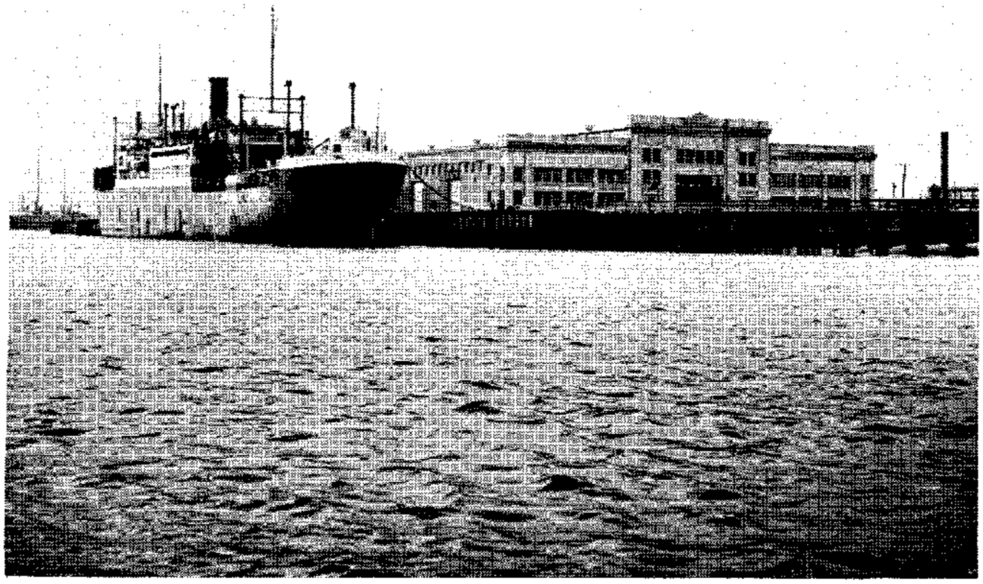
c. Evaluation. In evaluating the eligibility of the Grove Street Pier for the National Register, the most difficult issue is that of integrity. On the one hand, it could be said that the Grove Street Pier has lost its integrity since a majority of the structure has been demolished. On the other hand, it could be argued that the remnant is a self-contained whole incorporating in diminished form the essential features of the original, and viewed as such, that it possesses sufficient integrity of location, design, setting, materials, workmanship, feeling, and association. The transit shed and pier, as they stand today, comprise less than half the original; yet the transit shed is comparable in size and appearance to other transit sheds of the period, e.g., Transit Shed No. 1 at the Fourteenth Street Unit, the original Ninth Avenue Pier, and the Inland Waterways Terminal.

It is the opinion of the consultant that the surviving remnant of the Grove Street Pier possesses sufficient integrity to warrant inclusion on the National Register of Historic Places on the local level of significance under criteria A and C. The historic context is the development of municipal port facilities in the City of Oakland, 1910-1941.

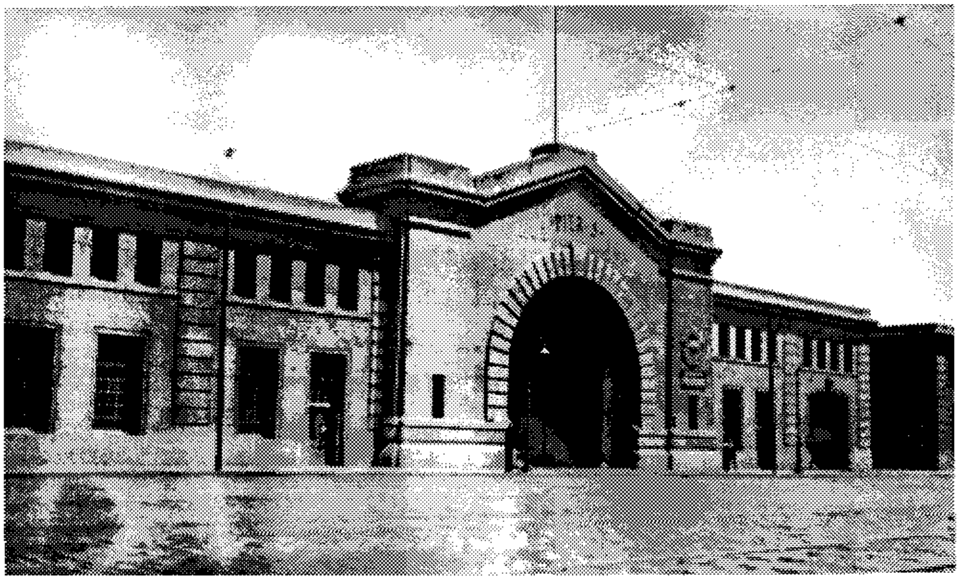
Under criterion A, for its historical associations, the structure is significant as the oldest surviving municipal port building on the Oakland waterfront. It is one of two major Port buildings from the prewar period -- the transit shed at Ninth Avenue Terminal is the other -- to have survived the intensive conversion from break-bulk to container cargo handling in the 1970s and 1980s. As such, the Grove Street Pier is a locally rare example of a rapidly disappearing building type, the break-bulk transit shed. The structure derives further significance from its association with Port administration (as an office building) over a 30-year period. The remnant of the quay wall under and adjoining the site adds further importance within the historic context. So considered, the Grove Street Pier would appear to be eligible for the National Register under criterion A at the local level of significance.

Under criterion C, as a work of architecture, the Grove Street Pier possesses less importance than it does for its historical associations. Its method of construction (reinforced concrete and steel frame) was typical for its time. The first reinforced-concrete pier and transit shed on the Bay were built in 1908 by the Port of San Francisco, where such structures were standard in the 1910s, 1920s, and 1930s. On the Oakland waterfront, the first reinforced-concrete pier was the Livingston Street Pier of 1910-12 (extant); the first reinforced-concrete transit shed was the Parr Terminal of 1919-20 (demolished). Virtually all transit sheds constructed by the Port of Oakland between the 1920s and the 1950s utilized reinforced concrete and steel framing. The Grove Street Pier is Oakland's oldest surviving transit shed built of these materials. There are older examples in San Francisco.

As for quality of design under criterion C, the monumental facade is noteworthy as an example of the "beautification" of a utilitarian/industrial structure -- a design practice widespread in the first four decades of the 20th century for both public and private buildings (such as the "beautiful" substations and power plants erected by the Pacific Gas & Electric Co. throughout northern California). The region's outstanding examples of "beautiful" port buildings are found on the San Francisco waterfront, where several dozen transit sheds were erected between 1908 and 1936 with Neoclassical, Mission Revival, and Tudor Revival facades, many of which survive (Figure 14). In Oakland, diverse examples include a PG&E substation (1910s to 1920s) adjoining the project site, and the Posey Tube Portal Building (1928) several blocks to the east. Oakland's only other port-related building with a "beautiful" facade is the Ninth Avenue Terminal transit shed (1930), which closely resembles the Grove Street Pier (Figure 14). Although not



1. Ninth Avenue Pier, 1929-30. View looking northwest, 1930s.



2. Pier 5 Bulkhead Building, Port of San Francisco, 1920. A reinforced-concrete structure with neoclassical facade, typical of many such structures built by the Board of State Harbor Commissioners at the Port of San Francisco between the 1910s and 1930s. (Courtesy Foundation for San Francisco's Architectural Heritage.)

Source: Port of Oakland, except where noted.

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT

Port of Oakland

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PLANNERS AND LANDSCAPE ARCHITECTS

FIGURE 14

Other Extant Bay Area Port Buildings from the 1920s

particularly significant in the regional context, on the local level, the Grove Street Pier appears to be eligible for the National Register under criterion C.

d. Previous Evaluations and Actions. In 1983, the Grove Street Pier received a rating of "A" ("Highest Importance") in the Oakland Cultural Heritage Survey (OCHS), the City of Oakland's official survey of architectural and historical resources. According to OCHS guidelines, the "A" rating is applied to "the most outstanding properties, considered clearly eligible for the National Register and City landmark designation." The State Historic Resources Inventory Form prepared by OCHS staff in 1983 states that the "Grove Street Pier appears eligible for individual listing on the National Register of Historic Places." In its evaluation, the OCHS treated the Grove Street Pier as a self-contained whole retaining a high degree of integrity rather than as a remnant of a much larger structure. (The historic name given the property by the OCHS -- "Grove Street Pier Section 'A'" -- reflects this judgement.) This interpretation produced a higher rating than would have resulted had the structure been considered the remnant of a larger whole.

In 1993, the Federal Emergency Management Agency (FEMA) reviewed the Grove Street Pier with reference to Section 106 of the National Historic Preservation Act and determined that the property is "potentially eligible for inclusion on the National Register of Historic Places." In its determination of eligibility, FEMA presumably concurred with OCHS's interpretation of integrity.

The City of Oakland Landmarks Preservation Advisory Board (LPAB) has maintained an interest in preserving the Grove Street Pier and in having the Port pursue options for its preservation. In 1991, the LPAB placed the building on the City's Preservation Study List, a regulatory mechanism within the City's zoning laws that can delay issuance of a demolition permit for a maximum period of 60 days. The LPAB has not recommended City landmark designation for the Grove Street Pier, and no such action is pending.

Impact HIST-1: The proposed project would require the demolition of the Grove Street Pier. No portion of the building would remain standing. All character-defining features would be destroyed. Demolition would constitute a significant unavoidable impact. (S)

> Mitigation Measure HIST-1: Prior to demolition, HABS documentation of the Grove Street Pier should be completed at an appropriate level, to be determined in consultation with the Advisory Council on Historic Preservation, the Army Corps of Engineers, the State Historic Preservation Office, and the Port of Oakland, and set

forth in a Memorandum of Agreement. Copies of the HABS documentation should be made available to the Oakland Public Library. In addition, the Port of Oakland should assemble an archive of Port materials and publish a book-length, illustrated history of the Port. Demolition of the Grove Street Pier is a significant unavoidable impact; these mitigation measures would not reduce the effect to a less-than-significant level.

B. Socio-Economics

■ ■ ■

1. Setting

a. The Port's Role in the Local and Regional Economy. The Port of Oakland is the fourth largest of the West Coast ports, and the fifth largest port in the nation in terms of cargo handled. The Port has more than 550 acres of marine terminal facilities, 27 deepwater berths, and 29 container cranes. Thirty-two shipping lines call at the Port. The 1991 Terminal Activity Report shows 1,405 vessel calls and 550 shared vessel calls. Three hundred barges, primarily transporting bunker fuel, were served by the Port that year. Approximately 669,000 containers were handled; 33 percent of these were sent to or from the Port by rail. In 1993 the Port processed 757,000 containers, shipping 18.1 million revenue tons. Seventy percent of the cargo that passes through the Port is "local", travelling by truck to or from locations in the western region, which extends to the Rocky Mountains. Thirty percent of the cargo is "intermodal," travelling by rail to or from more distant regions in the continental United States.

Table 5 shows the effect of the Port's shipping operations on revenues and employment in the Bay Area.

Total economic impact, or business revenue, for maritime industries is generated by the movement of cargo through Oakland's seaport. Maritime activity in 1993 earned $860 million in revenue for Bay area companies. Portions of this revenue directly benefit the Bay area economy, including income paid to employees and taxes paid to State and local government agencies.

Direct and induced jobs are dependent on the Port of Oakland's presence as a seaport; without the Port, these jobs would not exist in the Oakland area. The number of **direct jobs** fluctuates with changes in the amount and characteristics of the cargo moving through the Port. In 1993, about 6,900 direct jobs were due to maritime activity, encompassing businesses such as terminal operators, shipping lines, freight forwarders, warehouses, container repair and leasing, government, railroads and trucking, as well as

Table 5
ECONOMIC IMPACTS OF PORT OF OAKLAND MARITIME OPERATIONS, 1993

Total Economic Impact (business revenue)	$860 million
Includes:	
Payroll	$515
State/local taxes	$45
Directed and Induced Jobs	10,100
Includes:	
Direct	6,900
Induced	3,200
Related Jobs (with companies that ship or receive goods through Oakland)	188,600

longshoremen. **Induced (indirect) jobs** are generated by the "ripple effect" of direct job-holders spending their salaries on goods and services (housing, social services, retail purchases, food, transportation, etc.). Port of Oakland maritime activity in 1993 accounted for 3,200 induced jobs in the Bay Area.

Related jobs are with companies that ship or receive goods through the Port of Oakland. Although these jobs would likely exist if the Port were not available, inclusion of their economic impacts demonstrates the extent of the Port's role in the regional economy. In 1993, about 188,600 related jobs were associated with, but not generated by, Port of Oakland maritime activities.

b. Shipping in the Pacific Rim. Most of the goods flowing through the Port are being shipped to or from Pacific Rim locations, as shown in Table 6. Two-thirds of the containerized trade to and from the Port of Oakland is from Asia[1]. Other West Coast ports such as Long Beach/Los Angeles, Seattle and Portland compete with Bay Area ports for trans-Pacific shipping. During the 1980s, these ports added more facilities for container ships than did the Port of Oakland. Because large trans-Pacific ships are very capital-intensive, they must adhere to precise schedules. If ships must stand by in the bay awaiting a berth, they can be thrown off schedule.

---

[1] Journal of Commerce Piers Data and Port of Oakland, Port of Oakland Containerized Trade Share by Geographic Region, Fiscal Year 1992/1993.

Table 6
OAKLAND LINER FOREIGN TRADE
JULY 1992 - JUNE 1993

Country	Imports		Exports		Total	
	Dollars x 1,000	Percent of Total	Dollars x 1,000	Percent of Total	Dollars x 1,000	Percent of Total
Japan	5,318,106	35.9%	3,677,506	37.9%	8,995,612	36.7%
China	2,011,847	13.6%	282,743	2.9%	2,294,590	9.4%
Taiwan	1,535,003	10.4%	692,782	7.1%	2,227,785	9.1%
Hong Kong	991,783	6.7%	796,109	8.2%	1,787,892	7.3%
Korea	636,099	4.3%	776,705	8.0%	1,412,804	5.8%
Singapore	639,303	4.3%	751,718	7.8%	1,391,021	5.7%
Malaysia	530,176	3.6%	207,250	2.1%	737,426	3.0%
Thailand	376,807	2.5%	299,656	3.1%	676,463	2.8%
West Germany	286,579	1.9%	312,901	3.2%	599,480	2.4%
Australia	345,219	2.3%	138,845	1.4%	484,064	2.0%
Indonesia	282,585	1.9%	181,021	1.9%	463,606	1.9%
Philippines	117,573	0.8%	250,361	2.6%	367,934	1.5%
Netherlands	108,313	0.7%	252,782	2.6%	361,095	1.5%
United Kingdom	123,990	0.8%	222,662	2.3%	346,652	1.4%
France	193,461	1.3%	76,629	0.8%	270,090	1.1%
Italy	144,693	1.0%	38,812	0.4%	183,505	0.7%
India	99,328	0.7%	75,012	0.8%	174,340	0.7%
Bangladesh	144,714	1.0%	--	--	153,476	0.6%
Sri Lanka	125,085	0.8%	--	--	133,978	0.5%
Belgium	--	--	86,877	0.9%	121,310	0.55
Spain	69,062	0.5%	--	--		
Canada	--	--	58,727	0.6%		
Sweden	--	--	41,930	0.4%		
Total Top 20 Countries	14,079,726	95.0%	9,221,028	95.1%	23,183,123	94.6%
Other Countries	747,356	5.0%	471,114	4.9%	1,336,101	5.4%
Total	14,827,082	100.0%	9,692,142	100.0%	24,519,224	100.0%

Source: Bureau of Census and Port of Oakland.

c. Trends in Containerized Shipping. Containerized shipping has been increasing since the 1960s. The Port of Oakland opened ten container terminals between 1962 and 1982, including Howard Terminal. Although there is still a significant demand for newsprint and dry-bulk terminals, containerized shipping represents the largest economic portion of deep-draft shipping and is still growing. The Metropolitan Transportation Commission predicts that container cargo will quadruple the 1988 volume by the year 2010 (MTC, BCDC 1989).

2. Costs and Benefits of the Proposed Project

a. Throughput Capacity. For this report, Moffatt & Nichol conducted a preliminary analysis of the "throughput capacity" (maximum amount of cargo that can be processed) at Howard Terminal using existing data and the methodology recommended in the Port Handbook.[2] The throughput capacity was determined based on the following components affecting annual throughput:

- Number of ship calls per year
- Number of cranes
- Yard storage area
- Gate processing capability

Throughput estimates were based on the assumption that 80 percent of the containers are forty feet long, and 20 percent are twenty feet long. Other assumptions used in throughput analysis were related to the yard utilization capacity (assumed as 50 percent), and dwell time for a container (assumed as 8 days).

The existing frequency of ship calls at Howard Terminal is approximately three vessels per week. Addition of the new shipping line would result in approximately one more vessel call per week at the terminal. This results in an increase of approximately 33 percent, in terms of expected cargo transfer at the berth. The planned increase in crane handling capacity and an increase in yard area and equipment are needed to accommodate the additional cargo transfer expected at the berth. The southwest corner of the transit shed obstructs the proposed alignment of the crane rails. Removal of the shed would accommodate the new rail extension and provide additional yard area.

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[2] *Port Handbook for Estimating Marine Terminal Cargo Handling Capability*, Moffatt & Nichol, Engineers. Prepared for U.S. Department of Transportation, Maritime Administration, November 1986.

Moffatt & Nichol determined that the maximum throughput capacity under existing conditions at Howard Terminal is limited by the yard capacity and the existing gate system. Since the gate system is scheduled to be upgraded (to 12 lanes), the yard capacity is expected to be the only "bottleneck" in terminal operations for the short term.

Existing storage capacity at the terminal consists of approximately 2,300 twenty-foot equivalent unit (TEU) spaces. Discussions with the terminal operators indicated that import containers were stacked about two to three units high, on average. Export containers, which have to be closer to the berth, are stacked about three to four high. Empty containers are stacked about 4 units high. With the existing designations of import, export and empty container locations, the yard capacity with stacking is approximately 8,330 TEUs. The annual throughput capabilities of the terminal is about 106,000 containers.

Extending the wharf and demolishing the transit shed would result in an additional storage capacity with stacking of 1,170 TEUs (approximately 14 percent increase in storage capacity). This corresponds to an annual throughput of about 119,000 containers.

The increase of about 14 percent in yard storage capacity would compensate for the additional cargo transfer expected at the berth due to increased ship calls.

An increase in the gate processing capability is also required to meet the projected increase in throughput capacity. Construction of a new 12-lane gate layout is scheduled for completion by mid-1994. Preliminary analysis indicates that even with the proposed 12 lanes, the gate would have to process in excess of 20 transactions per hour per lane to eliminate off-site queues at peak periods. This is higher than the existing rate, which is approximately 12 transactions per hour per lane. For the long term, it is anticipated that additional "overflow" exits would be required at peak periods. The planned 12-lane gate configuration would be increased by using Jefferson Street as an overflow exit. Outbound trucks would queue at the edge of the wharf, where the transit shed currently exists.

b. <u>Preliminary Yard Efficiency Estimates</u>. The proposed yard layout would also result in improved traffic circulation within the terminal. A site visit was conducted to identify the existing traffic circulation pattern. Existing operations use a "merry-go-round" scheme. Gantry cranes transfer incoming containers (imports) from the ship to yard tractors at a rate of about 20-25 containers per hour. The yard tractors travel from east to west at the apron:

they come down from the mid-span of the yard to the crane, pick up a container, go to Lane 2 where a vehicle known as the "top pick" unloads and stacks the container, and go back to the apron maintaining a clockwise flow of traffic. Approximately 5-yard tractors are assigned to each crane during loading and unloading operations. Transtainers or top picks subsequently transfer the containers to trucks. The trucks follow a similar clockwise pattern, from the gate complex to the appropriate lane, and back to the gate complex. Outgoing containers (exports) are loaded onto the ship in a similar manner, maintaining the same clockwise flow of traffic.

Loading and unloading operations for a vessel at Berth 68 involve the maneuvering of yard equipment around the transit shed which slows down the cycle time per container movement. Extending the wharf and demolishing the building would result in a shorter cycle time, making the loading and unloading operations more efficient.

c. Effect on Employment. Construction, dredging and dredged sediment handling and disposal would employ 25 to 55 workers over the nine-month construction period. Once completed, the wharf extension would allow two new generation ships to be berthed at the same time. Thus, Howard Terminal could employ 122 people when two vessels are calling, compared to the 82 it employs when one vessel is calling. This would be a 49 percent increase in peak employment at the terminal. This in turn would have a physical change on the environment from the effects of increased traffic from both transport trucks and employee vehicles. However, the traffic would not be a substantial increase and would not have a significant effect on local streets. For additional detailed discussion, please refer to Section D, Transportation.

3. Impacts and Mitigation Measures

a. Significance Criteria. CEQA Section 15131 (a) and (b) states that economic or social effects of a project shall not be treated as significant effects on the environment. However, economic or social effects of a project may be used to determine the significance of physical changes caused by the project. For example, the construction of the wharf extension would increase employment and cargo storage area, thus resulting in a physical change to traffic on local streets. This impact is addressed in Section D, Transportation.

The proposed actions would have a beneficial impact on overall port operations and the local economy. No significant adverse impacts to socio-economic conditions were identified.

Impact ECON-1: The proposed project would increase the capacity of the Port of Oakland by one new-generation container vessel per week. This would increase peak direct employment on the terminal by 40 people. The increase in cargo handling would lead to an increase in business revenues, direct (port-dependent) employment, induced (indirect) employment and related employment in Oakland and the Bay Area. (B)

No mitigation measures are necessary.

C. Land Use

■ ■ ■

1. Setting

a. Port of Oakland. The Port of Oakland (Port) occupies 19 miles of waterfront on the eastern mainland shore of San Francisco Bay with more than 550 acres of marine terminal facilities and active support areas. The development of a Port began in 1855 when the City of Oakland dredged a bar at the mouth of the Oakland Estuary. In 1874, Congress appropriated funds for the construction of adequate jetties at the Estuary entrance and the following year the dredging of the Inner Harbor Channel was undertaken. A quay wall along the shoreline between Market and Clay Street was constructed in 1910. The Port of Oakland was created by the City of Oakland, by Charter, as an independent department in 1910. The Board of Port Commissioners has exclusive control and management of the Port area, including all Port facilities and properties.

The Port's marine facilities include nine container terminals, two break-bulk terminals, and one heavy lift berth. These facilities are organized into four main terminal areas: the Outer Harbor Terminal Area, the Seventh Street Terminal Area, the Middle Harbor Terminal Area, and the Inner Harbor Terminal Area.

Three main railroads -- the Southern Pacific Transportation Company; the Union Pacific Railroad; and Atchison, Topeka, and Santa Fe Railroad -- and a major highway network converge at and serve the Port. The Southern Pacific Transportation Company and Union Pacific Railroad, terminate in Oakland and have their major Northern California intermodal rail yards less than two miles from the Port of Oakland's marine terminals. The Santa Fe Railroad serves Oakland from its major rail yards in nearby Richmond, California, located approximately 11 miles to the north. All of these railroads have reciprocal switching agreements and have direct connections to the 19 miles of dockside rails at the Port's marine terminal facilities. Switching operations in the Outer Harbor area are performed by the Southern Pacific Transportation Company and by Oakland Terminal Railway, a belt line owned jointly by the Union Pacific Railroad and Santa Fe Railroad. The Santa Fe Railroad offers direct service to Chicago and Midwest points as well as to the

Gulf Coast and points in the Southeast states over its southern route. Union Pacific Railroad serves Chicago and the Midwest directly over its central corridor route through the Sierras. The Southern Pacific Transportation Company has direct service into Chicago and other Midwest points over the central corridor route and also serves the Gulf Coast and the Southeast over its southern route. All three railroads provide double-stack container service to Oakland on a daily basis.

The Port also has access to an extensive freeway system, including Interstate 80, U.S. 50, Interstate 5 and U.S. 101. All major trucking carriers serve the Port, and many maintain terminals in the harbor area.

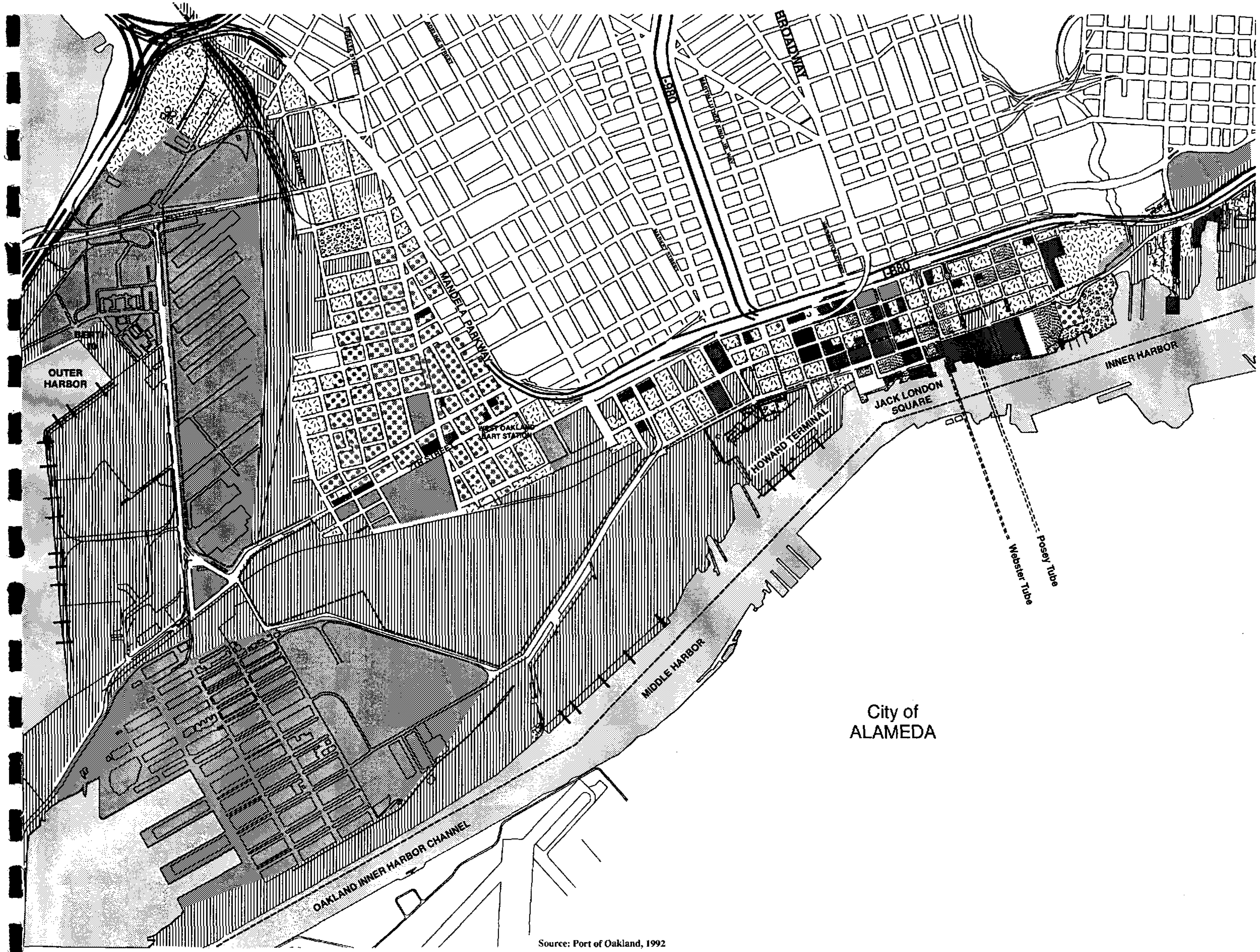
b. Inner Harbor Terminal Area. The Inner Harbor Terminal Area consists of the Ninth Avenue Terminal and Howard Terminal. The Ninth Avenue Terminal is located approximately one-mile south of Howard Terminal. It is the Port's primary break-bulk facility and historically has been a major steel import center for Northern California. Conversion to a container facility is unlikely because the channel depth is restricted by the Posey and Webster tubes to and from Alameda.

c. Howard Terminal. The area now known as Howard Terminal has been actively engaged in marine terminal operations since the early 1900s. The original emphasis of terminal operations was general cargo and scrap metal export. With the advent of containerized cargoes and a reduction in general cargo activity, Howard Terminal's productivity declined significantly.

In December 1974, all commercial terminal operations were ceased. It was then converted to other uses, namely warehousing and offices. In 1976, there were approximately twelve tenants in the Howard Terminal property. Approximately 370,000 square feet of office and warehouse space were leased.

In 1981, Howard Terminal was converted into a multi-purpose facility capable of accommodating full containerships, combination, roll-on/roll-off (RO-RO) cargo, and conventional vessels. The terminal is currently supported by four container cranes. This terminal experienced a large increase in volume during 1992 due to the DSR/Senator Line and Cho Yang Line movement of operations to Howard Terminal from the Outer Harbor area.

d. Adjacent Land Uses. Land uses in the vicinity of Harbor Terminal include a mix of maritime, maritime support, military, industrial, utilities, commercial, office, recreation, public (government/schools), and residential uses (see Figure 15). Maritime support services in the area include export packing, fumigation, cold storage and chill facilities, truck services,



Source: Port of Oakland, 1992

Figure 15

Existing Land Use

LEGEND

- ▥ Maritime
- ▨ Military/Government
- ░ Industrial
- ■ Commercial
- ▩ Office
- ▦ Residential
- ▤ Public Access/Park
- ☐ Vacant

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transloading services, warehousing/distribution services, shipper's agent and freight consolidation services backed up by U.S. Customs and other federal inspection services.

The Schnitzer Steel Terminal, a privately-owned 33-acre facility used for exporting break-bulk scrap metal, is located immediately to the west of Howard Terminal. Scrap auto bodies are brought to Schnitzer Steel where the autos are shredded into pellet-size pieces. The shredded metal and debris materials are then segregated and processed by machine. Shredded metal scrap is then stockpiled on-site and eventually shipped overseas through Schnitzer's marine facilities. Schnitzer Steel also processes "heavy metal" scrap on its premises. Heavy metal is a steel and iron scrap operation that calls for cutting up large heavy metal structures such as ships, machines, and boilers.

Railroad tracks within the Embarcadero roadway are immediately north of Howard Terminal. Industrial buildings are located on the north side of Embarcadero opposite Howard Terminal. Some of the former industrial sites in the area east of Howard Terminal have recently been converted into retail and restaurant uses. Commercial retail stores such as Cost Plus and the Bed & Bath complex have been constructed one block northeast of Howard Terminal. A new Amtrak Station is planned east of the site, between Harrison Street and Alice Street.

PG&E property also lies to the north between Howard Terminal and the Embarcadero between Martin Luther King Jr. Way and Jefferson Streets. The facility is still active for peak power generation and/or standby power generation. The PG&E property formerly housed steam turbine-generator units that were retired in 1969. PG&E's three natural gas storage tanks, erected in 1908, 1922 and 1929, respectively, were demolished for Howard Terminal project.

Jack London Square, a 12-block area along the Port of Oakland waterfront, is located approximately 400 feet east of Howard Terminal. Jack London Square has been developing over the past 50 years from a maritime/industrial area into a commercial/office and recreation/entertainment center. A mix of uses including restaurants; a 145-room waterfront plaza hotel/boatel; retail and office space; the Port Administration Building; a fire station; and public access areas are located at Jack London Square. Additional development is planned within Jack London Square, including a hotel expansion or a new hotel on the temporary lawn adjacent to the FDR pier.

e. Berth 10. The Port proposes to use most of Berth 10 as a handling facility for dewatering dredged sediments prior to disposal. Berth 10 is located near the Bay Bridge, between Sea-Land and the Army Terminal. Sea-Land currently uses Berth 10 for overflow container storage. That function would be relocated, as required, to Berth 9. The Oakland General Plan designates the site and the surrounding area for heavy industrial uses.

2. Impacts and Mitigation Measures

a. Significance Criteria. The impact of the project on existing land uses is evaluated in this section, in part, by the significance criteria as defined by the *CEQA Guidelines*,[1] which evaluates if a project will normally have a significant effect on the environment. The significant criteria relevant to land use and the project are as follows:

- Conflict with adopted environmental plans and goals of the community where it is located (existing or planned adjacent land uses);
- Induce substantial growth;
- Disrupt or divide the physical arrangement of an established community;
- Conflict with established recreational land uses of the area.

New land uses can also constitute a significant effect on the environment in indirect ways. Visual impacts, demands for public services, generation of additional traffic and noise, and other changes can be caused by proposed new land uses, thereby generating environmental effects. These effects are further analyzed and evaluated in the relevant sections of this EIR.

b. CEQA Compliance. The wharf extension, removal of the transit shed building, dredged sediment handling at Berth 10, and wharf removal at Sherex site and Pacific Dry Dock would not conflict with CEQA's significant effects criteria. **This would be considered a less-than-significant impact.** (LS)

The proposed wharf extension is consistent with CEQA criteria and compatible with surrounding land uses, because it expands and improves an existing maritime use within the Port jurisdiction. The dredged sediment handling at Berth 10 is consistent with the industrial uses in the area. The proposed project is consistent with plans and goals of the community, it does not induce growth, it would not divide the arrangement of a community, and

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[1] *California Environmental Quality Act Guidelines*, Appendix G, Significant Effects.

would not conflict with established recreational use areas such as the FDR Pier. The site is also buffered by water, structures and distance.

No mitigation measures are necessary.

c. Adopted Land Use Plans and Goals. The proposed project is consistent with current land use designations, planning policy documents, and would be compatible and not conflict with existing and proposed neighboring maritime (land and water) uses, maritime support, military, industrial, utilities, commercial, office, and residential land uses. **This would be considered a less than significant impact.** (LS)

The proposed wharf extension is generally compatible with surrounding land uses, because it expands an existing maritime use within the Port jurisdiction, and the site is buffered by water, structures and distance. The demolition of the transit shed building would alter the aesthetics of the surrounding area; however, it will also provide open views of the terminal operation, maritime activity, existing structures and land uses, and the San Francisco skyline from the prominent viewing areas such as the FDR public access pier. In addition, the incremental increase in maritime activity at the terminal would increase the levels of noise, traffic and activity around the site thereby affecting adjacent land uses and sensitive receptors (see Section D, Transportation and Section E, Noise).

The views from the public access paths and a park on the north end of Jack London's waterfront would be changed (see Section M, Public Access and Recreation and Section N, Visual Resources). The proposed pier extension and new container ship berth would be located approximately 400 feet west of the FDR fishing pier. Incremental increases in noise from container loading and unloading activities and nighttime light glare from the pier extension would have minor impacts primarily on the users of the pier and public access areas. However, the lighting could create a safer level of illumination for pier users and adjacent land uses.

The incremental increases in truck traffic and related traffic noise would also have impacts on surrounding land uses (see Section D, Transportation, and Section E, Noise). However, since there are few residences in the vicinity of the terminal, these impacts would be considered minor and incidental. The increased traffic and noise levels would not adversely impact nearby military maritime support, or industrial or utility areas. However, there could be minor inconveniences for nearby retail, restaurant and office uses during the construction phase where incrementally larger traffic delays and increased noise levels could result.

Finally, one more ship per week would call at Howard Terminal and thus there could be impacts on recreational boaters and ferry traffic in the Bay. However, with the implementation of Coast Guard boating and safety regulations and the insignificant amount of increased ship traffic, this would not be considered an adverse impact.

No mitigation measures are necessary.

D. Transportation

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The important traffic and circulation impacts created by the proposed project would be along the Embarcadero and Interstate 880 (I-880) freeway and ramps; related temporary construction-caused impacts near the main entrance to the Charles P. Howard Terminal; and to a lesser extent, related to the internal site circulation and along the I-980 freeway. This section covers the direct impacts of new vehicular activity at Howard Terminal.

The proposed project could increase the size and frequency of ships loading and unloading at the Port of Oakland. It is likely that one additional vessel call per week would be made on average, and the size of the ships would be larger, resulting in increased loading and unloading activity levels while ships are in berth. The number of containers handled in a given period of time would increase, as would the associated truck and rail activities.

The Oakland Harbor Deep-Draft Navigation Improvements Supplemental EIR/EIS for the 42-foot dredging project covers the transportation impacts of the disposal of dredge material removed from the channel in order to accommodate larger ships in the channel opposite the extended wharf and berth at Howard Terminal.

1. Setting

The terminal is located along the Embarcadero, between Market Street and Jefferson Street. Terminal gates are located at the foot of Market Street and Martin Luther King, Jr. Way. The major surface street access routes include Market Street, Brush Street, Martin Luther King Jr. Way, and Jefferson Street. The terminal has excellent freeway access to two interstate highways (880 and 980), which in turn connect to the San Francisco-Oakland Bay Bridge (I-80). Permitted container truck routes include Third Street, which connects to other container routes. These routes are designated (signed) routes for use by heavier trucks than are normally allowed on public streets and state highways.

Middle Harbor Road is a continuation of Adeline Street serving the Port, the Naval Supply Center, the Union Pacific Ferro Street intermodal facility, and the Southern Pacific Railroad. From Third Street to the American President Lines terminal, Middle Harbor Road is four lanes. Its mid-section is a narrow two-lane road (known as S.P. Road), and it becomes four lanes again south of 7th Street, where it is known as Maritime Street. The Port has plans to improve the west end of Middle Harbor Road, from Adeline Street to the 7th Street/7th Street Extension intersection. This will involve widening the two-lane section to a four-lane road with a 16-foot median left turn lane. The anticipated completion date is September 1994, and will be used as temporary construction detour during construction of the Cypress Replacement project.

The Embarcadero is a two-lane road with Southern Pacific rail tracks in the center for much of its length. Portions of the Embarcadero are currently being repaved. Recent construction has extended the Embarcadero as a two-lane truck haul road, from Martin Luther King, Jr. Way, to Adeline Street. Jefferson Street is two lanes (one in each direction) with parking on both sides. Martin Luther King, Jr. Way is four lanes with parking, and shows signs of uneven pavement settling in some locations. Third Street is a wide two-lane street with parking on both sides and Union Pacific railroad tracks in the middle; there are many signs of pavement distress due to the railroad tracks.

a. Traffic Counts/Data Collection. For the purposes of this EIR, four intersections were counted and analyzed in the vicinity of the project. These intersections were selected because they are near the proposed entrances to the improved Howard Terminal and thus would be the most directly impacted by the project, and because they provided a complete count of trucks entering and leaving the current Howard Terminal during normal hours of operations. All four intersections are currently controlled by Stop signs. The intersections were counted on December 2, 13, and 15, 1993, from 7:00 to 10:00 a.m. The time period of the count was selected to coincide with the normally high activity levels of the terminal. The intersections and the associated count date are shown below:

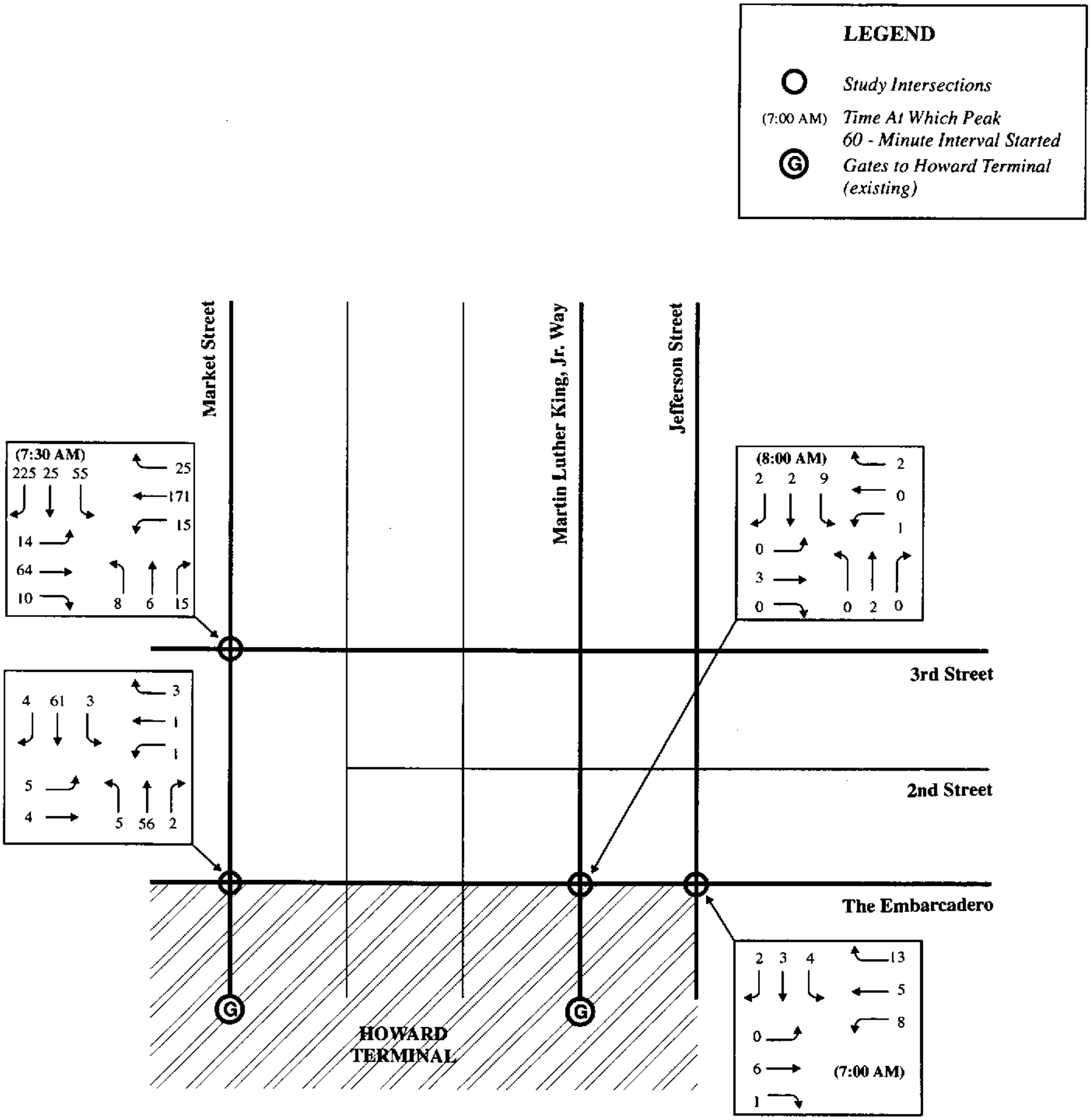
- Jefferson Street and the Embarcadero (12/13/93)
- Martin Luther King, Jr. Way and the Embarcadero (12/13/93)
- Market Street and the Embarcadero (12/15/93)
- Third Street and Market Street (12/2/93)

The counts included total traffic volumes by turning movement, and classified by type of vehicle (e.g., auto (including pickups and vans); two-axle truck, three-axle truck, four-axle truck, five+ axle truck). The count also included train movements along the Embarcadero. The peak hour of traffic varied depending upon the intersection studied, from 7:00-8:00 a.m. to 9:00-10:00 a.m. The heaviest truck volumes typically occurred between 9:00-10:00 a.m. At the Market Street gate to the terminal, the composition of the trucks entering the site was: 34 five (or more) axle semi trucks; 10 three-axle trucks; and 2 two-axle trucks, for a total of 46 inbound trucks. The composition of the trucks exiting the site was 38 five (or more) axle trucks; 17 three-axle trucks; and 2 two-axle trucks, for a total of 57 outbound trucks. The Market/Embarcadero intersection had, by far, the highest number and percentage of trucks of any of the intersections studied. The results of the AM peak hour vehicle counts are shown in Figure 16.

The City of Oakland conducted a traffic count at the intersection of Market and Third Streets in 1991. This count is shown at the beginning of Appendix C. Dowling's 1994 counts for 7:30 AM to 8:30 AM are similar to the City's 1991 counts. The overall volume through the intersection was 4 percent higher in 1994; this could be statistical variation. The number of southbound vehicles turning left from Market Street onto Third Street was 25 percent higher in 1994; this could represent a shift in traffic patterns. The total volume of the three movements toward Howard Terminal increased 12 percent, indicating that average AM peak volume toward Howard Terminal at this intersection may have increased 8 to 16 percent between 1991 and 1994.

b. Existing Intersection Level of Service. Traffic level of service (LOS) is a concept used to qualitatively evaluate the performance of an intersection during the peak period of highest traffic volumes (usually one hour). Available information indicates that most intersections in the Port area are generally performing satisfactorily. There are six levels of service, from A (best) to F (poorest), as indicated in Table 7. During the morning peak hour of traffic (during the 7:00-10:00 a.m. period counted), all four study intersections operate at LOS "A", which is the best of the six categorizations of intersection operation. (For unsignalized intersections, the "measure of effectiveness" is *reserve capacity,* which indicates how much unused capacity exists during an hour at the intersection. For this reason, the descriptions of the expected delay in Table 7 are necessarily qualitative.)

Generally, urban intersections operating at LOS "D" or better are considered to have acceptable delays. The existing intersection levels of service are shown in Table 8. Existing traffic volumes are shown in Figure 17.



Source: Brady and Asssociates, 1994

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Terminal Extension
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Port of Oakland

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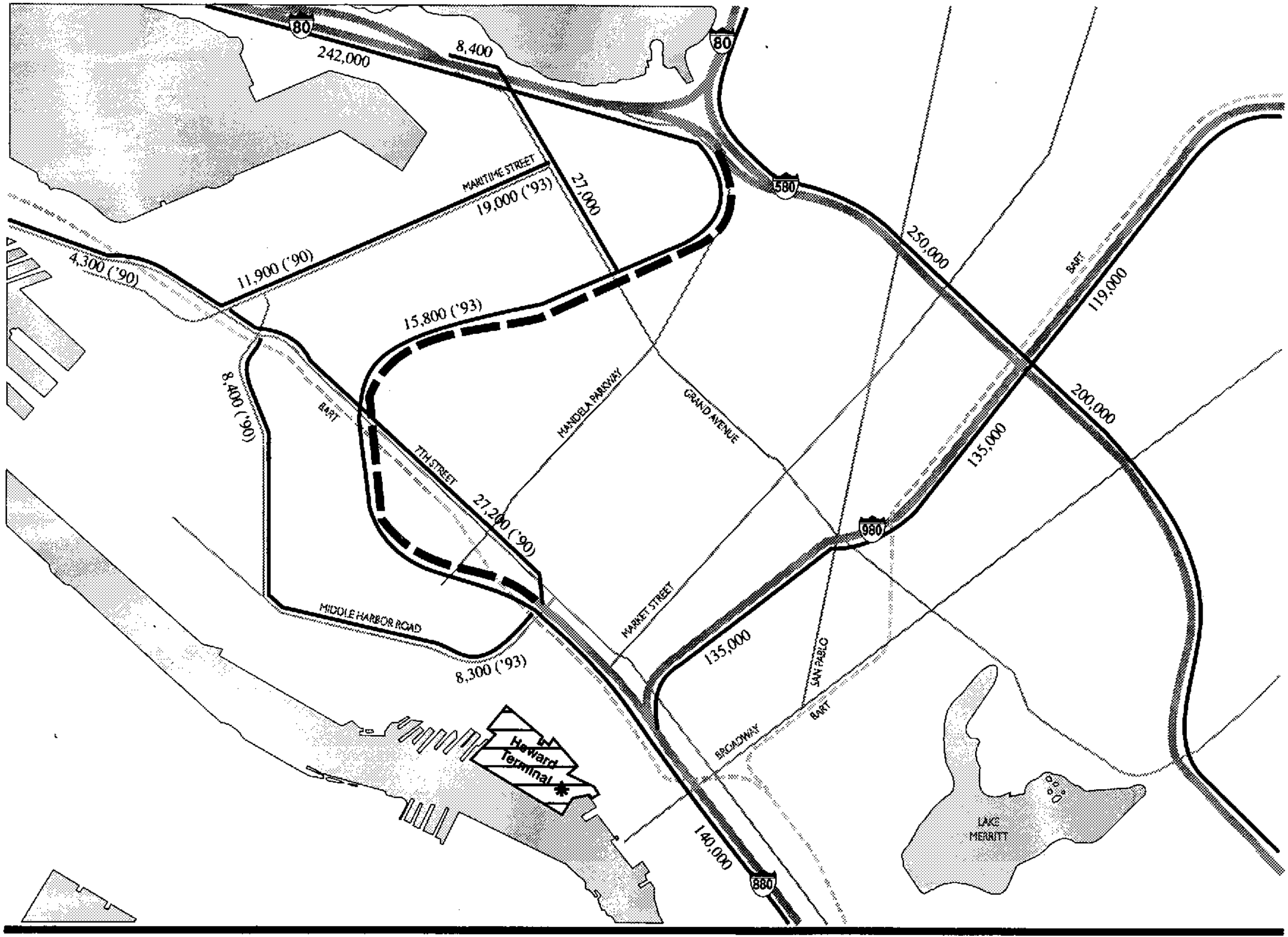
FIGURE 16

AM Peak Hour Traffic Counts



Source: Brady and Associates, 1994

SCALE IN MILES
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FIGURE 17

Existing Daily Traffic Volumes

Table 7
LEVEL OF SERVICE DEFINITIONS
UNSIGNALIZED INTERSECTIONS (ONE OR TWO-WAY STOP)

Level of Service	Expected Delay	Reserve Capacity (Vehicles/Hour)
A	Little or no delay	≥400
B	Short traffic delay	300 - 399
C	Average traffic delays	200 - 299
D	Long traffic delays	100 - 199
E	Very long traffic delays	0 - 99
F	Extreme delays potentially affecting other traffic movements in the intersection	≤ 0

Source: *Highway Capacity Manual*, Special Report 209, Transportation Research Board Washington D.C., 1985.

Table 8
EXISTING INTERSECTION LEVELS OF SERVICE
AM PEAK HOUR

Jefferson Street and The Embarcadero	A
Martin Luther King Jr. Way and The Embarcadero*	A
Market Street and The Embarcadero*	A
Third Street and Market Street	A

Source: Dowling Associates, based on December 1993 counts. All intersections are partially Stop sign controlled, except a * indicates the intersection is an all-way Stop.

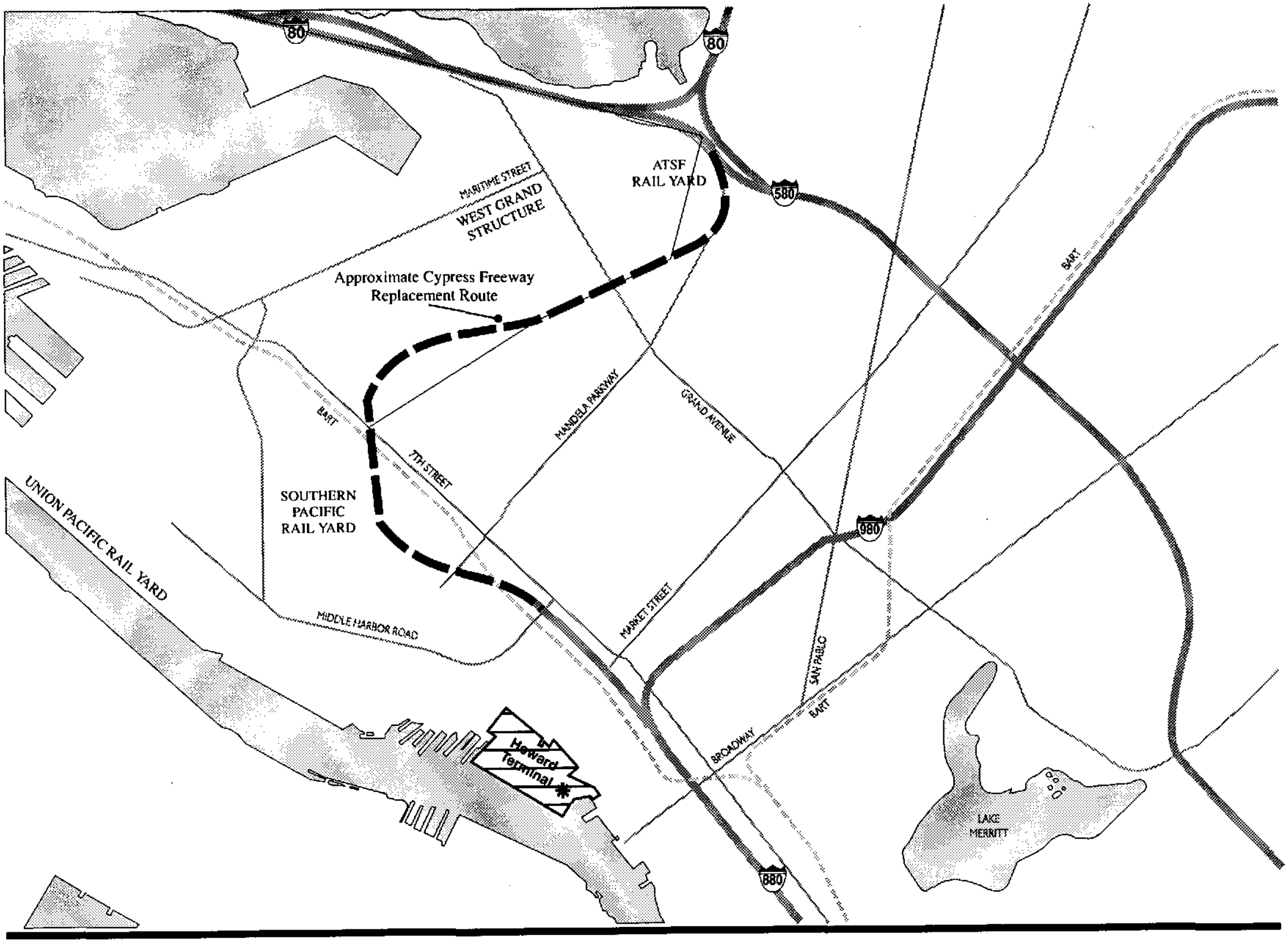
c. Regional Highway Facilities. Figure 18 shows a map of regional highway facilities. The Port is located near the hub of the Bay Area freeway system. A description of the system is provided in Table 9. Important regional streets serving Port traffic and circulation include: Maritime Street, Middle Harbor Road, and 7th Street. The West Grand Avenue structure provides a connection from the Port and downtown Oakland to Interstates 80 and 580. It is an elevated structure from Mandela Parkway to the Bay Bridge toll plaza, with on and off ramps provided at Maritime Street. Improvements are currently planned for several nearby freeways, as described below.

(1) Interstate 80. Widening with a high occupancy vehicle (HOV) lane from Route 4 (Pinole) will occur in a phased construction program over the next four years. One phase includes reconfiguration of the I-80/580 (Albany) interchange, where the existing left exit going toward Richmond will be replaced with a safer right-hand exit. A second phase will provide direct access to Cutting Boulevard from the HOV lane.

The third phase is a proposed elevated ramp to the Bay Bridge Toll Plaza for HOV's. Although the projected date of completion is late 1996, the project has not yet received the approval of the regulatory agencies.

(2) Interstate 580. The existing distribution structure will be modified as part of Cypress Structure replacement project.

(3) Interstate 880. The Cypress Structure (collapsed during Loma Prieta earthquake) will be replaced from about one mile northwest of I-980 to the 80/580/880 distribution structure. The new alignment will cross over the BART tracks near the Oakland West station, then generally follow the existing Southern Pacific Railroad track alignment. It will be a six-lane freeway, partly elevated and partly at-grade. A connection to/from the Bay Bridge will be provided at the West Grand Avenue connector, as well as ramps to and from I-80 east. HOV lanes will be provided. A full (i.e, all direction) split-diamond interchange will be provided at Adeline/Union Streets, for access to and from the Outer Harbor, the Middle Harbor, and downtown. Access will also be provided at 7th Street, which is to be connected by a frontage road. The Cypress replacement structure will split north of the West Grand Avenue Connector with one connector providing access to the Bay Bridge and the other heading toward Berkeley. The I-880/Cypress Replacement project should be completed by the end of 1997 or early 1998. The approximate alignment is shown in Figure 18.



Source: Brady and Associates, 1994

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FIGURE 18

**Area Setting - Highways
And Rail Yards**

Table 9
REGIONAL HIGHWAY FACILITIES

Route Number	No. Lanes (Total)	Ramps/Interchanges Nearest Port of Oakland	Destinations Served
24	6-8	No ramps directly serving.	Central Contra Costa County; Solano County and points east (joins I-80)
80	8-10	West Grand Avenue interchange Connections to Mandela Parkway (formerly Cypress Street) near 32nd St.	San Francisco/West Bay West Contra Costa County Sacramento and points north & east
580	8	West Grand Avenue/80 ramps Mandela Parkway connections near 32nd Street	Northern Alameda County Livermore-Pleasanton Stockton and I-5 Corridor south
880	8	Mandela Parkway/7th Street interchange Market Street ramps Oak/Jackson Street ramps	West (industrial) Alameda County Southbay and southern Peninsula San Jose
980	6-10	12th Street Ramps	Downtown and West Oakland

Source: Dowling Associates, based on information supplied by Caltrans' Public Information Office.

(4) Potential Tunnel or Bridge to Alameda. In 1966 the State proposed a roadway connection from Oakland to Alameda Naval Air Station, which would be an extension of I-980. One option was a tunnel projecting from Brush and Castro Streets under what is now Howard Terminal. The proposal was dropped in the 1970s, but the City of Alameda is now investigating options for a connection to the Naval Air Station. The piles supporting the crane rail portion of the existing Howard Terminal typically extend to 126 feet below sea level. These piles would preclude construction of a tunnel under Howard Terminal.

(1) AM Peak. Bottlenecks occur on I-80 westbound in the AM peak at two locations: demand exceeds capacity at the divergence of 80 and 580 (distribution structure), and at the foot of the Bay Bridge, where the nine lanes that feed the Bay Bridge narrow to five on the Bridge structure. On 580, slowing occurs regularly in both directions between 80 and 980 due to the re-routing of all traffic from the collapsed Cypress structure (in the westbound direction, it is mostly the outer lanes headed for 80 eastbound that are affected). I-980 is also congested for the same reason for much of its short length (generally southbound from the 12th Street off-ramps to I-580). Part of the purpose of the Cypress Replacement project is to divert traffic to/from San Francisco and Berkeley/Richmond from this congested area. State Route 24 is generally not congested on a regular basis in this area, although traffic will sometimes back up from I-580 onto State Route 24. Conditions on surface streets are generally within acceptable levels of service, although on some streets volumes are high.

(2) PM Peak. Congestion occurs in both directions on I-80 from the distribution structure to Albany, and sometimes beyond. Moderate *westbound* delay occurs at peak times at the Bridge toll plaza, and sometimes backups reach past the Oakland Army Base overcrossing. I-80 is sometimes congested in the eastbound direction of travel approaching the distribution structure. The most severe congestion on I-580 in the PM peak is in the westbound direction, between the ramp to I-80 eastbound and the 24/980 interchange. State Route 24 is congested in the eastbound direction because the Caldecott Tunnels are a bottleneck. Although some slowing occurs, I-880 is generally not severely congested in the area within the Oakland City limits; the main problem areas are from Hegenberger Road to Washington Street (in San Leandro), and in Hayward (especially Washington to A Street, and Tennyson to Lewelling).[2] I-980 congestion occurs due to a bottleneck at the 24/580 interchange, and can back up in the northbound direction for much of I-980s length.

Where feasible, trucking firms often schedule their work in the early morning and mid-day hours in order to avoid congestion in the above areas. The percentage of trucks in the PM peak (4-6 PM) traffic is generally less than that found during other hours of the day. Congestion affects trucks as well as other traffic, perhaps even more so, since congestion has a direct monetary cost (in wages, delivery delays, and direct vehicle operating costs) to trucking firms.

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[2] *Alameda County Draft 1993 Congestion Management Program,* Page 23, prepared by the Alameda County Congestion Management Agency, March 15, 1993.

e. Railroad Transportation. The Port is served by four railroads: the Southern Pacific Transportation Company (SP), the Atchison, Topeka, and Santa Fe Railway (ATSF, or Santa Fe), the Union Pacific Railroad (UP), and the Oakland Terminal Railway. The first three railroads have national route systems; the Oakland Terminal Railway provides local switching services between railroads and shippers. The SP serves the Port by both a southern and a central route. Its network goes from New Orleans across the southern and central tier of states and as far north as Portland, Oregon. The Santa Fe covers the central tier of the United States from Chicago west. The UP also covers the mid-section of the United States, including southern California, and has major interchange points with other railroads in Omaha and St. Louis. The Santa Fe also provides service to the Gulf/Southeast.

(1) Physical Facilities and Yards. All three major railroads have Bay Area intermodal yards. The SP has the largest yard facilities adjacent to the Middle Harbor area east of the Naval Supply Center Oakland (as shown on Figure 19). The UP has a long, narrow combination intermodal and classification/storage yard, as well as automobile terminal, located at the western end of the Middle Harbor area, southwest of the Naval Supply Center and directly adjacent to the Port's marine terminals. The Santa Fe's principal intermodal yards are located in west Richmond, near the Richmond-San Rafael Bridge. The Santa Fe has a small yard serving the Port of Oakland, located north of West Grand Avenue near the Bay Bridge distribution structure, and uses trackage rights over the SP to its Richmond intermodal facilities.

The UP line on Third Street and SP have begun to consolidate on the SP line along the Embarcadero. The consolidation removes the at-grade crossings on Third Street and speeds up movement in and out of both rail yards by removing the conflict near Adeline Street, where the UP tracks cross the SP tracks. Improvements will be made to the SP tracks to allow for the consolidation and to accommodate a new AMTRAK Oakland station on Alice Street at Second Street, near Jack London Square. The consolidation should occur by 1995.

(2) Schedules and Operations. Train schedules are driven by shipper and Port needs, and so change frequently due to variations in demand. Additional trains are added when demand warrants, and conversely, are annulled (i.e., suspended for the day) when there is insufficient rail traffic. There are also local switching trains that may operate around the Port without a fixed schedule. Some general statements are provided below based upon schedules in effect in 1994.

The Union Pacific schedules three trains each weekday to points in the east, which generally depart in the afternoon and early evening. On weekends, additional eastbound trains are scheduled to coincide with international traffic arriving at the Port. Normally there are two or three inbound trains from the east scheduled each day, generally arriving in the late evening or early morning.

The Santa Fe intermodal facility is located in Richmond. The Santa Fe typically has eight trains a day into and out of the Port of Oakland to points south and east, including one train a day to shuttle cars between the Port of Oakland and the Richmond yards. Arrivals and departures occur throughout the day, and many trains operate during the late night and early morning hours.

The SP schedules the number and timing of trains on an "as needed" basis. There are eight AMTRAK passenger trains per day using the SP line along the Embarcadero (four in each direction): the "Coast Starlight" (Los Angeles-Seattle, one in each direction); and the three "Capitols" (San Jose-Sacramento).

Currently, there is substantial unused capacity for intermodal containers being shipped (outbound) from the Port. This is because railroads are oriented toward carrying heavy manufactured goods, and the predominant flow of such goods is from the manufacturing belts of the midwest and northeast to California. This substantial unused capacity (known as "empty backhaul") is in the eastbound direction. Additional capacity of an incremental nature would most likely be added by lengthening existing trains, rather than running new trains.

(3) Railroad/Highway Grade Crossings. Public rail/highway at-grade crossings occur at several locations around the Port. The SP mainline travels in the center of the Embarcadero, from Webster Street to Clay Street. West of Clay, the mainline is in its own exclusive right of way, but there are perpendicular grade crossings at most cross streets. The UP mainline is in the center of 3rd Street, between Oak Street and Filbert Street, but is in the process of being abandoned/consolidated in favor of the SP line (see description above under Railroad Facilities). Additional grade crossings occur on the SP line at Middle Harbor, just south of 7th Street/7th Street Extension, and at Maritime Street south of 7th Street. Numerous other at-grade crossings occur for sidings and spur tracks.

f. Existing Truck Traffic. Truck volumes on state highways are shown in Table 10 and taken from Caltrans' *Average Annual Daily Truck Traffic on the California State Highway System*. The table shows that truck volumes vary from about three percent to almost 14 percent of total traffic volumes (one location was under three percent, but was counted prior to the 1989 earthquake and is probably not valid today). The composition of the trucks by number of axles is also shown (the row percentages of the right-most four columns add up to 100 percent, representing all trucks).

Table 10 shows that two-axle trucks predominate in most locations, except on I-880 (Nimitz Freeway), where five- or more axle trucks make up 63 percent of all trucks at this location, and on I-80 between Powell Street and Ashby Avenue (State Route 13). The total vehicular volumes on the routes shown in this table are shown in Figure 17.

Data were collected at the major entrance to Howard Terminal to establish the current volume of trucks and other vehicles. The Dowling Associates counts indicate that AM peak truck volumes vary from a low of just 5-10 percent along the Embarcadero, to as high as 43 percent along Market Street between the Embarcadero and Third Street (this area is immediately adjacent to Howard Terminal gates).

g. Distribution of Truck Traffic. A 1991 survey by the Port of Oakland[3] indicates that almost one-third of the garage locations of trucks working at the Port were reported as being in the City of Oakland. Almost 44 percent of the truck trips originate in Alameda County, with 33.5 percent of those trips originating in Oakland and 10.5 percent from the balance of Alameda County.

Over 40 percent of the truck trips were destined for a place in Alameda County, with 30 percent within the City of Oakland and 10 percent to remaining locations. About 27 percent of the truck trips were on local streets (i.e., did not use any freeway) to reach the Port terminal areas. This includes both inbound and outbound trips.

2. Impacts and Mitigations

In order to address project impacts, a threshold of significance is first defined. Then the assumptions for trip generation and trip distribution used for the impact analysis are described. Detailed printouts are shown in Appendix C.

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[3] Memo to John Glover, Port of Oakland, from Louise Engel, Port of Oakland, "Oakland Truck Traffic and Port Marine Terminals," October 30, 1991.

Table 10
ANNUAL AVERAGE DAILY TRUCK PERCENTAGES OF TOTAL TRAFFIC

Route/Location	Trucks[a]	2-axles	3-axles	4-axles	5+ axles
SR 24 at Junction 580/980	3.4%	54.6%	9.9%	2.5%	33.0%
I-80 between Powell and SR 13	7.3%	33.6%	10.4%	2.3%	53.7%
I-80 at Bay Bridge Toll Plaza	4.4%	53.8%	11.2%	2.1%	32.9%
I-580 between 24/980 Junction and San Pablo Avenue[b]	1.8%	63.4%	21.9%	3.5%	11.2%
I-880 south of Oak Street[b]	13.6%	20.9%	13.3%	2.8%	63.0%
I-880 north of Hegenberger Road	9.6%	37.8%	14.6%	8.6%	39.0%
I-980 at 14th Street	9.9%	38.7%	15.0%	10.6%	35.9%

[a] Truck volume as a percent of total traffic (all vehicles).

[b] Indicates most recent count (shown) was taken prior to Loma Prieta earthquake of October 1989.

Source: Caltrans, November 1992.

a. Significance Criteria. The level of significance for traffic is based on CEQA requirements in that a project will normally have a significant effect on the environment if it will:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system.

The threshold of significance used in this document is determined by the level of additional traffic that would be perceptible by the motoring public. While there is no absolute standard for this level, a change (increase) in the ratio of traffic volume to highway capacity (V/C) greater than 3 percent (0.03) has been used to define a significant impact. For example, an eight-lane freeway has a capacity of 8,000 vehicles per hour (VPH) in each direction, so an impact of 240 or more vehicles would be considered "significant" (8,000 x 0.03). Each truck is considered to be equivalent to two passenger cars for the purpose of this analysis, so in the above example, 120 or more trucks per hour would be considered "significant."[4] For intersections, any change in level of service that results in LOS "D" or worse operation during peak hours is considered significant.

b. Project Trip Generation. The proposed project would generate a net change of 19 additional peak hour truck trips and 18 additional peak hour employee trips.

(1) Truck Trip Generation. The project would increase the number of trucks entering and leaving the terminal because of the increased number of vessel calls, an increment of about one per week. The terminal will have 12 lanes: eight for inbound trucks, two for outbound trucks, and two reversible lanes (serving either inbound or outbound trucks, depending on demand). A reasonable peak hour would include 120 transactions per hour, or 65 outbound and 55 inbound truck trips. For short periods, the volume could exceed this, but the 120 transactions per hour represents a reasonable assumption. The additional truck trip generation due to the wharf extension is shown in the right hand column of Table 11.

(2) Employee Trip Generation. In addition to the 19 additional peak hour truck trips shown in this table, the project would result in trips due to additional employment at Howard Terminal. The number of employees on site is expected to be 82 when one ship is at the terminal, and 122 when two ships are present. The difference of 40 workers represents the increase in peak employment at the terminal. The Institute of Transportation Engineers' (ITE) *Trip Generation*, 5th edition (1991) was used to estimate the employee trip generation rate for light industrial (ITE land use #110) use, which is 0.44 trip per employee in the AM peak. The directional split of trips is 83 percent inbound and 17 percent outbound in the AM peak. With 82 workers on the terminal, there are 30 employee vehicle trips inbound to the site during the AM peak, and 6 trips outbound, for a total of 36 AM peak trips. If 122 employees were on site, as would occur after the wharf extension is completed, the AM peak vehicle trip generation would be 54 vehicles: 45 inbound and 9 outbound. Thus, 18 new trips would occur from the additional employees at the terminal because of the project. These trips would not have a significant impact on local or regional traffic.

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[4] Based on Tables 3-4 and 9-5 in the *Highway Capacity Manual*, Transportation Research Board Special Report 209, Washington, D.C., 1985.

Table 11
ADDITIONAL PEAK HOUR TRUCK TRIPS
(one-way trips, annual average)[a]

Direction	Existing Peak Hour Count	With Project	Net Change
Inbound (to Project)	36	55	+19
Outbound (from Project)	65	65	0
Total	101	120	+19

[a] The peak day is estimated to be double the annual average daily container loading. For example, there would be 240 one-way truck trips on the peak day with the project.

Source: Based on Dowling Associates' counts and information from the Port of Oakland.

(3) Truck Trip Distribution. Truck trips can be separated into local truck trips and intermodal truck movements. Local truck trips are those made by trucks within the Port's hinterland, which is a distance of approximately 150-200 miles from Oakland. Local service usually goes no further because other ports would be more convenient to those locations (e.g., Port of Long Beach/Los Angeles for Southern California). The intermodal truck movements are trips made to transport a container from a ship to a rail facility, or vice versa. The Port has no facilities for the direct loading or unloading of rail-borne containers to/from ships, so these are primarily short distance trucks operating from a ship berth to a rail yard. Although these movements would be mostly within the Port area, as noted elsewhere, movements to the Santa Fe Railway would be carried to the Richmond area by freeway, where its intermodal rail facility is located.

The activity levels at the Port vary dramatically according to seasonal and daily fluctuations. Typically the peak months for shipping activity are September through November, while Wednesday through Saturday are typically the highest days of the week. Truck activity is not exactly a function of crane activity, because the peak hourly activity level is constrained by the ability of equipment to load and unload containers, and by the lanes to process trucks into and out of the site.

c. Project Trip Distribution. The additional traffic generated by the proposed project would result in an unnoticeable distribution. **This would be considered a less than significant impact.** (LS) No mitigation measures are necessary.

Trip distribution refers to the locations of the origins and destinations of trucks serving the Port. This will, in turn, affect the routes used by trucks. The project trip distribution has been developed from a survey[5] done in July 1991. The survey included over 1,200 trucks. Table 12 shows the origin and destination locations of truck trips from the survey. As part of the 1991 survey, truck drivers were also asked for the routes used for their trips. These results are shown in Table 13.

d. Traffic Level of Service Results. The project would have no significant impact on the level of service at the study intersections, since all of the intersections would operate at LOS "C" or better. The impacts on regional highways are also less than significant; this is discussed along with Cumulative Impacts and the No Project sections. **This would be considered a less than significant impact.** (LS) No mitigation measures are necessary.

Based on the trip generation and distribution factors described above, the TRAFFIX 6.6 traffic impact analysis model was run to analyze the intersection impacts of the project. These results are shown in Table 14.

Table 14 shows that there are no significant impacts due to the project itself, although delays would increase very slightly due to the presence of additional trucks at these intersections.

e. Rail Impacts. It is assumed that railroad operators would handle the changes in container cargo volume by double-stacking container rail cars, thereby not effecting the length of trains or number of train trips to and from the Port. **This would be considered a less than significant impact.** (LS) No mitigation measures are necessary.

Changes in the container volumes handled at Howard Terminal would also affect rail traffic into and out of the Port. The estimates have been based upon information supplied by the Port on the annual change in the number of container units.[6] For both the No Project and Project Alternative, the actual number of trains operating is not likely to change; demand would be satisfied first by double-stacking containers where single-stacking is now used, and then

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[5] Memo from Louise Engel, Port of Oakland, to John Glover, Port of Oakland, "Oakland Truck Traffic and Port Marine Terminals," dated October 30, 1991.

[6] Fax from Jody Zaitlin, Port of Oakland, to Steve Colman, Dowling Associates, March 11, 1993.

Table 12
COMBINED ORIGIN/DESTINATION LOCATIONS OF TRUCK TRIPS

Drayage to/from other Port Terminals	6%
Oakland	26%
Other Alameda County	5%
Contra Costa County	8%
San Francisco/San Mateo Counties	10%
Santa Clara County	5%
North Bay Counties	4%
Central Valley	5%
Other California	17%
Out of State/Unknown	14%

Source: Port of Oakland survey, 1991, conducted by Caltrans.

Table 13
ROUTES USED BY TRUCKS TRAVELLING TO/FROM THE PORT OF OAKLAND

Route Used	Inbound Percent	Outbound Percent
Bay Bridge (I-80 west)	22.4	11.2
I-80 Eastbound	11.2	22.2
I-880	36.9	36.0
I-980	1.1	1.2
Surface streets only	28.1	29.4
Other freeway	0.3	0.0

Note: The 'unknown' (i.e., missing) responses from the original tables have been factored out of this table so that the totals add to 100.0%.

Source: Port of Oakland survey. Memo from Louise Engel, Port of Oakland, to John Glover, Port of Oakland, "Oakland Truck Traffic and Port Marine Terminals," dated October 30, 1991.

Table 14
INTERSECTION LEVELS OF SERVICE

	Existing	Existing + Project
Jefferson Street and The Embarcadero	A	A
Martin Luther King Jr. Way and The Embarcadero	A	A
Market Street and The Embarcadero	A	A
Third Street and Market Street	A	A

Source: Dowling Associates, based on December 1993 counts.

by lengthening existing trains (if needed) to accommodate the change in demand. It is not anticipated that the terminal improvements will generate enough demand to add new trains.

The significance of the additional rail crossing delay depends upon whether additional railcars are added, the number of railcars, and the time of day that the trains are scheduled. For example, an additional train at 3:00 or 4:00 a.m. would not have a significant impact on delays to traffic (and pedestrians). It is not possible to predict exactly what these numbers will be, but it is likely that the impacts will be less than significant, because of the use of existing empty backhaul capacity, and because any new trains are most likely to run in the late evening or early morning hours before the AM peak or after the PM peak.

f. Construction Period and Upland Disposal Traffic Impacts. The principal construction activities (from a transportation standpoint) would consist of demolition of an existing transit shed and wharf area, removal of piles, excavation, placement of new fill and piles, and disposal of dewatered sediments at one or more of the following landfills: Vasco Road, Keller Canyon, Redwood, or Forward.

The anticipated duration of construction of the wharf extension is approximately eight to nine months. During the first one to two months the existing building would be demolished, piles would be removed, dredging would begin, and piles would be driven. During the next four to five months the activity would include dredging and fill, and the construction of the concrete wharf. For purposes of this analysis, the dredge and fill operations are expected to take six months. This provides approximately 130 normal working days to accomplish the truck transportation.

Construction activity would typically occur between 7:00 a.m. and 3:30 p.m., Monday through Friday, but may occur during other hours if it becomes necessary to meet the construction schedule. During construction there would be between 20 and 50 construction workers on the site. Workers would enter the site between 6:30 and 7:00 a.m. and leave the site between 3:30 and 4:00 p.m.. Since these worker trips occur earlier than the normal peak periods (7:00-9:00 a.m. and 4:00-6:00 p.m.), these trips are not expected to have a significant impact on the traffic levels of service on surrounding streets, nor on regional highways.

Dredged mud would be transported by barge from Howard Terminal to an upland handling facility at Berth 10, the Bay Bridge Terminal, at the north end of Maritime Street. The facility would be used to dewater the dredge material prior to transporting it to one or more landfill sites for disposal. The same process would be followed in the subsequent four years, as the site is used to process dredge material from other projects.

Vehicular access to Berth 10 is from Chungking Street and Bataan Avenue, which are located off Maritime Street (see Figures 2 and 6). Bataan Avenue is located approximately one-quarter mile southwest of the West Grand Avenue connector ramps, which provide direct access to I-80 (Bay Bridge and eastbound Eastshore Freeway), along with I-580. Maritime Street is a four-lane arterial with a center, two-way left turn lane. It is heavily used by trucks (and other traffic) accessing the Outer Harbor container terminals and the Oakland Army Base, among other uses. Peak period traffic volumes (1991) were obtained from available Caltrans data, and from traffic counts done specifically for the 42-foot Dredging Project Supplemental EIR/EIS in January-February 1993 at Maritime Street, south of the West Grand Avenue ramps. These counts, conducted very near the project entrance, indicate a total of 19,000 ADT on Maritime Street, which is considered a moderate volume sustainable with relatively short delays.

g. <u>Trucking Sediments to Landfills</u>. Trucks would haul the dewatered sediment to one or more landfills for disposal. Each truck can carry about 12.5 cubic yards of dewatered sediments; therefore, the proposed project would produce approximately 3,488 truckloads over a period of eight to nine months. Trucks would make 8 to 20 trips per day. If trucks operate over a 24-hour period, this would be less than one truck per hour; if they operate over a 10-hour period, it would be up to two truck trips per hour. A similar or lower level of truck trips would continue for the four years the facility is in use after the Howard Terminal wharf extension is completed.

Dredged sediments that meet the criteria for a Class III landfill would be taken to either Vasco Road or Redwood landfill. Materials with contaminant concentrations that exceed the limits for Class III landfill disposal would be taken to Keller Canyon or Forward landfill. Keller Canyon and Forward landfills are Class II facilities. At Vasco Road landfill, a Title D cell is expected to be in place by August of 1994. This cell will be able to take Class II material that does not contain hazardous waste. Redwood landfill can accept some Class II wastes. Dredged sediments that meet the landfills' engineering criteria will be used for daily cover. Landfill disposal is discussed further in Chapter V, Section I, Sediment Quality.

The addition of 8 to 20 truck trips per day from Berth 10 would be a volume increment of less than one percent, so is not expected to have a significant impact on nearby streets. Since trucks would be able to access the regional freeway system with very little surface street travel, impacts on surrounding surface streets would also be minimal or virtually non-existent. **Therefore, the rehandling facility would not have a significant effect on local or regional traffic.**

Each of the four disposal sites is discussed below (see Figure 19 for locations).

(1) Redwood Landfill. This site is located in Marin County, near the Marin/Sonoma County line immediately adjacent to Highway 101.[7] Most of US 101 is a freeway with full access control, except that between Novato and south Petaluma, it is a divided expressway with a median guardrail. Between Atherton Avenue (Novato) and the South Petaluma Boulevard ramps, US 101 is classified as an expressway, with some access control. US 101 provides the regional access route to the Redwood Landfill site, and is located at approximately post mile 25.4, about two miles south of the Marin/Sonoma County line. The posted speed limit is 55 miles per hour.

Sanitary Landfill Road carries all traffic into and from the Redwood Landfill, and is a two-lane road. The intersection with US 101 is a "T" intersection, with a stop sign on Sanitary Landfill Road and no control for the US 101 traffic. On 101 southbound, a left turn deceleration lane is provided for traffic turning into the landfill, and an acceleration lane is provided for traffic

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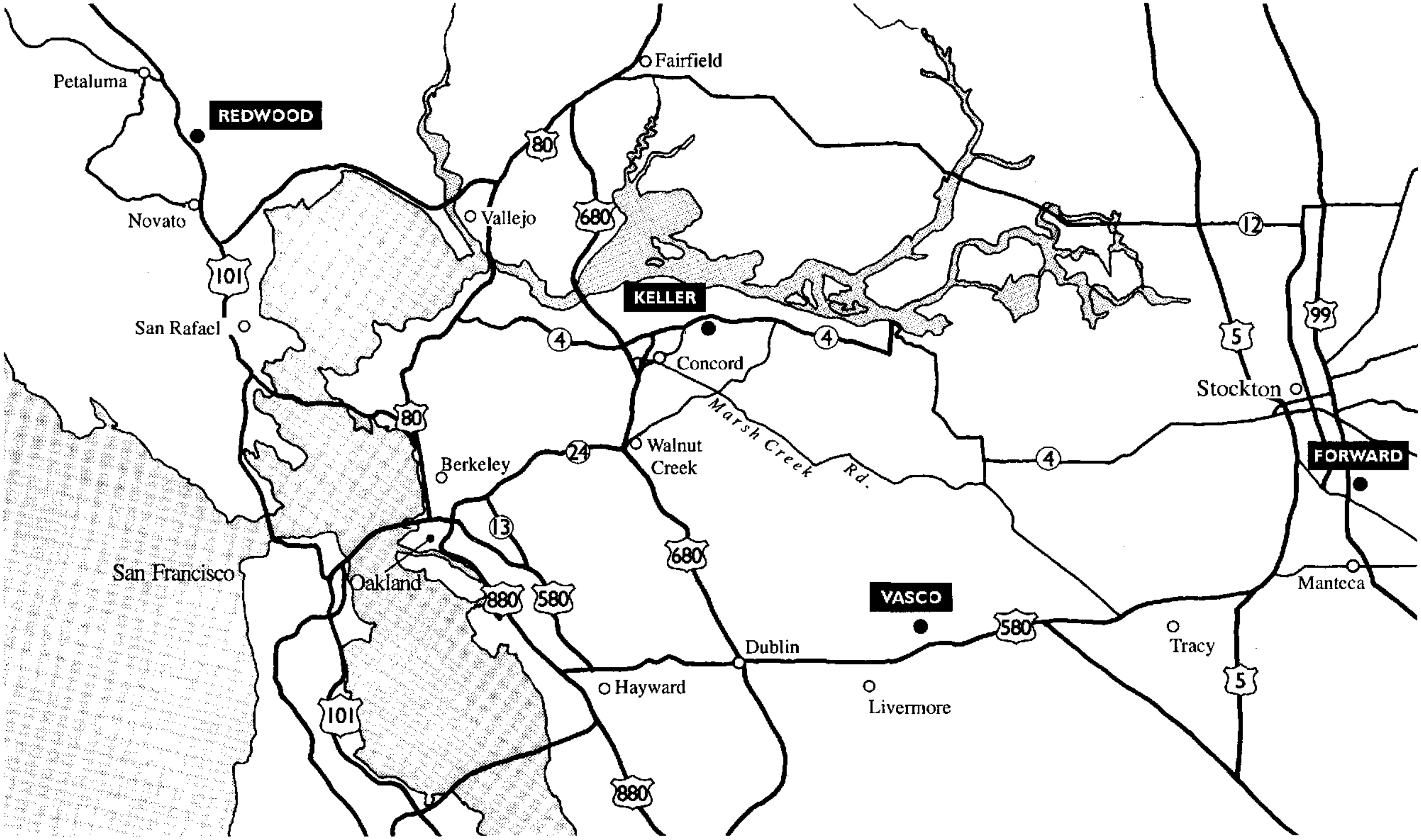
[7] For further reference, see *Redwood Landfill Solid Waste Facilities Permit Expansion Project*, prepared for the County of Marin, February 1994; and *Supplemental EIR/EIS Oakland Harbor Deep-Draft Navigation Improvements*, prepared for the Port of Oakland, January 1994.



Source: Brady and Associates

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

BRADY AND ASSOCIATES
PLANNERS AND LANDSCAPE ARCHITECTS

FIGURE 19

Landfill Sites

turning from the landfill into 101 southbound. From 101 northbound, traffic turning right into the landfill is provided with a wide apron that minimizes the delay to through traffic, although no separate right-turn deceleration lane is provided.

The Redwood Landfill site is directly adjacent to the tracks of the California Northern Railroad (formerly the Southern Pacific Railroad, SP).[8] The rail line follows Route 37 and US 101; an all-direction Y is provided near the junction of Highways 37 and 101. This is a single track line, with passing tracks (sidings) provided at strategic points. The Ignacio siding is near the Y; the Novato siding is just south of downtown Novato; and the Burdell siding is located about three miles north of Novato adjacent to Mount Burdell.

The existing annual average daily traffic[9] on US 101 are as follows:

Highway 37 to Rowland Avenue	97,000
Rowland Avenue to DeLong Avenue	83,000
DeLong Avenue to Atherton Ave.-San Marin Dr.	70,000
Atherton Avenue to South Petaluma Blvd. interchange	68,000

Peak month volumes are approximately 11 to 16 percent higher than this, depending on the locations, due to seasonal (mostly recreationally-related) traffic. The capacity of US 101 has been estimated at about 75,000 vehicles per day at an acceptable level of service in the four-lane sections[10] (i.e., just north of Atherton Avenue to South Petaluma Boulevard), and 113,000 vehicles per day in the six-lane section (most of the area south of the Atherton Avenue interchange).

The peaking pattern is the classic twice-a-day peak, occurring between 7:00-8:00 a.m. and 4:00-6:00 p.m., due to commute traffic. The heaviest westbound movement occurs from 7:00-8.00 a.m. (about 2,100 VPH), and the heaviest eastbound traffic occurs 4:00-6:00 p.m. (about 1,700 VPH).

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[8] Formerly the Northwestern Pacific Railroad. In late 1992, the NWPRR was absorbed into the Southern Pacific Railroad, losing its separate corporate identity. The line has subsequently been sold to the California Northern.

[9] This value is the equivalent of averaging traffic over 365 days of the year. Consequently, weekday volumes will (in most cases) be somewhat higher than the value noted, but probably by no more than 15%.

[10] Abrams Associates estimate, based on the *1985 Highway Capacity Manual*.

Daily traffic counts on Sanitary Landfill Road are 720 vehicles per weekday. The intersection of Sanitary Landfill Road and US 101 currently operates at level of service "F", which indicates long delays for vehicles turning out of Sanitary Landfill Road, especially making the left turn. The stop sign-controlled intersection of US 101 and the Sanitary Landfill Road presents a problem because of the high speed of traffic involved and the high percentage of trucks turning into or out of this intersection. Over a three year period (July 1, 1990 to June 30, 1993), a total of 13 accidents were reported at this location. One accident resulted in two fatalities, and three accidents involved 10 injuries. A calculation of the accident rate per million vehicles approaching the intersection indicates that the accident rate is not unduly high in comparison to statewide averages.[11] However, the number of fatalities and injuries suggest that an at-grade crossing and high speeds is a safety problem at this location.

The shortest travel route to this landfill is via Interstates 80, 580 (including the Richmond-San Rafael Bridge) and US 101. Trucks could use Maritime Street to access I-80 near the Oakland Army Base overcrossing. This route is relatively uncongested, especially during non-commute periods. One way travel time is between 55 and 80 minutes, depending upon the time of day.

(2) Vasco Road Landfill. The BFI Vasco Road Sanitary Landfill is located at 4001 N. Vasco Road in Livermore, approximately 2.5 miles north of I-580. Vasco Road is a two-lane road (one-lane in each direction), and a major route to Brentwood and eastern Contra Costa County. Due to relatively high traffic volumes for a two-lane road, it sometimes becomes congested. Vasco Road carries about 15,550 vehicles per day[12], and has been used as an access road to the landfill for many years, so truck traffic volumes are relatively high in the section between I-580 and the landfill. Other important routes in the area include I-580, an eight-lane freeway; I-238, a four-lane freeway connecting 580 to 880; and I-880, an eight-lane freeway which serves the Port area. There is no rail access adjacent to the site. Caltrans indicates AM peak congestion in the westbound-to-northbound movement from 238 to I-880; and in the PM peak in the southbound direction on 880, from 238 north to approximately 98th Avenue.

From Berth 10, trucks would head south on I-880, east on I-238 to I-580, and east on I-580 to the Vasco Road exit. From there it is approximately 2.5

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[11] See Abrams Associates report, cited above.

[12] Counted 2/93 approximately one-half mile north of I-580, as reported by Mr. David Maraji of the City of Livermore.

miles north on Vasco Road to the landfill site. The return trip would use the same route. One-way driving time is approximately 45-65 minutes, depending upon the time of day and traffic conditions.

Traffic counts and analysis were performed by DKS Associates as part of the environmental clearance for the Vasco Road landfill expansion. They indicate that 90 percent of the daily traffic on Vasco Road is autos and pickups, with the balance being trucks. Almost half of the daily truck volume is attributable to landfill trucks. The landfill currently generates about 1,000 daily, and 130 peak hour, vehicle trips.

DKS conducted turning movement counts at six nearby intersections during peak hours in November 1990. These counts indicate that level of service is generally "D" or better, except at three intersections during the PM peak hour: Crestmont Avenue approach at Vasco Road; Scenic Avenue approaches at Vasco Road; and Northfront Road approaches at Vasco Road. The operations on Vasco Road itself are acceptable. All freeway ramps at I-580/Vasco Road operate acceptably, except for the I-580 westbound on-loop, which currently operates at LOS "F" (V/C of 1.03). This ramp would not be affected by project traffic, however, since it serves vehicles travelling northbound from south of I-580.

(3) Forward Landfill. This landfill is located at 9999 South Austin Road, in San Joaquin County, approximately seven miles southeast of Stockton,[13] and 1.5 miles east of SR 99. There is no rail access immediately adjacent to the site. A Final EIR prepared for the expansion of this facility notes that all intersection levels of service in the immediate vicinity are (and will continue to be) "A". Regional impacts and access are similar to the Vasco Road site (discussed above), except that trucks would continue on I-580 eastbound over the Altamont pass to Interstate 205. From the junction of 205 and State Route (SR) 120, some trucks are likely to proceed north on I-5 and use Lathrop Road to cross over to SR 99, while others may use SR 120 to reach SR 99. Trucks would then exit SR 99 at the French Camp Road, which is a full (all direction) interchange. SR 99 and I-205 are four-lane freeways, SR 120 is a two- to three-lane divided highway, and Lathrop Road is a two-lane road.

Caltrans (1993) indicates that congestion currently exists in the westbound direction on I-580 near the junction of I-680 between 7:00-9:00 a.m., and on

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[13] For further information, see *Final Environmental Impact Report for the Forward, Inc. Landfill User Permit Modifications*," March 2, 1993, prepared for the San Joaquin County Community Development Department.

SR 238 between 6:30-9:00 a.m. This congestion would affect truck travel from either the Forward or Vasco landfills. In addition, there is AM peak congestion in the westbound direction on I-205 in the westbound direction for much of its length, due to the heavy commuting into the Bay Area from the Central Valley. One way driving time to this site is between 70-100 minutes, depending on traffic conditions.

(4) Keller Canyon Landfill. This site is located at 901 Bailey Road in Pittsburg. This landfill would be reached from Berth 10 via I-580 (see discussion of Redwood landfill for access routes to I-580), SR 24, I-680, SR 242, and SR 4. Trucks would exit the freeway at the Bailey Avenue exit. Caltrans (1993) indicates that traffic congestion extends over a considerable length of this route, primarily in the westbound direction. The duration of the congestion is generally 6:00-8:30 a.m., although in one location (I-680 through Walnut Creek), congestion persists to 9:30 a.m. The congested areas include SR 4 from Willow Pass to Pittsburg (this should be somewhat alleviated by the lowering of the grade over Willow Pass, which recently opened); the SR 242/I-680 junction, I-680 through Walnut Creek through the I-680/24 interchange (now under re-construction); SR 24 from Lafayette to the Caldecott Tunnels; and I-580 from 24 to the Oakland Army Base. SR 4 and 242 are four-lane freeways, and SR 24 is an eight-lane freeway. Although use of I-80 to SR 4 is an alternative route, congestion is also severe in this corridor and may not improve travel times, which are likely to be 45-90 minutes (one way), depending on traffic conditions. There is no rail access immediately adjacent to the site.

A previous traffic study by Abrams Associates indicates that Bailey Road currently carries about 13,000 average daily trips between Highway 4 and Leland Road, and 5,300 average daily trips south of the landfill access road. The four nearby intersections (two ramp junctions with Highway 4, the intersection of Bailey Road/Leland Road, and Bailey Road/Willow Pass Road) all operate a LOS "A" during the AM and PM peak hours. Truck volumes on Bailey Road are currently fairly low; during a four-hour AM peak period they constituted only 1.4 percent of the vehicles on Bailey Road. In the section of Bailey Road between SR 4 and Leland Road, trucks made up 5 percent of the vehicles, partly due to construction activity nearby. Steep grades (in excess of 6 percent) exist for a short distance on Bailey Road to the south of the Keller Canyon Landfill, but the approach from the south was not expected to be permitted at the time the Draft EIR was written.

The Draft EIR also studied the accident history in the area to see if nearby roads have any special safety problems. During the period from 1984-1989, the Bailey Road/Leland Road intersection had a total of 24 reported accidents. A large number of the accidents involved vehicles turning left to and from Leland Road. A widening project at the intersection and new traffic signal were reported to have improved the accident rate. The Draft EIR notes no special accident problems nor unusually high accident rates in the area.

(5) Construction Period Truck Trip Generation. The project would require removal of 43,600 cubic yards of dredge material, and importing of roughly 144,000 cubic yards of fill.[14] An average of 12.5 cubic yards per truck has been used for this analysis, which is consistent with the truck capacity used in other Port environmental studies. This equates to 3,488 truck trips for dredge removal from Berth 10, and 11,520 trips to bring fill into Howard Terminal. Assuming a six month duration of dredging and fill, and that the truck trips are spread evenly throughout this period, the project is expected to require approximately 171 daily trucks (roundtrips), or 21 inbound and 21 outbound trucks per hour (rounded). To constitute a three percent increase in traffic on regional facilities (counting one truck as equal to two passenger cars), a freeway would have to be carrying less than 1,500 vehicles per hour in total, which for a Bay Area freeway is an extremely low volume, even during off peak periods. The impact of construction vehicles on local streets and intersections is likely to be around the immediate vicinity of the project, and as noted earlier, since these intersections currently operate at LOS "A" during the AM peak, there is substantial reserve (i.e., unused) capacity at these intersections during the mid-day period. The construction schedule (ending work by 3:30 PM) acts as a mitigation to reduce traffic impacts, since in some areas (particularly the local street system) traffic volumes are heavier during the AM than the PM peak. Therefore, the construction truck impact represents a less than significant impact.

h. Cumulative Impacts. Cumulative impacts include the impacts from the project as well as an increase in the West Coast market share of intermodal cargo east of the Mississippi and Texas with the completion of the ship channel dredging and other long term projects. The increase in intermodal market share is reflected by the additional vessel per week.

The cumulative (with project) traffic forecasts were based on year 2000 projections made by the Alameda County Travel Model. This model projects peak hour traffic forecasts using the EMME/2 travel forecasting software. The model includes transit services as well as highways; and has a sophisticated congestion diversion (route choice) procedure. The travel

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[14] Estimates prepared by Moffat and Nichol, April 14, 1994.

forecasts include the various land use plans of the cities and unincorporated areas in Alameda County. These land uses were developed as part of a planning process undertaken by the Alameda County Transportation Authority. The County's Congestion Management Agency provided the model results to Dowling Associates.

In the vicinity of Howard Terminal, the growth in traffic to the year 2000 along Third Street was used to factor all traffic volumes at the four study intersections. This growth factor includes new trips generated by the re-use of a portion of the Naval Supply Center property. This assumption reflects a worst-case analysis, since it is likely that some intersection movements would grow at a slower rate than that indicated by the model (land use forecasts are also based on pre-recession estimates that now appear to be too high). Cumulative traffic impacts are shown in Table 15.

Table 15
YEAR 2000 CUMULATIVE TRAFFIC LEVEL OF SERVICE AT NEARBY INTERSECTIONS, WITHOUT MITIGATIONS

	Existing	Existing + Project	Cumulative
Jefferson Street and The Embarcadero	A	A	A
Martin Luther King, Jr. Way and The Embarcadero	A	A	A
Market Street and The Embarcadero	A	A	A
Third Street and Market Street	A	A	F

Source: Dowling Associates.

The cumulative impact of traffic at the four study intersections would be less than significant, except at the intersection of Market Street and Third Street. With cumulative traffic (which would occur for more reasons, including not only new Port traffic, but increased activity around Jack London Square, and downtown development), in the future this intersection would operate with long delays (LOS "F", Table 15) to the stopped (Market Street) approaches, potentially delaying trucks and other vehicles into and out of Howard Terminal. This is a cumulative impact that would occur regardless of whether the project is built. The principal cause of delays is the heavy right turn movement from Market Street southbound into Third Street.

Impact TRAN-1: The heavy right turn movement from the intersection of Market Street southbound into Third Street would cause this intersection to operate with long delays (LOS "F") to the stopped Market Street approaches, potentially delaying trucks and other vehicles into and out of Howard Terminal. This is a cumulative impact that would occur regardless of whether the project is built, assuming that traffic volumes do increase to the projected levels by the year 2000. However, if the Union Pacific Railroad abandons the use of Third Street, another lane could be created, possibly resulting in an acceptable level of service. (S)

> Mitigation Measure TRAN-1: If the railroad track on Third Street is not abandoned by the time the expanded wharf is occupied, a traffic signal could be warranted at Third and Market Streets, both to provide for safe movement of vehicles and to reduce delays. With a signal, this intersection would operate at level of service "B" (volume-to-capacity ratio of 0.61),[15] which is a less-than-significant impact. The signal should be interconnected with appropriate adjacent intersections along Market Street (such as 5th/Market) to provide a smooth progression of traffic. However, the need for this improvement is not created by the Howard Terminal project.

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[15] The volume-to-capacity (V/C) ratio was calculated using the Transportation Research *Circular 212* planning method; the corresponding delay using the 1985 *Highway Capacity Manual* operations method is 13 seconds average delay per vehicle, which also corresponds to LOS "B".

E. Noise

■ ■ ■

The noise impacts created by the proposed project are likely to be limited to the construction phase. Sensitive receptors in the area, including the Waterfront Plaza Hotel, several shops, and occupants of the 530 Water Street building would all be potentially affected to varying degrees by the construction noise. This section establishes existing baseline conditions in the area, sets out the applicable regulations and criteria of significance, and assesses impacts and recommends measures to mitigate significant noise impacts.

1. Setting

a. Fundamental Concepts of Environmental Acoustics. Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. Decibels and other technical terms are defined in Table 16.

Most of the sounds which we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflects the facts that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency mid-range. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Typical A-levels measured in the environment and in industry are shown in Table 17 for different types of noise.

Table 16
DEFINITIONS OF ACOUSTICAL TERMS

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Table 17
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

At a Given Distance From Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100 feet)	130		
Jet Takeoff (200 feet)	120		Pain Threshold
	110	Rock Music Concert	
Pile Driver (50 feet)	100		Very Loud
Ambulance Siren (100 feet)			
	90	Boiler Room	
Freight Cars (50 feet)		Printing Press Plant	
Pneumatic Drill (50 feet)	80	In Kitchen With Garbage Disposal Running	
Freeway (100 feet)			
	70		Moderately Loud
Vacuum Cleaner (10 feet)	60	Data Processing Center	
		Department Store	
Light Traffic (100 feet)	50	Private Business Office	
Large Transformer (200 feet)			
	40		Quiet
Soft Whisper (5 feet)	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which create a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{10}, L_{50}, and L_{90}, are commonly used. They are the A-weighted noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time period. A single number descriptor called the L_{eq} is now also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, L_{dn} (day/night average sound level), was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 a.m. to 10:00 p.m. and the nighttime of 10:00 p.m. to 7:00 a.m. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

The effects of noise on people can be listed in three general categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning;
- physiological effects such as startling, hearing loss.

The levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise in the last category. Unfortunately, there is as yet no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance, and habituation to noise over differing individual past experiences with noise.

Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of the existing environment to which one has adapted: the so-called "ambient".

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the hearers.

With regard to increases in A-weighted noise level, knowledge of the following relationships will be helpful in understanding this report.

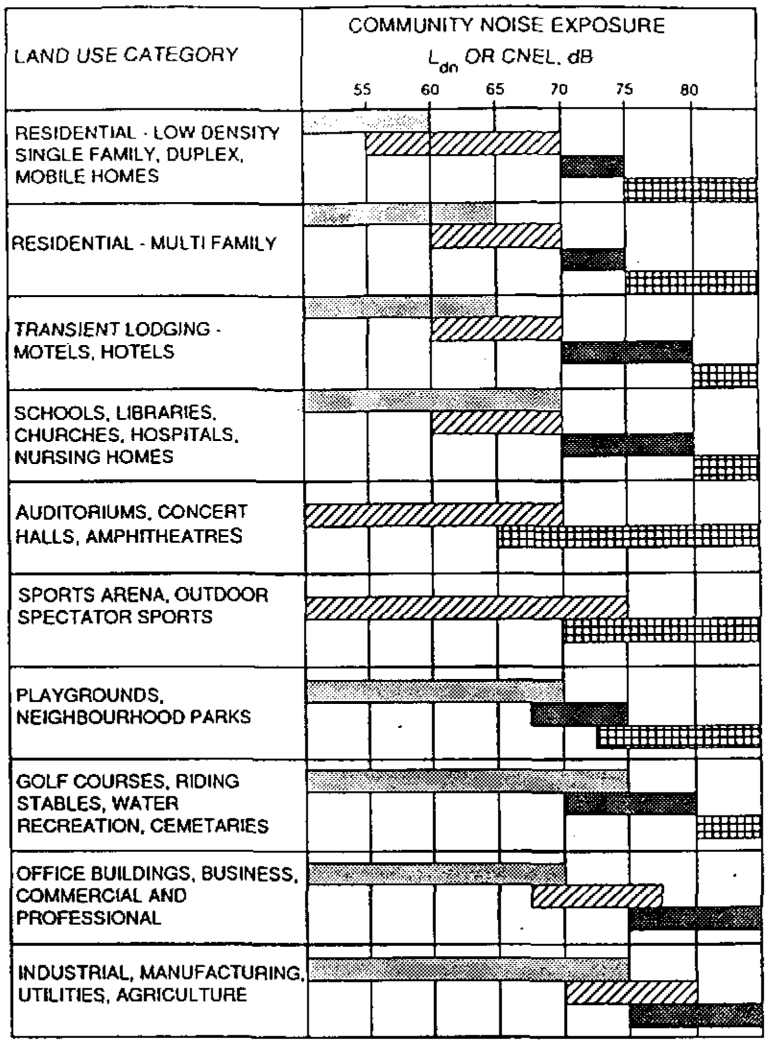
- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

b. Regulatory Background

(1) Federal and State Regulations. There are no federal or state noise regulations directly applicable to this project. The State of California, in Appendix G to the CEQA Guidelines, does establish general criteria of significance by stating that a project will normally have a significant adverse effect if it causes "a substantial increase in the ambient noise level in areas sensitive to noise adjacent to the project site." Significance criteria are presented in the Impact Section to address this directive.

(2) City of Oakland. The City of Oakland has adopted a Noise Element as a part of its Comprehensive Plan (1974). The Noise Element does not set forth specific guidelines for noise and land use planning. U.S. Housing and Urban Development Agency Guidelines are presented in the noise element. These guidelines are reproduced in Figure 20. The guidelines are generally applicable to the siting of new noise sensitive land uses in noisy areas. This project is a noise-generating project which could potentially affect existing noise sensitive land uses in the area. The guidelines do, however, provide a basis for judging the acceptability of existing and future noise environments.

(3) City of Alameda. The City of Alameda has adopted a quantitative ordinance in Section 11 of the City's Municipal Code. The noise ordinance establishes noise level standards based on the type of land use receiving the noise. The applicable portion of the ordinance limits A-weighted noise levels at commercial properties and is in Table 18.



░ **NORMALLY ACCEPTABLE**
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

▨ **CONDITIONALLY ACCEPTABLE**
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

▓ **NORMALLY UNACCEPTABLE**
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

▦ **CLEARLY UNACCEPTABLE**
New construction or development clearly should not be undertaken.

Source: U.S. Housing and Urban Development Agency

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

BRADY AND ASSOCIATES
PLANNERS AND LANDSCAPE ARCHITECTS

FIGURE 20

Noise Guidelines

Table 18
CITY OF ALAMEDA NOISE LEVELS FOR COMMERCIAL PROPERTIES

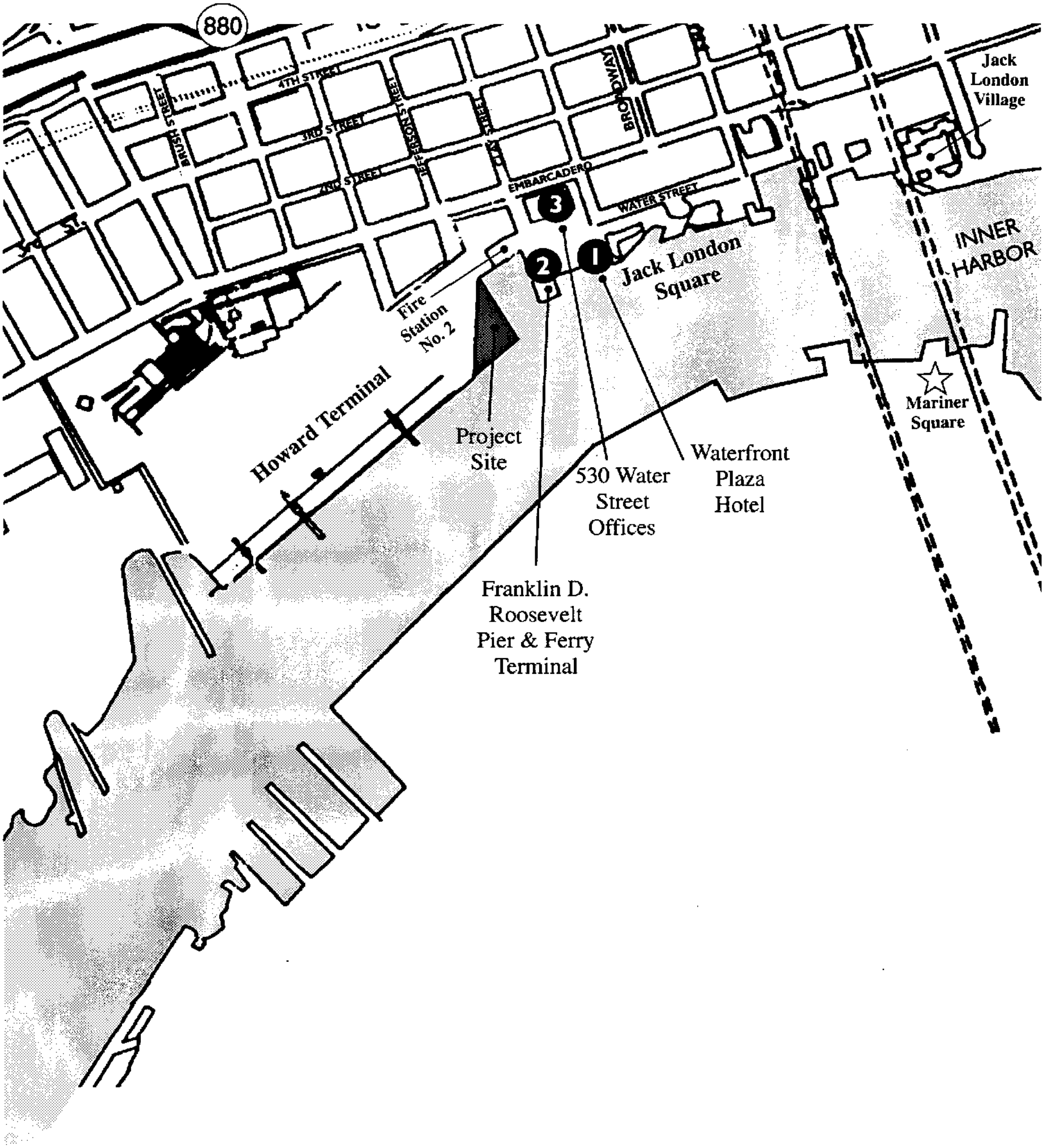
Cumulative number of minutes in any 1-hour time period	Daytime (7 a.m. - 10 p.m.)	Nighttime (10 p.m. - 7 a.m.)
30	65	60
15	70	65
5	75	70
1	80	75
0	85	80

The noise level standards are to be adjusted upward to reflect higher measured ambient noise levels and downward by 5 dBA if offending noises include simple tones, speech or music, or recurring impulsive noises.

c. Existing Noise Environment. Howard Terminal is located along the Embarcadero between Market Street and Jefferson Street. Four gantry cranes are located on the terminal for loading/unloading container ships. The proposed expansion is at the southern edge of the terminal where Jefferson Street intersects The Embarcadero at the north and west of Jack London Square. Sensitive receptors in the area include the 530 Water Street office building, the Oakland Fire Department Station No. 2, small shops along Water Street, the Waterfront Plaza Hotel located at the end of Washington Street, Franklin D. Roosevelt Pier, and the Ferry Terminal Pier (Figure 21).

The project area was visited in order to establish the qualitative and quantitative description of the noise environment at sensitive receptors near the project site. The noise environment results from existing marine terminal activities, including container operations, maintenance activities, and ship traffic in the middle harbor, vehicular traffic on the street network, jet aircraft overflights, and railroad trains on Embarcadero Street.

Noise levels were monitored outside the Waterfront Plaza Hotel, the fire station, at the foot of Washington Street, and inside the 530 Water Street building during the afternoon of January 4, 1994. The data are summarized in Table 19. Outside the Waterfront Plaza hotel next to the small boat marina, typical afternoon noise levels ranged from 50 to 65 dBA. During the measurement, jet aircraft overflights generated the highest noise levels, reaching 65 dBA, with small boat traffic generating 55 to 60 dBA. There was no activity at Berth 67 and 68 at Howard Terminal. Distant noise from the



Source: Brady and Associates, 1994

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

BRADY AND ASSOCIATES
PLANNERS AND LANDSCAPE ARCHITECTS

FIGURE 21

Noise Sensitive Receptors

Table 19
AMBIENT NOISE MEASUREMENT DATA, JANUARY 4, 1993

Location	Time	L_{eq}[a]	L_{01}[b]	L_{10}[b]	L_{50}[b]	L_{90}[b]
1) Waterfront Plaza Hotel	12:45 pm - 1:00 pm	55	58	55	52	51
2) Oakland Fire Dept. Station #2	1:05 pm - 1:20 pm	61	74	64	55	51
		(includes tugboat)				
3) Washington St. @ Water St.	1:54 pm - 2:09 pm	66	80	63	58	56
		(includes train horn)				

[a] L_{eq} = The average A-weighted noise level during the measurement period.
[b] L_{01}, L_{10}, L_{50}, L_{90} = The A-weighted noise levels that are exceeded during the measurement period 01, 10, 50, and 90 percent of the time, respectively.

port's other terminals was audible in the area. Vehicular traffic on Water Street and Washington Street was also audible during the measurement but did not significantly contribute to measured noise levels.

The noise environment outside the Oakland Fire Station No. 2 was similar to the environment at the Waterfront Plaza Hotel. During the measurement, however, a loud tug boat generated a maximum level of 75 dBA as it passed through the middle harbor, resulting in the higher average and maximum noise levels reported in Table 19.

The measurement at the intersection of Water Street and Washington Street was affected more by vehicular traffic on the roadways. During this measurement, a train passed through the area on the Embarcadero and generated repeated blasts of its warning whistle, ranging in noise level from 74 dBA to 87 dBA at the monitoring site, accounting for the very high noise levels reported in Table 19. Without the influence of the train, the average noise level would be about 58 dBA, typical of the entire plaza area south of the project site. It can be seen from the measurements that noise levels fluctuate from moment to moment, hour to hour, and probably day to day based on the type and amount of activity in the area due to the wide variety of different noise sources and land uses.

Noise levels were monitored on the second floor and the seventh floor of the 530 Water Street office building. The average noise level in the corner office of the second floor (#1562) facing the project site was 45 dBA. The background noise level in the office is steady and results from the heating, ventilating, and air conditioning systems. Other office-generated noise levels, including typing and conversations, result in some fluctuation of the noise level. Noise levels were similar in the seventh floor offices. They typically ranged from 40 to 42 dBA. A train engine passing on the Embarcadero resulted in a noise level of 45 dBA in the 7th floor corner office overlooking Embarcadero. The persons consulted in the Port's offices on the second and fourth floors, and the private law firm on the seventh floor, indicated the offices are typically used between 7:00 a.m. and 6:00 p.m.

2. Impacts and Mitigation Measures

a. Significance Criteria. The U.S. Housing and Urban Development Noise Acceptability ranges which are contained in the City of Oakland's Noise Element (Figure 21) are used to help assess the significance of long-term noise impacts. Project noise impacts would be significant:

- if they raised existing (ambient) noise levels from below to above the applicable criteria;
- if noise resulting from the project increased average ambient levels which are already above the applicable criteria by more than 3 dB; or
- if project generated noise resulted in a 5 dB increase, even if the resulting level remained below the maximum considered normally acceptable.

These criteria for significance recognize: (1) the threshold levels of acceptability established by governmental agencies; (2) that once the threshold level has been passed any noticeable change above that level (a 3 dB increase) results in a further degradation of the noise environment; and (3) a clearly noticeable change (a 5 dB increase) in the noise environment, even though the acceptability threshold has not been reached, is also a significant impact because people will respond to such changes in noise levels regardless of the absolute level of the noise.

The City of Alameda has adopted quantitative noise ordinance limits described in the Regulatory Background subsection of this section. If projected operational noise levels exceed the City of Alameda noise level standards at land uses in Alameda, then this would be considered a significant noise impact.

Noise resulting from construction is assessed somewhat differently. The construction phase does not create a long-term increase in noise levels. The long-term goals of the local jurisdiction are not appropriate criteria for determining the significance of the noise impact upon sensitive receptors during the construction phase. The potential for speech interference during the daytime or sleep disturbance at night are the most appropriate criteria for the purpose of assessing construction noise impacts. Sensitive receptors in the vicinity of the project site include office workers and patrons and workers in small businesses along Water Street, occupants of the Waterfront Plaza Hotel and patrons of the Rusty Pelican Restaurant located about 1/4 mile south of the site in Alameda. Persons staying in rooms of the Hotel would be the nearest nighttime sensitive receptors in the area. People using the Franklin D. Roosevelt pier would be the nearest outdoor sensitive receptors. To minimize speech interference outdoors, the hourly average noise level should not exceed 60 dBA. To minimize speech interference indoors, hourly average noise levels should not exceed 45 dBA. Assuming standard building construction, approximately 25 dBA of noise reduction would be provided by the office building's and hotel's facades. Therefore, average construction noise levels exceeding 70 dBA at the buildings' facades would be considered to cause a significant noise impact. To minimize sleep disturbance in the hotel, hourly average noise levels should not exceed 35 dBA inside. Hourly average construction noise levels should therefore not exceed 60 dBA outside of the hotel during the nighttime in order to minimize sleep disturbance.

Pile driving would occur during the construction of the proposed project. The maximum instantaneous noise level resulting from the pile driver should not exceed 55 dBA inside offices or 40 dBA inside the hotel during sleeping hours (10 p.m. - 7 a.m.) in order to minimize annoyance, speech interference, and sleep disturbance due to pile driving.

Noise from construction activities are exempt from the City of Alameda noise ordinance provided construction is limited to daytime hours.

b. Methodology. The methodology used to prepare the assessment consists of the following steps: (1) noise measurements were conducted at the nearest sensitive receptors to the project to define existing baseline conditions; (2) operational and construction noise levels were projected for each of these locations based on measurements of similar activity or published information; (3) the resulting noise levels were compared to existing noise levels and with applicable local criteria to evaluate impacts; (4) where significant impacts were identified mitigation measures were evaluated that could reduce the impact to a less than significant level.

c. Construction Noise. The proposed project consists of the extension of the wharf. The Port would demolish the existing transit shed, remove existing piles and build a new dike and fill behind it to support the wharf extension. The wharf extension would be on fill, except for a 100-foot wide strip of pile supported wharf for the crane rails. A pile supported wharf alternative is discussed in the Alternative section to this report.

Noise impacts resulting from construction depend upon the noise generated by the various pieces of construction equipment, the timing and length of time of noise generating activities, the distance between the noise generating activities and the nearby sensitive receptors, and the time of day or night that the construction activities occur. Construction activities are typically carried out in stages. During each stage of construction, a different mix of construction equipment is operating. Construction noise levels, therefore, vary by stage of construction and vary within each stage depending upon the numbers and types of equipment operating.

The construction of the wharf extension is anticipated to take a total of approximately eight to nine months. It is anticipated that the setup and demolition would take eight weeks, dredging two weeks and filling four weeks. The dredging would involve a barge crane, tug boat, dozer, compactor, grader and truck. An upland rehandling facility would be built on seven acres of wharf at Berth 10. Dredged mud would be transported to the upland handling facility where it would be dewatered. Trucks would haul the dewatered sediment to one or more landfills for disposal. The pile driving would then last up to three to five weeks. Piles would be driven with a 160,000-foot pound diesel hammer. Pile driving would typically occur between 7:00 a.m. and 3:30 p.m. Monday through Friday, but could operate during other hours if it becomes necessary to meet the construction schedule. No pile driving would take place during nighttime hours, between 10 p.m. and 7 a.m. During the next three months the activity would include importing fill and construction materials and constructing the concrete wharf. Concrete pumper trucks would be used extensively during this phase.

Projected noise levels during the pile driving and the other phases of construction at each of the representative sensitive receptor locations are shown in Table 20. The interior noise levels were estimated assuming 25 dBA of exterior to interior noise reduction for the nearby buildings. The projected interior levels only apply to those rooms of the buildings which have a direct line-of-sight to the construction activities, typically the north and west facades of the buildings.

Table 20
ESTIMATED RANGE OF CONSTRUCTION NOISE LEVELS

			Construction Noise Level (dBA)[a]	
Sensitive Receptor	Land Use	Distance from Site (ft)	Pile Driving (L_{max})	Other (L_{eq})
1) Oakland Fire Station No. 2	Municipal/w. sleeping	450' - 800'	outside 80-85 inside 55-60	70-79 45-54
2) Franklin D. Roosevelt Pier	Park	300' - 600'	84-88	71-75
3) 530 Water St.	Offices	600' - 900'	outside 79-82 inside 54-57	66-71 41-46
4) Water St. @ Washington St.	Office/ Commercial	800' - 1100'	outside 77-80 inside 52-55	64-67 39-42
5) Waterfront Plaza Hotel	Hotel	850' - 1200'	outside 76-79 inside 51-54	63-66 38-41

[a] Other construction activities include demolition, dredging, filling, concrete work, and paving.

Impact NOISE-1: The short-term noise impacts from pile driving would be sufficiently high to cause speech interference and annoyance. (S)

A comparison of the projected noise levels during pile driving with the single-event maximum noise level criteria indicates that pile driving noise would be sufficiently high to cause speech interference and annoyance inside the fire station and the 530 Water Street Building when pile driving is occurring nearest to the building. Exterior noise levels at the Franklin D. Roosevelt Pier would be sufficiently high to cause speech interference during both pile driving and other activities during the construction of the wharf extension. The balance of the construction activities would not result in significant impacts inside nearby buildings during the daytime.

> Mitigation Measure NOISE-1: The following measures are recommended to mitigate construction noise impacts 1 and 2 upon sensitive receptors in the area:
>
> (1) Construction using equipment powered by internal combustion engine should occur between the hours of 7 a.m. and 7 p.m., Monday through Friday (non-holidays), unless unforseen delays require Saturday work or work until 10:00 p.m. to maintain the schedule. If it is necessary to operate such equipment (other than pile drivers) between 10:00 p.m.

and 7:00 a.m., the Port should rent the rooms on the side of the Waterfront Plaza Hotel facing the construction for those nights.

(2) Best available control technology should be used during the pile driving phase. All available techniques to minimize the number of blows required to seat each pile should be utilized.

(3) Pile driving should be scheduled to have the least impact on sensitive receptors in the area. Pile driving activities should be restricted to the daytime hours. Late afternoon, evening and weekend pile driving would minimize impacts to adjacent office buildings, shops and some hotel functions, but would disturb sleep in many hotel rooms.

(4) All internal combustion engine driven equipment utilized in the demolition, dredging, filling, and concrete construction activities should be fitted with mufflers which are in good condition.

(5) A disturbance coordinator responsible for responding to noise complaints should be designated, whose name and telephone number would be clearly posted at the construction site. This person would determine the cause and implement measures to mitigate the noise impact. Examples include enforcing the allowable hours of construction, identifying poorly muffled equipment and requiring its repair or replacement, and recommending temporary construction noise barriers.

Impact NOISE-2: Construction noise at night, if work occurred then, would exceed the sleep disturbance criterion of 35 dBA. (S)

Mitigation NOISE-2: Same as Mitigation Measure NOISE-1.

If construction occurs at night, the interior noise level criteria for sleep disturbance would exceed 35 dBA inside the rooms of the Waterfront Plaza Hotel nearest to and facing the construction site. Noise-generating construction activities would therefore result in significant short-term noise impacts during pile driving inside the nearest sensitive buildings, throughout the duration of the construction phase at the Franklin D. Roosevelt Pier, and inside of the Waterfront Plaza Hotel at night.

d. Short-Term Construction Truck Traffic. The short-term construction truck traffic would make an imperceptible change to noise levels in the area because of existing high truck volumes on the roadways serving the wharf. **This would be considered a less than significant impact. (LS)**

During the construction phase there would be construction truck traffic on the roadways serving the site. There are projected to be 171 daily truck trips generated during the construction phase. The trucks would be distributed on the local roadway network. The truck traffic would be distributed fairly evenly during the 8-hour work-shift. Project-generated construction truck traffic would therefore not result in any significant noise impacts at sensitive receptors along the street network. Construction debris would be disposed of at Vasco Road, Forward, Keller Canyon, or Redwood Landfill. Dredge sediments would be trucked to the landfill sites. These materials would be shipped primarily via the freeway system. There would be no perceptible or significant increases in noise levels along the freeway system or near these landfills as a result of the proposed project.

No mitigation measures are necessary.

e. Upland Rehandling Facility. The barging, unloading and on-shore activities associated with the Upland Rehandling Facility would not result in a substantial noise level increase at any sensitive receptors in the area. **This would be considered a less than significant impact.** (LS)

A dewatering facility would be built on seven acres of wharf at Berth 10. The adjacent land uses are Sea-Land and the Army Terminal. Noise generating activities associated with the Upland Rehandling Facility include a tugboat used to push barges from Howard Terminal to Berth 10, a barge crane used to unload dredged sediments, a front-loader used to distribute the barge sediments at Berth 10, and trucks which would move the dry sediments. There would be approximately eight barge trips required in each of the three phases to fill the Berth 10 site. These tugboat movements within the port area would not result in a substantial increase in noise levels along the waterfront. There are no known noise sensitive receptors in the vicinity of Berth 10. The unloading and on shore activities would therefore not result in significant noise impacts. The truck traffic was assessed in the previous sub-section and found not to result in any significant noise impacts.

No mitigation measures are necessary.

f. Operational Noise. The small incremental increase in the amount of onshore activity would not result in a change in the noise levels at sensitive receptors in the area of more than 3 dBA. **This would be considered a less than significant impact.** (LS)

The proposed project could increase the size of ships loading and unloading at the Port of Oakland. It is likely that one additional vessel call per week would be made (on average) and the size of the ships would be larger, resulting in increased loading and unloading activity levels while ships are in berth. The number of containers handled in a given period of time would increase as would the associated truck and rail activities.

The noise levels generated during operation of the pier would not change substantially as a result of the proposed project, because there would be no change in the numbers or types of pieces of onshore equipment that would be utilized to handle the cargo. There would, however, be a slight increase in the duration of time that onshore activities would be occurring. The projected increase in wharf generated noise on a daily average basis is calculated to be less than 1 dBA as a result of the increased onshore activity. This is an *insignificant* change in the noise levels at sensitive receptors in the area and would not result in any significant noise impacts.

The removal of the transit shed would not have a significant effect on operational noise levels at sensitive receptors near the terminal. Although the building provides some shielding, it is too small relative to the size of the terminal and the size and distance of sensitive receptors to have a noticeable effect on levels at the sensitive buildings.

Incremental increases in truck traffic on the road networks were analyzed in the transportation section of this EIR. Truck traffic along the roadways serving the site, including the Embarcadero and other surface streets, would make an imperceptible change to the noise levels in the area. Project-generated traffic would not result in any significant noise impacts at sensitive receptors along the street network. No mitigation measures are necessary.

F. Air Quality

■ ■ ■

1. Setting

a. Climate. The project site is located in the San Francisco Bay Area, a large, shallow air basin ringed by hills, with a number of sheltered valleys around the perimeter. Two primary sea-level gaps in the hills exist: the Golden Gate and the Carquinez Straits. These two gaps are important sources of ventilation for the Bay Area.

Summers are warm and relatively dry while winters are mild and wet. Most of the rainfall is associated with Pacific storms that occur between the months of November and April.

Oakland, being located almost directly across from the Golden Gate, generally has good ventilation, particularly in the spring and summer months. During the winter months winds are generally lighter and more variable. The Bay Area is subject to inversion conditions when vertical mixing of pollutants is severely diminished. Rapid build up of pollutant concentrations is possible during periods of calm winds and inversion conditions.

b. Air Quality Standards. The applicable air quality standards for the Bay Area are the State of California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS). These two sets of standards are shown in Table 21. The standards have been developed to protect the public (with an adequate margin of safety) from various known undesirable effects upon health, vegetation and property.

c. Characteristics of Pollutants. The major air quality problems in the Bay Area are ozone, PM-10 and carbon monoxide. The following is a discussion of the characteristics of these important pollutants.

Table 21
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour	0.12 PPM	0.09 PPM
Carbon Monoxide	8-Hour	9.0 PPM	9.0 PPM
	1-Hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual	0.05 PPM	0.25 PPM
	1-Hour	--	--
Sulfur Dioxide	Annual	0.03 PPM	--
	24-Hour	0.14 PPM	0.05 PPM
	1-Hour	--	0.5 PPM
Particulates	AGM	--	30 ug/m^3
	Annual Mean	50 ug/m^3	--
	24-Hour	150 ug/m^3	50 ug/m^3
Lead	30-Day Avg.	--	1.5 ug/m^3
	3-Month Avg.	1.5 ug/m^3	--
Hydrogen Sulfide	1-Hour	--	0.03 PPM
Vinyl Chloride	24-Hour	--	0.01 PPM

ug/m^3 = micrograms per cubic meter
PPM = parts per million

(1) Ozone. Ozone is the most prevalent of a class of photochemical oxidants formed in the urban atmosphere, often referred to as photochemical smog. The creation of ozone is a result of complex chemical reactions between hydrocarbons and oxides of nitrogen in the presence of sunshine. Unlike other pollutants, ozone is not released directly into the atmosphere from any sources.

The major sources of oxides of nitrogen and reactive hydrocarbons, known as ozone precursors, are combustion sources such as factories and vehicles, and evaporation of solvents and fuels.

Ozone near the ground is an air pollutant. The same chemical in the stratosphere, about 10 miles above the earth's surface, plays an beneficial role in protecting us from excessive ultraviolet radiation. Surface ozone and stratospheric ozone are independent phenomena.

The known health effects of ozone are eye irritation and damage to lung tissues.

(2) Carbon Monoxide. Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels, and its main source in the Bay Area is vehicles.

Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

(3) Suspended Particulate Matter (PM-10). Suspended particulate matter consists of solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time. A portion of the suspended particulate matter in the air is due to natural sources such as wind blown dust and pollen. Man-made sources include combustion, vehicle exhausts, field burning, factory emissions and travel on both paved and unpaved roads. A portion of the particulate matter in urban atmospheres is also a result of photochemical processes.

The ambient air quality standards are for suspended particulate matter less than 10 microns in diameter, designated PM-10. Particulates of this size are small enough to be inhaled. The known effects of high concentrations on humans include aggravation of chronic disease and heart/lung disease symptoms. Non-health effects include reduced visibility and soiling of surfaces.

d. Attainment Status. Both the Federal Clean Air Act and the California Clean Air Act required the California Air Resources Board to designate areas of the state as attainment, nonattainment or unclassified for Federal and State standard, respectively.

Under the Federal Clean Air Act the entire Bay Area is considered nonattainment for ozone, while the "urbanized areas" of the Bay Area are considered nonattainment for carbon monoxide. The Bay Area is either attainment or unclassified for other federal standards.[1]

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[1] State of California Air Resources Board, *Area Designations for State and National Ambient Air Quality Standards*, November 1989.

Under the California Clean Air Act the entire Bay Area is considered nonattainment for ozone and PM-10 (Particulate Matter, ten microns). Alameda County is considered attainment for carbon monoxide, while the entire Bay Area is attainment for other pollutants.

e. Ambient Air Quality. The Bay Area Air Quality Management District (BAAQMD) monitors ozone and carbon monoxide in Oakland. Table 22 summarizes exceedances of State and Federal standards for the five most recent years. However, measured levels of ozone and carbon monoxide in the San Francisco Bay Air Basin have declined to the point that BAAQMD has requested a redesignation of the Bay Area as an attainment area for the pollutants.[2]

Table 22 shows that the State and Federal carbon monoxide standards are generally met in the project area. Ozone concentrations did not exceed the Federal standard during the period 1988-1992 in Oakland. The more stringent State ozone standard was exceeded on one day during this same time period.

Table 22
EXCEEDANCES OF AIR POLLUTANT STANDARDS AT OAKLAND, 1988-1992[a]

		Days Exceeding Standard During:				
Pollutant	**Standard**	**1988**	**1989**	**1990**	**1991**	**1992**
Ozone	Fed. 1-Hour	0	0	0	0	0
Ozone	State 1-Hour	1	0	0	0	0
Carbon Monoxide	State 8-Hour	0	0	0	0	0

[a] State of California Air Resources Board, *California Air Quality Data, Annual Summary,* Vols. XX-XIV, 1989-1993.

f. Regional Air Quality Planning. Attempts to combat air quality problems began at the federal level with the enactment of the Clean Air Act of 1967. Initial efforts were the establishment of national ambient standards,

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[2] Bay Area Air Quality Management District, *Draft 1994 Carbon Monoxide Redesignation Request and Maintenance Plan* and *Amendments*, June 1994, San Francisco.

designation of local air pollution control districts and creation of an air quality monitoring network.

State and local agencies have over the last 20 years adopted regulations for a multitude of air pollutant sources. After obvious and major sources of pollution were controlled (factories, automobiles), controls were implemented on smaller sources (gasoline vending, solvent-based paints for example).

While the state ambient air quality standards have existed for many years, no legislative attainment requirements existed until 1988, when the California Clean Air Act was enacted.

(1) Federal Program. The U.S. Clean Air Act Amendments of 1977 required that each state identify areas within its borders that did not meet federal primary standards as non-attainment areas. The states were required to prepare a State Implementation Plan (SIP) to show how the federal standards were to be attained by 1987. Despite considerable improvement in air quality, the Bay Area did not meet the 1987 deadline for attainment of the federal air quality standards.

The federal Clean Air Act Amendment of 1990 mandates a fresh attempt at attaining the national standards, requiring that nonattainment areas develop plans and strategies that will reduce pollutants by 15 percent during the first 6 years, then three percent annually thereafter until the standards are met. The schedule for attainment is different for different pollutants and depends on the severity of the problem. Failure to meet the requirements of the federal Clean Air Acts could result in the imposition of sanctions (e.g. withholding of highway project funding).

(2) State and Local Programs. The California Clean Air Act of 1988 empowers regional air quality management districts with new authority to design, adopt, implement, and enforce comprehensive plans for attaining and maintaining both the federal and the more stringent state air quality standards by the earliest practical date. Among its provisions, the California Clean Air Act provides districts with the authority to establish new controls on mobile sources of pollution.

The area-wide plan required by the California Clean Air Act was adopted in October 1991.[3] The Plan proposes the imposition of controls on stationary sources (factories, power plants, industrial sources, etc.) and Transportation

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[3] Bay Area Air Quality Management District, *Bay Area '91 Clean Air Plan,* 1991.

Control Measures (TCMs) designed to reduce emissions from automobiles, including indirect sources.

One of the first TCMs to be implemented was the adoption of a Trip Reduction Ordinance requirement by BAAQMD. Regulation 13, Rule 1 of the BAAQMD Rules and Regulations requires that large employers (those with 100 employees or more at a single work site) conduct employee transportation surveys and prepare an employer trip reduction program. Regulation 13 includes specific performance objectives for different parts of the Bay Area. Performance objectives are expressed in terms of average vehicle ridership (AVR) and vehicle employee ratio (VER). The objectives become more stringent over time. The Port of Oakland is located in an area that has an AVR objective of 1.10 and a VER objective of 0.87 in 1994. By 1999, the AVR objective will be 1.05 and the VER objective will be 0.74.

The *Bay Area '91 Clean Air Plan* contains forecasts which indicate continued improvement in regional air quality. An analysis of carbon monoxide trends shows attainment of the standards throughout the Bay Area by the mid-1990s. However, implementation of the Plan would not provide for attainment of the State ozone standard even by the year 2000.

2. Impacts and Mitigation Measures

a. Significance Criteria. *CEQA Guidelines,* Appendix G, establishes that a project will normally have a significant impact on air quality if it will:

- Violate any air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations.

For the purposes of this study a significant impact on local air quality is defined as a predicted violation of the carbon monoxide ambient air quality standards due to project traffic on the local street network. For regional air quality a significant impact is defined as an increase in emissions of an ozone precursor, sulfur dioxide or PM-10 exceeding the Bay Area Air Quality Management District's recommended thresholds of significance. The District considers increases in emissions of a regional pollutant of 150 pounds per day to represent a significant adverse impact.[4]

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[4] Bay Area Air Quality Management District, *Air Quality and Urban Development,* November 1985.

b. Terminal Construction Impacts. Construction on the project site would result in short term emissions of air pollutants from a variety of sources. Sources of pollutants would be exhausts from construction equipment and vehicles; the evaporation of hydrocarbons from curing asphalt, drying paint, solvents and adhesives; and fugitive dust. **This would be considered a significant impact.** (S)

(1) Regional Emissions. The regional emissions would be primarily from trucks hauling fill material to the site, exhaust from dredging and the unloading of dredged material, and exhaust from tugboats transporting dredged material to the de-watering site. Estimated emissions over the entire period of construction are shown in Table 23. Exhaust emissions would be spread out over a large area and over a period of eight to nine months, and thus would not have a significant effect on either local or regional air quality.

Table 23
CONSTRUCTION-RELATED REGIONAL EMISSIONS
(Total during construction period, in pounds)

Activity	**Reactive Organic Hydrocarbons**	**Nitrogen Oxides**	**Sulfur Dioxides**	**Particulates Under 10 Microns**
Dredging and unloading	322	1,227	88	82
Tugboats	728	3,932	422	583
Construction trucks	567	2,990	742	790
Dredge material transport trucks	3,531	18,624	4,624	4,920
Total	**5,148**	**26,773**	**5,076**	**6,375**

Source: Donald Ballanti.

(2) Local Emissions. Fugitive dust is the most significant local emission and has the greatest nuisance potential. Fugitive dust (PM-10) is emitted both during demolition, clearing and other construction activity and as a result of wind erosion over exposed earth surfaces. Demolition, clearing and excavation activities comprise the major potential source of construction dust emissions, but traffic on and off paved areas and general disturbance of the soil can also generate significant dust emissions.

Dust generation is not constant but highly variable. The amount of dust generated on a given day is highly dependant on the types and amount of construction activity and the meteorological and soil conditions. The highest potential for dust generation occurs during the summer months when winds are highest on average and soil moisture is lowest.

The effects of construction activities would be increased dustfall and locally elevated levels of total suspended particulates. Construction dust would be carried by the prevailing wind east and south of the site. Construction activities could create a temporary nuisance downwind of the site, although there are no sensitive receptors near the project site. Sensitive receptors include land uses with a high proportion of children, elderly or infirm persons, or persons engaging in strenuous work or exercise. Project construction impacts are considered to be potentially significant on a temporary and localized basis. The section on mitigation below suggests control strategies that would lower this impact to a level that is less than significant.

c. Dewatering and Transportation to Landfills. Dredged mud would be transported by barge from Howard Terminal to a dewatering site at Berth 10 (Bay Bridge Terminal, north end of Maritime Street). The barge handling dredged materials would generate small amounts of exhaust pollutants. The actual dredged material would be wet and would not generate dust emissions. During dewatering dredged materials would be a minor potential source of odors. The proposed dewatering location is, however, located within an industrial area and quite distant from any sensitive receptors, so no odor impacts would occur.

Loading of dried dredged materials onto trucks for transport to landfills could create fugitive dust if the material has dried to the point that it could blow away. The potential for fugitive dust is dependent on the moisture content of the material and the strength of the wind.

Trucks hauling dried dredge material to landfills would generate exhaust emissions over the Bay Area transportation network. Project truck traffic would represent very small portion of total traffic at any location within the roadway network, so project construction truck traffic would have an insignificant effect on local air quality along streets and roads used by construction trucks.

Total emissions associated with the hauling of dried dredge material to landfills has been estimated based on a trip length, 89.5 miles, that is the average round trip distance to the four candidate landfills. These additional emissions would not have a significant impact on regional air quality over the period of construction.

d. Landfill Impacts. Disposal of dredged sediments at landfills would contribute incrementally to the impacts that landfills have on air quality. These impacts have been described in EIRs for the landfills, but are summarized briefly below.

Typical sources of pollutants at landfills are exhaust emissions from vehicles and equipment, fugitive dust from earthmoving and bulldozing, and landfill gas generated by covered materials, consisting of methane and other organic gases. Landfill gas is controlled at all potential disposal sites.

e. Permanent Local-Scale Impacts. The project could affect local air quality by changing traffic patterns. Emissions of local pollutants, such as carbon monoxide, would be modified along streets providing access to the site. **This would be considered a less than significant impact.** (LS)

Carbon monoxide concentrations under worst-case meteorological conditions have been predicted for four intersections near the project site. Typically, the highest concentrations of carbon monoxide are found near congested intersections, where vehicle idling, acceleration and deceleration result in the highest rate of emissions. These four intersections were selected as having the highest volume changes due to the project.

A.M. peak traffic volumes were applied to the CALINE-4 dispersion model to predict maximum 1-and 8-hour concentrations near these intersections. The model was run for existing traffic conditions, with the addition of project traffic and with cumulative traffic increases. Appendix D provides a description of the CALINE-4 model and a discussion of the methodology and assumptions used in the analysis.

Table 24 shows the results of the intersection analysis for the peak hour traffic period and the 8-hour peak traffic period. These values can be compared to the federal 1-hour standard of 35 PPM and the state standard of 20 PPM, and the 8-hour standard (federal and state) of 9.0 PPM.

Table 24
PREDICTED WORST-CASE CARBON MONOXIDE CONCENTRATIONS

Intersection	Existing		Existing + Project		Cumulative + Project (2000)	
	1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr
Market/Third Street	6.2	4.0	6.3	4.1	6.2	4.0
Market/Embarcadero	5.1	3.3	5.1	3.3	4.4	2.9
Embarcadero/Martin Luther King	4.7	3.1	4.7	3.1	3.8	2.5
Embarcadero/Jefferson	4.7	3.1	4.7	3.1	3.9	2.5

Existing concentrations at the four intersections analyzed do not exceed the state and federal standards. Project and cumulative traffic increases would cause an incremental increase in concentrations, but concentrations would remain below the state and federal standards.

The carbon monoxide concentrations shown in Table 25 are expected to be the highest occurring in the vicinity of the project. Concentrations away from these intersections would be considerably lower. Concentrations at any sensitive receptors near the project site would be below those shown in Table 23 and would meet the applicable state and federal standards. **The project's impact on local air quality would be less than significant.**

f. Permanent Regional-Scale Impacts. The proposed project would result in increased business activity in Oakland and the Bay Area. Increased port activity would result in an increase in emissions from the following sources:

- automobiles driven by new employees
- ships and tugboats
- trucks

The terminal extension would change rail traffic into and out of the Port by a very small amount. No new trains would be added, but trains leaving the Port could be lengthened. The addition of a few rail cars to a train would have only minor effects on locomotive-generated emissions, and no significant change in railroad-related emissions is expected.

Table 25 shows the estimated maximum daily and annual average daily emissions related to the proposed wharf expansion. The incremental daily emissions associated with each source is shown in Table 24 for reactive organic gases and oxides of nitrogen (two precursors of ozone), PM-10 and sulfur dioxide. The methodology utilized in estimating emissions from each of these sources is described in Appendix D.

Table 25
PERMANENT PROJECT-RELATED REGIONAL EMISSION INCREASES
(in Pounds Per Day)

	Maximum Daily				**Annual Average Daily**			
	ROG	**NOx**	**PM-10**	**SOx**	**ROG**	**NOx**	**PM-10**	**SOx**
Employee Vehicles	9	12	1	1	5	7	1	1
Ships and Tugs	69	208	20	20	20	58	6	6
Truck Traffic	359	2,519	573	610	51	358	81	87
Total	437	2,739	594	631	76	423	88	94

ROG = Reactive Organic Gases
NOx = Nitrogen Oxides
PM-10 = Particulate Matter, 10 micron diameter or smaller
SOx = Sulfur Oxides

Guidelines for the evaluation of project impacts issued by the Bay Area Air Quality Management District consider emission increases of ozone precursors and other regional pollutants to be significant if they exceed 150 pounds per day. Based on these criteria, **the project would have a significant impact on regional air quality.**

Impact AIR-1: Construction activities could increase dust levels in the project vicinity. (S)

> Mitigation Measure AIR-1. To minimize construction dust impacts, the Port should specify dust control requirements in construction contracts. These requirements should include:
>
> - watering all exposed or disturbed soil surfaces as necessary to eliminate visible dust plumes;
> - watering or covering stockpiles of debris, soil, sand or other materials that can be blown by the wind;

- suspending any earthmoving or other dust-producing activities during periods of high winds (15 mph or more) when watering cannot eliminate visible dust plumes;
- sweeping paved portions of the construction area and adjacent streets of all mud and debris, since this material can be pulverized and later resuspended by vehicle traffic;
- limiting the speed of all construction vehicles to 15 miles per hour while on-site; and
- covering trucks hauling debris, construction materials or earth.

Water sprinkling for dust control is estimated to reduce dust emissions by about 50 to 75 percent. The combined effect of the above measures would have a control efficiency of 70 to 80 percent, which is expected to reduce this impact to a less-than-significant level.

Impact AIR-2: The proposed project would affect regional air quality. (S)

> Mitigation Measure AIR-2: Transportation sources are regulated by local, state and federal agencies, so the Port's ability to impose emission controls on these sources is extremely limited. The following are programs that the Port could implement to partially offset increased regional emissions. These measures are consistent with the Alameda County Congestion Management Program.
>
> - Include Howard Terminal employees in the Port's trip reduction program.
> - Establish a preference and policy for use of trucking companies that haul with late-model trucks, or that equip their trucks with effective emission controls.

Implementing the above mitigation measures would reduce the project's impact on regional air quality somewhat, but this impact would be a significant unavoidable impact even after mitigation.

G. Geology, Seismicity and Soils

■ ■ ■

1. Setting

a. Geology. The following discussion was abstracted from available data, reports, maps, and review of the report *Geotechnical Investigation Charles P. Howard Container Terminal, Port of Oakland*, prepared by Woodward-Clyde Consultants, Oakland, CA, October 1979.

Regionally, the site is located on the east shore of San Francisco Bay. San Francisco Bay is a depression formed during the late Pliocene or early Pleistocene Epochs. A combination of faulting, warping, and tilting of several large blocks west of the Hayward Fault created a trough which was subsequently partially filled by marine and alluvial deposits. Bedrock of the Franciscan Formation forming the bottom of the trough is deepest on the east shore of the Bay. The depth to bedrock is not known at this site, but it is estimated to be at least several hundred feet.

The project area overlies sediments of the Bay floor and alluvium deposits. Three distinct geologic formations are recognized in the project area:

(1) Alluvium (Qal). This Quaternary unit consists of unconsolidated clay, silt, sand, and gravel occurring as alluvium along drainages and alluvial fan deposits, and in many areas covering marine terrace deposits.

(2) Bay Mud (Qm). This Mid-Pleistocene to Holocene unit includes Pleistocene marine and marine terrace deposits. It is mainly silty carbonaceous clay with very minor amounts of sand. It contains shell fragments and lenses of peat and sand.

(3) Artificial Fill (Qal). This recent unit includes dam embankments and associated structures, soil and wood debris, berms along drainages, scattered wood debris piles, dredged bay muds, rubble, and concrete foundation remnants.

Table 26 gives generalized descriptions and some engineering characteristics of the three geologic units.

Table 26

GENERALIZED DESCRIPTIONS AND SOME ENGINEERING CHARACTERISTICS OF MAJOR GEOLOGIC MAP UNITS IN THE PORT OF OAKLAND

Name and Map Symbol	Lithology	Soil Development	Permeability	Slope Stability	Earthquake Stability
Alluvium (Qal)	Primarily unconsolidated mixtures of clay, silt, sand, and gravel, the proportions varying from place to place. Mostly well compacted.	Mostly dark organic soils, well developed.	Moderate to low, depending on content of clay minerals and proximity to water table.	Low	Moderate to shallow deposits, low for deep, water saturated deposits.
Bay Mud (Qm)	Mainly silty carbonaceous clay with very minor amounts of sand. Contains shell fragments and lenses of peat and sand. Very soft and plastic when saturated, shrinks and becomes hard when dry.	None	Very low, except for lenses of sand which have high permeability.	Unstable.	Low. Subject to lurching and to differential settlement,the latter particularly where sand lenses are present within the mud.
Artificial Fill (Qal)	Highly variable from place to place. Soil silty, clay, rock waste, garbage and trash, and dredged Bay mud.	None	Mostly low to very low because of abundance of clay minerals and proximity to water table.	Low because of high clay content and unconsolidated nature. Strongly influenced (potentially weakened) by underlying soft Bay mud in fills on former Bay marshlands.	Moderate to well engineered fills on stable uplands base to very low in fills on Bay mud where lurching movements and differential settlement likely because of soft underlying mud.

b. Seismicity. The project site is located in a highly seismic region, as with the rest of the San Francisco Bay Area. The Hayward fault is the closest active fault, and it is located approximately 4½ miles northeast of the site. The Calaveras and San Andreas faults are approximately 14 miles northeast and 14½ miles southwest of the site, respectively.

The shoreline at the project site, based on the location of the existing quay wall, is located about 1,000 feet south of the former Oakland shoreline of the mid-nineteenth century. The tidal flats (marshland) fronting the former shoreline were reclaimed by filling. Inner Harbor Channel was formed by dredging through the Oakland Estuary eastward to San Leandro Bay, thus making Alameda an island.

The existing shoreline quay wall was constructed around 1910, and was used for ship berthing along its total length. The estimated bottom of Bay Mud[1] contours indicates that the original dredge level may have extended the entire length of the quay wall. Additional dredging was done in the mid-1920s to place a rock dike and sand fill as part of the Grove Street Pier construction. Specific information on the dredging operation and dike materials is not available, but it is assumed that essentially all of the Bay Mud was removed in the rock dike and sand fill area under Grove Street Pier. The existing piers were subsequently constructed, and several dredging operations took place between the existing piers to allow for berthing of various sized ships. The dredging operations between the piers removed the original Bay Mud and the underlying sands to the required depths, but may have left some of the original Bay Mud under Howard Terminal Berth 68.

c. Soils. The types of soils encountered at Howard Terminal in depth sequence include the following:

(1) Recent Bay Sediment. This consists of clay and silt deposits accumulated approximately over the last 70 years. The consistency of this material varies from floccule at the top to a very soft mud at the bottom. This sediment is a very highly compressible material.

(2) Original Bay Mud. The original Bay Mud consists of soft to very soft organic silty clays. This material is similar to the recent Bay sediment; however, it is slightly less compressible and has higher shear strength.

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[1] Bay Mud refers to both the recent Bay deposits and the original Bay Mud layer.

(3) Upper Sand Layer. The upper sand layer consists of silty sands interlayed with occasional clayey sands. Lenses and thin layers of sandy clays are also present. These sands are fine-grained with consistencies that vary from medium dense to very dense. The thickness of this layer varies considerably over the site due to the previous dredging operations.

(4) Silty and Sandy Clays. These clays consist of stiff to very stiff silty and sandy clays with varying contents of silt and sand and occasional contents of calcareous nodules and shells. This material has relatively low compressibility characteristics.

(5) Lower Sand Layer. The lower sand layer is similar to the upper sand layer having similar gradation but slightly higher consistency (dense to very dense).

(6) Old Bay Mud. The lower sands are underlain by stiff silty clays which are referred to locally as *Old Bay Mud*. These clays have relatively low densities and high water content. Because the older bay mud is more deeply buried, it contains less moisture, and is overconsolidated; i.e., the degree of consolidation is greater than would be expected from the weight of the sediments that overlie the clay today.

The soils below the Bay Mud are relatively incompressible, have competent bearing properties, and are capable of supporting fills and pile foundations satisfactorily.[2] The sand fill under Grove Street Pier is loose; however, it should be capable of supporting light static loadings. The Bay Mud encountered above the upper sand layer is weak and highly compressible. The Bay Mud would undergo a significant amount of subsidence, both totally and differentially, under the weight of any new fill and/or structures placed thereon.

The project would entail an estimated 178,000 cubic yards of fill material where a portion of this would be obtained from authorized dredging sites. The sands to be dredged will be reused as fill between the new wharf dike and the existing dike and quay wall. The placement method for this sand fill would depend on the dredge method used to excavate the sand. The existing pier would be removed prior to dike construction and filling.

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[2] Woodward-Clyde, *Geotechnical Investigation, Charles P. Howard Container Terminal*, Port of Oakland, 1979.

d. Port of Oakland Engineering Design Criteria. The Port has adopted wharf design criteria to be used in design, construction, reconstruction, and/or repair of all existing and future wharf structures, except in the event that current engineering practice require adjustments or modification of the wharf design criteria. The wharf design criteria are discussed below.

(1) The general criteria are as follows:

(a) The wharf shall be designed as a ductile moment resisting frame supported by vertically driven piles reinforced and so connected to the wharf as to act as an integral part of the ductile moment resisting frame. No batter pile shall be used.

(b) Both crane rails shall be pile supported and shall be connected horizontally by continuous wharf deck or other means to control the gage of the rails.

(c) The reinforcing steel in the piles shall be insulated from the reinforcing steel in the wharf structure, and the crane rails shall be grounded.

(d) A sufficiently deep cutoff wall or other means, shall be provided along the back of the wharf to prevent erosion of yard materials by tidal, wave or other action under the wharf.

(e) The slope beneath the wharf shall be protected from erosion by placement of rip-rap or by other means as recommended by a geotechnical consultant.

(f) The dike or cut slope beneath the wharf shall be designed to withstand the same seismic forces as the wharf structure. It shall contain the soil behind the slope under the design earthquake loading.

(g) Flexible connections shall be provided where utilities pass from the yard through the cutoff wall or other rigid structure at the back of the wharf.

(2) The criteria for loads are as follows:

(a) Vertical Loads. The wharf deck shall be designed to support a uniform live load of at least 1,000 pounds per square foot and point and distributed loads appropriate to the maximum equipment and cargo loading likely to be imposed on the structure over its economic life.

(b) Horizontal Loads. The wharf shall be designed for the maximum berthing and tie-up loads likely to be imposed on the structure over its economic life.

(c) Seismic Load (Earthquake). The seismic loads shall be based on site response spectral curves developed by geotechnical consultants taking into account the effects of earthquakes on the two major faults in the vicinity of the wharf structure (San Andreas and Hayward) as well as other faults in the region.

2. Impacts and Mitigation Measures

a. Significance Criteria. The level of significance for geology, soils and seismicity is based on review of CEQA requirements. A project will normally have a significant effect on the environment if it will:

- Expose people or structures to major geologic hazards.

b. Seismicity. The project site is exposed to credible seismic events, and with the placement of fill it is subject to potential impacts from ground motion and ground failure such as from liquefaction, lurching (lateral movement), and/or differential settlement. **This would be considered a significant impact.**

Liquefaction of saturated sands is a rather common phenomenon during earthquakes and because of the project's location and dredged sand to be reused for fill, it is an issue of concern. Liquefaction is a process by which water saturates sands, silt or salt deposits causing them to lose cohesion when shaken. Liquefaction results if loose or medium dense saturated cohesionless materials are subjected to earthquake ground vibrations. The tendency of sand or silt when shaken is to compact accompanied by an increase in water pressure in the soil and a resulting movement of water from the voids. Water is thus caused to flow upwards to the ground surface where it emerges in the form of mud-spouts or sand boils. The development of high water pressures in soils due to ground vibrations and the resulting upward flow of water will often turn sand into "quick" or liquefied condition. Liquefaction cannot be entirely ruled out due to the proposed placement of the new dike and backfill.

Lurching is the lateral movement which occurs in soft, water-saturated material during seismic shaking. These movements can result in cracks opening at the ground surface or can result when fill has been placed on mud which rests upon an inclined plane, thus creating the tendency for the loaded fill to creep downward. The mud undergoes a slow lateral displacement along the inclined plane and carries the fill with it.

Differential Settlement is an uneven subsidence of the ground surface during an earthquake. Typically, this differential movement is the result of substantially different strength characteristics of the near soils. Differential settlement affects engineering structures as a result of compaction of cohesionless soils (soils that contain no significant clay component) where one portion of a structure settles more than another portion such as from the placement of the new dike and backfill.

Fills placed in the extension area must be selected and fairly incompressible. Fill must be well-graded and compacted with the absence of voids which might permit mud to squeeze upward into the fill body. In compliance with BCDC's safety of fill policy, the Port intends to submit the plans for the placement of fill to BCDC's Engineering Criteria Review Board for their review and approval.

Impact GEO-1. The fill placed for the project is subject to ground motion and ground failure from liquefaction, lurching, and/or differential settlement. (S)

> Mitigation Measure GEO-1. Site specific engineering geology, soils, and foundation investigation reports should be prepared and provide detailed guidelines and recommendations regarding grading, fill placement and compaction, surface and subsurface drainage control, and seismic safety. All mitigation measures recommended in the report should be implemented. All geotechnical engineering design work should be prepared by and construction work monitored by a certified geotechnical or soil engineer.

H. Hazardous Materials

■ ■ ■

1. Setting

The proposed project would involve the demolition of the transit shed and the pier on which it sits, and the removal of some existing piers nearby. The transit shed is mostly unused. A portion near the westernmost corner of the building is used as a maintenance shop. The project could also involve the excavation and movement of soil in the vicinity of the terminal.

The transit shed was built to provide warehouse storage for break-bulk shipping. It consists primarily of a single large open space. The front of the building, representing perhaps 15 percent of the floor space, is divided into two floors of offices and some storage areas. The building is constructed primarily of concrete with a steel and wood roof. The office area portion includes what appear to be wood walls dividing the work areas.

The concrete walls of the main structure are painted both inside and out. The warehouse area floor is concrete, unpainted, with a grated trench running the length of the building.

The transit shed was inspected on December 15, 1993 for the purpose of this evaluation. In addition, the maintenance shop area was inspected. This area is still in use and likely contains hazardous materials typical of such facilities. These materials will be handled in accord with the Port's best management practices contained in its National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Program, which was prepared in 1992.

Several areas could not be viewed during the inspection. These included several locked rooms in the office portion of the building, a 12-foot by 12-foot cement "block house" adjacent to the southeast wall, and all areas under the building. In addition, the floor, although in generally good condition, was cracked in a few locations and these areas can accumulate spilled materials.

Although there was no specific information related to hazardous materials in the preceding areas, the potential presence of such material needs to be considered during building demolition.

Potentially hazardous materials and other potential pollutants associated with the building and the immediate area are described below. Hazardous materials are defined in Chapter 6.95 of the California Health and Safety Code.

a. Lead-Based Paint. Because of the age of the building, the interior and exterior paint may contain significant concentrations of lead. This was confirmed by the sampling conducted on December 17, 1993, and January 25, 1994 (See Table 27, Results of Paint Sampling). Lead contamination of the Oakland Inner Harbor is particularly critical since lead is one of the contaminants found in elevated concentrations in mussels by the State Water Resources Control Board Mussel Watch Program.[1]

Samples were collected by John Borrego, Uribe & Associates on December 15, 1993 and January 25, 1994. All wall samples were collected approximately 4 feet from the ground or floor. All samples consisted of a chip of paint.

An analysis of the samples was performed by Curtis and Tompkins, Inc., a state-certified analytical laboratory in Berkeley. The analytical method used by Curtis and Tompkins was EPA 7420. The Chain of Custody form and laboratory report are available on request from Brady and Associates.

Table 27
RESULTS OF PAINT CHIP SAMPLING

Sample Number	Interior or Exterior Location	Wall Location	Lead Concentration (mg/kg)
S-1A	Interior	Southeast wall	8,000
S-3A	Exterior	Northeast corner facade (blue)	900
S-4	Interior	Office window sill (northeast end of building)	1,900

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[1] State Water Resources Control Board, 1988. *California State Mussel Watch, Ten Year Data Summary, 1977-1987,* Water Quality Monitoring Report No. 87-3.

b. Grated Floor Drain and Floor Spills, Including Oil. The inspection indicated numerous areas of what appeared to be crankcase oil on the concrete floor. In addition, an unknown quantity of spilled material may be located in the grated sump or drain running the length of the warehouse floor. The spilled oil, if in a liquid state, would likely be classified as hazardous based on the State Health and Safety Code section 25250.4. Waste oil is listed in the regulations at 22 California Code of Regulations 66261.126 Appendix X on the List of Chemical Names and Common Names for Hazardous Wastes and Hazardous Materials. The Port is taking steps to ensure that all waste liquids and other related materials will be removed and disposed of prior to the initiation of the demolition project.

c. Discarded Waste Liquids and Related Materials. Some waste materials left in the building may contain hazardous materials. These include several open drums, a compressed gas tank (contents unknown), and a floor spill of oily material in the area enclosed by a wire cage on the northeast end of the building. The Port is taking steps to ensure that all waste liquids and other related materials will be removed and disposed of prior to the initiation of the demolition project.

d. Transformer. A transformer labeled T 28 is located next to the exterior of the building on the northwest side. In the past, transformers typically contained polychlorinated biphenyls (PCBs). Port staff members have checked their records and verified that this transformer does not contain PCBs.

e. Piling. The project would include the removal and disposal of piling from a portion of the existing wharf. The Port has test results for the materials used in the piling which enable them to dispose of the pilings at the appropriate landfills (see Section J. Water Quality for more information).

f. Fluorescent and mercury vapor light fixtures. Some of the lighting in the office portion of the building consisted of fluorescent light tubes. Mercury vapor lights may also be present. These fixtures may contain small amounts of hazardous materials.

g. Asbestos. Asbestos-containing materials are located in the flooring, the heating and ventilation system, and the roof, as shown in Table 28. These materials are non-friable (not crumbly).

Table 28
ASBESTOS-CONTAINING MATERIALS AT TRANSIT SHED (BUILDING E-407A)

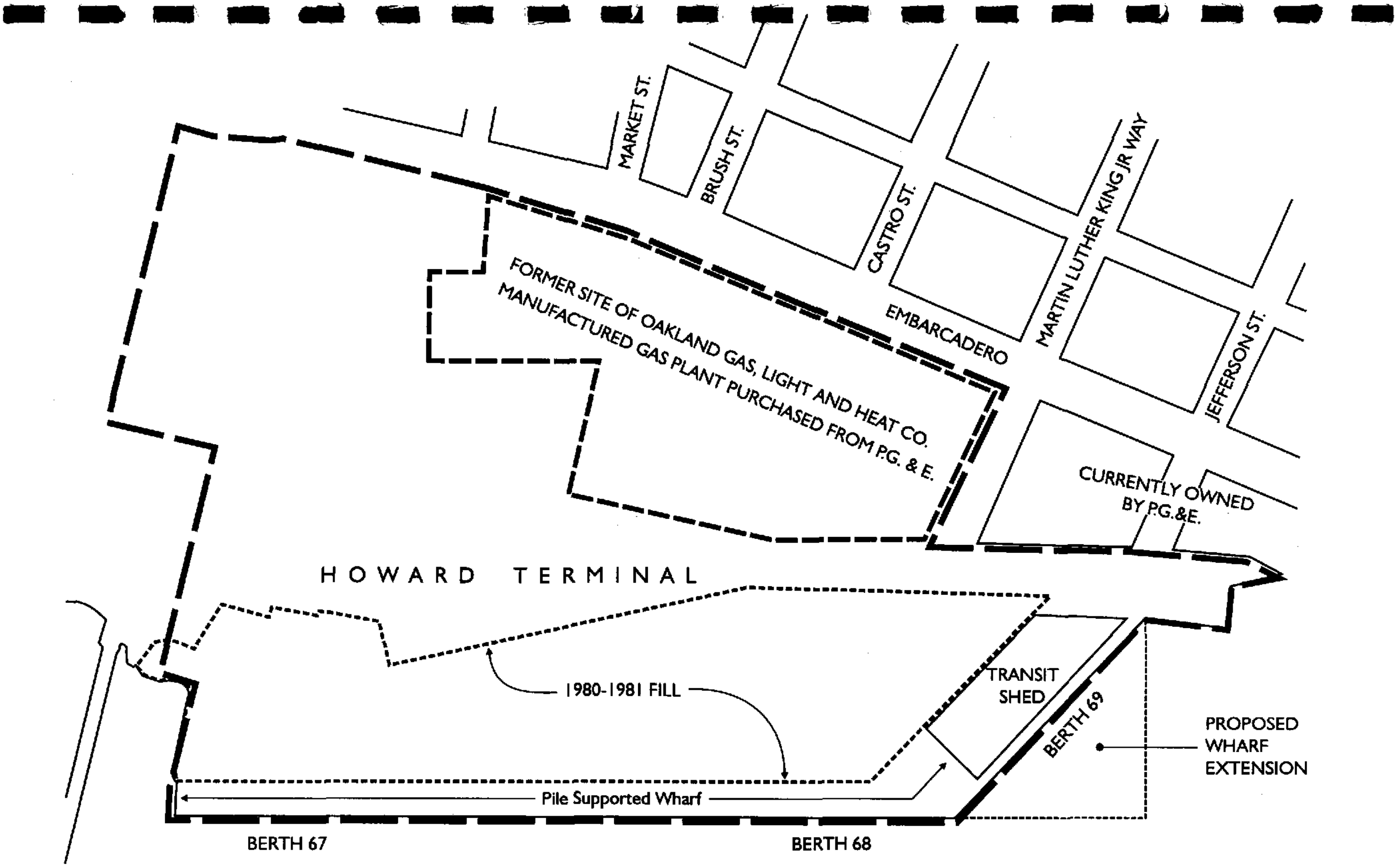
Material Type	Quantity	Percent Asbestos	Friability
Floor tile 9x9 (black) & adhesive in entrance	200 sf	5-10%	NF-I
Vinyl flooring (yellow) & adhesive in dispatch office	300 sf	30-40%	NF-I
Floor tile 9x9 (brown) & adhesive SE corner office	600 sf	5-10%	NF-I
Floor tile (black) & adhesive in hallway and stairs	850 sf	5-10%	NF-I
Floor tile (green) & adhesive 3rd floor center office	600 sf	10-20%	NF-I
Duct tape on HVAC in attic	40 lf	80-90%	NF-II
Duct insulation on HVAC in attic[a]	85 sf	80-90%	NF-II
Black roof patch	800 lf	20-30%	NF-I
Silver paint roofing & felt	71,000 sf	trace, 1%	NF-I

Notes:
NF-I (non-friable, Category I)
NF-II (non-friable, Category II)

[a] Uribe & Associates personnel conducted a site visit on December 15, 1993. The visit confirmed that all thermal system insulation identified in the ACC survey has been removed from the building. No additional asbestos-containing materials were identified during this visit.

Source: ACC Environmental Consultants, May 1992, inspection and sampling program.

h. Contaminated soil. The area north of the project area was formerly the site of a gas plant. This area is shown in Figure 22. The remainder of Howard Terminal has always been in maritime use. Beginning in 1903, the Oakland Gas, Light and Heat Company operated a facility which produced gas from crude oil. The gasification process produced a by-product known as lampblack. Wastes from the plant probably included tar sludges, oxide wastes, emulsions and ash. The plant was dismantled in 1961. The Port bought the land from PG&E in 1980. The results of soil tests on the gas plant site are summarized in Appendix D. The gas plant land has characteristics that could make it eligible for the State Cortese list. The Port has an ongoing program for the assessment and mitigation of contaminated soils encountered during construction projects. Because potentially hazardous materials are present in



Source: Brady and Associates, 1994

Scale In Feet

0' 300' 600'

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT

Port of Oakland

BRADY AND ASSOCIATES
PLANNERS AND LANDSCAPE ARCHITECTS

FIGURE 22

Location of Former Manufactured Gas Plant near Howard Terminal

the soil, excavation and other activity on the gas plant site have been limited. The proposed Howard Terminal wharf extension would not involve excavation of land that was part of the gas plant.

2. Impacts and Mitigation Measures

a. Significance Criteria. The level of significance for hazardous materials is based on review of CEQA requirements. A project will normally have a significant effect on the environment if it will:

- Create a potential public health hazard or involve the use, production or disposal of materials which pose a hazard to people or animal or plant populations in the area affected.

This section reviews the hazardous materials which could cause significant adverse effects if improperly handled or otherwise released into the environment. The impacts and proposed mitigation measures are divided into three categories:

- impacts during demolition;
- impacts during renovation; and
- impacts during operation.

For each of the identified impacts there are proposed mitigation measures which should reduce the potential impacts to an insignificant level.

b. Impacts During Demolition. During demolition, hazardous materials and other debris could be released, with possible impacts on human health and the environment. Project workers and nearby residents or office workers could be exposed to airborne lead dust or asbestos. Lead dust and other hazardous materials could accumulate on the surrounding wharf and be washed or fall directly into the inner harbor. Improper disposal of debris containing hazardous materials could result in air, soil, or groundwater contamination elsewhere. Specific impacts and mitigation measures are addressed below.

(1) General Demolition Impacts.

Impact HAZ-1: Demolition of the transit shed, which is close to Bay waters, and removal of the timber wharf, debris and wastes, could result in wastes entering the Bay. (S)

Mitigation Measure HAZ-1: The Port should require the contractor to develop and adhere to a debris containment and demolition pollution control plan for building demolition and removal of the wharf. If demolition takes place during the wet season, the Port should require the contractor to prepare a Storm Water Pollution Prevention Plan (SWPPP) as discussed in Mitigation Measure WATER-1. The construction SWPPP should be integrated and compatible with the Port's SWPPP. The debris containment and demolition pollution control plan should include the following components:

(1) specific measures to control demolition debris. This may include a boom around the construction area to allow retrieval of floating materials which enter the water and protection for storm drains

(2) measures to control liquid spills, including the provision of on-site spill cleanup kits

(3) worker training concerning the importance of protecting Bay waters and specific response activities

(4) assignment of responsibility

(5) independent oversight controls including visual monitoring of the water surfaces and work areas.

Implementation of the plan(s) would reduce the potential impacts to an insignificant level.

(2) Lead-based Paint.

Impact HAZ-2: Demolition of the transit shed and wharf would result in release of lead-based paint. (S)

The sampling conducted on December 15, 1993 and January 25, 1994, indicated that the paint on the interior and potentially the exterior surfaces contained significant concentrations of lead. This lead could be released in dust form as the building is being demolished. This potential release presents risks to the project workers and other workers in the area. The dust fallout could directly impact nearby surface water and indirectly impact surface water by being washed from surfaces during rain storms. **This is a significant impact.**

The new OSHA lead standard became enforceable on June 3, 1993. The permissible exposure limit has been reduced from 200 ug/m3 to 50 ug/m3. This is the level below which a worker can operate without the need for respiratory protection. The action level at which the employer must provide protective measures to employees is 30 ug/m3. The employer will need to complete exposure assessments or otherwise provide proof of the effectiveness of engineering controls. Based on the results, the Port (or contractor) will need to provide evidence of plans to comply with the interim final rule. If the contractor uses engineering controls in order to comply with the Standard and if the construction debris and associated wastes are controlled appropriately, the potential environmental impacts should be significantly reduced.

> Mitigation Measure HAZ-2: The Port should insert a contract clause to require the site contractor to comply with the Lead in Construction Standard (29 CFR Parts 1910, 1915, 1917, and 1918) for the demolition of the transit shed. The contract should require the contractor to complete a plan demonstrating the following: (1) dust from lead-base paint will not be released into the environment at concentrations greater than the OSHA standard, (2) collected dust (e.g., from HEPA vacuum engineering controls) will be disposed of as hazardous wastes, (3) construction debris containing lead-based paint will be disposed of as required by the California Health and Safety Code, Chapter 6.5, and (4) other controls will be implemented as necessary to prevent the environmental release of lead.

Implementation of the preceding control measures would reduce the potential impacts to an insignificant level.

(3) Grated Floor Drain and Floor Spills.

Impact HAZ-3: The demolition of the transit shed could result in the discharge of hidden wastes. The grated sump area or drain running the length of the building may contain the residue of previous spills. During demolition, and during disposal of debris, it could be difficult to control the wastes in this area and prevent them from either entering the water or from being disposed of improperly. (S)

> Mitigation Measure HAZ-3: The Port should require the demolition contractor or tenant to complete a pre-demolition assessment and cleanup of the sump area in the transit shed and any other major spill areas. The assessment and cleanup plan should consist of the following: (1) sampling to determine characteristics of the wastes, (2) assessment of the volume and characteristics of the waste material, (3) cleanup, and (4) disposal in compliance with California law.

Completion of this mitigation would reduce the potential impacts to an insignificant level.

(4) Discarded Waste Liquids and Related Materials.

Impact HAZ-4: Demolition of the transit shed could involve discharge of accumulated wastes. (PS)

These materials are potentially hazardous wastes and must be removed prior to the building demolition. This includes any wastes located in the area of the maintenance shop.

> Mitigation Measure HAZ-4: The Port or current tenant should provide for the removal and disposal of any discarded waste liquids or related materials in the building prior its demolition.

Completion of this mitigation would reduce the potential impacts to an insignificant level.

(5) Fluorescent and Mercury Vapor Light Fixtures.

Impact HAZ-5: The transit shed's fluorescent and mercury vapor light fixtures could result in release of hazardous waste during demolition. (S)

These fixtures contain small quantities of hazardous chemicals which can present problems if handled inappropriately.

> Mitigation Measure HAZ-5: The fluorescent light tube fixtures should be collected prior to the demolition. If functional, they should be reused. If not, and if the number exceeds 25, they must be handled as hazardous wastes. Mercury vapor light fixtures, if present, should be similarly collected and disposed of.

Completion of this mitigation should reduce the potential impacts to an insignificant level.

(6) Uninspected Areas.

Impact HAZ-6: The demolition of the transit shed and wharf could discharge hidden wastes that were uninspected. (PS)

Areas that were not inspected during the site visit in December 1993 may contain hazardous substances which could present a risk to the environment during demolition. For example, the area under the building may contain lead pipe or other materials. These additional materials, if present, are of unknown significance.

> Mitigation Measure HAZ-6: The Port should complete a pre-demolition inspection of the entire building to identify any potential hazardous materials or other substances presenting an environmental risk and as appropriate should identify and implement control measures.

Completion of this mitigation would reduce the potential impacts to an insignificant level.

(7) Piling Removal.

Impact HAZ-7: The removal of the wharf pilings would create a disposal hazard of creosote-treated pilings. (PS)

The pilings which would be removed are assumed to contain creosote and possibly other toxic compounds intended to prevent deterioration of the wood. Creosote is high in polycyclic aromatic hydrocarbons (PAHs), and wastes containing creosote may be classified as designated wastes by the California Regional Water Quality Control Board (23 CCR 2522). These chemicals are a potential source of continuing pollution if the pilings are inappropriately disposed of. **This is a potentially significant impact.** (The potential water quality impacts of the pilings and the piling removal within the Bay are discussed in Section J. Water Quality.)

> Mitigation Measure HAZ-7: The Port should ensure that all pilings, parts of pilings, and related decking are disposed of at a site permitted by the State to accept these materials.

Completion of this mitigation would reduce the potential impacts to an insignificant level.

(8) Asbestos.

Impact HAZ-8: The demolition of the transit shed, if improperly conducted, could release asbestos. (PS)

The Port has removed the friable (tending to crumble) asbestos materials from the building. However, asbestos-containing materials can become broken and consequently friable during demolition, if inappropriate demolition methods such as sanding are used. (PS)

> Mitigation Measure HAZ-8: The National Emissions Standard for Hazardous Air Pollutants (40 Code of Federal Regulations 61) and

> other Federal and State regulations (29 CFR 1926, 8 California Code of Regulations 1529) separate non-friable asbestos-containing materials into two categories. Category I includes floor tile, asphaltic roof coverings, and gaskets. Category II includes transit cement pipe and board, plaster, stucco, ceiling tiles, fire doors, and drywall mudding tape and compounds. Category I materials are not required to be removed prior to demolition unless they are significantly damaged. Category II materials must be removed prior to demolition, but may be disposed of as non-hazardous construction debris if there is no potential for damage during transportation and disposal activities.

If these industry-standard conditions are met, the removal of asbestos-containing materials at the Howard Street Terminal will not impact the surrounding environment.

c. Impacts During Renovation of the Wharf.

(1) General Construction Impacts.

Impact HAZ-9: Construction would generate construction debris and wastes. (PS)

After the proposed demolition of the transit shed, the wharf would be demolished. Construction materials and debris and waste liquids from construction equipment would be in close proximity to the Bay waters. Even a minor spill could immediately end up in the Bay. **This is a potentially significant impact.**

> Mitigation Measure HAZ-9: The Port should require the contractor to develop a debris containment and construction pollution control plan for the renovation. This plan should present measures to ensure that debris and other pollutants do not enter the water during the construction phase. If construction takes place during the wet season, the Port should require the contractor to prepare a Storm Water Pollution Prevention Plan (SWPPP) as discussed in Section J. Water Quality. The construction SWPPP should be integrated and compatible with the Port's Storm Water Pollution Prevention Plan (which is applicable to general industrial activities and exclusive of specific construction projects). The debris containment and construction pollution control plan should include the following components:

(1) specific measures to control construction debris (wood scraps, other wastes). This may include a boom around the construction area to allow retrieval of floating materials which enter the water

(2) measures to control liquid spills, including the provision of on-site spill cleanup kits

(3) worker training concerning the importance of protecting Bay waters and specific control measures and response

(4) assignment of responsibility

(5) independent oversight controls including visual monitoring of the water surfaces and work areas

(6) procedures to insure that construction vehicle maintenance is consistent with Port requirements and the NPDES permit conditions (best management practices).

Implementation of the plan(s) would reduce the potential impacts to an insignificant level.

(2) Contaminated Soil Impacts. During the reconstruction period, earth moving activities could disturb contaminated soil. If improperly handled this contaminated soil may present a health and safety risk to workers and neighbors and could potentially contribute to environmental pollution. For example, exposed or improperly placed contaminated soils could allow contaminants to enter Bay waters. Typical contaminants found in the soils in this area include organics (coal tars) and metals from industrial production in the area many years ago. **This would be considered a less than significant impact.** (LS)

Contaminated soils exposed during construction projects are regulated primarily by the County Department of Public Health, Hazardous Materials Division, the California Regional Water Quality Control Board, the Department of Toxic Substances Control and the Bay Area Air Quality Management District. The involvement of the individual agencies depends on the type of pollutant involved and the exposure risks. For example, the Bay Area Air Quality Management District becomes involved and has procedures which apply if volatile organics are present (such as from gasoline spills).

Because of the many ongoing construction projects at the Port and because of its active program to identify and correct past releases of pollutants (especially from underground tanks), the Port has existing procedures and extensive experience in managing the situations when contaminated soils are encountered. If contaminated soils are encountered during this project, the Port would manage them in accordance with its ongoing practices and procedures which are in conformance with local, state, and federal requirements. Consequently, there should not be any significant impacts.

Additional information regarding contaminated soils in the vicinity of Howard Terminal is included in Appendix E.

d. Impacts During Operation of the Wharf Extension. The new portion of the wharf would be operated as a container facility as opposed to the break-bulk operations which previously used the transit shed. Container operations are inherently "cleaner" than break-bulk since the shipped goods remain in the container rather than being handled in smaller units as occurs with break-bulk. Observations during the site visit on December 15, 1993, indicated that the container portion of the wharf was in a relatively clean state for an industrial/commercial site.

After construction and during port operations, pollutants are likely to occur on the wharf and yard surfaces related to operating the container moving equipment and trucks. These pollutants are similar to those found on roadways and would include particulates, copper, lead, zinc, oil and grease, and polycyclic aromatic hydrocarbons (PAHs). These pollutants could be washed into the inner harbor; however, the volume of traffic at the terminal is low. **The impacts would not be significant.**

Completion of the review and plan improvements, as necessary, and implementation of controls, if warranted, should reduce the potential impacts to an insignificant level.

Impact HAZ-10: The renovation of the wharf could require the relocation of materials that could be sources of pollution, which are stored on-site for Port use. (PS)

The maintenance shop in the transit shed did not appear to be operation in compliance with the requirements for the control of hazardous wastes, specifically waste oils and batteries. These standards are in regulations implementing hazardous waste laws in Chapter 6.5 of the California Health and Safety Code and hazardous materials laws in Chapter 6.95 of the Code. If this maintenance shop is relocated to another portion of the Port and operated in the same manner, this would be a significant impact. Because these materials are stored close to water and because of the potential that a spill would adversely affect water quality, these materials need to be controlled as required by California law.

> Mitigation Measure HAZ-10: The Port should assure that the tenant complies with state regulatory standards on the storage and handling of potential sources of pollutants.

The Port is implementing a new audit program. The scope of this audit program will include inspections of maintenance operations such as those in the transit shed to ensure that hazardous materials and hazardous wastes on the wharf are stored in compliance with the California Health and Safety Code. Conformance with the State requirements for the handling of hazardous materials and hazardous wastes would reduce the potential impacts to a less-than-significant level.

I. Sediment Quality

■ ■ ■

1. Setting

a. Project Description. Approximately 30,000 cubic yards of dredging would be required in order to extend the wharf at Howard Terminal. Most of this dredging is required to remove muds that are not stable enough to be used as a base for the dike. Approximately 144,000 cubic yards of solid fill would be necessary. Of the material dredged from the site, the material which is suitable for reuse as fill material would be used, as well as additional sandy material which is obtained from new dredging as other berths are deepened.

In addition to the dredging from the wharf extension, approximately 13,600 cubic yards of material would be dredged at Howard Terminal to deepen Berth 68 for the container ships. Berths 22, 23, 24, 30, 67 and 68 would be deepened to a depth of 44 feet plus two feet overdredge, to provide fill for the project and a needed safety margin of depth for the berths. Dredging to a depth of 42 feet plus two feet overdredge is covered by the Port's maintenance dredging permits, as shown in Appendix A.[1] Maintenance dredging involves recent Bay mud on top of Merritt sands. The recent Bay mud is tested for contaminants and disposed of according to the regulations of the U.S. Army Corps of Engineers (COE), the San Francisco Regional Water Quality Control Board (RWQCB), the U.S. Environmental Protection Agency (EPA), and the San Francisco Bay Conservation and Development Commission (BCDC). The Merritt Sands are extremely hard-packed and cohesive and have never been exposed to man-made contaminants.[2] Therefore, the EPA and COE have stated that Merritt sands do not need to be tested prior to ocean disposal. For this project, the portion of the deepening down to the depths specified in the maintenance permits would be tested and disposed as described in those permits. The portion below the depths specified in the

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[1] U.S. Army Corps of Engineers Permit No. 18921E35 and San Francisco Bay Conservation and Development District Permit No. M92-41.

[2] U.S. Army Corps of Engineers, 1992. *Environmental Assessment, Oakland Inner Harbor 38-Foot Separable Element of the Oakland Harbor Navigation Improvement Project.* U.S. Army Corps of Engineers, San Francisco.

maintenance permits would all be in Merritt sands; therefore, no testing would be required before the dredged sands are used for fill in constructing the Howard Terminal extension. In the unlikely event that holes have been dug in the Merritt sands, recent Bay muds would have filled in these holes. If recent Bay muds are encountered in the deep Merritt sands, they will be treated and disposed of according to agency regulations, in the same manner as specified in the maintenance dredging permits. The effects of dredging on water quality and biological resources at Howard Terminal are discussed in Sections J and K of this chapter.

Dredged sediments would be dewatered at a rehandling facility which would be built at Berth 10. In addition to dewatering, any bioremediation of contaminated dredge material[3] would occur at the upland rehandling facility.

b. Dredge Material Disposal Options. Four disposal options for San Francisco Bay sediments that fail in-bay and ocean disposal tests include (1) confined aquatic disposal, (2) wetland creation or restoration, (3) on-site disposal and (4) managed landfill disposal. Each of these options has potential problems.

- Confined aquatic disposal has been used in some areas of the United States, but is not currently available in the San Francisco Bay Region.
- Wetland creation is problematic because sediments that fail aquatic disposal criteria would, under most cases, also be unacceptable for wetland creation. Recent RWQCB Interim Final Guidelines indicate that this may become a more viable option; however, no wetland creation site is yet available for "non-cover" contaminated material.
- On-site disposal on the dredger's property (upland areas adjacent to the dredged channels or berths) is only possible if space is available, County and State health department requirements are feasible, RWQCB waste discharge requirements can be met, and the dredged material has suitable physical properties to be used as construction material. No upland disposal site on Port-controlled land is available at this time.
- Upland disposal to a Class II or Class III landfill is expensive, but is the only option that is currently available.

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[3] Amdur, Jon, A. Clark-Clough, R.G. and Michaeaux James, 1994. "The Feasibility of Bioremediating Contaminated Dredge Material," in: *Proceedings of the Fifth Annual West Coast Conference on Hydrocarbon Contaminated Soils and Groundwater.*

The Port proposes to segregate the dredge material into three types for upland disposal depending on the physical and chemical nature of the material. The three types consist of:

- the undisturbed Merritt sand and old Bay muds, which have physical properties and low contaminant burdens that allow them to be used as on-site fill;
- recent bay muds which have no construction value and contaminant burdens that allow disposal of the material into Class III landfills; and
- recent bay muds which have no construction value and have a contaminant burden that will require disposal to a Class II landfill, or treatment prior to disposal into a Class III landfill.

The confined upland disposal facilities, or landfills, under consideration for dredge material disposal sites have either Class II or Class III disposal criteria. Waste discharge requirements for these upland sites are proposed on a site-specific basis by the landfills and approved by the Regional Water Quality Control Board. For Class III landfills, restrictions also may be imposed by the local enforcement agency and the Integrated Waste Management Board in the Solid Waste Facilities Permit. In general, landfills can only accept material that has at least 50 percent or greater solids by weight. Each landfill has prepared an EIR[4] and maintains permits to cover the type of material to be disposed of at that facility.

(1) Class II Facilities. Class II facilities can accept designated wastes that contain pollutants which may cause degradation of State waters (including groundwater) typically up to but not exceeding hazardous waste concentrations. Any waste containing concentrations of chemicals that exceed hazardous waste criteria must be taken to a Class I facility. All dredge material from the proposed project would be acceptable at Class II facilities, based on sediment testing that the Port has conducted. Two Class II facilities are under consideration by the Port as dredge material disposal sites -- Forward, Inc. and Keller Canyon Landfill.

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[4] Alameda County, *Vasco Road Sanitary Landfill Area "Y" Expansion Environmental Impact Report,* 1994, State Clearinghouse Number 87022420; Contra Costa County, *Keller Canyon Landfill Environmental Impact Report,* Draft 1989, Final 1990, State Clearinghouse Number 89040415; Woodward Clyde for Marin County, *Redwood Landfill Solid Waste Facilities Permit Expansion Project Environmental Impact Report,* 1994, State Clearinghouse Number 91033042; LSA Associates for San Joaquin County, *Forward Landfill Use Permit Modifications Environmental Impact Report,* 1993, State Clearinghouse Number 92032013.

(2) Class III Facilities. Class III landfills are limited to accepting non-hazardous solid waste. Because construction and operation requirements are more strict for Class II landfills than for Class III landfills, disposal fees are significantly higher for Class II landfills. Several Class III landfills exist in the San Francisco Bay area. These landfills vary significantly in their capacity and ability to separate wastes from State waters. This in turn affects their acceptance criteria. Two Class III facilities are being considered as dredge material disposal sites; Redwood and Vasco Road Landfills. Vasco Road is in the process of installing a clay liner and plans to have subtitle D cell certification (EPA) by August or September 1994. This cell will be able to accept Class II wastes that are not hazardous. Redwood landfill can accept some Class II wastes. Dredge sediments that meet the landfills' engineering criteria will be used for daily cover.

Regulatory limits are not defined for individual PAHs under CCR Title 22. Landfill facilities assess PAH levels on a case-by-case basis. Total petroleum hydrocarbons (TPH) and total recoverable hydrocarbons (TRPH) are used as indicators of petroleum contamination, even though they are not numerical objectives in the strictest sense. These analyses involve a complete extraction containing all the organic contaminants that are bound up in the sediment matrix. These analyses do not describe the availability of the contaminants. The TCLP analyses, discussed earlier, is designed to predict how much if any of the contaminants present can become soluble in a landfill and migrate into the groundwater.

Until recently, landfills have not been asked to deal with the large quantities generated by dredging projects. Landfills are more familiar with wastes resulting from process waste streams or contaminated site remediations. A large leaking underground storage tank (LUST) soils disposal project may consist of disposing of 1,000 cubic yards of soil. A relatively small dredging project would be in the range of 5,000 cubic yards. This terminal expansion project will require 43,600 cubic yards of sediment disposal.

Often the regulators reject a proposal for unconfined aquatic disposal for a dredging project due to the ambiguous results generated by the current in-bay testing protocols. In some instances, the best a port can hope for is to segregate a project and to minimize the upland disposal component. Unfortunately, by the time an area requires dredging, time is of the essence. It is often more cost effective not to reanalyze sediment repeatedly or more intensively, but to proceed with upland disposal. In many cases the sediment is not contaminated above the general background levels of contamination found throughout the Bay. Currently, landfills treat dredge material as a process waste with unknown constituents. The types of tests required for a LUST site are typically much less rigorous than those from a dredging project.

c. Sediment Tests. Sediments at Berth 68 and 69 were conducted in 1993.[5] The results of the these tests were compared to the Testing Guidelines for Dredged Material Disposal at San Francisco Bay Sites.[6]

After thorough review, the Port of Oakland determined that although the contaminants in the materials tested at Berth 68 do not appear to be toxic to the bioassay test organisms, the concentration of contaminants in the recent bay muds, particularly the polycyclic aromatic hydrocarbons (PAHs) warranted upland disposal. The Port of Oakland conducted new tests, over a larger area, specifically required for upland disposal of dredge material at Class II or III land fills.[7]

(1) Sediment Analysis for Upland Disposal at Class II and III Landfills. The analyses were made as two separate episodes. In the first of these, by MEC, the dredge material testing program for Berths 68 and 69 collected sediments from eight locations along the south end of Berth 68 and two stations off Berth 69. Analyses were conducted to fulfill all current testing requirements for assessing disposal at Redwood Landfill, Inc., a Class III facility.

Sediments were mostly fine grained with high silt/clay fractions that ranged from 64.2 to 94.4 percent; pH results were typical for marine sediments, ranging from 7.90 to 8.17. There were no detectable concentrations of phenols, cadmium, molybdenum, or silver measured in any sample. One core from Berth 69 had a trace level of Aldrin (0.002 mg/kg); otherwise, no pesticides were detectable. Phthalates and acetone were detected in nearly all cores, but these chemicals could have come from the plastic bags in which core samples were stored, or from compounds used to clean glassware in the testing laboratory. Concentrations of PCBs measured in all cores were well below the TTLC for PCBs (50 mg/kg), with a maximum reported concentration of 0.14 mg/kg. Contaminants above the TTLC would be classified as hazardous waste.

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[5] MEC, *Results of Chemical, Physical and Bioassay Testing of Sediments at Berth 68,* Port of Oakland, 1993.

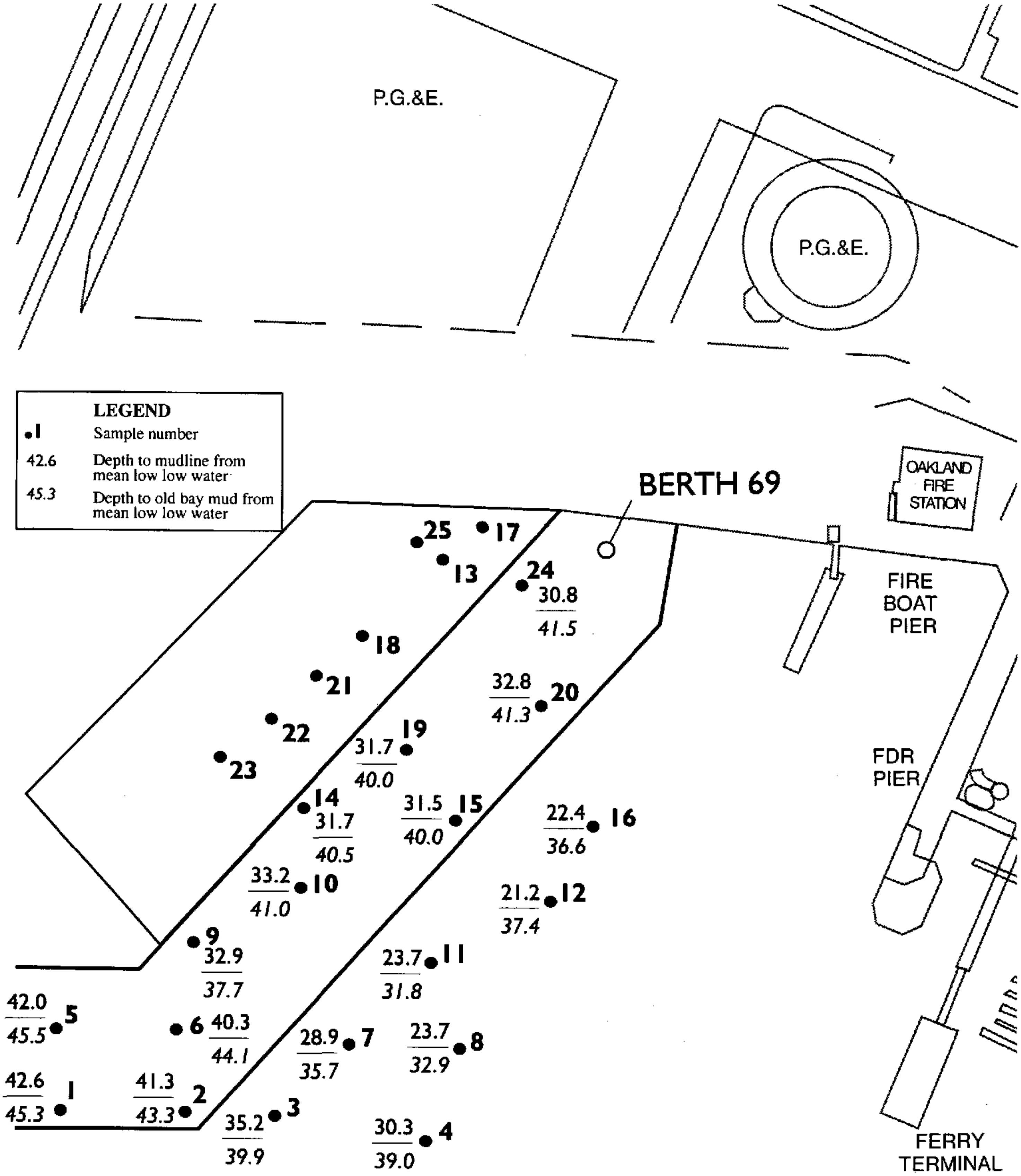
[6] U.S. Army Corps of Engineers Public Notice 93-2.

[7] *Results of Chemical and Physical Testing of Sediments at Berth 68 and 69 for Upland Disposal, Port of Oakland,* MEC 1994; Battelle and Jon Amdur, *Draft Sediment Quality Report, Charles P. Howard Terminal Expansion Project,* Port of Oakland, 1994.

All cores displayed detectable concentrations of PAHs, indicative of chronic input of combustion-related products. Fluoranthene and pyrene were the two most prominent PAHs in most of the cores. Total PAH concentrations for the sixteen priority pollutant PAHs ranged from 3.6 to 70.8 mg/kg, with a mean total concentration of 16 mg/kg. Regulatory limits are not defined for individual PAHs under California Code of Regulations Title 22. Hazardous waste guidelines exist for some petroleum-related contamination through results reported from GC/FID (gas chromatograph/flame ionization detection) and IR (infrared spectrometer) screening tests (EPA methods 8015 and 418.1, respectively). Although hazardous waste guidelines do not exist for total petroleum hydrocarbons (TPH) and total recoverable petroleum hydrocarbons (TRPH), TPH results of 100 mg/kg and TRPH results of 1,000 mg/kg have been used as indicators of petroleum contamination. Because tests detect TPH and TRPH of biotic as well as petrochemical origin in dredge material, neither TPH or TRPH was specifically required or analyzed in the study reported in MEC 1994.

Of the sixteen priority pollutant metals, concentrations reported for zinc, barium, chromium, copper, lead, nickel, and vanadium were greater than 20 mg/kg, while concentrations of the remaining metals were less than 10 mg/kg. STLC values measured from the WET procedure were generally one to two orders of magnitude lower than the total metal concentrations reported. Only zinc, lead, and barium were measured at concentrations consistently greater than 1 mg/l. Lead STLC criteria for the Class III disposal facilities at Redwood Landfill (0.831 mg/l) and Vasco Road Landfill (1.02 mg/l) were exceeded in 9 out of 10, and 6 out of 10 cores, respectively. However, STLC lead concentrations exceeded Redwood and Vasco Road Waste Acceptance Criteria by less than 0.4 mg/l and 0.2 mg/l, respectively. Although thallium was not detected, the detection limit (0.2 mg/l) was not low enough to determine suitability for disposal at Redwood Landfill (0.1 mg/l) or Vasco Road Landfill (0.14 mg/l). While elevated lead and possibly thallium concentrations could prevent disposal of some of the dredge material at the Class III facilities under consideration, disposal at the Class II facilities would not exceed disposal criteria.

Since the MEC 1994 testing did not fulfill the requirements for all the landfills under consideration, the Port of Oakland conducted additional sediment analyses (Figure 23 and Appendix F) to fulfill Waste Acceptance Criteria for all the landfills proposed as disposal sites (Battelle and Amdur 1994). Six out of seven sediment samples collected from under the pier had lead concentrations ranging from 2 to 2.8 mg/l, above the 1.05 mg/l Waste Acceptance Criteria at Vasco Road Landfill (Class III). Two other cores from under Pier 69 had lead concentrations of 1 mg/l, above the 0.75 mg/l Waste



Source: Jon Amdur, Sediment Quality Report, Port of Oakland, 1994

0' 31.25' 62.5' 125'

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Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

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FIGURE 23

Location Of Sampling Stations At Berth 69

Acceptance Criteria at Redwood Landfill (Class III). In addition, two sediment samples, one from under the pier and one off of Pier 69, had mercury levels of 0.007 and 0.008, respectively, above the 0.006 mg/l Waste Acceptance Criteria at Vasco Road Landfill. The laboratory detection limit for thallium was 0.2 mg/l, which is .06 mg/l above the Waste Acceptance Criteria at Vasco Road Landfill for thallium of 0.14 mg/l. A thallium analysis detection limit below 0.2 mg/l is not easily or usually met; therefore, Vasco Road and Keller Canyon landfills are willing to accept thallium at non-detectable values based on the laboratory detection limit of 0.2 mg/l.

The Waste Acceptance Criteria at Vasco Road and Keller Canyon Landfills include a sediment analysis for TRPH (total recoverable petroleum hydrocarbons). This analysis includes an extraction method which theoretically extracts all organic material from a sediment, including organics from biological sources. The extract is processed in an effort to remove the non-petroleum based organics. However, if the concentrations of organics in the sediment is high, as it often is, the organics of biological origin are not removed and are analyzed along with the petroleum based organics. Thus the TRPH analysis often does not describe the level of contaminants in the sediment. The Port negotiated adequate testing protocols with both Vasco Road Landfill and the Landfill Management Group of the RWQCB. The sediment analyses agreed upon by the Port, the landfill, and the RWQCB replaced the TRPH analysis with a TCLP (threshold concentration leachate procedure) analysis. The TCLP was designed to predict how much, if any, of the contaminants present can become soluble in a landfill and migrate into groundwater. The TCLP results for all the organics constituents indicated that the PAHs that are present in the sediment are not leachable into the groundwater. Results from the sediment testing for upland disposal indicate that all Waste Acceptance Criteria at Vasco Road and Redwood Landfills, other than those discussed above, would be met. Dredge sediments which are not acceptable by the Class III landfills would be acceptable at the Class II landfills under consideration.

The Port will determine the disposal material from future projects on a case-by-case basis. If a landfill is chosen that is not discussed in this report, an additional environmental document will be prepared for that disposal.

2. Impacts and Mitigation Measures

a. Significance Criteria. The level of impact significance for sediment quality is based on review of CEQA requirements. A project will normally have a significant effect on the environment if it will:

- Breach published national, state, or local standards relating to solid waste.
- Create a potential public health hazard or involve the use, production or disposal of materials which pose a hazard to people or animal or plant populations in the area affected.

Project-related impacts associated with sediment quality would be associated with handling and disposal of the dredge material. All impacts related to on site dredging activities are addressed in Section K. Biological Resources.

b. Summary of Sediment Analysis. Physical analyses of these sediments revealed typical estuarine sediments consisting of slightly basic, fine-grained particles with high moisture content. Results from chemical analyses revealed relatively clean sediments displaying moderate levels of PAHs from the chronic input of combustion-related materials. Lead and PAHs were the only contaminants present in moderate concentrations, and these levels were much lower than those used to designate hazardous waste. Low levels of nearly all other priority pollutant metals were measured with concentrations generally two to three orders of magnitude below CCR Title 22, TTLC criteria, for classification of hazardous waste. Other CCR Title 22 priority pollutants were either not detected or much lower than TTLC criteria. The results of the additional sediment testing conducted by the Port determined the acceptability at specific landfills. The results reported in MEC 1994 and in Battelle and Amdur 1994 indicate that these sediments will likely be classified as either non-hazardous or designated wastes, suitable for Class III or Class II (respectively) landfill disposal.

Review of test reports (MEC 1993 and 1994, Battelle and Amdur 1994) do not indicate the presence of hazardous waste in the sediment samples tested at Berths 68 and 69. Four confined upland disposal facilities are being considered for dredge disposal. Two of these are Class III facilities: Vasco Road and Redwood Landfills; the other two are Class II facilities: Keller Canyon and Forward Landfills. These facilities maintain permits for the wastes they accept. Therefore, dredge disposal at these facilities would not require mitigation measures.

Dredge material would be disposed at confined upland disposal facilities. The dredge disposal would not result in a significant impact due to facility controls on hazardous wastes. **This would be considered a less than significant impact.** (LS)

No mitigation measures are necessary.

c. Use of Merritt Sands. Merritt Sands would be obtained for fill on the project by deepening Berths 22, 23, 24 and 30 to 44 feet plus two feet overdredge. Merritt Sands in the Oakland Inner Harbor are free of man-made contaminants. **The dredging of Merritt Sands and subsequent use as fill on the project would have no significant impact.** No mitigation measures are necessary.

J. Water Quality

■ ■ ■

This section summarizes the environmental issues related to water quality for the proposed Howard Terminal expansion. It is based on a site visit on December 15, 1993 and a review of available documentation.

The focus of this section is strictly on water quality. Issues related to water supply, sewer, dredging, sediment quality, and biological resources are discussed in other sections.

1. Setting

a. Storm Water Runoff.

(1) Infrastructure. Charles P. Howard Terminal now has 1,642 lineal feet of wharf apron. The Port proposes to extend the apron 306 lineal feet (46,500 square feet) to make it long enough to accommodate two new generation container ships simultaneously. Currently, 57,000 square feet (1.31 acres) of the site is roofed over and the resultant roof runoff is directed to sixteen rainwater drain pipes extending down the face of the transit shed and then discharged directly into the Estuary. Storm water runoff from the outside areas sheet flows away from the building on two sides (east and south) into the Estuary. On the north and west sides of the transit shed there are six storm drains including one in the southwest corner of the loading dock. This storm drain and at least one other on the east side of the building appear to be clogged with debris and oil/grease. A site visit in December 1993 and photographs documented heavy accumulation on and around the storm drain inlet. Accumulation included trash, sediment, and oil/grease. These storm drains discharge directly into the Estuary.

(2) Activities. Currently, a repair shop is housed in the southwest corner of Building E-407A. Vehicle and equipment repair activities take place both inside and outside the transit shed. Materials and wastes, including oil and batteries, are stored both inside and outside the building. There are outside areas with relatively significant staining, particularly near the shop (see Section H. Hazardous Materials for more information).

b. Water Quality. Howard Terminal is located in the Oakland Inner Harbor. In general, water and sediment quality values are lower in the Inner Harbor than in the open Bay.[1] Water quality in the Inner Harbor is affected by urban runoff, direct discharges from human activity on the shoreline, poor circulation, and seasonal and diurnal temperature fluctuations. In addition, as a result of documented sediment contamination, the Inner Harbor has been identified as a known toxic "hot spot" by the San Francisco Bay Regional Water Quality Control Board (RWQCB).[2] Sediments in the Inner Harbor are contaminated with heavy metals (cadmium, chromium, copper, lead, mercury, and silver), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), tributyltin (TBT), and pesticides (chlordane, DDT, and dieldren). The deeper Merritt sands do not contain measurable levels of man-made contaminants.[3]

The wharf structure is supported by 400 creosote-treated timber pilings and 700 concrete pilings. Creosote is high in PAHs and these pilings may act as a continuing source of PAHs to the water column. Data from two recent studies appear to confirm this pollution source: data from the Inner and Outer Harbor deepening project indicate that total PAH concentrations in the sediments offshore of Berth 68 are high, with the highest value closest to the expansion area. Data for this project[4] also indicate elevated PAH levels at the berth expansion area.

c. Proposed Berth 10 Rehandling Facility. Two options are currently being evaluated for the construction of the Berth 10 rehandling facility. Option 1 consists of using a tube made of geotextiles filled with dredged material to create a 4-foot high berm around the site. Option 2 consists of constructing the berm out of modified K-rail (3-foot high) with 2-inch by 12-inch boards attached to the top to increase the freeboard. Site preparation and management would be identical regardless of the construction materials.

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[1] U.S. Army Corps of Engineers, 1992. *Environmental Assessment, Oakland Inner Harbor 38-Foot Separable Element of the Oakland Harbor Navigation Improvement Project, Alameda County, California.*

[2] SFBRWQCB. 1993. *Bay Protection and Toxic Cleanup Program - Status Report*, October 1993.

[3] U.S. Army Corps of Engineers, 1992, op.cit.

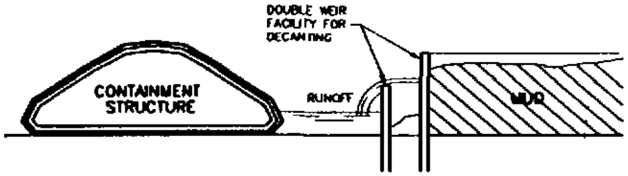
[4] MEC. *Results of Chemical, Physical and Bioassay Testing of Sediments at Berth 68,* Port of Oakland, 1993.

Final decisions on how the facility will be constructed will depend on which method, or combination of methods, is approved by the Regional Water Quality Control Board (RWQCB). If both methods are approved, the final decision will be based on the cost to construct and remove the facility and the ease and efficiency of operation. A description of each option can be found below. Cross-sections of the facility are shown in Figure 24.

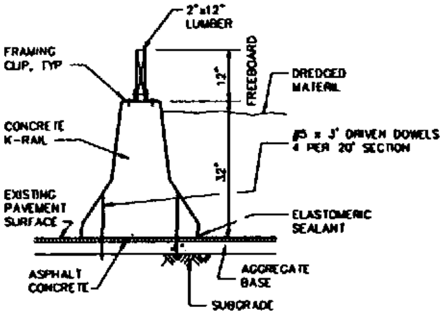
(1) Option 1. A perimeter dike would be constructed of two-ply, sealed tubes of geotextile (construction liner) and filled with dredged material. This type of liner has been used in a number of projects throughout the country to contain dredged material. Other projects that have used geotextile tubes to hold dredged materials have included berms, levees and groins. The two-ply liners can retain particles as small as clays and silts. Due to electrochemical and physical bonding, clay and silt range sediments contain the majority of the contamination. The geotextile tubes can retain the material and the bound contaminants and allow only the water to pass through. The water discharged from the tubes could contain low concentrations of dissolved phase contaminants, especially metals. To prevent water that is extruded from the tubes from discharging to the estuary, storm drains would be blocked and the water would be diverted into the effluent collection basin. The water would be diverted by inserting impermeable plastic liner between layers of geotextile on the outer half of the tube. The internal liner would divert and retain the water within the bermed area. The water would eventually be discharged to the estuary or treated prior to discharge. The RWQCB would establish discharge requirements.

The materials used to fill the tubes would consist of mostly silt and clay range sediments with some minor amounts of sand. Permeability tests on this type of material have shown that it will act as an efficient barrier to both water and sediment placed inside the containment area. Because the material is dense and relatively impermeable, water tends to pool on the surface of the dredged material rather than percolate through it. Because of the impermeable liner inside the tube and the nature of the material, water would not flow through the berm. In addition, the geotextile tubes would spread and flow at the base, making a wide footprint that can conform to the shape of the surface upon which it is placed. Therefore the filled tubes would act as an efficient seal at the base.

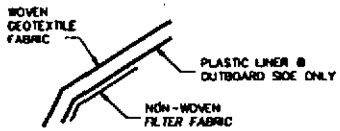
(2) Option 2. A perimeter dike would be constructed of reinforced concrete K-rail, approximately 3 feet high, with 2-inch by 2-inch timbers attached to the top of the railing, to give a total height of approximately 4 feet. Each rail would be pinned down to the surface with three-foot long, 5/8-inch steel pins (four per 20-foot K-rail section). Pinning would add more than



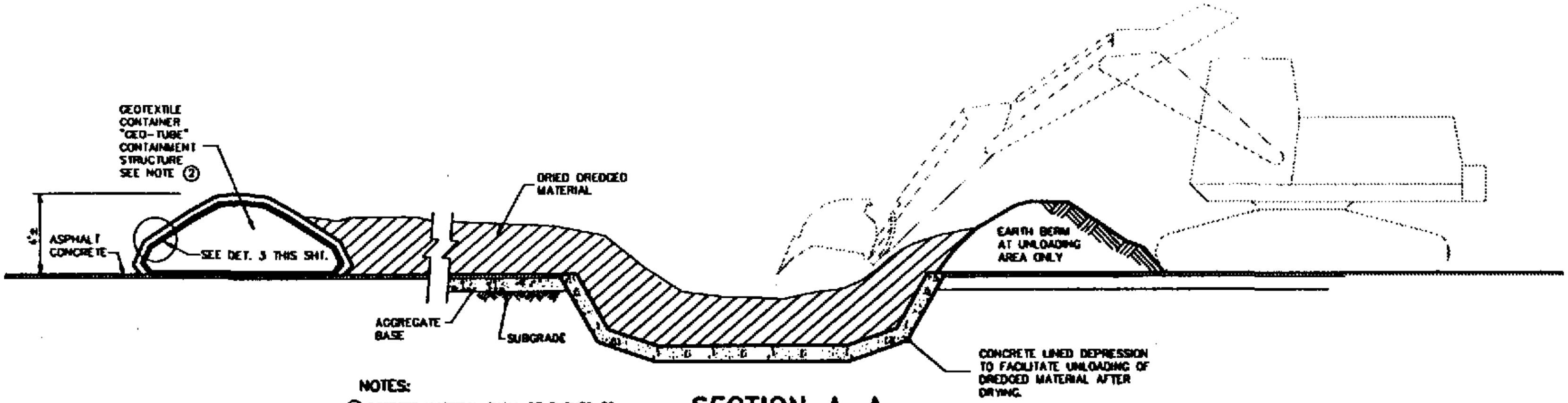
1 DECANT AREA DETAIL
NTS



2 K-RAIL DETAIL
NO SCALE



3 GEOTEXTILE CONTAINER WALL DETAIL
NO SCALE



SECTION A-A
NO SCALE

NOTES:

① DREDGED MATERIAL SHALL BE PUSHED TO UNLOADING AREA WITH A BULLDOZER ONCE IT HAS DRIED.

② PERIMETER CONTAINMENT STRUCTURE SHALL BE EITHER GEOTEXTILE CONTAINER AS SHOWN IN SECTION A-A OR MODIFIED "K-RAIL" AS SHOWN IN DETAIL 2

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Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

BRADY AND ASSOCIATES
PLANNERS AND LANDSCAPE ARCHITECTS

FIGURE 24

Cross-Sections of Proposed Rehandling Facility

adequate seismic stability. Joints and corners where the K-rail sections meet would be sealed with mortar with an asphalt sealer as required. To seal the containment area, the base of the K-rail sections would be sealed using an elastomeric around the entire perimeter. Additionally, impermeable plastic liner would be draped over the railing and attached to the floor of the containment area to prevent water or sediment from escaping from joints or seams.

(3) Surface Preparation and Site Management. The surface of the drying area would be sealed with a sealing coat of asphalt before any material is deposited on the surface. The sealing coat would fill any cracks in the surface and decrease the permeability of the surface to a permeability of approximately 1/1,000,000 centimeter per second. A pit would be excavated to allow a backhoe to scoop up large volumes of material from the holding area. The pit would be lined with concrete to a suitable thickness to prevent infiltration. All storm drains would be covered and sealed within the facility. Low weirs would be placed around drains near the facility. Two weirs would be built at the low spot within the containment area. The weirs would be made of wood, K-rail or both with a geotextile screen to further reduce the amount of suspended solids in the decant water.

A barge-mounted crane would remove dredged material from the scows and place it into the drying yard. Contaminants would be bound to sediments. Some sediments could be briefly suspended in the water when the dredge material is first placed in the facility. A tractor would distribute the material in the yard. Solids would slowly be worked toward the sediment unloading area, which would be located slightly up-gradient from the decanting area. Because of the density of the sediment, water should be easily separated from the dredge material during handling. The decant water would flow to the decant area while the sediment is pushed towards the unloading area. Decant water would collect behind the first of the weirs until it begins to spill over the top and through the first of the geotextile screens. The geotextile screen would be similar to felt and should retain more than 90 percent of the sediment behind the weir. A second settling area and weir would be built on the inside of the first weir. The second settlement area should remove the remaining suspended material from the decant water. The decant water on the discharge side of the second weir would be tested for permit compliance.

Representative samples would be taken of the water to ensure compliance with the discharge requirements before the effluent is discharged to the estuary. The RWQCB has determined that a National Pollutant Discharge Elimination System (NPDES) permit will be required for effluent discharged to the estuary. Testing frequency and analysis will be determined by the

RWQCB to address the concentration of the constituents of concern. If the discharge needs to continue over a period of days to weeks, the decant water will be tested daily for suspended solids and on a regular basis for contaminants of concern. The discharge requirements imposed on the effluent by the RWQCB will protect the estuary and may be based on background concentrations in the estuary. If the water content of the dredged material is low, the water might evaporate in the containment area and there might not be any effluent. It is possible, although unlikely, that there would be a continued discharge from the site over a long-term rather than a brief one-time discharge. Decant water discharged over a longer time period would be tested as it is being discharged to the storm sewer system, as is allowed by the NPDES permit.

If decant water does not meet RWQCB permit guidelines for discharge, the water can be held and treated in a variety of ways. The exact treatment method would be determined by the contaminants of concern. Organic contaminants could be removed by activated carbon filtration. Metals could be removed through chelation, precipitation, or electrode removal methods. Landfills can typically accept material that contains greater than 50 percent solids and no standing water. Although free water cannot be taken to the landfill, sediment with a higher percentage of water than would be optimum based on cost per ton for disposal (but still greater than 50 percent solids) can be sent to the landfill. The final option would be to haul the water to a wastewater recycler at a premium price.

Dredged material would be placed in the drying yard to a thickness of approximately three feet. One foot of freeboard would be left around the drying yard to prevent surging material from going over the dikes. The material would be left in the facility to dry for up to four months. As previously stated, the landfills can accept soil/sediment with up to 50 percent liquid content. Material dredged using the clamshell method can generate material with approximately 50 percent solid content. The cost for hauling and disposing of soil that is 50 percent water is cost prohibitive. The material would be left on the terminal to dry to minimize disposal cost and not interfere with construction schedules.

A storm water management plan would be developed for this facility. Because of the physical characteristics of the sediment, water would not percolate through the material, but might pool on the surface. This water can be decanted and tested in a similar fashion as the original decant water. As long as the water is decanted promptly, there is little risk of contamination from the dredged sediments. Covering the entire seven-acre site with plastic may be difficult and unnecessary based on the low potential risk of contamination.

Storm water would not be allowed to discharge directly to a storm without testing. If very large storms are expected that could overwhelm the water holding capacity of the facility, as much of the site would be covered as possible and geotextiles would be used to remove particulates before storm water from the facility is allowed to enter the estuary.

Dredged sediments would be left at the upland rehandling facility for a day to seven weeks. The surface material would be kept moist to prevent dust formation. Landfills will accept sediments with up to a 50 percent water content; however, shipping sediments with that high a water content is not economical. The major factor in deciding residence time is the time required for contaminants to settle out of the decant water and bind with the sediments. The Port is conducting a risk assessment to determine the maximum residence time required for this to occur. This residence time will be included in an operations plan, which will be submitted to the San Francisco Regional Water Quality Control Board for approval.

2. Impacts and Mitigation Measures

a. Significance Criteria. The level of significance for water quality is based on CEQA requirements. A project will normally have a significant effect on the environment if it will:

- Substantially degrade water quality.

b. Storm Water Runoff at Howard Terminal.

(1) Construction Impacts.

Impact WATER-1: Demolition and construction could generate pollutants that could pollute storm water runoff or be discharged directly into the Bay. (S)

The State's General Industrial Activities Storm Water Permit (SWRCB, 1992a) does not require the Port of Oakland's Storm Water Pollution Prevention Plan (SWPPP) (Port of Oakland, 1992) to include provisions for addressing storm water pollutants generated during construction activities at the Port. Also, the State's General Construction Activity Storm Water Permit does not cover construction activities of less than five acres unless the activity is part of a larger common plan of development. Therefore, it is not necessary for the Port or its contractor to file a Notice of Intent or pay a fee to cover the work at Howard Terminal under the State's General Construction

Activity Storm Water Permit. (The rehandling facility, discussed below, would require a permit.)

> Mitigation Measure WATER-1: The contractor should prepare, and the Port should review, a construction Stormwater Pollution Prevention Plan (SWPPP) following the guidelines in the State's General Construction Activity Storm Water Permit. The Port should require the general contractor and the subcontractors, via contract language, to abide by the construction SWPPP.

Adherence to the construction SWPPP by the contractors should mitigate pollutants, generated as a result of demolition and construction activities at the site, to a level of insignificance.

(2) Post-Construction Impacts.

(a) Increased runoff quantity. The existing pattern of sheet flow runoff is not likely to change significantly. There will be increased runoff as a result of the increase in impervious surface area (one acre in a 53 acre complex is 2 percent). However, the increase in runoff volume is not expected to cause flooding or require upgrading of existing storm drains, since the additional area currently is over water. Therefore the increase in runoff volume is not a significant impact. **This is considered a less than significant impact.** (LS)

(b) Decreased runoff quality. When the wharf extension has been constructed, the transit shed demolished, and the site re-paved, the runoff from that area will pick up pollutants associated with terminal operations and storage of chassis or containers. These are the same activities being conducted at the rest of the new Howard Terminal and that are covered by the Port's Industrial SWPPP.[5] Adherence to the Industrial SWPPP by the new Charles P. Howard Terminal tenants would control pollutants, generated as a result of expanded activities at the site. **This is considered a less than significant impact.** (LS)

c. Storm Water Runoff at Dredged Sediment Rehandling Facility. Dredging for the new wharf and berth area would generate 43,600 cubic yards of dredged material. The dredged sediment would be dewatered at a seven-acre rehandling facility constructed at Berth 10. Because the facility would

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[5] Port of Oakland, 1992. National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Program.

cover more than five acres, a State General Construction Activity Storm Water Permit would normally be required under the National Pollution Discharge Elimination System (NPDES), through the Regional Water Quality Control Board (RWQCB). However, in this instance the RWQCB will require an NPDES permit to operate the site, rather than a construction permit. Implementation of the proposed project would include the following:

- obtaining the NPDES operation permit from RWQCB,
- constructing a containment area,
- testing and sealing the asphalt (if necessary),
- securing containment system to the wharf,
- using a RWQCB-approved operations plan,
- controlling dust, and
- collecting, testing, and treating the decant water (if necessary).

Implementation of these actions would keep water quality impacts at a level of insignificance.

Decant runoff from the dredge material will be required to meet NPDES permit conditions before discharge into the bay. Concerns with decant water relate to suspended sediments and associated contaminants. Although the suspended sediment load in the decant water is high, discharge could exceed allowable levels of turbidity, PAH's, and heavy metals, particularly lead. Proper treatment of the decant water, either through allowing sufficient time for suspended sediments to settle or through the use of a flocculent agent, should eliminate these problems. If it is determined that the decant water cannot be treated at the rehandling facility to meet NPDES permit standards, the Port has committed to haul decant water to a waste water treatment plant for treatment.

d. Water Quality.

(1) During Construction at Howard Terminal.

(a) Removal of Creosote-Treated Timber Piles. Existing concrete and wood piles to be removed would be cut off at the mud line.

Impact WATER-2: The removal of the wood piles could release creosote; however, removing the wood piles would eliminate a continuing source of pollution from the exposed creosote surfaces of the piles and result in an overall net environmental benefit. (B)

No mitigation is required.

(b) Sediment contamination release during dredging. After pile removal, approximately 43,500 cubic yards of sediments in the new wharf area and the new berth area would be dredged. Sediment samples collected just offshore of Berth 68 as part of the Inner and Outer Harbor deepening project[6] were tested. Despite the presence of elevated pollutant concentrations in the sediments just offshore of Berth 68, results of suspended particulate phase (SPP) bioassay tests showed no water column toxicity to biota. More recent samples taken specifically for this project showed some elevated levels of PAHs and PCBs (Aroclor 1254 and 1260) that could be released into the water column during dredging. However, bioassay tests of these same samples with amphipods and larval bivalves showed a high survival rate.

It appears that metals and PAHs, although sometimes present at elevated concentrations in these sediments, are not available to the biota. This result is not surprising since both metals and PAHs are known to complex with organic matter and sediments, particularly in marine environments. For a further discussion of the potential impacts of dredging on the biota, see Section I. Sediment Quality.

Deepening Berths 22, 23, 24 and 30 would not release contaminants, because the dredged material would be Merritt sands. Merritt sands are discussed on the first page of Section I, Sediment Quality.

(c) Pile Removal. Port tests show that most of the sediment contamination occurs in the upper sediments that have been exposed to human sources of pollution. Most of these top layers of sediment will be removed by the dredging operation and properly disposed of by the rehandling operation. The remaining Merritt Sand Formation sediments have not been exposed to anthropogenic sources of pollution and should be relatively clean. Therefore, as a result of project design, piles will be driven into these relatively clean sediments thereby reducing the potential for impacts. **Pile driving would thus be considered a less than significant impact.** (LS)

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[6] U.S. Army Corps of Engineers, 1992. *Environmental Assessment, Oakland Inner Harbor 38-Foot Separable Element of the Oakland Harbor Navigation Improvement Project, Alameda County, California.*

(2) Post-Construction at Howard Terminal.

(a) Reduction of Creosote-Treated Piling. The project would involve removal of 1,200 cubic yards of creosote-treated piling and the placement of 536 cubic yards of concrete and recycled plastic piling.

Impact WATER-3: The project would result in a net decrease in piling of 664 cubic yards and the substitution of creosote-treated piling with concrete and recycled plastic piling. Therefore, the impacts to water quality from creosote-treated piles would be reduced by the proposed project. (B)

No mitigation is required.

(3) Pile-supported Wharf Removal at Pacific Dry Dock and Sherex sites. Approximately 33,000 square feet of wharf at the Pacific Dry Dock site and 13,590 square feet of wharf at the Sherex site would be removed to meet permit requirements regarding Bay fill.

Impact WATER-4: The removal of creosote-treated piles at the Pacific Dry Dock and Sherex sites would reduce creosote in Bay waters. (B)

No mitigation is required.

Impact WATER-5: During removal of the timber wharf at the Pacific Dry Dock and Sherex sites, debris and wastes would be close to Bay waters. Even a minor accident or spill could result in these wastes entering the Bay. (S)

> Mitigation Measure WATER-5: Implement Mitigation Measure HAZ-1, debris containment and demolition pollution control plan, during wharf removal at the Pacific Drydock and Sherex sites as well as during demolition and construction at Howard Terminal.

Implementation of the plan would reduce the potential impacts to an insignificant level.

(a) Reduction of Creosote-Treated Piling. The wharf removal process includes the removal of 820 cubic yards of creosote-treated timber piling. Piling would be removed by cutting each pile at the mud line and removing the upper portion. The portion below the mud line would not be removed.

Impact WATER-6: The removal of 820 cubic yards of piles at the Pacific Drydock and Sherex sites could release some creosote; however, the removal of piling would eliminate a continuing source of pollution from the exposed creosote surfaces of the piles and result in an overall net environmental benefit. (B)

No mitigation is required.

(b) Sediment contamination release during piling removal. Crowley Maritime Corporation, operator of the Pacific Dry Dock and Repair Yard, is presently under a Clean Up Order from the RWQCB. Crowley Maritime Corporation was found to be in violation of Waste Discharge Requirements at various times before 1993. A site characterization[7] found that sediments contained elevated concentrations of chromium, copper, lead, mercury, zinc, PAHs, and organotin. Mercury, given its high toxicity and the detection of sediment concentrations in excess of the Title 22 Total Threshold Limit, will be driving the cleanup[8]. The RWQCB will be reviewing the investigation of sediment contamination by Crowley Marine Corp. Given that there is a process in place to remediate the site and that the Port will not be removing piling until it is environmentally safe to do so, **this would be considered a less than significant impact.** (LS)

e. Water Quality Impacts of Upland Disposal at Landfills. The EIRs for the four landfills where dewatered dredged sediments may be transported after drying at the Berth 10 rehandling facility identified the impacts of the Class II and III facilities.[9] All impacts are identified in the landfill EIRs.

The disposal of the proposed project's dredging material would contribute to surface and groundwater impacts at the landfills. These impacts are identified in each of the landfill expansion EIRs. Measures recommended in the landfill EIRs would mitigate these impacts to a less than significant level.

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[7] Versar for Crowley Maritime Corporation, 1992, *Revised Inshore Sediment Impairment Study, Pacific Dry Dock and Repair Yard II, Oakland, California.*

[8] San Francisco Bay Regional Water Quality Control Board, 1993, letters to Pacific Dry Docks I and II, Oakland Inner Harbor, from T. Wu, RWQCB to R.S. Wilson, Crowley Environmental Services, November 9 and December 30, 1993.

[9] Alameda County, *Vasco Road Sanitary Landfill Area "Y" Expansion Environmental Impact Report,* 1994, State Clearinghouse Number 87022420; Contra Costa County, *Keller Canyon Landfill Environmental Impact Report,* Draft 1989, Final 1990, State Clearinghouse Number 89040415; Woodward Clyde for Marin County, *Redwood Landfill Solid Waste Facilities Permit Expansion Project Environmental Impact Report,* 1994, State Clearinghouse Number 91033042; LSA Associates for San Joaquin County, *Forward Landfill Use Permit Modifications Environmental Impact Report,* 1993, State Clearinghouse Number 92032013.

K. Biological Resources

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1. Setting

This assessment addresses two concerns; the loss of habitat, and the possible increased bioavailability of contaminants associated with dredging, filling and storage of dredged material. The area of influence for biological resources has been defined as the Oakland Inner Harbor. The biological resources described in this section include benthic (bottom) organisms, fish, wildlife and threatened and endangered species. Species that are common in the Oakland Inner Harbor are listed in Table 29. Although benthic, fish and wildlife resources are common to the San Francisco Bay, the biological community in the Oakland Harbor has been described as having reduced fish and wildlife habitat values due to past channel dredging projects and maintenance dredging activities.[1] Portions of Howard Terminal are supported by piles. Although the pile-supported area has a benthic community and provides potential fish habitat, the shaded condition has resulted in a limited plant community and has reduced the area's value as a biological resource.

The Port of Oakland has a maintenance dredge permit (U.S. Army Corps of Engineers Permit No. 18992E35, amended December 1993 as Permit No. M92-41) for annual dredging which includes the areas from the existing wharves out 130 feet at Berths 68 and 69. Berth 68 is permitted to be dredged to -42 feet and Berth 69 is permitted to be dredged to -35 feet, with a 2 foot allowance for overdredging.

Therefore, the area of the Oakland Inner Harbor that will be impacted by the Howard Terminal extension is presently under pile supported fill or in an annual maintenance dredge program. These conditions result in degraded habitat which will be considered in assessing adequate mitigation for the project-related impacts to biological resources.

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[1] U.S. Army Corps of Engineers, 1992. *Environmental Assessment, Oakland Inner Harbor 38-Foot Separable Element of the Oakland Harbor Navigation Improvement Project, Alameda County, California.*

Table 29
SPECIES OF COMMON ORGANISMS IN THE OAKLAND INNER HARBOR

Common Name	Scientific Name	Status
Representative Benthic Species		
Polychaete worms	*Exogone lourei* *Cirriformia spirabrancha* *Cirriformia luxuriosa*	
Mollusks	*Gemma gemma*	
Shipworm	*Bankia setecar*	
Bent-nose clam	*Macoma nasuta*	
Bent-nose clam	*Macoma inquinata* *Lifforina* sp. *Mysella* sp. *Musculista senhousia*	
Asian clam	*Potamocarbuta amoreisis*	
Blue mussell	*Mytilua edulus*	
Amphipods	*Corophium* sp.	
Isopods		
Gribble	*Limnoria* spp.	
Anemones	*Metridium senile*	
Chitons	*Cyanoplax hartwegi*	
Barnicles	*Balanus glandula*	
Bay shrimp	*Crangon* spp.	
Common Fish Species		
Topsmelt	*Atherinops affinis*	
Jacksmelt	*Atherinops californiensis*	
Northern anchovy	*Engraulis mordax*	
Arrow goby	*Clevelandis ios*	
Surfperch	*Embiotoca* sp. and *Hypsurus* sp.	
Shiner perch	*Cymatogaster aggregata*	
Pile perch	*Damalichthys vacca*	
Starry flounder	*Platichthys stellatus*	
English sole	*Pleuronectes vetulus*	
California halibut	*Paralichthys californicus*	
Pacific staghorn sculpin	*Leptocotus armatus*	
Leopard shark	*Triakis semifasciata*	
Spiny dogfish	*Squalus acanthias*	
Bat ray	*Myliobatis californica*	
White croaker	*Genyonemus lineatus*	
Pacific herring	*Clupea harengus*	
Marine Mammal Species		
California sea lion	*Zalophus californianus*	
Harbor seal	*Phoca vitulina*	
Terrestrial Animal Species		
House mouse	*Mus musculus*	
Norway rat	*Rattus rattus*	

Common Name	Scientific Name	Status
Representative Bird Species		
California least tern	*Sterna antillarum browni*	SE/FE[a]
Brown pelican	*Pelecanus occidentalis californicus*	SE/FE[b]
Western grebe	*Aechmophorus occidentalis*	
Scaup	*Aythya spp.*	
Canvasback	*Aythya valisineria*	
Surf scoter	*Melanitta perspicillata*	
Western sandpiper	*Ereunetes mauri*	
Dunlin	*Erolia alpina*	
Marbled godwit	*Limosa haemastica*	
Willet	*Catoptrophorus semipalmatus*	
California gull	*Larus californicus*	CSC[c]
Gulls	*Larus spp.*	
Cormorant	*Phalacrocorax pelagicus*	
Great blue heron	*Ardea herodias*	
Common egret	*Casmerodius albus*	

[a] State and federally-listed endangered species.

[b] State and federally-listed endangered species, fully protected by California Department of Fish and Game.

[c] California species of special concern.

Additional fill material (Merritt sands) required for the project would be obtained by deepening Berths 22, 23, 24 and 30 from 42 feet plus two feet overdredge to 44 feet plus two feet overdredge. Merritt sands have no measurable levels of man-made contaminants, and have no adverse biological effects.[2]

a. Benthic Organisms. The channel bottoms and adjacent areas provide habitat for worms, crustaceans and shellfish. These benthic invertebrates play an important part in the aquatic food chain as they are primary or secondary consumers and are often prey for fish at higher trophic levels. Surveys conducted in Oakland Inner and Outer Harbors and Port of Oakland's Market Street Terminal identified 137 taxa as inhabiting the benthic community.[3] Although no surveys have been conducted since 1992, bottom conditions are similar to those described at Carnation Terminal and other

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[2] *ibid.*

[3] Ibid.

areas in the Oakland Inner Harbor.[4] The project site is adjacent to the sampled areas, and the depths and sediment composition are similar.

b. <u>Fish</u>. The fish community in San Francisco Bay includes a wide variety of species due to varying salinity regimes. Anadromous game species are not expected to inhabit the Oakland Inner Harbor area because it is not located near any main migration routes.[5]

Pacific herring (*Clupea harengus*) represent an important herring roe fishery in San Francisco Bay and the bay is a major spawning ground in California. Spawning occurs both intertidally and subtidally to depths of about 30-40 feet. The spawning season in California extends from late October through March, but in San Francisco Bay it peaks from December through February. Subtidal areas comprise 50-70 percent of the spawning areas. The eggs are usually attached to a variety of surfaces such as marine vegetation, rocks, pier pilings, eelgrass, seaweed or sand. Soon after spawning, the adult herring usually leave to return to their offshore feeding grounds.[6]

In San Francisco Bay the major subtidal spawning areas have historically been just inside the Golden Gate, at Angel Island, off of the Marin and Tiburon peninsulas and between Richmond and Oakland.[7] More recently the distribution of herring spawning has changed to the San Francisco Bay waterfront and the Oakland-Alameda area.[8] Herring were reported spawning along the Oakland Inner Harbor during 1987-1990.[9] Given the close proximity of known spawning areas to the project site, it is possible that Pacific herring may utilize the intertidal and subtidal areas in Oakland Harbor as spawning grounds.

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[4] Earth Metrics, Inc. 1990. *Draft Supplement to the Environmental Impact Report for the Redevelopment of Carnation Terminal Area.* Prepared for the Port of Oakland.

[5] U.S. Army Corps of Engineers, 1992.

[6] Suer, A. 1987. *The Herring of San Francisco and Tomales Bays.* The Ocean Research Institute, San Francisco, CA.

[7] Earth Metrics, Inc. 1990. *Draft Supplement to the Environmental Impact Report for the Redevelopment of Carnation Terminal Area.* Prepared for the Port of Oakland.

[8] California Department of Fish and Game. July 1992. Biomass Estimates of Pacific Herring, *Clupea pallasi,* in California from the 1991-92 Spawning-Ground Surveys. Marine Resources Division, Administrative Report No. 92-2.

[9] Spratt, J.D., 1987, 1988, 1989,1990, Biomass Estimates of Pacific Herring, *clupera harengus pallasi*, in California Spawning Ground Surveys. California Department of Fish and Game, Marine Resource Division Administrative Reports 87-12, 88-7,89-6, 90-13.

c. Wildlife. No terrestrial mammals except for the house mouse (*Mus musculus*) and Norway rat (*Rattus rattus*) are expected to inhabit Howard Terminal. Occasionally, marine mammals such as the California sea lion (*Zalophus californianus*) and harbor seal (*Phoca vitulina*) use the Inner Harbor Channel[10]. The nearest known harbor seal haulout area is Yerba Buena Island, several miles from the project area.

San Francisco Bay is one of the most important sites for shorebirds and waterfowl along the Pacific Flyway.[11] Shorebirds and waterfowl use the bay because the shallow bay fringes include intertidal marsh and mudflat habitats which serve as important staging areas as birds make their way to and from their wintering sites in Central and South America.

The Bay also provides habitat for the thousands of shorebirds that remain in the bay during the winter and spring. Waterfowl prefer open water habitat and will occupy tidal channels when water is present. Shorebirds forage in mudflats exposed during low tide. During high tide shorebirds seek the higher marsh areas and bare ground for resting. Shorebirds forage in greater numbers along mudflats that are adjacent to or near areas that provide resting habitat, such as upper tidal marsh and seasonal marsh habitat.[12]

Waterbirds found in the adjacent waters of the San Francisco Bay use the Oakland Inner Harbor to a certain degree. For example, shorebirds have been recorded as feeding along the Oakland Shoreline in limited numbers.[13] Species such as grebes, diving ducks and cormorants forage in the deeper open waters in the Inner Harbor.[14] The open water habitat is also utilized as a resting area. Gulls commonly forage in the intertidal areas, but use the open water as loafing sites. Typically, they are observed resting on the roofs of buildings. Herons and egrets forage in the shallow water along the banks

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[10] U.S. Fish and Wildlife Service, 1980, *California Least Tern Recovery Plan*, Region 1, Portland Oregon, cited in U.S. Army Corps of Engineers, 1992.

[11] Stenzel, L.E., J.E. Kjelmer, G.W. Page, W.D. Shuford. 1989. *Results of the First Comprehensive Shorebird Census of Northern and Central California Coastal Wetlands 8-12 September 1988.* Point Reyes Bird Observatory, Stinson Beach, CA.

[12] Ibid.

[13] Port of Oakland. 1982. *Jack London Square Project Development Plans, Draft Environmental Impact Reports.* Prepared by the Port of Oakland, dated November 1982.

[14] U.S. Army Corps of Engineers. 1984. *Final Feasibility Study and Environmental Impact Statement, Oakland Inner Harbor, California Deep-Draft Navigation.* U.S. Army Corps of Engineers, San Francisco District, CA.

of channels. Several species of gulls and egrets are year-round residents, while most shorebirds and waterfowl species are winter residents or fall and spring migrants.

d. Threatened and Endangered Species.

(1) California Least Tern. The California least tern (*Sterna antillarum browni*) is a state and federally-listed endangered species. This species winters in Central and South America and breeds along the Pacific Coast from southern Baja, Mexico to San Francisco Bay. The California least tern generally arrives at breeding sites around the last week of April where they remain, on the average, until August[15]. Recently reported nesting sites around San Francisco Bay include Alameda Island, Bay Farm Island, Coyote Hills and Bair Island. Within the project region the California least tern is known to nest on artificially-created, sandy upland sites at the Oakland International Airport and a runway apron at the Alameda Naval Air Station.[16] Ready access to foraging habitat in nearshore, shallow water within 250 meters of the nesting colonies is a necessary habitat component for reproductive success.[17]

During the nesting season least terns can be found foraging in the Bay waters within and adjacent to the Oakland Inner Harbor Channel.[18] Foraging activity by least terns at the Alameda Naval Air Station colony indicates that dominant foraging activity occurs in areas of relatively calm, shallow water less than 10 feet deep and in eddy slicks.[19] In a study of the overall geographic distribution of California Least Tern foraging around the Alameda Naval Air Station,[20] no foraging activity was observed in the immediate vicinity of

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[15] U.S. Fish and Wildlife Service, 1980. *California Least Tern Recovery Plan*, Region 1, Portland Oregon, cited in U.S. Army Corps of Engineers, 1992.

[16] U.S. Army Corps of Engineers. 1988. *Supplement I to the Environmental Impact Statement - Oakland Outer and Oakland Inner Harbors Deep-Draft Navigation Improvements - Alameda County.* U.S. Army Corps of Engineers, San Francisco District, CA.

[17] Erickson, R.A. 1985. *Ecological Characteristics of Least Tern Colony Sites in California.* Masters Thesis, 110 pages, California State University, Hayward.

[18] U.S. Army Corps of Engineers, 1988, op.cit.

[19] Baily, S.F. 1985. *California Least Tern Foraging and Other Off-Colony Activities around Alameda Naval Air Station During 1985.* California Academy of Sciences, San Francisco, CA.

[20] Collins, L.D. 1987. *California Least Tern Nesting Season at the Alameda Naval Air Station.* U.S. Department of the Navy, Natural Resources Branch, Western Division Naval Facilities Engineering Command, San Bruno.

Howard Terminal, and less than 2 percent of foraging activity was found in the area of the Oakland Estuary. The majority of the foraging activity around Alameda Naval Air Station was to the east and south, in San Francisco Bay. Therefore, limited foraging use, if any, is expected near the terminal.

(2) California Brown Pelican. The California brown pelican (*Pelecanus occidentalis californicus*) is classified as a State and federally-listed endangered species, as well as a fully protected species by the California Department of Fish and Game. The nearest breeding colony to the project area is on the Channel Islands in southern California. After the breeding season this species disperses north to estuarine, marine, subtidal and marine pelagic waters along the California coast. Brown pelicans are commonly found around San Francisco Bay from June to November[21]. The largest roosting area of brown pelicans in San Francisco Bay is located on the breakwaters to the south of the Alameda Naval Air Station. Brown pelicans are also known to forage along the Oakland Inner Harbor channel (COE 1992). They usually forage in the early morning or late afternoon or during rising tides when they feed almost exclusively on fish (Zeiner *et al.* 1990). Limited foraging and roosting use, if any, is expected near the terminal due to the lack of appropriate habitat and scarcity of prey.

(3) American Peregrine Falcon. The American peregrine falcon (*Falco peregrinus anatum*) is listed as endangered by the federal and State government. This species is an uncommon breeding resident and migrant. Although nesting is uncommon in the San Francisco Bay area, several pairs of falcons have begun nesting on the Bay Bridge[22]. In winter peregrine falcons are found inland throughout the Central Valley and along the coast as further northern breeding residents migrate into California during winter[23]. This species feeds primarily on a variety of birds, but occasionally takes mammals, insects and fish. There are no known peregrine falcons inhabiting the area of the terminal.

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[21] Zeiner, D.C., W.F. Laudenslayerm Jr., K.E. Mayer and M. White, 1990, *California's Wildlife, Volume II Birds*. California Statewide Wildlife Habitat Relationships System, Department of Fish and Game.

[22] U.S. Fish and Wildlife Service, 1992, Preliminary Planning Aid Letter dated March 5, 1992 to the Corps of Engineers, San Francisco District.

[23] Zeiner, D.C., W.F. Laudenslayerm Jr., K.E. Mayer and M. White, 1990, *California's Wildlife, Volume II Birds*. California Statewide Wildlife Habitat Relationships System, Department of Fish and Game.

2. Impacts and Mitigation Measures

a. Significance Criteria. Identification of impacts resulting from the proposed project has been evaluated under the guidelines presented in Appendix G of the California Environmental Quality Act, which identifies 26 project effects on the environment that would be considered significant. Three of these significant impacts are directly applicable to biological resources from the dredging and disposal activities associated with the proposed project:

- substantially affect a rare or endangered animal or plant or the habitat of the species;
- substantially degrade water quality;
- interfere substantially with the movement of any resident or migratory fish or wildlife species.

Impacts can occur to biological resources, in general, and to sensitive species and habitats in particular. Potential impacts to sensitive species and habitats are usually more highly regulated than are impacts to less sensitive resources. Potential impacts to biological resources have been assessed in terms of a predicted decline in critical habitat or wildlife habitat values. The significance of these impacts is based upon type, magnitude and duration of project impacts on sensitive biological resources. The potential impacts may result from the dredging of Berth 68, and placing fill in the bay to extend the existing pier 306 feet to the east. The impacts associated with these activities could include increased turbidity associated with dredging and pile removal reduced foraging efficiency of waterbirds during dredging and burying benthic communities under solid fill.

b. Dredging. Approximately 39,000 square feet of benthic habitat would be dredged to create the new berth area. Benthic organisms in the Oakland Inner Harbor would be directly impacted by the proposed dredging activities. Most of this area is within the existing Charles P. Howard Terminal, however, and has been dredged regularly. With annual maintenance dredging of existing channels, the community stability of benthic life is limited and the existing populations are probably adapted to recovering after periodic dredging disruption.[24] Thus, these dredging impacts on the benthos are

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[24] U.S. Army Corps of Engineers. 1992. Environmental Assessment Oakland Inner Harbor 38-Foot Separable Element of the Oakland Harbor Navigation Improvement Project. U.S. Army Corps of Engineers, San Francisco, CA.

expected to be temporary and minor. **This impact is not considered significant.** (LS)

(1) Disruptions to Biological Resources. The benthic habitat and food resources for fish would be temporarily disturbed in the dredged area. There may be a temporary decrease in dissolved oxygen levels and an increase in available nutrients due to the suspension of nutrient-rich sediments. These effects occur each year when maintenance dredging is conducted. Thus, fish are expected to disperse in response to dredging events, but will quickly return to the area within a few hours after dredging ceases.[25]

Suspended sediments may cause stress by clogging gills and interrupting the exchange of gas across the gills. Most fish inhabiting estuarine environments are adapted to high turbidity levels and can tolerate a high concentration of suspended sediments. **Thus, no significant impacts to fish are expected.**[26] (LS)

(2) Disruptions to Pacific Herring. Spawning success of the Pacific Herring could be adversely affected due to increased sediment loads on the eggs during dredging thus increasing egg mortality. Dredging could result in a reduction of spawning substrate, as herring may avoid the areas disturbed by dredging[27]. Dredging activities from December to March could result in significant impacts to Pacific Herring inhabiting the site. The zone of impact is expected to be small, but should be mitigated by avoiding dredging activities during critical periods.

Impact BIO-1. Pacific Herring spawning within a half mile of the activity could be adversely affected by dredging. (PS)

> Mitigation Measure BIO-1: Dredging activities should be scheduled to avoid the period from December to March when the Pacific Herring spawning is anticipated.

(3) Disruptions to Wildlife. Considering the short-term occurrence of dredging and the large area of open water habitat available nearby, dredging activities are not expected to adversely affect common waterbirds or

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[25] Ibid.

[26] Ibid.

[27] Ibid.

marine mammals, as they would most likely avoid the immediate vicinity until dredging is complete. **This would be an insignificant impact.**

(4) Disruptions to Threatened and Endangered Species. The nearest nesting sites of the California least tern are located at the Oakland Airport and the Alameda Naval Air Station. Temporary increases of turbidity could occur as a result of dredging at the project site. This could reduce the foraging efficiency of California least terns. Most least terns nesting in Alameda Naval Air Station forage in San Francisco Bay. The immediate project area does not function as a critical foraging area. Thus, no impacts to California least terns are expected.

The Oakland Inner Harbor Channel provides limited foraging habitat for the California brown pelican and the American peregrine falcon. **No impacts are anticipated for the California least tern or the California brown pelican.**

(5) Degradation of Water Quality. As discussed in the section on sediment quality, the PAHs in the sediment at Berth 68 exceed U.S. Army Corps of Engineers standards for in-bay disposal. Disturbance of the material during dredging could cause the material to become available to the organisms and biological resources in the area. **This would be viewed as a short-term temporary construction impact.** The long-term effects are considered to be insignificant based on the results of the bioassay tests.[28] (LS)

c. Filling. The footprint of the wharf extension area would consist of approximately 150,300 square feet covered by solid fill. Of the solid fill, approximately 48,240 square feet would be placed on previously uncovered benthic organisms. About 47 percent of the area which is currently covered by pile-supported wharf would be covered with solid fill. As discussed above, the benthic community, both under the existing wharf and in the uncovered annually dredged areas, is a degraded biological resource. **The impact of the solid fill on the benthic community would be considered insignificant, given the degraded condition of the resources.** Therefore, no mitigation would be required under the California Environmental Quality Act. The Port proposes wharf removal to meet permit requirements, as described in subsection e. below.

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[28] MEC Analytical Systems, Inc., Tiburon, CA, December, 1993. *Results of Chemical, Physical and Bioassay Testing of Sediments at Berth 68, Port of Oakland.*

d. Pile Driving. An area of 495 square feet of new piles would be driven to support the wharf extension. Pile driving would create noise and vibrations. The benthic habitat and food resources for fish would be temporarily disturbed in the project area. Temporarily, dissolved oxygen levels could decrease and nutrients could increase due to the suspension of nutrient-rich sediments. Piles would be driven through the new dike over Merritt sands; therefore, pile driving would not resuspend contaminated sediments.

Impact BIO-2. Increased noise and vibration from pile driving would affect Pacific herring spawning within a half mile of the site, and would temporarily disturb benthic habitat and fish food. Dissolved oxygen levels would decrease and available nutrients would increase. (PS)

> Mitigation Measure BIO-2. Pile driving should be scheduled to avoid the period from December to March to avoid disruptions to Pacific herring spawning and other biological resources.

e. Shading. Pile supported fill constructed for the extension of the wharf at Howard Terminal would shade 34,425 (112.5 by 306) square feet of the aquatic community. The shading would permanently reduce the amount of available light and, therefore, reduce plant production in this area. **The shading impacts are considered insignificant.** No mitigation is required under the California Environmental Quality Act.

f. Off-Site Wharf Removal.

Impact BIO-3. In order to meet the permit requirements of the San Francisco Bay Area Conservation and Development Commission and the U.S. Army Corps of Engineers, the Port of Oakland proposes to remove 33,000 square feet of wharf (pile supported fill) at Pacific Dry Dock located at Embarcadero at Channel Estuary Park and 13,590 square feet at the former Sherex Site adjacent to the American Presidents Line (APL) Terminal. These actions would improve biological resources within the Middle and Inner Harbors. (B)

No mitigation is required.

g. Upland Disposal and Temporary Storage of Dredge Material.

(1) Dredge Material Rehandling Facility. The walls around the facility have been designed to withstand a maximum credible earthquake.

If brine flies, salt mosquitos or other insects breed in the decant water on the sediments next to the wiers, they could take up contaminants from the water. If shorebirds eat these insects, they could in turn take up the contaminants. However, it is unlikely that a significant number of insects will breed on the site because of the prevailing winds along the shore. Water insects are surface feeders, and rely on surface tension; wind tends to break the surface tension of the water, making it difficult for the insects to rest on the water surface. Therefore, the number of insects breeding in the decant water would not pose a serious threat to birds. **This would not be a significant impact.** (LS)

Shorebirds could also be contaminated through contact with dredge material. If migratory birds do come into contact with contaminants from the sediments, it would be most likely by skin contact with the low concentrations of contaminant that could dissolve into the decant water. The majority of the contaminants are bound up in the sediment clay/silt matrix and would only be available to a migrating bird through direct ingestion of the contaminated sediment or foraging on benthic organisms that have themselves ingested contaminated sediment. In general, the contaminants can only be taken up through ingestion where stomach acid would allow the contaminant to become available for incorporation. Dermal contact is not considered a significant pathway for uptake unless there are exposed receptor organs, such as gill epithelia. It is therefore reasonable to assume that short duration dermal exposure to migratory birds would be insignificant.

During the process of pumping the sediment to the disposal site, benthic organisms that may have body burdens of contaminants could be available to foraging birds. Sensitive species such as terns, plovers, or billed species are unlikely to forage or aggressively out-compete local gull species. The potential for gulls to take up contaminants is much higher in Class II or III landfills where highly contaminated soils from various sources are accepted. No concern or obvious destabilization of gull populations have been noted near landfills. The discharge of sediment with potential food items would be temporary and localized, and would consist of only material in the surface sediment layer where there is sufficient oxygen for the benthic organisms to reside. Many other more typical food sources and foraging areas exist in the general project vicinity. There is no reason to believe that large groups of migratory birds would abandon other sources of food in preference for the dredge material discharge. **No significant impact is expected.** (LS)

(2) Upland Disposal in Landfills. Upland disposal of dredged sediments at landfills would contribute to the impacts of these landfills on biological resources. These impacts have been addressed in the certified environmental impact reports for the four candidate landfills.[29] The Vasco Road landfill has eliminated 80 acres of non-native grassland that provided a wildlife corridor and supported a kit fox population. The Keller Canyon landfill eliminated three acres of riparian habitat and four heritage trees, and disturbs San Joaquin pocket mouse, Alameda striped racer and tiger salamander. If leachates reach groundwater, contaminants could affect aquatic habitat downstream. The recently approved Redwood landfill expansion will disturb a half-acre of jurisdictional wetland and an area of oak woodland, and birds could transfer microbial or chemical contaminants to other biota. The Forward landfill EIR has no biotic section; this indicates that biotic impacts were considered less than significant in the Initial Study. All of the biotic impacts identified in the landfill EIRs are being mitigated to a less than significant level.

h. Deepening of Berths 22, 23, 24, 30, 67 and 68. Merritt sands, which are needed for fill on the project, would be obtained by deepening these berths from 42 feet plus two feet overdredge, to 44 feet plus two feet overdredge. Merritt sands have never been exposed to man-made contaminants and have no adverse biological effects. The newly exposed sediments resulting from dredging at these berths would expose compacted, uncontaminated, and biologically favorable sediments. Release of contaminants from, or resuspension of, this sediment would be unlikely. **The dredging of Merritt sands and subsequent use as fill on the project would have no significant impact.** No mitigation is required.

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[29] Alameda County, *Vasco Road Sanitary Landfill Area "Y" Expansion Environmental Impact Report*, 1994, State Clearinghouse Number 87022420; Contra Costa County, *Keller Canyon Landfill Environmental Impact Report*, Draft 1989, Final 1990, State Clearinghouse Number 89040415; Woodward Clyde for Marin County, *Redwood Landfill Solid Waste Facilities Permit Expansion Project Environmental Impact Report*, 1994, State Clearinghouse Number 91033042; LSA Associates for San Joaquin County, *Forward Landfill Use Permit Modifications Environmental Impact Report*, 1993, State Clearinghouse Number 92032013.

L. Public Services and Utilities

■ ■ ■

1. Setting

a. Water Service. Water service in the City of Oakland is provided by the East Bay Municipal Utility District (EBMUD), a publicly owned utility which designs, constructs, operates, and maintains the water distribution system. EBMUD provides water to 20 cities and 15 towns in Alameda and Contra Costa County, with a total consumption of 215 million gallons per day.

The primary water source is Pardee Reservoir in the foothills of the Sierras, a few miles outside the town of Jackson. Raw (untreated) water is transported 91.5 miles to the seven East Bay filter plants and stored in the San Pablo, Upper San Leandro, Chabot, Lafayette, and Briones terminal reservoirs in the East Bay hills. The reservoirs have a combined maximum capacity of 155,150 acre feet of untreated water and hold a four to six month supply.

EBMUD published the *Updated Water Supply Management Plan EIR* in February 1993. EBMUD expects its water needs to increase because the number of customers is projected to increase. In addition, EBMUD foresees a decrease in its supply. For example, use of Mokelumne River water by non-EBMUD users is expected to increase, allocations for fisheries could increase, and droughts could recur. EBMUD has estimated that it needs an additional 130,000 acre feet to limit rationing to 25 percent in a worst-case drought scenario. If EBMUD's *Updated Water Supply Management Plan* is successful, EBMUD will be able to provide water for the level of development projected by the Association of Bay Area Governments in its service area.

The project site is serviced by gravity-fed water lines, including a 10-inch line northeast of the site under Martin Luther King, Jr. Way and an 8-inch line east of the site under Myrtle Street. In 1981, the existing on-site water lines were abandoned and replaced with lines which provide for both fire and domestic water service. The existing lines provide flows of 1,500 gallons per minute for fire purposes and 600 gallons per minute for domestic purposes. The existing water lines on-site vary in size from 3 to 8 inches. Berth 10 has water service for fire flow.

b. Sewer Service. Both the City of Oakland and East Bay Municipal Utility District (EBMUD) provide sewer service to the project site. The City of Oakland owns and operates the sewer collection system within the City limits. EBMUD owns and operates three intercepting sewers in Alameda County, which collects wastewater from sewer systems in nine cities in Alameda and Contra Costa County, and transports it to EBMUD's treatment facility. The treated wastewater is discharged into San Francisco Bay.

The EBMUD Wastewater Treatment Plant, located in Oakland near the San Francisco-Oakland Bay Bridge, has a peak dry weather capacity of 128 million gallons per day (mgd) for both primary and secondary treatment. It has an average dry weather flow of 83 mgd. Wet weather capacity is 458 mgd. EBMUD has no plans to expand its wastewater treatment capacity.

The project site is located in District One, which is served by EBMUD's South Interceptor. This 108-inch interceptor is located along Second Street. Lateral sewer lines from the terminal areas connect to the interceptor at Market Street, Martin Luther King, Jr. Way and Clay Streets. The collected sewage is treated at the District's treatment plant near the Bay Bridge approach. Berth 10 does not have sewer service.

c. Vessel Wastes. Howard Terminal does not provide waste disposal services for ships calling at the terminal. Coast Guard regulations require ships to dispose of oily wastes, bilge, and garbage three miles out to sea, or to contain them while the ships are in port. If a ship is in port long enough to exceed its holding capacity, it contracts with private companies who haul away sewage and garbage by truck. If new regulations are adopted restricting waste disposal at sea, Howard Terminal has existing sewer pipelines to Berths 67 and 68 so that sewer service could be provided to ships in the future.

d. Fire Protection. The City of Oakland Fire Department provides fire protection service to the project site. The Fire Department currently has approximately 123 fire fighters on duty per day, organized into 23 engine companies and seven ladder truck companies. The total fire suppression force is 474 uniformed personnel. All fire stations provide "first response" emergency medical services; ambulance response is provided by a County contracted ambulance service. Emergency medical responses comprise 73 percent of the Department's responses.

The nearest fire station to the project site is Station 2 immediately southeast of the site adjacent to the FDR Pier. The station has a total staff of 12, working four per shift. Station 2 equipment includes a pumper engine, a

32-foot fire boat (soon to be replaced by a 65-foot boat), an air van for filling air bottles, and a foam suppression apparatus.[1]

e. Police Protection. The project site receives police protection from the City of Oakland. The City's Police Department has 35 beats City-wide and approximately 608 sworn police officers. The Oakland Police Department receives between 4,000 and 5,000 calls per day. The City keeps track of dispatch times, which measures the time from receipt of a call to the time an officer is assigned. Dispatch times throughout the City are well within the City's standards, which are broken down into three priority codes. Priority A calls, the most urgent calls, have a dispatch time goal of 2 minutes, and an actual average dispatch time of 1.7 minutes. Priority B calls, which are less urgent, have a 15-minute dispatch time goal, and a 10.8-minute actual average dispatch time. Priority C calls, which are not urgent, have a 60-minute dispatch goal time and an actual average dispatch time of 51.4 minutes.

The site is located in Beat 1 and is served by a one-person patrol car in operation 24 hours per day. Beat 1 has 47 officers, who work in three shifts to provide 24-hour patrolling. The beat extends from the water to 27th Street and from Emeryville to 5th Street.[2]

2. Impacts and Mitigation Measures

a. Significance Criteria. The level of significance for public services and utilities is based on CEQA requirements. A project will normally have a significant effect on the environment if it will:

- Encourage activities which result in the use of large amounts of water.
- Uses water in a wasteful manner.
- Extend a sewer trunk line with capacity to serve new development.
- Interfere with emergency response plans or emergency evacuation plans.

b. Water Service. Water use at Howard Terminal would increase but not effect EBMUDs water main facility or capability of supplying water to meet the demand. **This would be considered a less than significant impact.** (LS)

The Port uses water for steam cleaning equipment, supplying vessels, and providing drinking water and toilets for longshore gangs and regular Port

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[1] Lloyd Salisbury, Engineer, Oakland Fire Department, Station 2, January 11, 1994.

[2] Richard Zamora, Oakland Police Department, January 13, 1994.

employees. Howard Terminal uses approximately 8,600 to 8,900 gallons per day.[3] The 67 percent increase in ships calling at Howard Terminal could increase water use to 14,300 to 14,900 gallons per day. This would be a .027 percent increase in EBMUD water; however, EBMUD would not consider it a substantial increase and has the capacity to meet the projected water demands.[4] In addition, the existing 8-inch main is an adequate size to supply water.[5]

The transit shed water lines will be removed with the demolition of the transit shed building. **This would be considered a less than significant impact.** (LS)

The wharfs other 4-inch and 6-inch domestic and fire water lines do not extend to the proposed extension area at Berth 68. As part of the project plans, the Port proposes 4-inch domestic water line extensions, new outlets, and two new fire hydrants in order to supply domestic and fire water to ships docked along the new wharf extension at Berth 68. **This would be considered a less than significant impact.** (LS)

No mitigation measures are necessary.

c. Wastewater Treatment. The main source for sanitary wastewater discharge due to the proposed project would be from restrooms and possibly from truck and container washing. The proposed project is not anticipated to significantly increase the wastewater discharge and does not include any plans for new sewer hookups. The project is unlikely to have a significant impact on EBMUD's wastewater transmission or treatment facilities. The Port would be charged a Wastewater Capacity Fee based on projected wastewater flows to contribute to funding of future upgrades and expansions. **This would be considered a less than significant impact.** (LS)

No mitigation measures are necessary.

d. Vessel Wastes. The completion of the proposed project would accommodate an increase in shipping traffic. This would lead to a proportionately slight increase in vessel wastes disposed of at least three miles out to sea. **This would be considered a less than significant impact.** (LS)

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[3] Scott Thomas, Steven Owens Services, Howard Terminal, January 14, 1994.

[4] John Houlihan, EBMUD, April 6, 1994.

[5] Bill McGowen, EBMUD, April 6, 1994.

No mitigation measures are necessary.

e. Fire Protection. The demolition of the transit shed building which poses a fire hazard would reduce the current fire hazards on site. Thus, no staffing increases would result from the proposed project. **This would be a beneficial impact.** (B)

No mitigation measures are necessary.

f. Police Protection. The increase in activity due to additional ships calling at Howard Terminal would not require an increase to police staffing or equipment needs, result in a change to response times, nor result in unsafe conditions at and around the project site. The proposed wharf extension would not lead to a need for additional police staffing within Beat 1. In addition, the increase in trucks exiting the terminal and weighed by the Police Department can be handled with current staffing levels.[6] **There would be no impact on police services as a result of the project.** (LS)

No mitigation measures are necessary.

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[6] Scarlett Ku, Oakland Police Department Planning Division, January 13, 1994.

M. Public Access and Recreation

■ ■ ■

1. Setting

a. Existing Public Access and Recreation Provisions. Existing public access and recreation areas near the project site are shown in Figure 25.

Existing public access provisions extend continuously from the public access path at the City of Oakland Firehouse adjacent to Howard Terminal, southward through Jack London Square to the vicinity of Webster Street, where the path is interrupted by Port buildings and Jack London Village. These provisions include the FDR Public Access Pier west of the central area of Jack London Square, and a variety of public access provisions in Jack London Square, including marinas, gathering places, viewing and resting areas, and linear paths along the water's edge of the Inner Harbor.

Within the Port of Oakland jurisdiction, Estuary Park is located on the Inner Harbor at the edge of the Lake Merritt channel. This park on Port land was developed and is maintained by the City of Oakland. It includes a boat launch facility on the channel, and passive and active recreation facilities. As noted above, there is a discontinuous shoreline public access path between Jack London Square and Estuary Park.

Two miles to the east of the project site, Lake Merritt in the City of Oakland is the nearest major recreation facility, with a multi-purpose path surrounding the lake, a boat house, amusement parks, gardens and numerous public facilities.

In addition to the FDR Pier and Jack London Square public access areas, the Port of Oakland has within its maritime area and jurisdiction the Portview Park public access facility at the Seventh Street Marine Terminal, about four miles to the west of Howard Terminal. The new Portview Park now under construction will have public fishing facilities, areas for passive recreation, and a public access path along the water's edge.

There is also a public access park and fishing pier, Middle Harbor Park, within the Port's maritime jurisdiction. The pier is accessed by Ferro Street via Middle Harbor Road, and has a parking area and fishing and picnicking facilities.

Berth 10 does not have pubic access because it is located between a container terminal and the Army terminal. Army and maritime uses occupy the area between Berth 10 and public and residential uses.

b. Plans for Future Public Access and Recreation. The San Francisco Bay Trail is a regional multi-purpose trail that will provide a continuous link around the Bay.[1] The alignment in this area will be the public access path that follows the waterfront in the vicinity of Jack London Square. The Bay Trail will parallel the Embarcadero north of Howard Terminal continuing west and north to Mandela Parkway, with a spur to Middle Harbor Park and Portview Park.

Requirements for the main trail are a path with a minimum width of 10-12 feet, designed to be accessible for the physically challenged.

c. Proposed Project Public Access. The Port proposes both new and improved public access areas. Figures 26-29 show the proposed public access area. The following public access and recreation features would be part of the project:

- The new public access would be a public walkway around the harbor side of Shenanigan's Restaurant, connecting the existing public access boardwalk on the north of the restaurant to the existing public access path on the south at Alice Street. This component of the project would provide continuous public access along the water from FDR Pier to Estuary Park, except for a brief interruption between the El Pescatori Restaurant and Jack London Village.
- Public access would be improved along the existing pathway from Alice Street south to KTVU. This public access path is now a 10 foot asphalt paved path with no plantings or other improvements. The Port proposes to seal-cote the path, provide landscaping, an improved edge along the bay and two access points with seating. The Alice Street terminus area would be improved with landscaping and amenities, such as seating and signage.

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[1] San Francisco Bay Trail Project, *San Francisco Bay Trail*, Association of Bay Area Governments, 1990.

Figure 25

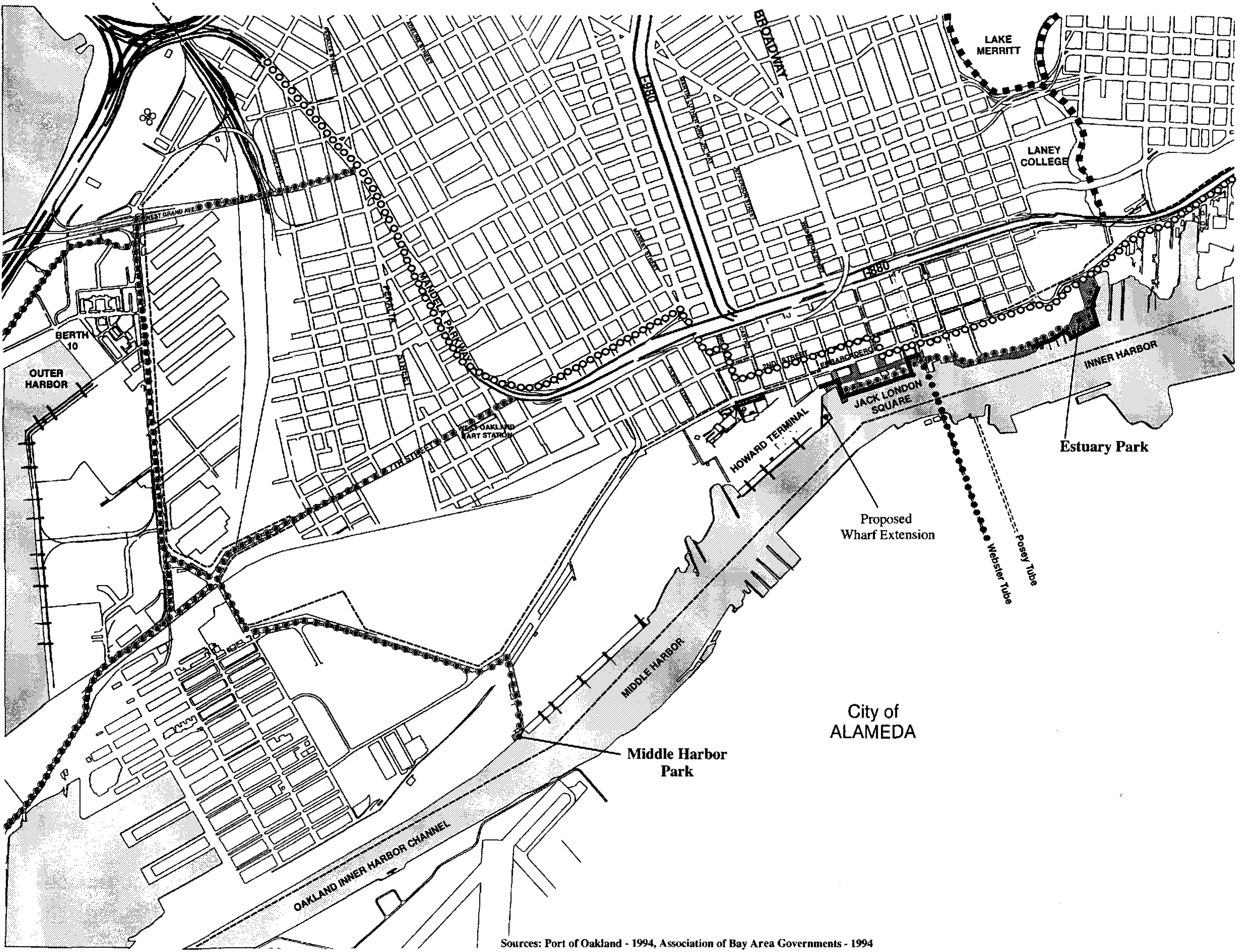
Public Access And Recreation In The Vicinity

LEGEND

▨	Existing Public Access And Recreation
▬	Existing Trail

BAY TRAIL

● ● ● ●	Proposed Spur Trail
○ ○ ○ ○	Proposed Spine Trail
• • • •	Existing Foot Path
■ ■ ■ ■	Existing Connector Trail



Sources: Port of Oakland - 1994, Association of Bay Area Governments - 1994

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0' 450' 900' 1800'

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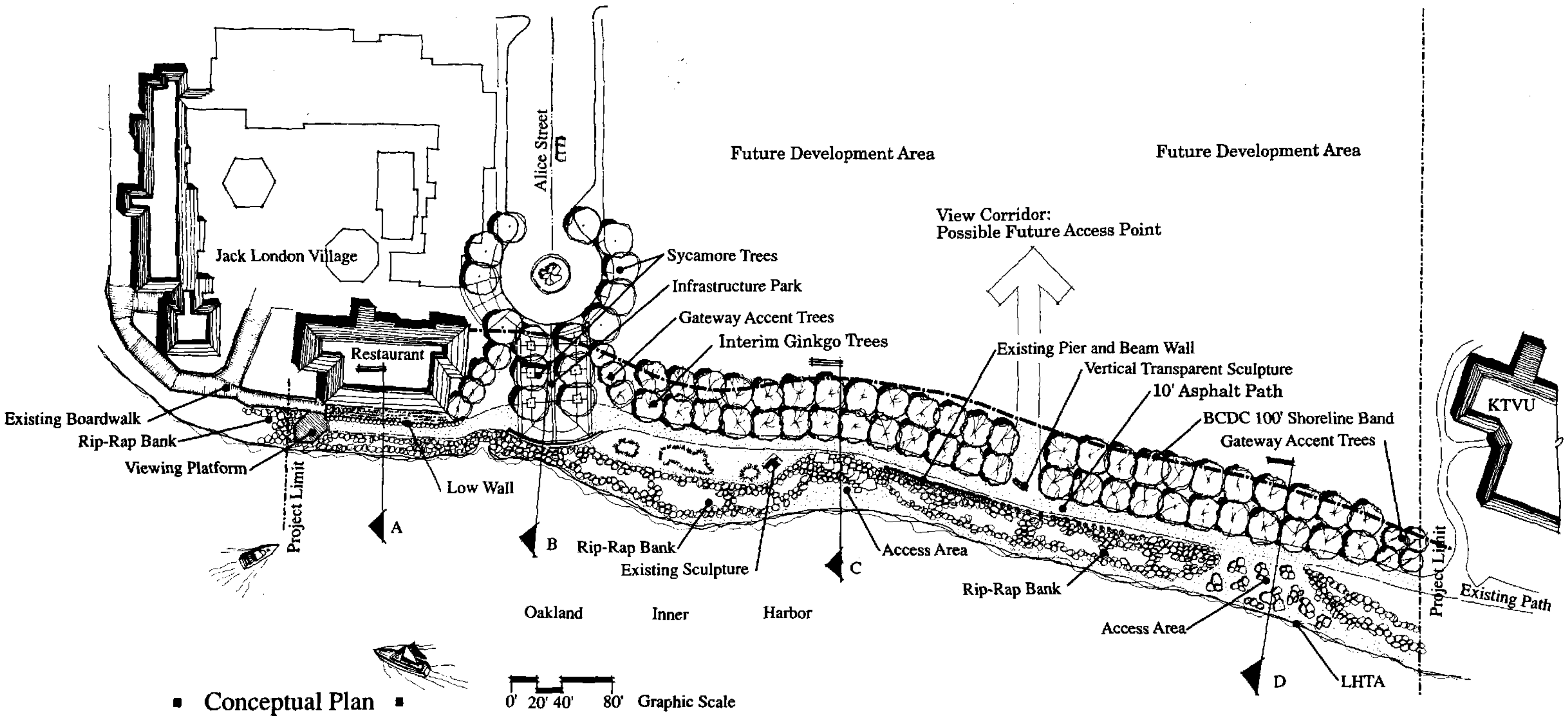
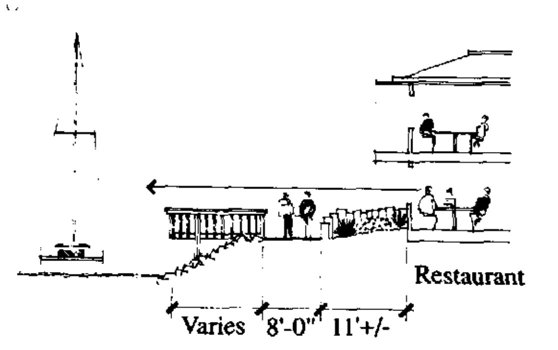
Figure 26

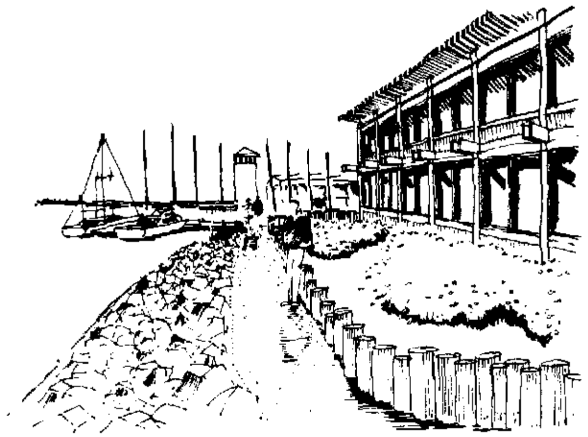
Proposed Public Access — Conceptual Plan and Section A: Shenanigan's Restaurant

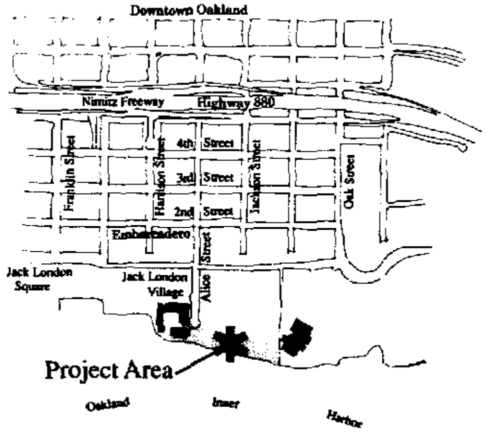


■ Conceptual Plan ■



■ Section A: Shenanigan's





■ Vicinity Map

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0' 125' 250' 500'

Source: Brady and Associates, 1994

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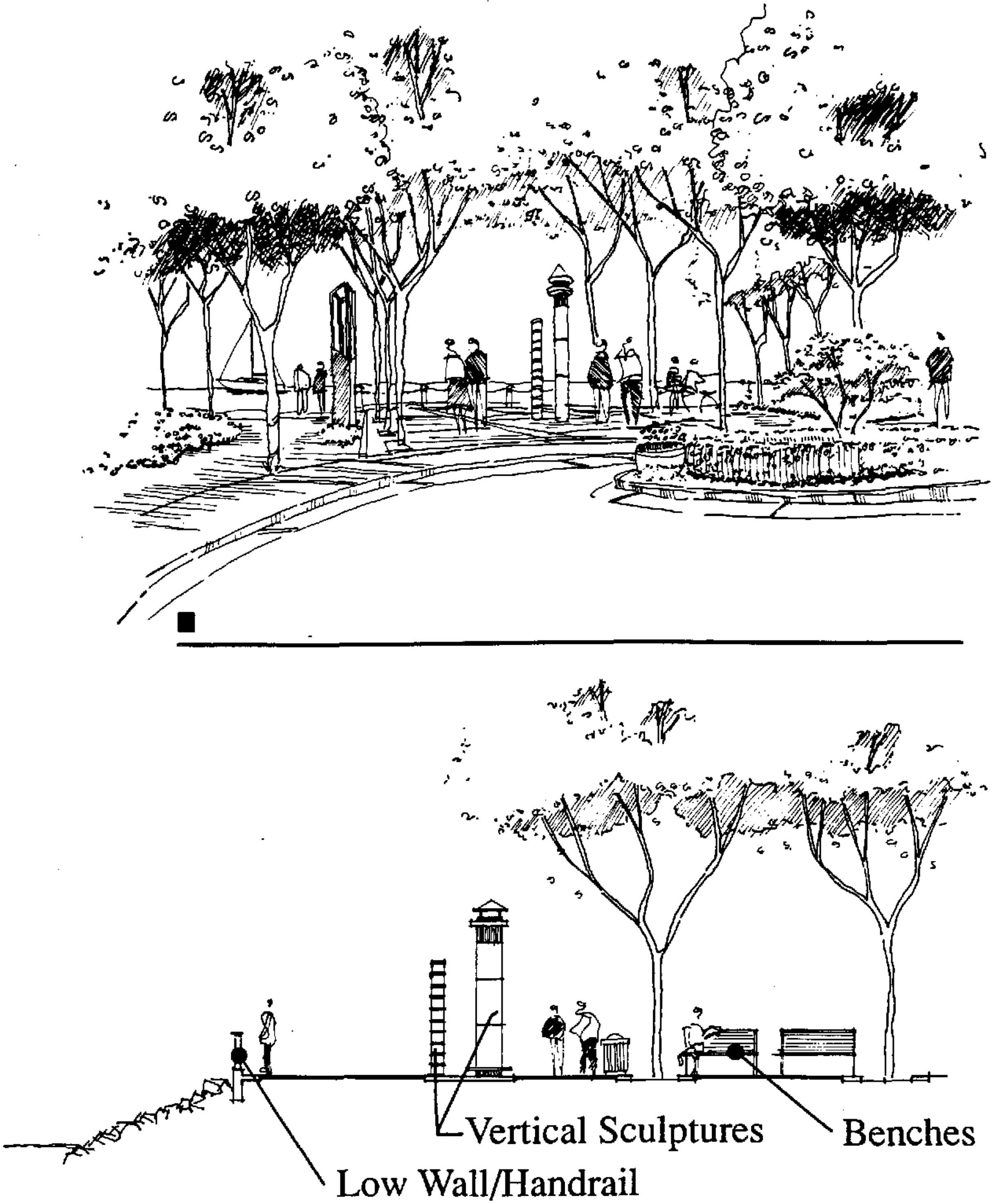
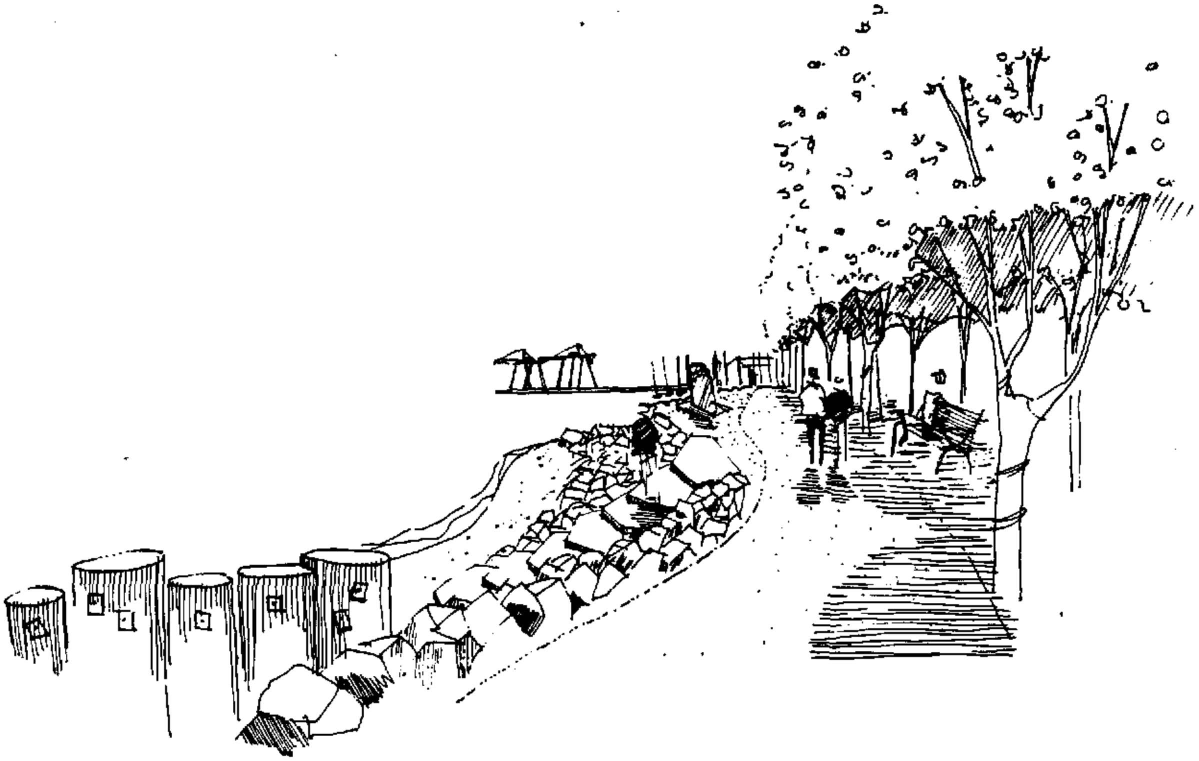
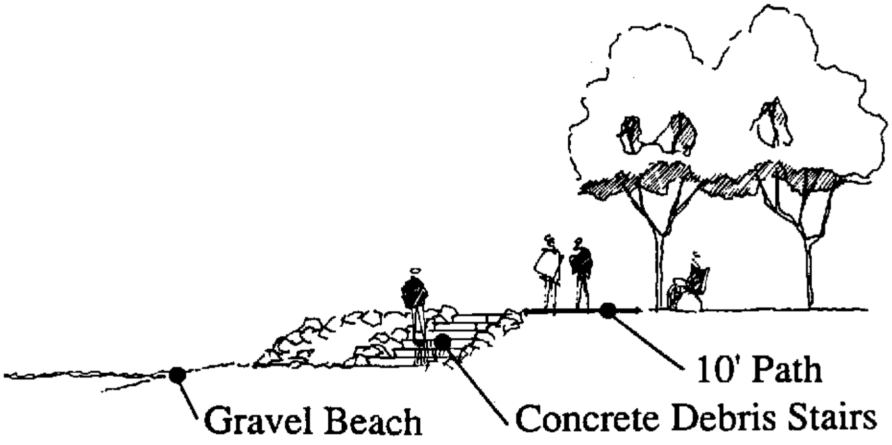


Source: Brady and Associates, 1994

FIGURE 27
Proposed Public Access
Section B: Infrastructure Park
and View From Alice Street





Source: Brady and Associates, 1994

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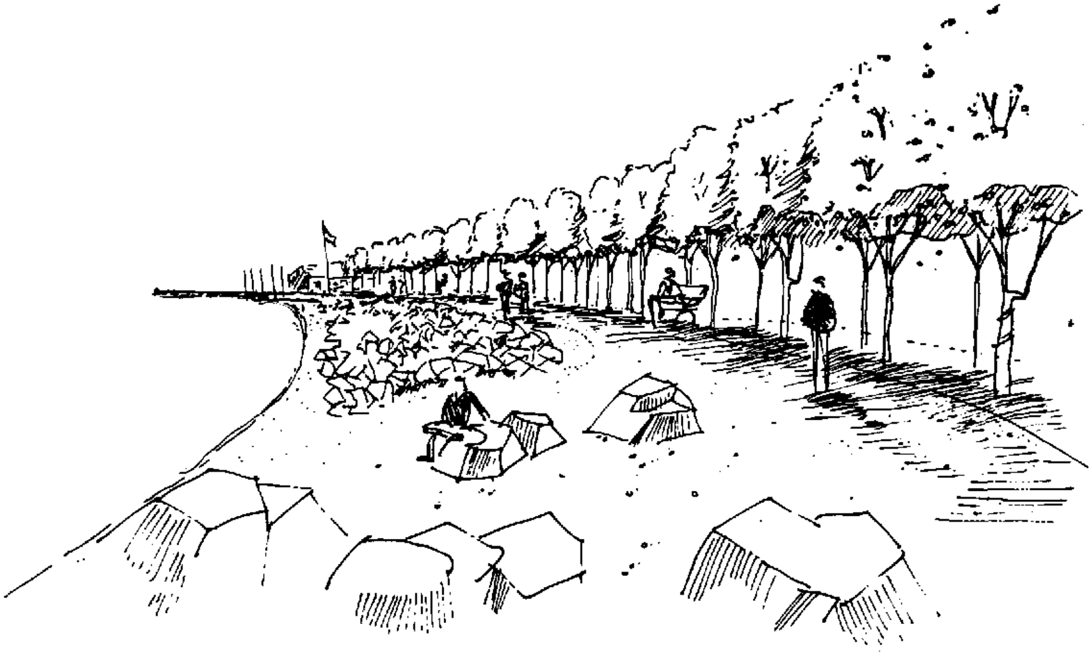
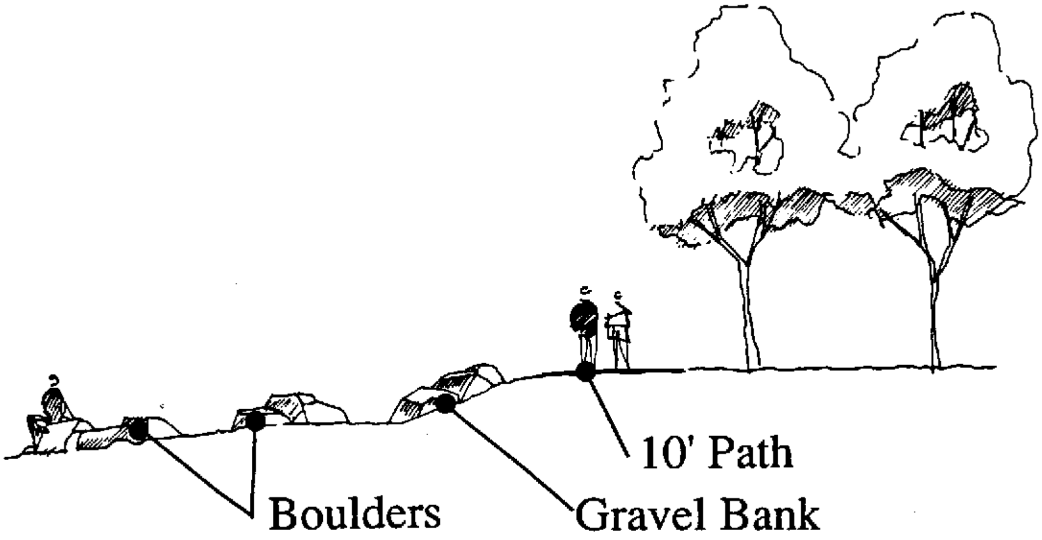
FIGURE 28

Proposed Public Access
Section C: Concrete Landing





Source: Brady and Associates, 1994

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■ ■ ■
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FIGURE 29

Proposed Public Access
Section D: Boulder Benches

- Viewing of Port maritime activities at Howard Terminal would be facilitated with educational exhibits located on the FDR Pier, explaining activities at the terminal.

These public access improvements would complete a critical link in the spur trail for the Bay Trail system, closing the gap around Jack London Village. Future development by the Port of a marina between Jack London Village and Jack London Square will likely complete the link so there will be continuous waterside access between Estuary Park and the FDR Pier.

d. Policies Regarding Public Access. The City of Oakland Comprehensive Plan (amended 1980) shows proposed park linkages along the waterfront from the foot of Broadway to Estuary Park, and along the Lake Merritt Channel. It also shows a proposed recreational bikeway from Lake Merritt, along the Estuary, through Jack London Square and then north and west along a route to be determined to cross under the freeway distribution structure to Emeryville.

(1) City of Oakland. The Open Space and Natural Resources Element of the Oakland Comprehensive Plan includes the following policy regarding public access:

General Considerations

> *Policy 7: In the development of shoreline areas, every reasonable effort should be made to provide attractive public access to the water-edge. (Pg. J-2)*

Two policies in the Parks & Recreation Element of the Oakland Comprehensive Plan relate specifically to the waterfront:

The Parks and Recreation System

> *Policy 13: A wide range of boating, fishing and other public and commercial recreation uses should be provided along Oakland's waterfront. (Pg. I-2)*
>
> *Policy 14: A citywide system of pedestrianways and bicycle paths will be developed. (Pg. I-2)*

(2) San Francisco Bay Conservation and Development Commission (BCDC). In accordance with the McAteer Petris Act, BCDC requires new

development to comply with its San Francisco Bay Plan[2] policies regarding public access and recreation. The Public Access policies state:

> *Policy 1: Maximum feasible access to and along the waterfront and on any permitted fills should be provided in and through every new development in the Bay except in cases where public access is clearly inconsistent with the project because of public safety considerations or significant use conflicts. In these cases, access at other locations preferably near the project, should be provided whenever feasible. This access usually consists of pedestrian access to and along the waterfront. (Pg. 27)*
>
> *Policy 2: Public access should be provided to permit study and enjoyment of the bay and estuary via boardwalks or piers. (Pg. 27)*
>
> *Policy 4: Public access improvements should permit barrier-free access for the physically challenged to the maximum feasible extent, should include an on-going maintenance program, and should be identified with appropriate signs. (Pg. 27)*
>
> *Policy 6: Access to the waterfront should be provided by walkways or other appropriate means and connect to the nearest public thoroughfare where convenient parking or public transportation may be available. (Pg. 27)*
>
> *Policy 9: The Public Access Supplement to the Bay Plan should be used as a guide in determining whether a project provides maximum feasible public access. The Design Review Board should advise the Commission regarding the adequacy of the public access approved. (Pg. 28)*

2. Impacts and Mitigation Measures

a. Significance Criteria. Appendix G of the CEQA Guidelines establishes that a project will normally have a significant impact on public access and recreation if it will:

- Have a substantial, demonstrable negative aesthetic effect.
- Conflict with established recreational uses of the area.

---

[2] San Francisco Bay Conservation and Development Commission, *San Francisco Bay Plan*, SFBCDC, 1986, as amended.

b. Public Access. The direct effect of the proposed project on public access would be beneficial. The Port proposes to provide an improved public access area and important access link as part of the project.

Impact ACCESS-1: BCDC's preference is for on-site public access; however, because security and functional considerations make on-site public access infeasible, the best options for off-site public access have been incorporated into the project. Visual access to the proposed expanded maritime activities would be provided as part of public access provisions. (B)

No mitigation measures are necessary, assuming implementation of the proposed public access along the Oakland waterfront near Alice Street.

N. Visual Resources

■ ■ ■

1. Setting

a. The Context. The area of Oakland in which the Charles P. Howard Terminal is located, from Interstate 880 to the waterfront and from Broadway northwest to Adeline Street, is dominated by medium to large two- to four-story industrial buildings, sited on regular city blocks in a grid pattern. The wide streets with railroad tracks, absence of uniform street trees, and overhead wiring visible in the streets contribute to the industrial character of the area. Industry remains the dominant land use but the area nearest Broadway is slowly converting to office and retail commercial uses.

East of Howard Terminal and continuing east from Broadway, the area changes in character from industrial to commercial and office use. The Produce District is located in this area, as is Jack London Square.

Viewpoint locations referenced below are shown in Figure 30.

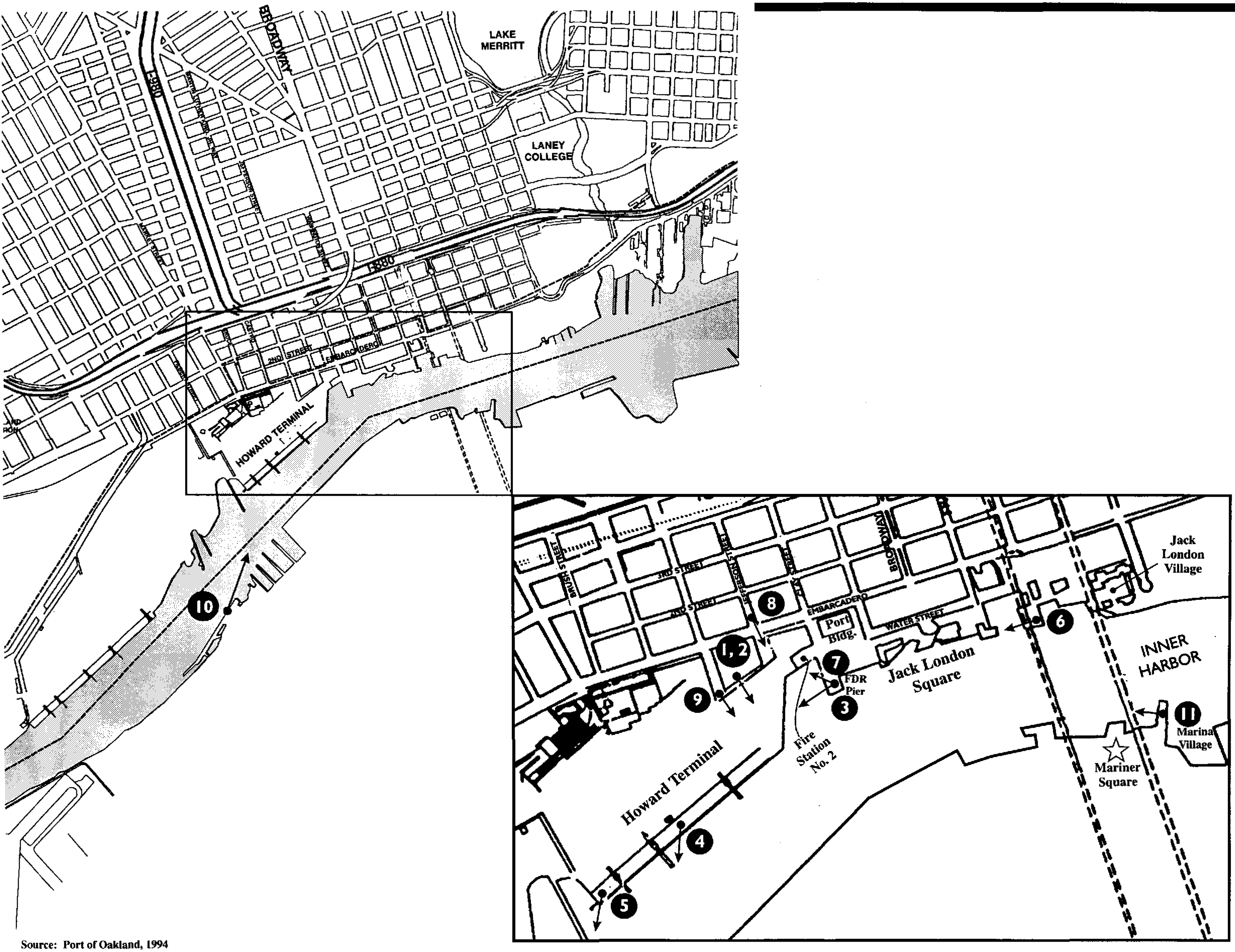
b. The Project Site. Howard Terminal is sited at the edge of the City on a Port of Oakland wharf that extends diagonally into the Inner Harbor. The terminal is in an area of the Port with restricted access, and so is usually inaccessible to non-Port employees. The most visible portion of the terminal is the transit shed (Figure 31, photos 1 and 2 from within the terminal, not public views). This building is a massive structure, painted blue. The north and east facades of the building are visible to the public. The northern main facade (Head House) is 40 to 45 feet high, equivalent to a three-story building, and 200 feet long, about a third the length of a city block. The eastern facade is 450 feet long and 33 feet high. The historic "beaux art" architectural style of the building and the distinct blue color contribute to the prominence of the shed as an important visual element along the waterfront. Even though the terminal is inaccessible to the public, the size and location of the transit shed building make it a major visual element in many bayward views along the Inner Harbor (photo 3). The shed rests on a concrete wharf elevated by piles about four feet above the highest tides (ten feet above mean sea level).

c. Views from On-Site. Views from within the terminal itself are varied. The transit shed blocks views to the south and east and is the major structure on site. Gantry cranes are a strong vertical element, framing and accenting views to the water (photo 4 from within the terminal, not a public view). The terminal wharf is filled with equipment, containers, vehicles and loading facilities. From the terminal there are open views across the Inner Harbor to the Alameda waterfront, bayward (photo 5) and southeast to the Jack London waterfront where the seven-story Port building is a key feature. The public does not generally have access to views from the wharf.

d. Views from Off-Site. The Howard terminal transit shed is one of several large historic buildings in the area; it is infrequently seen from surrounding streets as the property is fenced and inaccessible to the public from city streets. It is visible from the FDR pier, the foot of Clay Street, and from the end of Jefferson Street where from these locations Howard terminal serves as a focal point and marks the water's edge. From the chain link fence located at the end of Martin Luther King Jr. Way (which is part of the terminal), the terminal yard and the western long facade of the transit shed become visible behind containers and equipment. From south of Broadway, the terminal is visible only from the waterfront edge, where the transit shed provides an important component of the view west along the Inner Harbor, directing views bayward.

Howard terminal is most visible from the FDR Pier, the Inner Harbor, Jack London Square, and several points along the Alameda waterfront. It can be glimpsed from the industrial area to the north and from piers south of Jack London Square. These views are described below.

(1) Views from Jack London Square. The transit shed is most visible from the FDR Pier, located directly across the water from the Howard terminal and in front of the Port Building (photo 3). This pier functions as the primary public access point near the terminal. The ferry terminal for San Francisco and Oakland is accessed adjacent to the FDR pier. Views of the shed are unobstructed from any point on this pier, and the shed dominates views to the west, closing off views of maritime activities on the terminal, but also providing closure to the view and drawing the eye to the water and the bay. At this distance, one can see building details. The public can also view the transit shed from a dockside area west of the FDR Pier where the Potomac ship is docked (from area shown in Figure 32, photo 7), which is opened for special events. The view may, however, be blocked by container storage.



Source: Port of Oakland, 1994

Figure 30

Photograph Locations

Viewpoints 1,2, 4 and 5 are restricted to tenants and employees.

Viewpoint 8 is subject to container stacking.

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Port of Oakland

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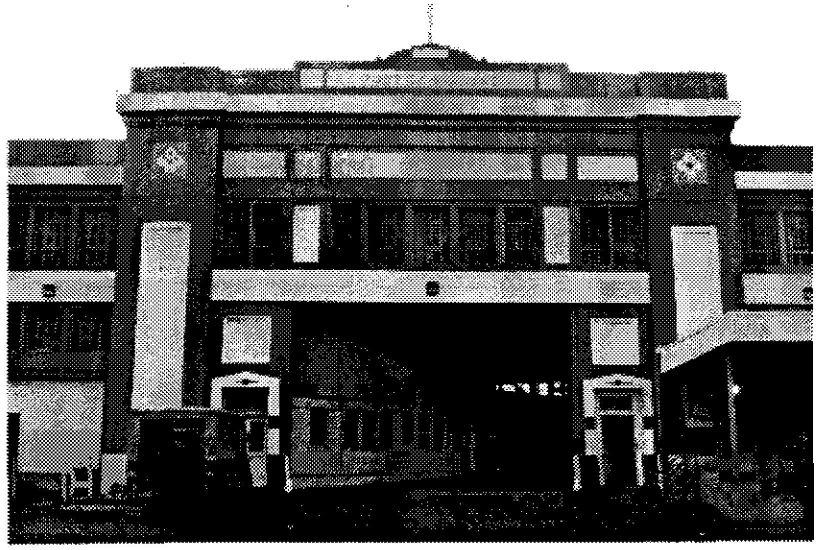
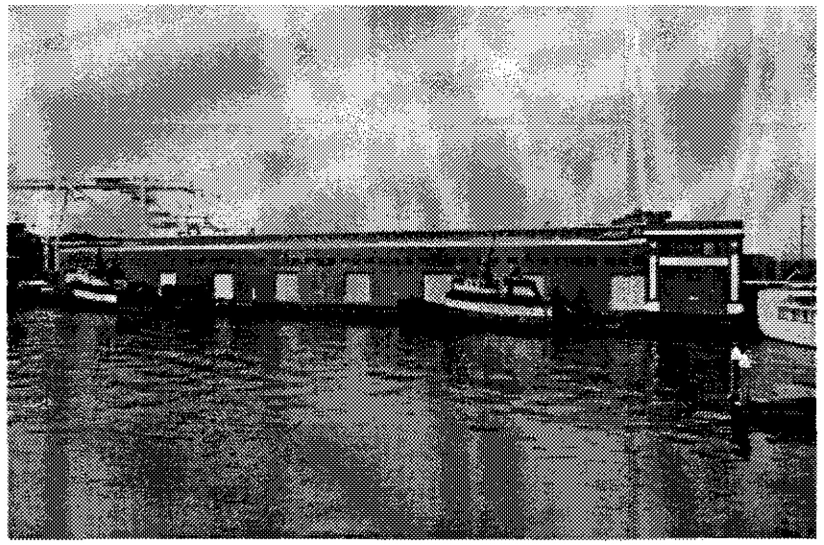
Figure 31

Views of the Site

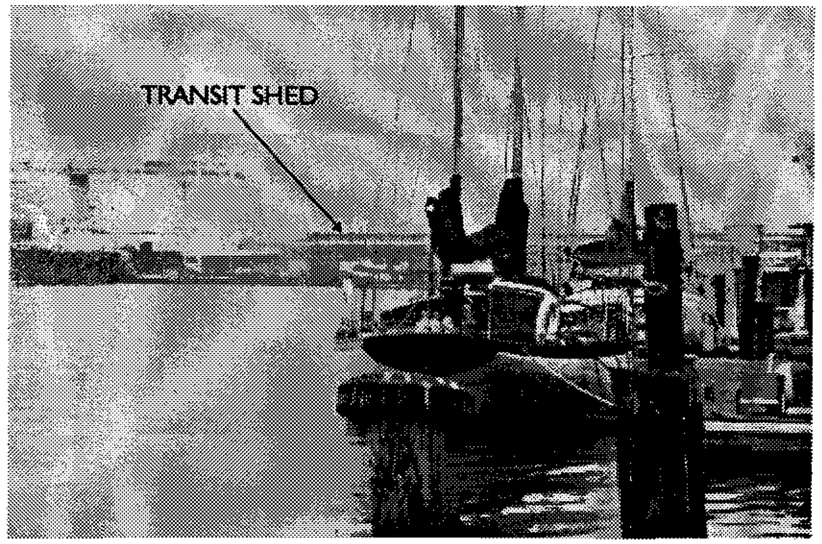

1. View from within Howard Terminal.


2. View from within Howard Terminal.


3. View from within FDR Pier.


4. View from within Howard Terminal.


5. View from Howard Terminal.



6. View from East of Jack London Village.

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

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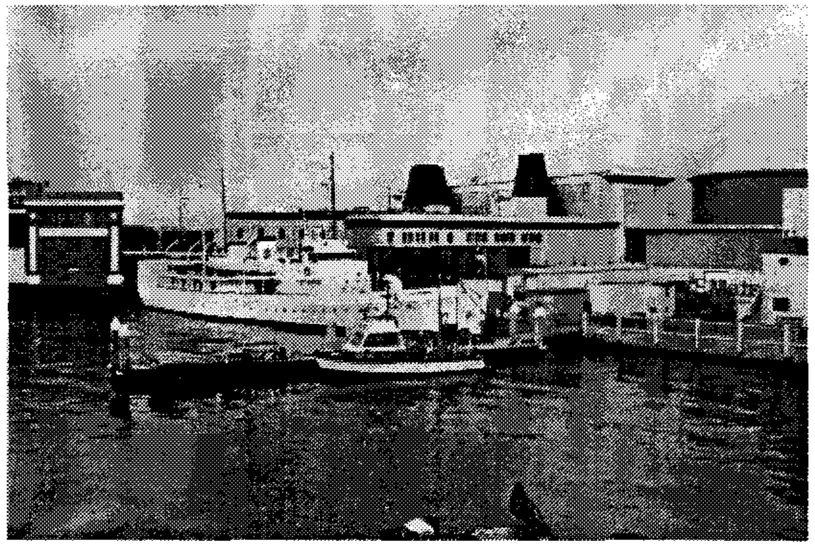
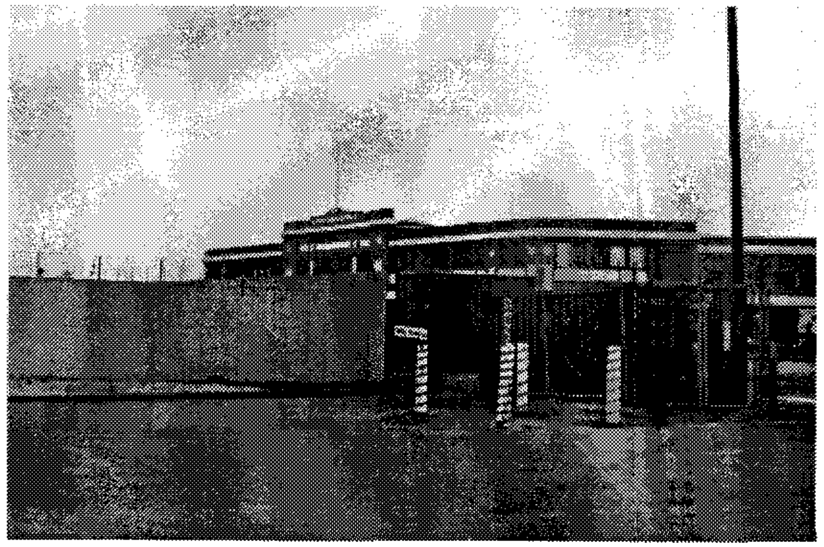
Figure 32

Views of the Site

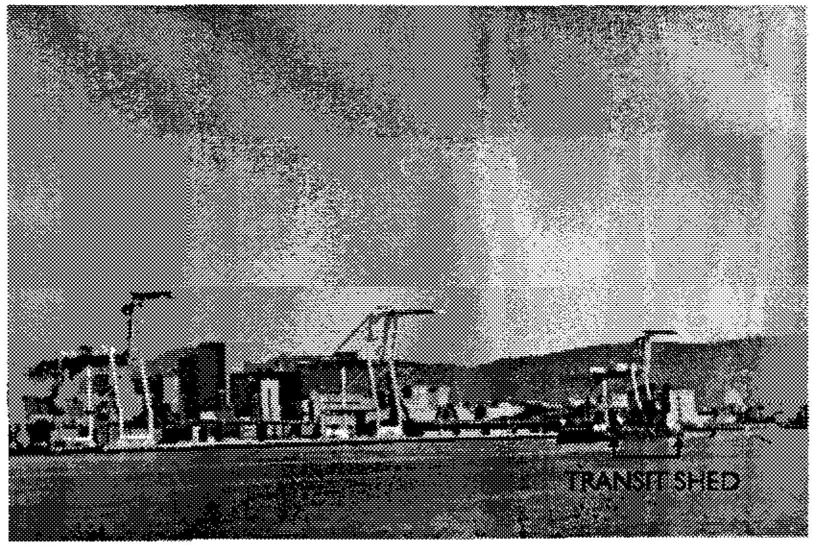


7. View of Potomac Docking Area.

8. View from Jefferson Street.



9. View from the foot of Martin Luther King Jr. Way within Howard Terminal.



10. View from Ferry Terminal in Alameda.

11. View from Mariner Square in Alameda.

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

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To the immediate east, the public areas adjacent to the Port Building also provide clear views of the terminal. This open space grass area is scheduled for hotel development with public access consistent with the Jack London Square Master Plan.

Howard Terminal is visible from the linear public space along the water's edge in Jack London Square. As the viewer moves toward the city from the water's edge, however, views of the terminal are obstructed by buildings, such as the Waterfront Plaza Hotel and the Port Building. South of Franklin Street, views of the terminal from the water's edge are mainly obstructed by buildings, such as Kincad's Restaurant, although the transit shed can be seen from the Franklin Street Pier where the Salty Dog Restaurant is located (photo 6). The transit shed is visible from areas east of Jack London Village and from the public access path that extends east from the Village.

(2) Views from the Industrial Area to the North. In views from the industrial area north of Howard Terminal, a third of the main north facade (Head House) of the transit shed is visible as a terminus to Jefferson Street (photo 8). The view from Jefferson Street is sometimes blocked by stacks of containers. The shed is also seen in occasional views from the Embarcadero. Views of the transit shed from other streets in this area are blocked by buildings or port structures, fences and equipment, although gantry cranes are visible behind and above the buildings, until the viewer is at the edge of Port property at the end of Martin Luther King Jr. Way where the transit shed and terminal are visible (photo 9).

(3) Views from Alameda. From the ferry terminal in Alameda, the south and west facades of the transit shed are clearly seen as a distant but substantial component of the Oakland shoreline. The transit shed is distinguished from the other buildings by its size, detailing and color. The remainder of the terminal is seen as a miscellany of containers, cranes, equipment and vessels (photo 10).

In views from Mariner Square in Alameda, the transit shed can be most clearly seen from the San Francisco Bay Yachting Center, where it appears as a close and dominant feature of the opposite shoreline. This view becomes obscured by buildings (the Rusty Pelican and Chevy's restaurants) as the viewer moves eastward (photo 11).

e. Views of Berth 10. Berth 10 is visible from the container terminals to the south and the Army terminal to the north and east. It appears as a flat area with stacks of containers and light standards. These views are generally restricted to employees at the container terminals and Army terminal.

f. Policies Regarding Visual Resources.

(1) Port of Oakland Design Guidelines for Jack London Square. The Guidelines for View Corridors states that view corridors must be established to protect and maintain important views from entry and activity points, and along important movement corridors. The policies relevant to the proposed project are as follows:

> *Policy 2: Views from each of the four major activity spaces (Broadway Terminus, FDR Pier, Lot 1 Plaza, and Food Pavilion; and Lot 3) to other spaces and to the Estuary shall be protected.*
>
> *Policy 3: Views along the waterfront walk to other parts of the walk and out over the water must be kept as unrestricted as possible.*

(2) City of Oakland. The Oakland Comprehensive Plan contains policies in the Land Use Element related to visual resources. The policies relevant to the proposed project are as follows:

> Policies on Urban Design and Preservation
>
> *Policy 1 : The City will pursue a continuing, comprehensive process of urban design to seize opportunities as they occur and direct physical changes toward a more efficient, more livable, more beautiful and more dramatic urban environment. (Pg. H-5)*
>
> *Policy 2: The City will see that all public facilities . . . form in the aggregate a logical, visible framework which organizes and stimulates private development. (Pg. H-5)*
>
> *Policy 4: Every effort should be made to preserve those older buildings, other physical features, sites, and areas which have significant historical, architectural, or other special interest or value. (Pg. H-6)*
>
> Policies Relating to the Natural Setting
>
> *Policy 1: Urban development wherever it occurs should be related sensitively to the natural setting, with the scale and intensity of development*

> *in each case bearing a reasonable relationship to the physical characteristics of the site. (Pg. H-1)*

Scenic Corridors. Howard terminal is not visible from Interstate 580, which is designated by the Oakland Comprehensive Plan as a Scenic Route. However, the Oakland Comprehensive Plan indicates a possible future designation for portions of the Embarcadero. The City has policies, but no restrictions or guidelines for properties visible from scenic routes.

(3) BCDC. The San Francisco Bay Plan, administered by the San Francisco Bay Conservation and Development Commission (BCDC), contains policies regarding appearance, design and scenic views. The policies relevant to the proposed project are as follows:

> *Policy 1: To enhance the visual quality of development around the Bay and to take maximum advantage of the attractive setting it provides, the shores of the Bay should be developed in accordance with the Public Access Design Guidelines and the General Development Guide. (Pg. 29)*
>
> *Policy 3: In some areas, a small amount of fill may be allowed if the fill is necessary--and is the minimum absolutely required--to develop the project in accordance with the Commission's design recommendations. (Pg. 29)*
>
> *Policy 5: To enhance the maritime atmosphere of the Bay Area, ports should be designed, whenever feasible, to permit public access and viewing of port activities by means of (a) view points (e.g., piers, platforms, or towers), restaurants, etc. that would not interfere with port operations, and (b) openings between buildings and other site designs that permit views from nearby roads. (Pg. 29)*
>
> *Policy 14: Views of the Bay from vista points, from roads, and from other areas should be maintained by appropriate arrangements and heights of all developments and landscaping between the view areas and the water... (Pg. 30)*
>
> *Policy 15: Vista points should be provided in the general locations indicated in the Plan maps. Access to vista points should be provided by walkways, trails, or other appropriate means and connect to the nearest public thoroughfare where parking or public transportation is available. In some cases, exhibits, museums, or markers would be desirable at vista points to explain the value or importance of the areas being viewed. (Pg. 30)*

The San Francisco Bay Plan Map for the project area shows a West Basin of the Jack London Square Marina adjacent to the Howard terminal, and states that at Jack London Square continuous public access should be provided along the Estuary to the Lake Merritt Channel.

2. Impacts and Mitigation Measures

a. Significance Criteria. The level of significance for visual resources and aesthetics is based on CEQA requirements. A project will normally have a significant effect on the environment if it will:

- Have a substantial, demonstrable negative aesthetic effect.

b. Effect on Views of Howard terminal. Significant visual impacts of removal of the transit shed would be on views from the FDR Pier, the public areas in front of the Port Administration Building and the Waterfront Plaza Hotel, and from the water's edge public access facilities at Jack London Square. The transit shed has two primary visual functions from these areas: one is as a historic building that was part of the old Grove Street Pier; and the other is to frame views to the northwest and direct them to the waterscape of the Inner Harbor and more distant Bay.

The transit shed has aesthetically pleasing character and historic significance; thus, the removal of the transit shed would have a significant adverse effect on views from the FDR Pier, the public area just east of the FDR Pier, and Jack London Square. Upon project completion, the open views of the wharf would be predominately the cranes and the multi-colored cargo containers stacked four high and reaching approximately 38 feet in height, as shown in Figure 33. Removal of the shed would, however, open up the view toward the terminal, the water, and the distant San Francisco skyline.

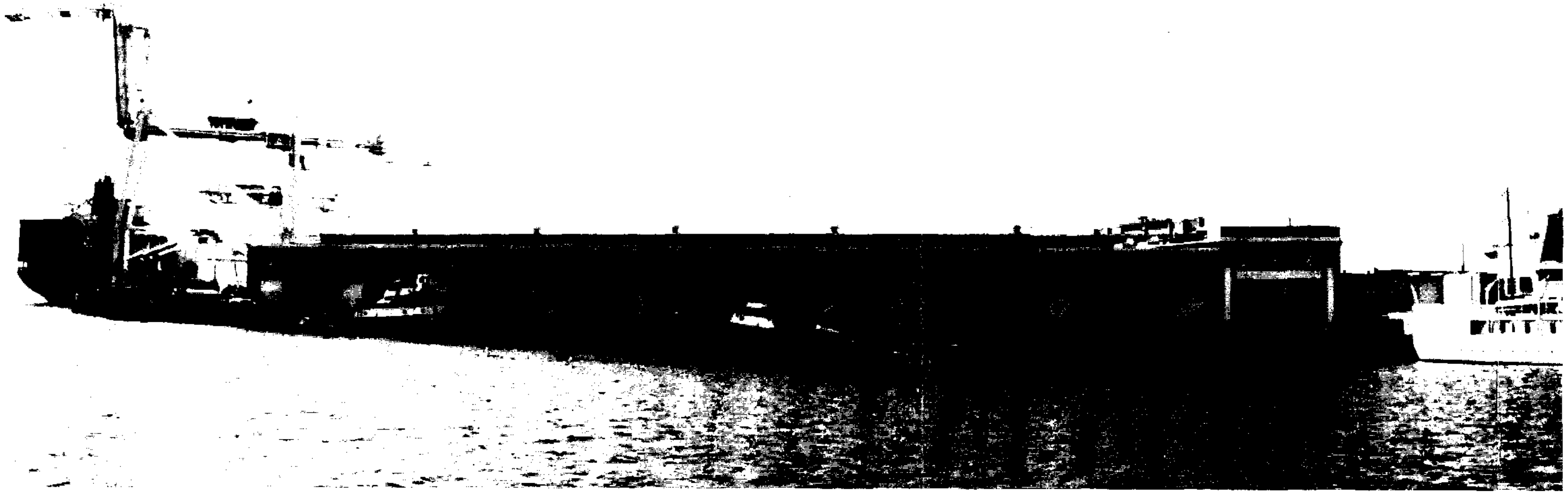
With the removal of the transit shed and the extension of the wharf, the character of the area would change and have an impact on views from the Inner Harbor and the City of Alameda. However, these impacts would be less than significant because of distance.

Views of part of the Head House from Jefferson would also be affected. Removal of the Head House and transit shed would open views into the wharf from Jefferson Street. Depending on the fencing design and treatment of the wharf, the change could be adverse, but would not be considered significant.

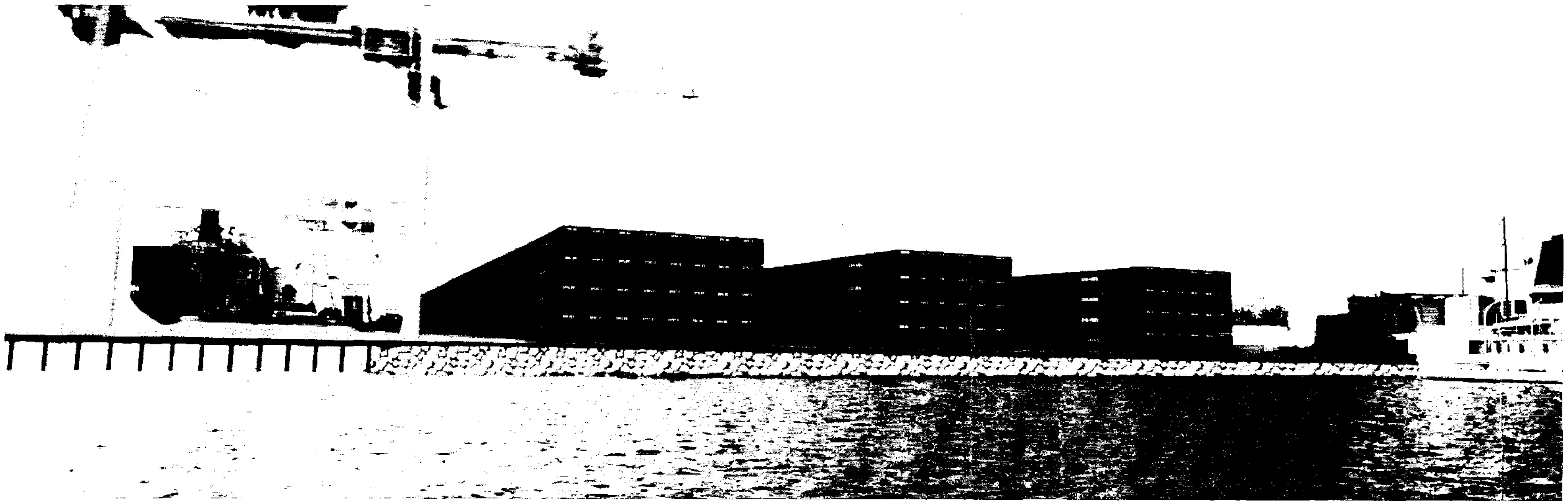
Overall, the view would change from an aesthetically pleasing character because of the transit shed being a prominent feature to a less aesthetic

Figure 33

Visual Simulation of Proposed Project



Existing View of Howard Terminal from the End of FDR Pier



Simulated View of Proposed Project from the End of FDR Pier

Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT

Port of Oakland

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Visual Simulations by CADP, Inc.

character of waterfront industry because of the placement of additional cargo containers. However, since the area is used for maritime industry, the cargo containers are an expected feature to be viewed on the wharf. The view opportunity presented by the proximity of public access to the proposed wharf extension is unique; such opportunities are not available at other ports. There is sufficient distance to appreciate the magnitude of Howard Terminal operations within the context of the waterfront.

Visual benefits of the project would result from the opening of views into the Port's maritime activities from the FDR Pier and the area adjacent to the Port Building, assuming that the area is not screened from view. This area is accessible from downtown Oakland and public transit and gets used by many people. The opening of views to any operating terminal will allow viewers to see port operations which is not feasible at port operations in the Bay Area.

<u>Impact VIS-1</u>: Removal of the transit shed, an aesthetically pleasing architectural terminus for the pedestrian access along the shore, would be a significant adverse impact on views from FDR Pier. The current view would be replaced by a more industrial view of Howard Terminal operations. (S)

> <u>Mitigation Measure VIS-1</u>: The Port should provide an all-weather educational exhibit on the FDR Pier that includes photos of the transit shed and explains evolving activities at the terminal.

<u>Impact VIS-2</u>: Removal of the transit shed would replace aesthetically pleasing architectural views of the transit shed from the public area in front of the Port Building, the Waterfront Plaza Hotel and the water's edge at Jack London Square with industrial views of Howard Terminal operations. (S)

> <u>Mitigation Measure VIS-2</u>: No mitigation is available for this impact.

<u>Jefferson Street Viewshed</u>. Removal of the transit shed would affect views from Jefferson Street and open views to the wharf. The change could be adverse if fencing and other structure at Jefferson Street entrance to Howard Terminal are not designed to provide an attractive terminus to Jefferson Street. **This would be considered a less than significant impact.** (LS)

c. <u>Effect on Views of Berth 10</u>. The sediment handling facility would restrict container stacking to the inland and northwestern edges of Berth 10. The containers would be replaced by geotextile tubes or concrete K-rails topped with lumber (less than four feet tall), a ramp over the rail, and a front-end loader in the sediment handling area. This change would replace one industrial view with another, and would not be visible by the general public. **This would be considered a less than significant impact.** (LS)

Chapter VI.
PROJECT ALTERNATIVES

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A. Alternatives Considered But Eliminated

1. Off-Site Alternatives

Ten off-site alternatives were reviewed but eliminated due to various environmental consequences. The off-site alternatives considered are as follows:

a. Bay Bridge Terminal (South and West). This alternative site would include 103 acres of fill south and west of the existing Oakland Army Base Pier 7. The proposed project does not require such a large land area. Permitting and construction of the facility at this location would take five to seven years, have greater environmental impacts and cost much more than necessary.

b. Bay Bridge Terminal (West). This alternative site would include 20 acres of fill west of Berth 10. This alternative would cause 2,950 lineal feet of wharf to be unusable: 1,350 of the wharf is now used for container operations. The creation of backland would eliminate Berths 20 and 21 and most of Berth 9 which is not owned by the Port but leased from the Army. Loss of existing Berths would be counter productive.

c. Naval Supply Center (NSC). This alternative site would involve construction on 540 acres of NSC located in the heart of the Port maritime operations. The potential exists for developing the area into a modern terminal in the future; however, it is a long term project requiring careful planning, capitalization and permitting. Improvements needed for facilities sharing are five years away. The Port will control this property under a lease/license agreement by December 1994.

d. American President Line (APL)/Sherex Site. This alternative site would include 1.8 acres of fill with the potential for an additional 550 feet of wharf parallel to the channel. However, the added area for APL would be at the expense of a turning basin. The basin is being created to enable loaded vessels to turn in the channel. This will save the time currently required to travel up the channel at high tide to a wide place in the vicinity of the Ninth Avenue complex. Loss of the turning basin would be an unacceptable ongoing cost in inefficiency and loss of competitive edge.

e. Schnitzer Site. This alternative site would include 14 acres of fill behind dikes that could produce 1,700 lineal feet of wharf parallel to the channel, with access to 28 or more acres of backland, for a total of 32 acres. The Schnitzer steel site is an actively used scrap iron and steel yard with an on-going demand for both dismantling out-worn products and shipping scrap to the orient for re-processing and manufacturing. The property owner is not willing to close his operation at this time. Redevelopment on the site for a modern marine terminal is not feasible within the Port's stated timeframe.

f. Ninth Avenue Terminal Expansion. This alternative site would include 10.8 acres of fill and would add 400 lineal feet of wharf to the Ninth Avenue Terminal. In addition, modern container ships have drafts of 42 feet and can not navigate past the Alameda tubes, which are only 35 feet below sea level. The terminal is marginally suitable for continued breakbulk operations, although the loading capacity of the wharf is becoming a distinct limitation for types of cargo that can be received without major reconstruction.

g. San Leandro Bay/66th Avenue Site. This alternative site would include up to 5,000 lineal feet of wharf now partially occupied by the East Bay Municipal Utility District and the City of Oakland. The existing channel to this site is only dredged deep enough to accommodate pleasure craft. A project at this site would have extensive environmental impact on sensitive ecological areas of the bay and marshlands, as well as constraints on the transportation network.

h. Encinal in Alameda. This alternative site would include 11.5 acres of an existing terminal facility. The terminal acreage is too small for a stand-alone facility. The constraints on vessel size are similar to those of the Ninth Avenue Terminal as noted above. The land and water do not belong to the Port and would have to be purchased or leased at additional cost.

i. Alameda Naval Air Station. This alternative site would include 37 acres in the vicinity of the existing harbor. However, the terminal acreage is too small for a remote stand-alone facility, and the time frame for site cleanup, political land and water use decisions, and facility reconstruction are too far in the future.

j. San Francisco and/or Richmond Facilities. These alternative sites have under-utilized container terminals. The tenant would need to be relocated to these sites and receive intermodal and other services. The Port of Richmond's channel will not accommodate deep draft ships. The Port would lose employment opportunities and the opportunity to maximize the use of resources available at Howard Terminal. The Port would also need to find a new tenant, if the current tenant were to relocate.

2. On-Site Alternatives: Preservation of All or Part of the Transit Shed

Two on-site alternatives to preserve all or part of the transit shed were reviewed but eliminated. These two alternatives and the reasons for rejecting them are described below:

a. Preservation of the Transit Shed. Continued use of the transit shed would require costly seismic repairs to the quay wall which supports one side of the shed; continued use without these repairs would constitute a seismic hazard. Furthermore, the location of the transit shed would block access to the new wharf extension, defeating the purpose of the project.

b. Preservation of the Head House. Preservation of the two-story office portion of Building E-407A would not mitigate the project impact on historic resources, because the historical significance of the building lies in its combined use as a transit shed and office. Retention of the head house would also interfere with the circulation of vehicles and the storage of containers on the wharf.

B. No Project Alternative

The California Environmental Quality Act, Section 15126(d)(2), requires discussion of the no project alternative. For the proposed project, this alternative could occur if the Port made a determination that the site is not suitable for the wharf extension or could not be developed; or that the development would result in significant unavoidable, adverse impacts that cannot be mitigated for which the Port was unwilling to make findings of overriding considerations.

Under the no project alternative, expansion to wharf operations would still be permitted based on the site's current maritime industrial land use. The Port would still be faced with development pressure to improve and enhance port operations to keep up with the market demands, the advancement of maritime technology, and the need to accommodate new generation ships.

The no project alternative would not achieve the Port's goals for providing state-of-the-art marine facilities and maintaining increased economic viability. The no project alternative would likely lead to other wharf development and expansion options elsewhere within the Port and potentially at a more unreasonable site location and with potentially more environmentally adverse impacts. The potential impacts of the no project alternative are discussed below.

1. Historic Resources

This alternative would leave the transit shed in its current use, with all character-defining features intact. However, the quay wall that supports the transit shed was damaged by the Loma Prieta earthquake in 1989. Saving the transit shed would require costly repairs to the quay wall, using methods that keep the transit shed intact. Although there would be a potential for deterioration from lack of maintenance, this alternative would not have a significant impact on historic resources.

2. Socio-Economics

No expansion to Howard Terminal would result in pursuit of other less reasonable alternatives to meet the demands for port expansion and maintain economic viability. In addition, no expansion would not create additional jobs.

3. Land Use

There would be no change in or expansion of Howard Terminal and its current land use operations.

4. Transportation

For the No Project Alternative, the existing traffic generation from Howard Terminal and the remainder of the Port would not change. As shown in Table 30, the No Project year 2000 traffic conditions are identical to the cumulative conditions shown at the four nearby intersections. The volume-to-capacity ratio (V/C) corresponds to specific service levels, which are a qualitative measure of traffic conditions. Typically, the LOS standard is "C" or "D", which correspond to a V/C of less than 0.77 for LOS "C" and a V/C of

Table 30
CUMULATIVE IMPACT ANALYSIS - YEAR 2000 WITH AND WITHOUT PROJECT

	Volume-to-Capacity (V/C)[a]				Change		
	No Project		With Project				
Link	AM	PM	AM	PM	AM	PM	Significant?
Bay Bridge (I-80 West)	1.10	1.18	1.10	1.18	0.00	0.00	N
I-80 E - southwest of Powell	1.05	0.91	1.05	0.91	0.00	0.00	N
I-880 - south of 7th Street	0.70	0.67	0.70	0.67	0.01	0.00	N
I-980 - north of 17th Street	0.64	0.77	0.64	0.77	0.00	0.00	N

[a] The volume-to-capacity (V/C) ratio represents the percentage of the maximum number of vehicles that can be accommodated by a facility. The capacity used for this analysis is based on near ideal conditions for basic freeway lanes, i.e. 2,000 vehicles per lane per hour.

Note: AM and PM volumes reflect flow in the peak direction only.

Source: Dowling Associates, based on Alameda County Travel Model scenario 1001.

less than 0.93 for LOS "D" based on a 70 mph design speed for a basic freeway section.[1] Generally, level of service "A" describes free flow conditions where vehicles are almost completely unimpeded by other vehicles, while level of service "E" describes operating conditions at or near capacity. Levels of service "C" and "D" describe stable flow at various vehicle densities.

Table 31 indicates that the project does not result in any significant impacts on regional freeways. The cumulative impact of land use and traffic growth in the area, with or without the project, would be significant on the Bay Bridge and the Eastshore Freeway (I-80).

The cumulative No Project impacts are likely to be significant, but are beyond the control of the Port, since they occur due to land development and regional growth throughout the Bay Area. Caltrans has programmed a number of improvements that are reflected in Table 31 (e.g., the Cypress Structure replacement project), but despite this, unacceptable peak LOS would still occur on much of I-880 in the year 2000. The project is expected to increase employment at the Port itself; these impacts are covered in the section on

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[1] The design speed refers to the physical, geometric characteristics of the freeway, not the posted speed limit. Virtually all new freeways, and many older ones, use a 70 MPH design speed. The use of 60 or 70 MPH does not have a significant impact on the LOS calculations, however.

Table 31
CUMULATIVE LEVEL OF SERVICE ON FREEWAYS - YEAR 2000 WITH AND WITHOUT PROJECT

	Level of Service (LOS)				Change		Project Impact Signifi-cant?
	No Project		Extg+Project				
Link	AM	PM	AM	PM	AM	PM	
Bay Bridge (I-80 W)	F	F	F	F	--	--	N
I-80 E - southwest of Powell	F	D	F	D	--	--	N
I-880 - south of 7th Street	C	C	C	C	--	--	N
I-980	C	D	C	D	--	--	N

Source: Dowling Associates, based on Alameda County Travel Model.

socio-economic impacts. The project has the potential for secondary impacts on increased employment in the surrounding area (e.g., the employment of trucking, warehousing, import/export, and related firms could increases as a result of the project). The transportation impacts of such an employment increase are likely to be widely diffused throughout the central Bay Area and Northern California, and are not likely to have a significant transportation impact.

5. Noise

The no-project alternative would retain existing operations. There would therefore be no change to the noise environment in the area due to the operational noise and there would be no construction activities which could potentially generate significant short-term noise levels at sensitive receptors in the area. There would be no noise impacts associated with the no-project alternative.

6. Air Quality

The no project alternative would not contribute to generation of dust or increase the regional emissions.

7. Geology, Seismicity and Soils

The no project alternative would retain the transit shed and wharf as is. The transit shed would continue to pose a threat to public safety under credible seismic events because of the seismic instability of the structure, unless expensive repairs are made to the quay wall supporting the building.

8. Hazardous Materials

The no project alternative would retain the hazardous materials where they are and still pose a threat to public health and safety if disturbed.

9. Sediment Quality

There are no known activities planned that would affect the sediment quality at the project site other than the proposed project. Without the project, the additional dredge material associated with the project, above that excavated in the annual maintenance program, would not need to be disposed of in a landfill. Polluted sediments would remain in the bay.

10. Water Quality

No disruptions to the water would result other than from annual maintenance dredging. Creosote from pilings would continue to affect bay water quality.

11. Biological Resources

There are no known activities planned that would affect the biological resources at the project site other than the proposed project. Annual maintenance dredging would continue to impact the benthic community, the pile-supported fill would remain, and biological resources would retain their degraded condition.

12. Public Services and Utilities

No changes in demand for public services and utilities are likely to result because Port operations would not be expanded.

13. Public Access and Recreation

The no project would preclude public access improvements to be made along the Oakland Shoreline consistent with the San Francisco Bay Trail Plan.

14. Visual Resources

Viewsheds would remain unchanged, and the transit shed would remain a prominent visual feature on the wharf.

C. Pile-Supported Wharf Alternative

To meet the objectives of CEQA, one alternative to the proposed project was evaluated. The pile supported wharf alternative involves building a pile supported wharf instead of a fill supported wharf. The existing pile supported concrete wharf would be extended 306 linear feet to the east, and from that point north to the cutoff wall, forming a triangular wharf extension. The edge of the pile supported wharf extension would be at the cutoff wall west of the west wall of the transit shed, as shown in Figure 34. A rock structure would be constructed against the cutoff wall, at a 2:1 slope down to the top of sand. In this alternative, the center of the transit shed facade would be moved to the space between Howard Terminal and the FDR Pier entrance. The remainder of the transit shed would be demolished.

As in the proposed project, Berth 68 would be dredged to 42 feet plus two feet overdredge, resulting in 39,000 square feet of dredged area and 13,600 cubic yards of dredged sediments. Dredged sediments would be dried at Berth 10 and disposed at one of four landfills. This is the same as the proposed project except that the amount of dredged sediment to be disposed of would be much smaller with the pile supported wharf alternative.

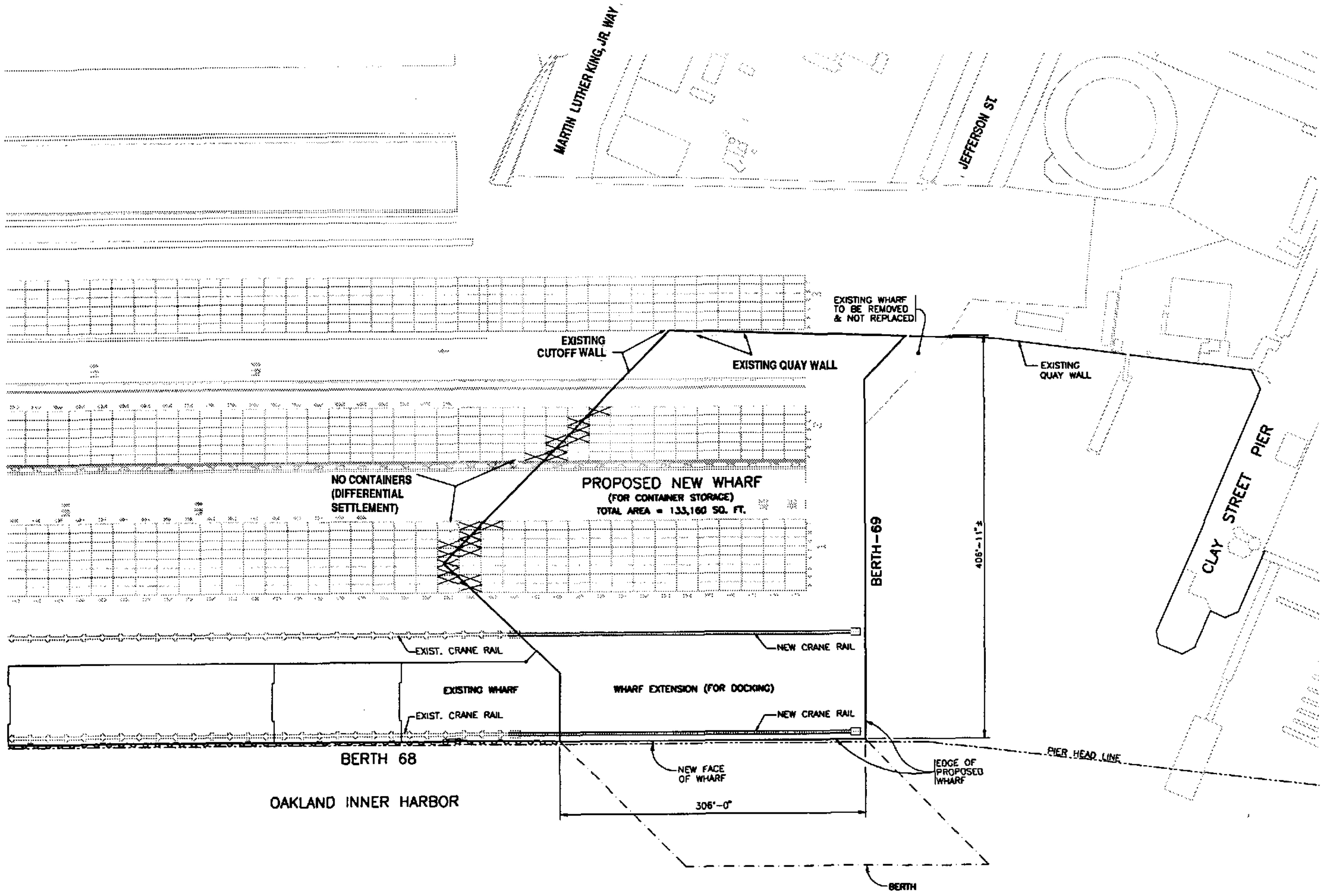
As is the proposed project, the upland portion of the site would be graded, paved, lighted and striped; the biotic impacts would be offset by wharf removal at the Pacific Drydock and Sherex sites, and public access would be improved along the Oakland shoreline. The timeline, increase in vessel calls, and employment increase would be similar to those of the proposed project, but the pile driving would take longer. The same permits would be required as the proposed project.

The pile supported wharf alternative would be similar to the proposed project in area of wharf extension (48,240 sq.ft.), in volume of dredging for the Berth 68 extension (13,600 cubic yards) and in area of piles (2,520 sq. ft.) and volume of piles (1,200 cubic yards) to be removed, but would differ as follows:

- dredging of 24,000 cubic yards for the wharf extension, compared to 30,000 cubic yards for the proposed project;

Figure 34

Pile-Supported Wharf Alternative



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Charles P. Howard
Terminal Extension
ENVIRONMENTAL IMPACT REPORT
Port of Oakland

BRADY AND ASSOCIATES, INC.
PLANNERS AND LANDSCAPE ARCHITECTS

- placement of 16,650 cubic yards of solid fill, compared to 144,000 cubic yards for the proposed project;
- driving 1,900 cubic yards of new piles, compared to 536 cubic yards for the proposed project.

This alternative would accomplish the same goal as the proposed project, to extend the wharf, but would have impacts that differ and may be viewed as more environmentally adverse. The potential impacts are discussed below.

1. Historic Resources

Same as the proposed project.

2. Socio-Economics

Construction of the pile-supported alternative would be more costly, even considering the lower cost of dredge material disposal. Differential settlement between the pile-supported extension and the fill-supported existing terminal would diminish the useable area of the terminal, pose a hazard to worker safety, and require ongoing repairs.

3. Land Use

Same as the proposed project.

4. Transportation

Same as the proposed project.

5. Noise

This alternative involves building a pile supported wharf extension instead of the proposed fill supported wharf extension. Pile driving required for this alternative would require a substantially longer duration and would bring the pile driving activities substantially closer to sensitive receptors in the area. Maximum noise levels generated during pile driving would increase to 92 dBA outside the Oakland Fire Station and 67 dBA inside. At the 530 Water Street building maximum noise levels would increase to 84 dBA outside of the building and 59 dBA inside the building. Pile driving would occur for up to three months. The proposed project is therefore preferable to this alternative because of the difference in construction technique. Operationally, the two alternatives are identical from a noise impact perspective.

6. Air Quality

Same as proposed project.

7. Geology, Seismicity and Soils

The pile-supported wharf alternative increases the potential for damage, and the severity of damage, as a result of an earthquake. The large space of pile-supported wharf and its connection to the existing shoreline presents engineering problems. This alternative raises issues regarding safety of fill. The potential for increased instability of pilings due to potential differential settlement, liquefaction, and lateral movement in the underlying soils or bay mud is raised by this alternative.

8. Hazardous Materials

As discussed in Chapter V, Section J, the impacts related to hazardous materials are for the most part the consequence of demolition and construction activities. Consequently, the proposed project impacts described in Chapter V, Section J are common to this alternative.

9. Sediment Quality

This alternative would require dredging of 24,000 cubic yards, which is 6,000 cubic yards less than the proposed project. Hence less dredge material would be processed through the rehandling facility and less material would be disposed of in the landfills.

10. Water Quality

As discussed in Chapter V, Section K, the impacts related to storm water runoff are related to construction and dredged sediment disposal. The impacts to water quality are associated with the removal of pilings, installation of new pilings, and filling of the Estuary. The only aspect of the pile-supported wharf alternative that differs from the proposed action is the surface area of new pilings. The net decrease in creosote-soaked piling surface area is 1,215 square feet for the pile-supported wharf alternative, as opposed to a net decrease of 2,025 square feet in the proposed project. All of the potential impacts can be reduced to insignificance by the implementation of the appropriate mitigation measures as described in Chapter V, Section K.

11. Biological Resources

This alternative would require only 16,650 cubic yards of solid fill, compared to 144,000 cubic yards for the proposed project. This fill would cover only 2,625 square feet of bay bottom, compared to 150,300 square feet of coverage for the proposed project. Because this alternative would involve less dredging, it would have a smaller unavoidable short-term impact on biological resources during dredging than the proposed project. The pile-supported wharf alternative would shade 45,615 square feet of bay bottom. Much of this area has been dredged to maintain Berth 69. Therefore, the biotic resources are degraded and the impact of fill and shading would be low, as with the proposed project.

12. Public Services and Utilities

Same as proposed project.

13. Public Access and Recreation

Same as proposed project.

14. Visual Quality

Same as proposed project.

D. Comparison of Alternatives with the Proposed Project

Table 32 compares the impacts of the No Project and Pile Supported Wharf alternatives to the impacts of the proposed project.

Table 32
COMPARISON OF ALTERNATIVES

Resource/Issue	Proposed Project	Pile Supported Wharf	No Project
PLANS AND POLICY COMPATIBILITY	Consistent with all public policy to the extent possible with the exception of significant impacts due to the Historic Preservation policies.	Same as proposed project.	Would not contribute to the Port of Oakland reaching its goals and objectives for expansion or new capacity projects. Would be inconsistent with policies pertaining to economic benefits and marine terminal operation expansions.
HISTORIC RESOURCES	Transit shed would be demolished. Significant impact.	Same as proposed project.	Transit shed would remain. No significant impacts.
SOCIO-ECONOMICS	Expansion would create additional jobs and increase economic viability. Beneficial impact.	Same as proposed project.	No expansion would result in other alternatives to meet demands for port expansion and maintaining economic viability. Potentially significant impact.
LAND USE	Would not disrupt or conflict with existing and established land uses of the area. No significant impact.	Same as proposed project.	No change in operations. No significant impacts.
TRANSPORTATION	Delays in right-turn movement resulting in LOS "F" at Market and Third streets. Significant impact.	Same as proposed project.	Traffic conditions would degrade because of cumulative conditions. Significant impact with or without project.
NOISE	Short-term impacts from pile-driving and from construction activity. Significant impact.	Increased duration of construction noise activity due to pile driving. Short-term impacts from construction activity. Significant impact.	No change in noise levels. No significant impacts.
AIR QUALITY	Increase dust levels and affect regional air quality. Significant impact.	Same as proposed project.	No increase in air emissions. No *significant impact.*
GEOLOGY, SEISMICITY AND SOILS	Fill placement subject to ground motion and failure from liquefaction, lurching, and/or discrete differential settlement. Significant impact.	Increase for damages during credible seismic events. Increase in instability of pilings due to geologic and soil conditions. Significant impact.	Transit shed would pose a threat to public safety under credible seismic events. It is likely to fail and collapse. Significant impact.

Table 34 (continued)

Resource/Issue	Proposed Project	Pile Supported Wharf	No Project
HAZARDOUS MATERIALS	Demolition and construction activities would produce hazardous materials and disturb existing materials. Significant impact.	Same as proposed project.	Hazardous materials retained would pose a threat to public health and safety if disturbed. Significant impact.
SEDIMENT QUALITY	Increase in sediment material from dredging and increase in processing and disposal. No significant impact.	Decrease in sediment material from dredging and decrease in processing and disposal. No significant impacts.	No affect to sediment quality due to no disturbance; polluted sediments would remain in the channel. Potentially significant impact.
WATER QUALITY	Wastes could be discharged into the estuary during demolition and construction activities. Significant impact. Contaminants would be removed from the Bay. Beneficial impact.	Wastes could be discharged during demolition and construction, driving piles through mud would release contaminants, and creosote-treated piles would remain. Significant impact.	No disruption to water quality, creosote from pilings would continue to affect water quality. Potentially significant impact.
BIOLOGICAL RESOURCES	Potentially adverse effects to fish and shorebirds and benthic habitat. Significant impact.	Same as proposed project with less disturbance to benthic habitat due to less fill and less dredging activity. Potentially significant impact.	Annual maintenance dredging would continue to affect the benthic community. Potentially significant impact.
PUBLIC SERVICES AND UTILITIES	Slight increase in demands for services and utilities. No significant impacts.	Same as proposed project.	No change in demand for services and utilities. No significant impacts.
PUBLIC ACCESS AND RECREATION	Development of public access along the Oakland shoreline. Beneficial impact.	Same as proposed project.	Preclude public access improvements to be made along the Oakland shoreline. Potentially significant impact.
VISUAL RESOURCES	Demolition of the transit shed would open views to the wharf and increase views of daily wharf operations and the cargo container storage area. No significant impact.	Same as proposed project.	Viewsheds would remain unchanged. Transit shed would remain a prominent visual feature. No significant impact.

E. Environmentally Superior Alternative

The California Environmental Quality Act, Section 15126(d)(2), requires identification of the environmentally superior alternative. The pile-supported alternative would require less dredging and biologic resources would be affected less; however, harbor waters would be exposed to more creosote, known contaminants would remain, temporary construction noise would be longer due to more pile driving, the less stable pile-supported wharf would pose a higher seismic hazard, and differential settlement would cause hazards to workers. Therefore, it is determined that the proposed project offers the most reasonable and environmentally superior alternative.

Chapter VII
CEQA-REQUIRED OVERVIEW

■ ■ ■

A. Introduction

All phases of a project must be considered when evaluating its impact on the environment: planning, acquisition, development, and operation. As required by the California Environmental Quality Act (CEQA), this chapter provides an overview of the impacts of the proposed project based on the technical topics analyses. Chapter V, *Setting, Impacts and Mitigation Measures*, assesses the effects the proposed project would have on the environment and suggests measures to minimize those effects. A summary table describing the impacts and mitigation measures is provided in Chapter II. Chapter VI, *Project Alternatives*, describes and analyzes the alternatives, the alternative sites considered but dismissed, and the environmentally superior alternative. The topics covered in this Chapter include effects not found to be significant; short-term uses versus long-term productivity; significant irreversible and unavoidable environmental changes; growth-inducing impacts; and cumulative impacts.

B. Effects Not Found to be Significant

The Port prepared an Initial Study (Appendix B) for the proposed project in order to "scope" the content of this EIR. The Initial Study was based on a preliminary review of issues related to development of the expansion of the wharf. Subsequent scoping discussions with responsible agencies and input from recipients of the Notice of Preparation have further refined the scope of this EIR.

The following areas are technical topics that were effects not found to be significant and have not been evaluated in this EIR.

1. Natural Resources

No on-site natural resources, such as aggregate, oil or timber have been identified, so no impact would occur from project site development. Mineral resources of the site were granted to the City/Port along with the waterfront property so that it is not necessary to further consult the State Lands Commission prior to dredging the site.

2. Population and Housing

The project will not have significant effects on population growth. It also will not significantly affect the numbers of housing units made available within the City and County. Employment opportunities may increase slightly as a result of project construction, but the increase would not create a demand for housing.

3. Energy

The project would not result in excessive energy use. No new buildings are proposed. The net increase in container ships using the terminal due to the wharf extension would not result in an increase demand on energy use. The ships could still use another portion of the port or wharf terminal if the project were not constructed.

C. Short-Term Uses Versus Long-Term Productivity

CEQA Guidelines state that an EIR for a project must include an assessment of the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity. This assessment describes the cumulative and long-term effects of the proposed project which adversely affect the state of the environment. Special attention should be given to impacts which narrow the range of beneficial uses or pose long-term risks to health and safety. In addition, the reasons why the proposed project is believed by the Port of Oakland to be justified now, rather than reserving an option for future alternatives are included in this discussion.

The implementation of the proposed project would have both short- and long-term effects from dredging, demolition of the transit shed, and socio-economics.

1. Dredging

Dredging activities would have short-term effects by temporarily increasing the turbidity and dissolved constituents, scaring off or removing habitat for marine organisms, and to some degree modifying the bottom contours. However, in the long-term the turbidity will settle although ship propellers have a continued affect on turbidity; post construction, marine organisms will re-establish habitat; and the effects of bay currents and tidal flows will continually transform the bottom contours to some degree; and thus, result in limited short-term environmental consequences due to dredging activities. The maintenance and enhancement of long-term productivity would be the benefits of providing efficient shipping access and expanded port operations.

2. Demolition

The demolition of the transit shed would have a long-term effect on cultural resources through the loss of a structure with historic significance of local importance. The demolition of the transit shed can be viewed in two ways, one is the permanent loss of a building with historic significance, and the other is that the structure is not earthquake proof and poses long-term risks to public health and safety. Because of its location along an active area of the wharf and unsafe condition, the structure does not provide the most suitable and compatible location for a museum and visitor center. Demolition of the transit shed would open views to the marine terminal operations.

3. Socio-Economics

The tradeoff of both short- and long-term environmental effects is the short- and long-term socioeconomic benefit of maintaining the Port as a major import and export center. During construction there would be a short-term economic gain from construction workers at the local and regional levels. During daily port operations there would be a long-term economic gain from the capability of accommodating an increase in shipping operations and providing potential employment and thus increase the long-term economic viability at the local, regional, and state levels. The short- and long-term environmental effects of the project are considered minimal at the regional level and to some degree at the local level.

4. Project Justification

The Port of Oakland considers that the proposed project is justified now, rather than reserving an option for future alternatives. The wharf is built out and in order to accommodate new generation ships and cargo storage area the proposed wharf extension at the proposed location is the most reasonable alternative. The Port did evaluate off-site alternatives, but concluded that most off-site alternatives did not provide feasible options or suitable locations to meet their current needs, or they were outside of the Port's control. Some of the off-site alternatives would also be more environmentally adverse and are located on sites with acreage beyond the needs necessary for the proposed project.

D. Significant Irreversible and Unavoidable Changes

Implementation of the proposed wharf extension project would result in the following significant irreversible and unavoidable impacts:

- Demolition of the transit shed building which has historic significance would alter the aesthetics of the surrounding area;
- Views from the public access FDR pier and a park on the east end of Jack London's waterfront would be changed;
- Noise would increase during construction activity and may affect nearby businesses and the Waterfront Plaza Hotel due to the incremental noise increases from construction truck traffic, pile driving activity, and dredging operations (this would be considered a significant but temporary construction impact);
- Contribution to the increase in regional air emissions due to increased port activity from vehicles, ships and tugboats, and trucks; and
- Food resources for fish would be temporarily disturbed in the dredged area (this would be considered a significant but temporary construction impact).

Noise from construction activity would be of short duration and temporary, but would be viewed as significant. Loss of benthic habitat from dredging and placement of fill at Berth 68 would be long-term but be offset by creation of new habitat from wharf and pile removal at Sherex and Pacific Dry Docks. In addition, loss of benthic habitat is viewed as insignificant due to annual maintenance dredging activity within the Inner Harbor. Demolition of the transit shed building would be a significant irreversible and unavoidable change and would require findings of overriding consideration. Other impacts that would be unavoidable but less than significant after mitigation, are alterations to the public viewsheds and covering of habitat for benthic organisms.

E. Growth-Inducing Impacts

The proposed wharf expansion could induce growth by directly and indirectly creating additional jobs; however, the increase in employment would be a beneficial impact. Therefore, the wharf extension is not considered growth-inducing, other than growth in container shipping activities.

F. Cumulative Impacts

The major projects that are planned within the vicinity of the Port of Oakland's jurisdiction are the intermodal rail facility, Naval Supply Center (NSC) lease of 220 acres expansion to American Presidents Line (APL) terminal, a new Amtrack station between Harrison Street and Alice Street, and build-out of Jack London Square immediately south of the site with either an expansion of the waterfront plaza hotel or a new hotel, and a new theatre.

The development of the project would contribute to cumulative effects. The potentially significant cumulative effects of the proposed project and other proposed developments within the Port of Oakland relate to issues concerning historic resources, transportation, sediment quality, and biological resources, and air quality.

1. Historic Resources

The project would contribute to the cumulative loss of historic structures with local importance because of the proposed demolition of the transit shed building. In this context there will be some modification to historic structures in the district with the NSC lease.

2. Transportation

The project would contribute to cumulative effects to transportation which would also occur regardless of whether the project is built. Delays in the heavy right turn movement from the intersection of Market Street southbound into Third Street would result in this intersection to operate with long delays (LOS "F") to the stopped (Market Street) approaches, and potentially delaying trucks and other vehicles into and out of Howard Terminal.

3. Water Quality Turbidity and Biological Resources

The project would result in cumulative effects from dredging on water quality and benthic organisms.

4. Biologic Resources

The project would result in a cumulative loss to benthic habitat due to the 48,240 square foot wharf extension.

Chapter VIII
ORGANIZATIONS AND PERSONS CONSULTED

■ ■ ■

A. Consultation

1. Local Agencies

Port of Oakland
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    Michael Beritzhoff, Senior Maritime Projects Analyst
    James Putz, Senior Maritime Projects Analyst
    Robert Middleton, Jr., Public Affairs Manager
    Oceana Rames, Associate Transportation Planner
    Michael Morley, Civil Engineer

City of Oakland, Department of Planning and Building
    Christopher Buckley, Planner

Oakland Cultural Heritage Survey
    Gary Knecht, Coordinator
    Betty Marvin, Senior Surveyor

Oakland Landmarks Board
    Helaine Kaplan Prentice, Secretary

City of Alameda
    Collette Menuier, Planning Director

Oakland Fire Department
    Lloyd Salisbury, Fire Marshal

Oakland Police Department
    Richard Zamora
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East Bay Municipal Water District
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2. State Agencies

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U.S. Fish and Wildlife Service
  Ruth Pratt

National Marine Fisheries Service
  David Mattens

3. Federal Agencies

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  Bob Tasto

California Department of Health Services
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4. Private Companies, Organizations and Persons

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B. Report Preparers

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Nick Haskell, Land Use Planner
Lyn Hogan, Graphics Manager
Paul Seaton, Graphics Technician
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3. CADP - Visual Simulations

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Adam Noble, Technician

4. Dowling Associates - Transportation

Steve Coleman, Principal, Professional Traffic Engineer

5. ENTRIX - Biology and Sediment Quality

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Joe Rudek, Staff Biologist
Joan Duffield, Project Biologist

6. Illingsworth and Rodkin - Noise

Richard Rodkin, Principal, Acoustical Engineer

7. Moffat and Nichol - Port Operations, Engineering

Robert Battalio, Engineer II
Dilip Trivedi, Staff Engineer

8. Uribe and Associates - Biology and Sediment Quality

Geoff Brosseau, Senior Project Manager
Fred Kreiger, Senior NEPA Manager

9. Woodruff Minor - Architectural Historian

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Appendix A
PERMITTED BERTH MAINTENANCE DEPTHS

■ ■ ■

Table A-1
PERMITTED BERTH MAINTENANCE DEPTHS

Location	Permitted Depth[1] (M.L.L.W.)
7 Army	-37'
8 BBT	-37'
9 BBT	-37'
10 BBT	-36'
20 SEALAND	-42'
21 SEALAND	-42'
22 OHPCT	-42'
23 NOL	-42'
24 MAERSK	-42'
25 TBCT	-38'
INTERCONNECTING CHANNEL	-38'
26 TBCT	-42'
30 MITSUI/TRAPAC	-42'
32 MATSON	-38'
33 MATSON	-38'
34 MATSON	-38'
35 7TH ST PCT	-42'
37 7TH ST PCT	-42'
38 7TH ST PCT	-40'
40 PORT	-37'
60 APL	-38'
61 APL	-38'
62 APL	-40'
63 APL	-40'
67 HOWARD	-42'
68 HOWARD	-42'
69 HOWARD	-35'
82 9TH AVE	-35'
83 9TH AVE	-35'
84 9TH AVE	-35'
BROADWAY MARINA	-15'
OTHER MARINAS	-12'

Appendix B
INITIAL STUDY

■ ■ ■

INITIAL STUDY

EXPANSION OF WHARF AREA - CHARLES P. HOWARD TERMINAL

Port of Oakland

I. GENERAL INFORMATION

A. **Project Name:**
Expansion of Existing Wharf
Charles P. Howard Terminal

B. **Project Purpose:** The purpose of the project is to maximize the containerized shipping potential of the Charles P. Howard Terminal by extending the length of the wharf, by increasing the amount of useable backland within operational reach of the cranes and by improving out-bound truck circulation.

C. **Project Sponsor:**
Port of Oakland
Maritime Division
530 Water Street
Oakland, CA 94607

Contacts:

John Verheul Maritime Division	(510) 272-1302
or	
Jerry Serventi Engineering Design	(510) 272-1268
or	
Dean Luckhart Environmental Department	(510) 272-1177

D. **Assessor #:** Book O/Map 410/Parcel 1-5

E. **Land Use:**
Designated - Shipping (Oakland Shoreline Plan)
Existing - Shipping (Charles P. Howard Terminal)

F. **Project Description:** The proposed project consists of the demolition of a transit shed and wharf apron, the repair of a quay wall, the strengthening of portions of the wharf previously covered by the transit shed, the construction of approximately 46,500 square feet of pile-supported wharf structure, the dredging and potential upland disposal of approximately 12,000 cubic yards of sediments from the Bay, the provision of miscellaneous site improvements and finally, the uncovering of -------- square feet of existing Bay fill and the provision of ------ square feet of improved public access in the vicinity of -------

The transit shed that is to be demolished was constructed circa 1929 as a "state-of-the-art" break bulk facility with two floors of offices to house the newly formed Port Commission. Port offices relocated in the 1960's and the space was never reused. The containerization of the shipping industry has left the transit shed vacant much of the time and the Loma Prieta Earthquake in 1989 caused extensive damage to the pilings under the shed and the wharf apron on the east and south of the building. The building itself sustained minor damage but further deterioration of the quay wall could affect the whole building. The building appears eligible for the National Register of Historic Buildings.

The quay wall, a large concrete "gravity type" retaining wall, extending east from Market Street to Clay Street, has functioned as the land/water interface since it was constructed circa 1910. The wall also serves as the foundation of the front wall of the transit shed. Little was known of the condition of the quay wall until recent explorations revealed extensive cracking and settling under the building.

The pilings under the building and wharf aprons were damaged in the Loma Prieta earthquake and were subsequently repaired to support the original design load of the wharf of 600 pounds per square foot. Federal Emergency Management Act (FEMA) staff have been actively involved in the pile repair project. Since Marine terminal operations today routinely require a loading capacity of 1000 pounds per square foot, work will be undertaken to increase the strength of the old wharf.

Charles P. Howard terminal now has 1642 lineal feet of wharf apron. An additional 298 lineal feet (46,500 square feet) would make it possible to accommodate two new generation container ships simultaneously. The longer vessel is now standard in the industry and call routinely at CPH Terminal and when schedules overlap, the second ship must stand-by in the Bay. This extension would create handling capacity for the terminal operator and would minimize the amount of Bay fill required for what is essentially a new berth - a goal of both the Bay Plan and the Seaport Plan.

Berth 68 is currently maintained to -42 feet Mean Lower Low Water (MLLW) plus 2' of over-dredge. The new berth area will need to be dredged to -42 feet MLLW plus 2' of over-dredge. This will generate 12,000 cubic yards of sediments that will be disposed of as required depending upon the chemistry of the sediment sampling. The material that is clean enough for disposal at Alcatraz will be disposed of at that site, the balance will be designated for upland disposal. There are no plans to deepen the channel adjacent to the additional length of berth at this time.
The non-pile supported landside area will be graded, paved, drained, illuminated and striped for terminal use.

The project's required pile supported fill in the Bay will be mitigated by the removal of existing unused or under-utilized structures in or over the bay. These structures have yet to be identified in their entirety but their demolition will contribute to the health of the Bay in excess of the area of coverage. The removal of the old piles (cutting at mud line) will eliminate a continuing source of contamination from the exposed creosote surfaces of the piles.

The provision of public access at this site is not appropriate due to the nature of the heavy equipment in use on the site and the hazardous conditions to the unwary visitor that result from normal operations at a container terminal. There are no nearby unimproved sites. The type and extent of feasible, in lieu public access has not yet been identified but would ideally be transportation/shipping oriented and could perhaps showcase a visual record of the early history of the Port and its development.

G. **Location:** The project is located in the Inner Harbor of the Port of Oakland, within the City of Oakland, in the County of Alameda. The San Antonio Estuary, widened and deepened over the years to create the Middle and Inner Harbor Channels, provides water access to the site while the land-side access to the terminal is by way of Market Street with secondary access from Martin Luther King Jr. Way. The site is less than a half mile from Interstate 880/980 and the relocation/construction of the failed portion of I-880.

H. **Environmental Setting:** The Charles P. Howard Terminal is located on the Inner Harbor Channel of the Oakland-Alameda Estuary (once known as the San Antonio Estuary) in the City of Oakland. In 1927, at the time the Port Commission was established, the site was already a municipal harbor facility known as the Oakland Municipal Dock and Warehouse. Plans were underway to redevelop it into a "state-of-the-art" break-bulk terminal, and this was done as one of the first acts of the newly formed Board of Port Commissioners. It also became their first "permanent" home in 1930. Although the Port offices were officially moved in the 1960's some portion of the offices were occupied into the 1970's. As originally constructed, the building formed a "U" shape with wharf frontage on three sides and rail service down the middle. The site was redeveloped in the early 1980's to respond to the growing demand for marine facilities with the capacity and technology to handle containerized freight. As part of that modernization, well over half of the transit shed was demolished and fill was placed to create a continuous wharf face along the Inner Harbor, leaving the remaining structure as it is today. That work was the subject of an environmental document prepared in 1976. Development of the site has been regulated in the past by the San Francisco Bay Conservation and Development Commission and by the US Corps of Engineers under BCDC Permit No. 13-78 and COE Permit No. 12571-35 respectively. The site is part of the Oakland Chinatown/Central Community Development District, but typically the District's involvement in the Port Area has been nominal.

In the early 1980's the City of Oakland undertook an inventory of the historic resources of the City. This was done under the authorship of the State Historic Preservation Officer (SHPO) as required by the National Historic Preservation Act of 1966 (NHPA). The remaining portion of the transit shed was surveyed by the Oakland Cultural Heritage Survey Staff for architectural and historic interest and was rated 'A' (Highest importance). The building is on the City of Oakland Preservation Study List and is possibly eligible for inclusion on the National Register of Historic Places.

In 1989, the old section of wharf under the transit shed sustained extensive damage during the Loma Prieta earthquake. The building sustained relatively minor damage but the major foundation, a 1910 quay wall under the front of the building, is severely distressed. The Port applied for Federal Emergency Management Act funds for the repair of the damaged pilings (the work has since been completed) which in turn triggered a Section 106 consultation process regarding the Port's proposal to demolish the transit shed.

The site is sandwiched between the Estuary and the rail tracks that have historically served the development of the waterfront. Upland, to the north and west, is a largely industrial section of the City of Oakland. This industrial section, like many others in the Bay Area is beginning to give way to retail, commercial and office uses. United Iron works has become Cost Plus and a series of smaller retail outlets; a cannery has become a leather accessories factory and retail outlet. These newer uses, with their heavier reliance on passenger vehicles and pedestrian traffic may have a different level of compatibility with the increased intensity of landside trucking activity that is typical of a marine terminal and that will be increased with the proposed wharf extension. A similar transition is in process on the other side of the estuary, in Alameda. This transition will likely be accelerated by the decommissioning of the Alameda Naval Air Station and the conversion of that property into some combination of currently unknown uses.

The geological structure of the area is largely marine and alluvial sedimentary deposits with Merritt sands underlain by the San Antonio formation. The upper soils are of medium dense to dense brown silty and clayey sands. The sediments to be dredged are known to contain the usual components and concentrations of potentially contaminated materials characteristic of urban run-off. Bedrock is known to be up to 250' or more below the existing ground surface. The site is within a highly active seismic area, however, there is no known or suspected fault within the site itself or the immediate vicinity. The most recent seismic event of note was the Loma Prieta Earthquake in 1989 which did cause significant damage to this older portion of the wharf. The rest of the terminal was reconstructed in the early 1980's and sustained only minor non-crippling inconveniences.

The Inner Harbor Channel has an authorized depth of 38'. The U.S. Army Corps of Engineers is currently working on a related project to deepen the channel to -42'MLLW and to provide a turning circle for vessels just west of the proposed project. The channel width at the Charles P. Howard Terminal is approximately 600'. The average diurnal tide range is 6.5 feet with an average current of 0.7 knots. The channel is well sheltered with wind induced wave action ranging from 0 to 2'.

II. PROJECT IMPACTS EVALUATION:

Discussion of impacts the project may have on natural and man-made resources:

A. **Geological Factors:** Could the Project or its related activities affect, or be affected by the following:

		YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO, UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
1.	Seismic hazards, including fault surface rupture, liquefaction, seismic shaking, landsliding, tsunami inundation	☐	☐	☒	☐
2.	Slope failure	☐	☐	☒	☐
3.	Soil hazards: soil creep, shrink-swell (expansiveness), high erosion potential	☐	☐	☒	☐
4.	Mineral resources	☐	☐	☒	☐
5.	Other (State)____________________	☐	☐	☐	☒

COMMENTS:

1. The demolition of the building, which was somewhat damaged in the Loma Prieta earthquake in 1989, will actually make the overall site safer in the event of another natural disaster. The structure has been adversely affected by the Loma Prieta earthquake of 1989 and is not constructed to modern seismic codes. The

removal of the building would have the net result of improving the safety of the site during a future seismic event. The proposed repairs to the existing quay wall will also have a positive effect on the safety of the site.

The wharf will be designed to a standard compatible with earthquake safety requirements and the necessity of economic viability.

4. Mineral resources of this site were granted to the City/Port along with the waterfront property so that it is not necessary to further consult State Lands Commission prior to dredging the site.

B. **Hydrologic Factors:** Could the Project affect, or be affected by the following:

		YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO, UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
1.	Public or private water supply	☐	☐	X	☐
2.	Septic tank functioning (inadequate percolation, high water table, location in relation to watercourses, etc.)	☐	☐	X	☐
3.	Increased sedimentation rates	☐	☐	X	☐
4.	Surface or groundwater quality (contaminants other than sediment, i.e. urban runoff, nutrients, pesticides, temperature, dissolved oxygen, etc.)	☐	☐	X	☐
5.	Groundwater recharge	☐	☐	X	☐
6.	Watercourse configuration, capacity, or hydraulics	☐	☐	X	☐
7.	Degradation of riparian corridor, marsh, lake, estuary, slough	?	Y	☐	☐
8.	Increased runoff due to impervious surfacing	☐	☐	X	☐
9.	Flood hazard areas, their depth or extent	☐	☐	X	☐
10.	Cumulative saltwater intrusion	☐	☐	X	☐
11.	Other (State) ____________________	☐	☐	☐	X

COMMENTS:

4. The wharf extension portion of the project will increase the amount of impervious surfacing by exposing the floor area of the building and by the addition of 46,500 square feet of pile supported wharf structure. Potential mitigation would, in turn, reduce the amount of impervious surfacing for an over-all no "net" increase. Also, there may be some effect on the water quality of the surface run-off from the site. Currently, 57,000 square feet (1.31 acres) of the site is roofed over and the resultant run-off is directed to sixteen points of entry into the estuary. When the wharf extension has been constructed, the building has been demolished and the site repaved, the run-off from that area will have the opportunity to pick up contaminants associated with terminal operations and storage of chassis or containers. The potential for significant degradation of surface waters is minor compared to the total runoff from the 53 acre terminal or from the larger urban environment. Through pavement drainage design, compliance with NPDES standards and "best management practices", contaminated runoff can, for the area under consideration, be reduced to levels of insignificance.

During the demolition and construction phases, every effort will be made to prevent pollutants from entering the storm system or from being directly discharged into the estuary.

6. The bottom of the watercourse configuration will be changed and the actual capacity for water (volume of the Bay) will be increased by the proposed dredging. This is not considered to be an adverse impact and therefore does not require mitigation.

7. There will be some unavoidable degradation of the estuary waters during the dredging and pile driving operations. From previous testing, we know that there may be contaminants in the sediments which will be disturbed during the construction phases. This degradation will be of limited duration and until further testing and analysis is completed it is unknown whether the dredging will have a significant adverse effect.

C. **Biotic Factors:** Could the Project affect, or be affected by the following:

	YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO, UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
1. Known habitat of rare/endangered plants or animals (identify specific species, if known)	☐	☐	X	☐
2. Unique or fragile biotic community	☐	☐	X	☐
3. Wildlife habitat or migration corridor	☐	☐	X	☐
4. Alterations to the plant community	☐	☐	X	☐
5. Fire hazard from flammable brush, grass or trees	☐	☐	X	☐
6. Anadromous fishery	☐	☐	X	☐
7. Lands currently utilized for agriculture	☐	☐	X	☐
8. Other (State) ____________________	☐	☐	☐	X

COMMENTS:

The proposed project will have no effect on land based biotic factors except for depriving the bird population of roof-top nesting or resting places. This is not considered significant. The wharf extension will increase the area of shadowed marine habitat and therefore there could be some displacement of organisms requiring the degree of exposure currently available. As a part of the overall project, an approximately equal area of water will be exposed to light and will offset the proposed loss.

D. **Noise, Air and Energy Factors:** Could the Project affect or be affected by the following:

	YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
1. Existing noise levels (ambient and single event)	?	Y	☐	☐
2. Ambient air quality (by hydrocarbon, thermal, odor, dust, smoke, radiation, etc.)	?	Y	☐	☐
3. Climate (locally or regionally)	☐	☐	X	☐
4. Use of substantial amounts of fuel energy	☐	☐	X	☐
5. Cumulative increase in energy demand, noise, or air pollutants	☐	☐	X	☐

COMMENTS:

1. Existing noise levels will increased during construction and may increase nominally during operations. The increased capacity of the terminal may result in additional truck trips. The current transition of the land use in the area from industrial to commercial and office does not really affect the receptor sensitivity factor as the terminal was a pre-existing use. Therefore the increased noise levels are unlikely to constitute a significant adverse environmental impact.

2. During the demolition and construction process there will be a decrease in ambient air quality due to dust. This impact on air quality can be mitigated through the partial control of airborne particulates by wetting down the site during the demolition and construction process and by adhering to accepted practices for the handling of regulated materials. The Port conducted an asbestos survey of the building as required by EPA and the Bay Area Air Quality Management District regulations. Asbestos was identified in floor tile and mastic, sheet vinyl, pipe insulation, and roofing materials. All asbestos will be removed and disposed of in accordance with Federal and State regulations prior to or in conjunction with the demolition of the building. Upland disposal of dredged materials unsuitable for disposal at Alcatraz will be handled and transported in ways that will minimize air borne particulates and it will be done under the supervision of qualified personnel in accord with an approved plan.

E. **Natural Resources:** Could the Project affect, or be affected by the use, extraction or conservation of any natural resources?

	YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO, UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
	☐	☐	X	☐

COMMENTS:

The project does not affect the use, extraction or conservation of any natural resource.

F. **Cultural/Aesthetic Factors:** Could the Project affect or result in the following:

	YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO, UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
1. The established character, aesthetics or functioning of the surrounding area	X	Y	☐	☐
2. Physical change affecting unique ethnic cultural values	☐	☐	X	☐
3. Restriction of existing religious or sacred uses within the potential impact area	☐	☐	X	☐
4. Prehistoric or historic buildings, structures, objects or unique cultural features	X	Y	☐	☐
5. Archaeological or paleontological resources	☐	☐	X	☐
6. Areas having important visual/scenic value	X	Y	☐	☐
7. Adopted scenic highways or areas of scenic value	☐	☐	X	☐
8. Lands preserved under an agricultural, scenic, or open space contract	☐	☐	X	☐

		YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO, UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
9.	Hazard to people or property from risk of explosion or release of hazardous substances either on site or in transit	☐	☐	☒	☐
10.	Significant new light or glare impacts on site or surrounding area	☐	☐	☒	☐
11.	Displacement of people or business activity	☐	☐	☒	☐
12.	Public controversy	☐	☒	☐	☐
13.	Other (State) ____________________	☐	☐	☐	☒

COMMENTS:

1. The removal of the transit shed will alter the aesthetics of the surrounding area. The views from Alameda, the Estuary, the Waterfront Plaza Hotel, the Franklin Delano Roosevelt (FDR) pier, the ferry dock and the public access paths of Jack London's waterfront will be changed. The view towards the site from each of these locations is currently dominated by expanses of blue wall. The visually dominant eastern face of the building is 450' long and 33' in height 32' from the edge of wharf with an undifferentiated series of vehicular entries below banded, industrial sash windows. The main facade of the building is in the "beaux art" style of the City Beautiful movement which flourished in the 1920's. This 40-45' high by 200' long face of the building is viewed primarily from the public access in Jack London's Waterfront which approaches obliquely from the east. The utilitarian wall facing the Estuary was constructed in the early 1980's when the other portion of the original transit shed structure was removed. The removal of the remaining structure will serve to provide a better opportunity to view maritime terminal operations from existing public access facilities and will possibly open up views to the west.

   The removal of the building will affect the character though not the functioning of the surrounding area. The function remains maritime and shipping related (although more intensely so and more visibly accessible) and the beaux art architectural style will still be represented in the area by the more visible and dominant PG&E structure along the Embarcadero that will remain. The major visual/aesthetic difference will be in the lack of a visual terminus to the vistas listed above.

4. The demolition of the building will destroy a visible and tangible reminder of the historical development of the Port of Oakland as the first permanent offices of the newly formed Board of Port Commissioners were located within the upper floors of this shed and the sister shed that was demolished in the early 1980's. In June of 1983, the remaining portion of the building was studied by City of Oakland staff and consultants as part of the Oakland Cultural Heritage Survey which was performed at the direction of the State of California Resources Agency. As a result of the survey, the building was placed on the City of Oakland Landmark study list (it received an 'A' rating) because of the building's association with the economic and industrial past of Oakland, because of its architectural significance, and because of its association with local governmental history. All of these factors can be thoroughly documented and made available to the public as a mitigation measure. Some historic photographs of the building exist and these can be augmented by recent photographs to document the style and details of the structure. Original blueprints, and microfilm thereof, exist and these can be archived if the original drawings cannot be found. The available historical documents of the origins of the Port and the context of the City can be assembled for archiving and/or public display. With the involvement of interested citizens and knowledgeable, skilled professionals, it should be possible to document the building historically and architecturally so as to create a fitting retrospective of the building. It would then be most appropriate to replace what was once a "state-of-the-art" shipping facility with a current "state-of-the-art" maritime facility.

12. Public controversy does surround this project because of the expressed need of the Port of Oakland Maritime Department to maximize the efficiency and the potential of existing facilities. A crunch is felt on

the landside because of existing non-maritime land uses and the difficulties inherent in street closures, hazardous materials clean-up and the probable historic interest in the structures that would be in the way of the most likely other expansion direction (north and west) of the Charles P. Howard Terminal. Also, in considering overall seaport development and existing policies relating to fill in the Bay, an opportunity exists at this location to substantially increase the capacity of the terminal by a very minimal addition of pile supported fill.

G. **Public Service Factors:** Could the Project or its related activities have effects upon or result in a need for new or altered governmental services in any of the following areas:

		YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
1.	Fire protection			X	
2.	Police protection			X	
3.	Schools			X	
4.	Park and recreation facilities			X	
5.	Traffic (increases in congestion, hazard)	?	Y		
6.	Emergency response or evacuation plans			X	
7.	Maintenance of public facilities (roads, channels, etc.)			X	
8.	Public mass transportation or alternative transportation modes (preempting of some)			X	
9.	Other (State)______________				X

COMMENTS:

5. There may be a substantial increase in truck traffic to and from the terminal when both berths are occupied and being worked. This will in part be off-set by freeing space within the terminal for chassis that are now stored off-site. Overall queuing time will be significantly reduced by the expansion and modernization of the gate complex that is currently being designed for construction. In addition, the improvements to Embarcadero by Caltrans will reduce the congestion on Market and Third Streets.

H. **Public Utility Factors:** Could the Project or its related activities have an effect on or result in a need for new systems or substantial alterations to the following utilities:

		YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
1.	Sewer or septic systems			X	
2.	Water for domestic use and fire protection			X	
3.	Natural gas or electricity			X	
4.	Storm water drainage			X	
5.	Solid waste disposal			X	

		YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
6.	Communication systems	☐	☐	☒	☐
7.	Plant facilities for any of the above (sewer plants, microwave station) water tanks, etc.)	☐	☐	☒	☐

COMMENTS:

There are no known environmental impacts to the Public Utility factors listed that would result from this project as all needed services currently exist on the site.

1. & 2. The domestic water and sanitary sewer service that exist on the site will no longer be required and will be cut, capped and abandoned as appropriate. Fire protection service will be maintained either through the service that exists to the structure or through the extension of the existing service to the yard.

3. There is no natural gas service to the structure and the electric service is sufficient to meet the electrical needs for the additional yard area.

4. Storm water drainage is currently handled by way of 16 rainwater leaders extending down the face of the building and then dropping directly into the Estuary. Storm runoff from the wharf sheet flows from the building on two sides into the Estuary. This latter drainage pattern will likely remain intact with the repaved floor area being directed to new and existing yard catchment basins as needed to drain the yard. There will be a slight increase (one acre in a fifty three acre complex) in the amount of impervious paving which will be reflected in storm water concentration levels and times. Because this addition is over water, it is not expected to contribute to any potential flooding problems.

5. The communications system service to the building site will be discontinued.

I. **Socio-Economic:** Could the Project involve:

		YES SIGNIFICANT ADVERSE EFFECT	MITIGABLE (YES, NO UNKNOWN)	NO SIGNIFICANT ADVERSE EFFECT	UNKNOWN EFFECT
1.	Expenditure of public funds in excess of public revenues generated by private projects	☐	☐	☒	☐
2.	Reduction of low/moderate income housing	☐	☐	☒	☐
3.	Creation of demand for additional housing	☐	☐	☒	☐
4.	Land use not in conformance with character of surrounding neighborhood	☐	☐	☒	☐
5.	Other (State) ____________________	☐	☐	☐	☒

COMMENTS:

No adverse Socio-Economic impact will result from this project. The terminal expansion will provide additional employment opportunities and additional revenue to the Port as well as to the City through a healthier local economy.

J. **General Plans and Planning Policy:** Is the Project:

		YES	NO
1.	Inconsistent with the Oakland Comprehensive Plan	☒	☐
2.	Inconsistent with the Oakland Shoreline Plan	☐	☒
3.	Inconsistent with other adopted policies	☒	☐
4.	Potentially growth-inducing	☐	☒

COMMENTS:

1. The Port of Oakland is a department of the City of Oakland. The City of Oakland has prepared a Comprehensive Plan which reflects the Oakland Shoreline Plan prepared by the Port and which is used by the Port to guide the development of the Port. The proposed project is consistent with the Policy Plan and the Illustrative Future Land Use map showing the maritime shoreline uses. However, other sections of the Comprehensive Plan, such as the General Considerations, Policy 4 of the Land Use and Urban Design Element, establish an advisory policy of preservation of historic resources, to the extent possible, within the City.

3. The proposed project is inconsistent with the policies of the State and Federal Government insofar as they seek to reinforce the preservation of historic resources. Specifically, the National Historic Preservation Act of 1966, through accountability of federal agencies in granting assistance to local agencies, and through the activities of the State Historic Preservation Officer, seeks to preserve known historic buildings and places whether on the national, state or local level. The Federal project evaluation process (Section 106) will not be required but the State Historic Preservation Officer will still have to rule on the historical status of the building because of its inclusion on the City of Oakland Landmark Preservation Study List. If the structure is found to have historical significance the State Historic Preservation Officer is charged with assisting the local agency in finding and/or adopting feasible measures to eliminate or mitigate the adverse effects.

III. MANDATORY FINDINGS OF SIGNIFICANCE

Pursuant to Section 15065 of the State CEQA Guidelines, a project shall be found to have a significant effect on the environment if any of the following are true:

		YES	NO
1.	The project has the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.	☒	☐
2.	The project has the potential to achieve short-term to the disadvantage of long-term environmental goals	☐	☒
3.	The project has possible environmental effects which are individually limited but cumulatively considerable. Cumulatively considerable means that the incremental effects of an individual project are considerable when viewed in connection with the effect of past projects, the effects of other current projects, and the effects of probable future projects.	☐	☒

	YES	NO
4. The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly.	☐	☒

COMMENTS:

Locally significant impacts that could be partially mitigated include:

1. The potential loss of the views of the building and the physical reminders of the history of the Port caused by the proposed demolition of Building E407A can be ameliorated through the careful and systematic assembly of current and historic records of the building and the placing of these records in the hands of interested historians, librarians and museum curators for the purpose of marking this structure's place in history. The Port may attempt to find, and partially underwrite, an interested third party willing to relocate the "headhouse" portion of the structure to some suitable location outside of the terminal.

2. The Bay "fill" required for this project can be mitigated by the uncovering of a comparable number of square feet of currently covered water or by the creation of --- of new bay or by some combination of the above.

3. The dredging required to create the additional length for Berth 68 is nominal and is contiguous with other areas receiving routine dredging. Therefore, no "new" area is being dredged. The sediments removed in the dredging process will be taken upland for disposal if they are inappropriate for disposal at the in-bay Alcatraz site, or if that site has been seasonally used to capacity in advance of this project being under construction.

4. The public interest in access to the waterfront, since for reasons of safety cannot be accommodated on the site can be mitigated by the provision of 300 (600 ?) lineal feet of enhanced public access along the Oakland shoreline that is not otherwise the subject of a current requirement from the San Francisco Bay Conservation and Development Commission.

DETERMINATION

___ 1. I find that the proposed project will not have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.

___ 2. I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described above have been added to the project by the project sponsor. A **NEGATIVE DECLARATION** will be prepared.

X 3. I find that the project may have a significant effect on the environment and an **ENVIRONMENTAL IMPACT REPORT** is required.

9- 7 -93

Name | Date

Manager, Environmental Department
Title

V. REFERENCES:

City of Oakland. 1972. General and Comprehensive Plans.

City of Oakland. As amended through May, 1990. Zoning Plan.

City of Oakland. May 1990. Ordinance No. 11217. Permanent Procedures and Regulations for the Repair and Demolition of Earthquake Damaged Structures.

City of Oakland. June 1983. Historic Resources Inventory: Howard Terminal Transit Shed.

USCS. As amended through April 1992. Historic Sites and Antiquities: Conservation. (Also known as the National Historic Preservation Act of 1966.)

CFR. Revised through July 1991. Chapter VIII - Advisory Council on Historic Preservation: Part 800 - Protection of Historic and Cultural Properties. (Also known as Section 106.)

PRC. Revised through 1991. Article 2. Historic Resources. Section 7: State Historical Resources Commission.

Port of Oakland. September 1976. Final Environmental Impact Report for Redevelopment of the Market Street Terminal, Oakland, California.

Port of Oakland. September 1987. The Port of Oakland... Sixty Years: A Chronicle of Progress.

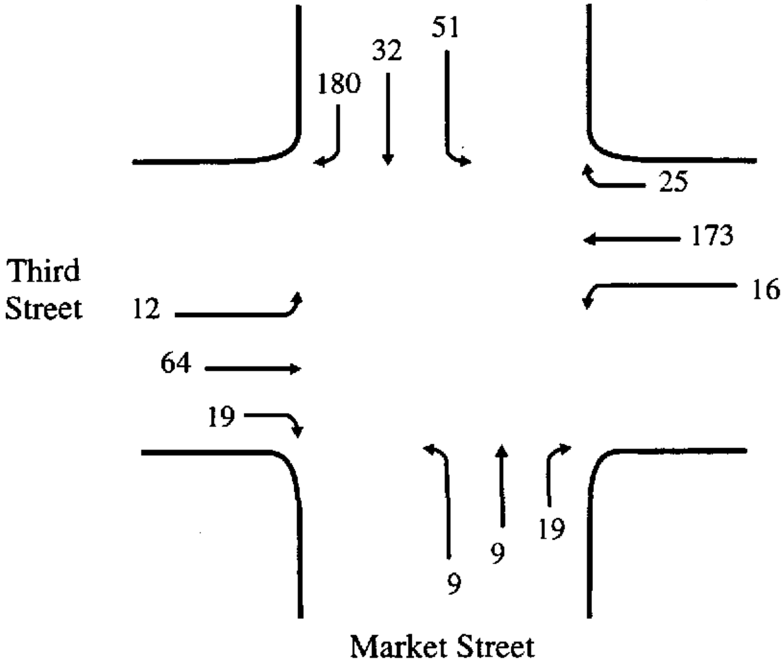
September 13, 1993

Appendix C
TRANSPORTATION

■ ■ ■

City of Oakland Traffic Count

Market Street and Third Street
August 21, 1991, 7:30 to 8:30 AM

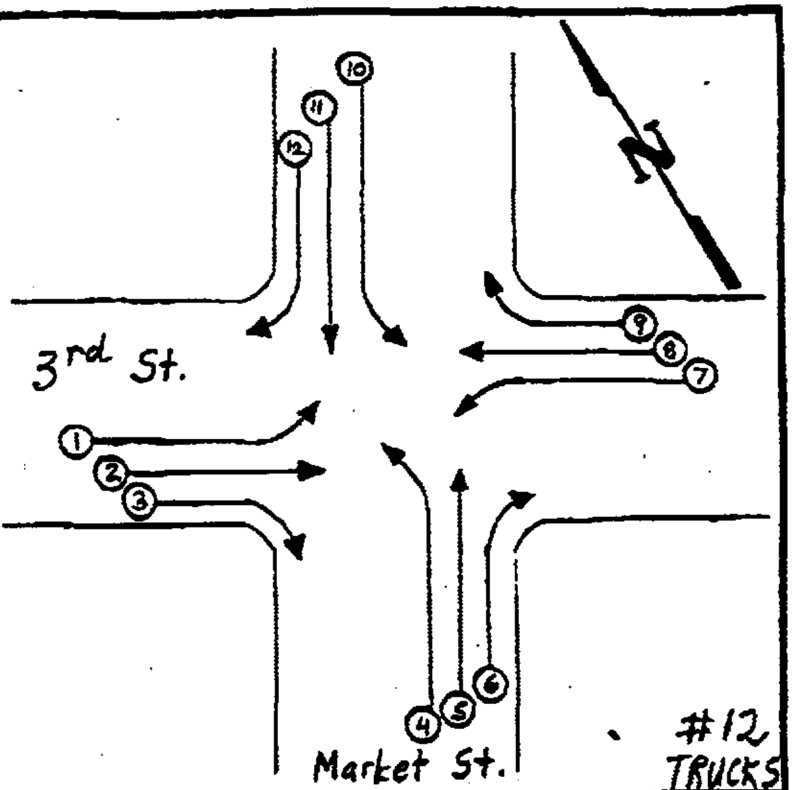


LOCATION: Market & 3rd Street

RECORDER: R

DATE: 8/21/91 7-9AM
3-5PM

WEATHER: clear



#12
TRUCKS

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	Fixed Chassis	Other
7-7:15AM	0	27	2	0	0	0	0	45	4	10	2	42	1	6
7¹⁵-7:30AM	6	13	2	3	2	0	2	50	4	10	10	65	1	14
7³⁰-7:45AM	2	17	6	1	2	1	7	57	11	11	6	53	2	9
7⁴⁵-8:00AM	3	17	5	2	0	4	2	48	4	21	11	56	1	8
8-8:15AM	4	10	3	4	2	10	3	48	2	9	9	41	2	5
815-8:30AM	3	20	5	2	5	4	4	20	8	10	6	30	0	6
830-845AM	4	29	10	10	6	5	4	38	16	15	18	43	3	9
845-900AM	8	23	3	10	7	4	6	29	7	9	5	36	2	11
totals	30	156	36	32	24	28	28	335	56	93	67	366	12	68
3-3:15PM	3	30	4	5	2	2	6	32	11	9	8	25	6	5
315-330PM	10	35	7	1	3	3	0	34	18	10	7	23	1	7
330-345PM	12	47	3	5	7	4	1	35	9	18	7	25	2	7
345-400PM	11	40	0	8	2	4	2	19	10	14	10	22	1	5
4-4:15PM	10	52	4	3	8	3	3	44	11	13	5	34	1	10
415-4:30PM	9	35	4	4	7	2	1	36	7	17	7	29	1	7
4:30-4:45PM	8	66	2	5	8	4	1	22	17	16	4	21	1	4
4:45-5PM	6	30	2	7	2	6	2	37	13	13	4	20	1	4
totals	69	335	26	38	39	28	16	259	96	110	52	199	14	49

CITY of OAKLAND **TRAFFIC ENGINEERING AND PARKING DEPARTMENT**

APPROVED BY

TRAFFIC ENGINEER

APPROVED BY

DRAWN BY

SCALE

DATE

```
****************************************** INTERSECTION TURN MOVEMENT SUMMARY *****************************************

PROJECT:   PORT OF OAKLAND             ^              10    64      14       INTERSECTION:
DATE:      DECEMBER 2, 1993           ^N^              ||            ||       N/S:          THIRD ST
DAY OF WK: THURSDAY                    |               ||     ||     ||       E/W:          MARKET ST
                                       |               ||     ||     ||
                                                    <<===     ||     ===>>                           PEAK PERIOD
    SURVEY HOURS:                             AA              VV             AA                   APPROACH VOL
  From      7:00 AM                    8 =====||                             ||=====      221       NB:      211
  To        10:00 AM                                                                                SB:       88
                                       6   =====>>                        <<=====         25        EB:       29
                                                                                                    WB:      301
    PEAK HOUR:                        15 =====||                             ||=====      55
  From      07:30 AM                          VV              AA             VV                    PEAK PERIOD
  To        08:30 AM                                    <<===     ||     ===>>                    DEPARTURE VOL
                           MARKET ST                       ||     ||     ||                         NB:      400
                                                           ||     ||     ||                         SB:      134
    PEAK HOUR                                              ||            ||                         EB:       45
    FACTOR:    0.86                                        15    171     25                         WB:       50

                                                                THIRD ST
```

*** 15-MINUTE PERIOD TOTALS ***

		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	VOLUME
07:00 AM	07:15 AM	1	33	4	1	12	1	1	0	2	6	5	44	110
07:15 AM	07:30 AM	3	41	4	4	13	0	0	0	1	4	7	47	124
07:30 AM	07:45 AM	2	51	4	5	12	5	1	4	1	10	2	71	168
07:45 AM	08:00 AM	8	59	8	2	20	2	0	1	2	13	9	58	182
08:00 AM	08:15 AM	4	37	5	2	19	3	0	1	6	12	6	47	142
08:15 AM	08:30 AM	1	24	8	5	13	0	7	0	6	20	8	45	137
08:30 AM	08:45 AM	2	50	7	6	34	1	4	7	4	11	8	33	167
08:45 AM	09:00 AM	0	33	5	8	16	2	3	2	5	11	11	26	122
09:00 AM	09:15 AM	1	42	6	10	33	2	4	15	4	19	7	37	180
09:15 AM	09:30 AM	1	42	14	7	22	0	1	12	4	8	9	35	155
09:30 AM	09:45 AM	4	30	5	7	30	6	4	11	3	12	9	32	153
09:45 AM	10:00 AM	0	28	6	7	23	3	1	7	3	20	6	27	131

*** HOURLY TOTALS ***

		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	VOLUME
07:00 AM	08:00 AM	14	184	20	12	57	8	2	5	6	33	23	220	584
07:15 AM	08:15 AM	17	188	21	13	64	10	1	6	10	39	24	223	616
07:30 AM	08:30 AM	15	171	25	14	64	10	8	6	15	55	25	221	629
07:45 AM	08:45 AM	15	170	28	15	86	6	11	9	18	56	31	183	628
08:00 AM	09:00 AM	7	144	25	21	82	6	14	10	21	54	33	151	568
08:15 AM	09:15 AM	4	149	26	29	96	5	18	24	19	61	34	141	606
08:30 AM	09:30 AM	4	167	32	31	105	5	12	36	17	49	35	131	624
08:45 AM	09:45 AM	6	147	30	32	101	10	12	40	16	50	36	130	610
09:00 AM	10:00 AM	6	142	31	31	108	11	10	45	14	59	31	131	619

CUSTOM SPREADSHEET DESIGN

** Traffic Data Collection **

Terminal Gates

```
********************************************  INTERSECTION TURN MOVEMENT SUMMARY  **************************************

PROJECT:   PORT OF OAKLAND          ^              4       0       5         INTERSECTION:
DATE:      DECEMBER 15, 1993       ^N^             ||              ||        N/S:          EMBARCADERO
DAY OF WK: WEDNESDAY                |              ||      ||      ||        E/W:          MARKET ST
                                    |              ||      ||      ||
                                               <<===       ||      ===>>                      PEAK PERIOD
  SURVEY HOURS:                          AA                VV             AA                APPROACH VOL
 From      7:00 AM               5 =====||                                ||=====      4       NB:      5
 To        10:00 AM                                                                            SB:      9
                                 56   =====>>                        <<=====           61      EB:     63
                                                                                               WB:     68
  PEAK HOUR:                     2 =====||                                ||=====      3
 From      09:00 AM                      VV                AA             VV                  PEAK PERIOD
 To        10:00 AM                            <<===       ||      ===>>                     DEPARTURE VOL
                       MARKET ST                   ||      ||      ||                          NB:     10
                                                   ||      ||      ||                          SB:      5
  PEAK HOUR                                        ||              ||                          EB:     64
   FACTOR:    0.80                                 1       1       3                           WB:     66

                                                     EMBARCADERO
```

*** 15-MINUTE PERIOD TOTALS ***

From	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL VOLUME
07:00 AM	07:15 AM	1	2	0	1	3	0	0	1	0	2	4	5	19
07:15 AM	07:30 AM	0	0	0	1	1	3	1	1	0	2	7	11	27
07:30 AM	07:45 AM	0	0	0	1	4	3	4	7	2	7	10	4	42
07:45 AM	08:00 AM	0	0	0	1	0	9	0	3	2	10	17	1	43
08:00 AM	08:15 AM	0	0	0	0	0	4	1	7	0	2	8	3	25
08:15 AM	08:30 AM	1	0	0	0	0	1	1	6	1	1	8	1	20
08:30 AM	08:45 AM	0	0	1	2	0	0	1	14	0	1	7	1	27
08:45 AM	09:00 AM	0	0	0	3	0	0	1	13	0	1	15	3	36
09:00 AM	09:15 AM	1	0	0	2	0	0	2	14	1	2	9	1	32
09:15 AM	09:30 AM	0	0	1	2	0	1	1	12	1	1	17	1	37
09:30 AM	09:45 AM	0	0	1	1	0	2	0	15	0	0	12	1	32
09:45 AM	10:00 AM	0	1	1	0	0	1	2	15	0	0	23	1	44

*** HOURLY TOTALS ***

From	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL VOLUME
07:00 AM	08:00 AM	1	2	0	4	8	15	5	12	4	21	38	21	131
07:15 AM	08:15 AM	0	0	0	3	5	19	6	18	4	21	42	19	137
07:30 AM	08:30 AM	1	0	0	2	4	17	6	23	5	20	43	9	130
07:45 AM	08:45 AM	1	0	1	3	0	14	3	30	3	14	40	6	115
08:00 AM	09:00 AM	1	0	1	5	0	5	4	40	1	5	38	8	108
08:15 AM	09:15 AM	2	0	1	7	0	1	5	47	2	5	39	6	115
08:30 AM	09:30 AM	1	0	2	9	0	1	5	53	2	5	48	6	132
08:45 AM	09:45 AM	1	0	2	8	0	3	4	54	2	4	53	6	137
09:00 AM	10:00 AM	1	1	3	5	0	4	5	56	2	3	61	4	145

CUSTOM SPREADSHEET DESIGN

** Traffic Data Collection **

```
********************************************  INTERSECTION TURN MOVEMENT SUMMARY  ***************************************

PROJECT:   PORT OF OAKLAND          ^              1     6     0      INTERSECTION:
DATE:      DECEMBER 13, 1993       ^N^             ||          ||     N/S:        EMBARCADERO
DAY OF WK: MONDAY                   |              ||    ||    ||     E/W:        JEFFERSON ST
                                    |              ||    ||    ||
                                                <<===    ||    ===>>                     PEAK PERIOD
   SURVEY HOURS:                        AA               VV          AA                  APPROACH VOL
     From     7:00 AM            0 =====||                           ||=====       2       NB:      26
     To       10:00 AM                                                                     SB:       7
                                 0   ======>>                     <<======         3       EB:       0
                                                                                           WB:       9
   PEAK HOUR:                    0 =====||                           ||=====       4
     From     07:00 AM                  VV               AA          VV                    PEAK PERIOD
     To       08:00 AM                          <<===    ||    ===>>                     DEPARTURE VOL
                        JEFFERSON ST               ||    ||    ||                          NB:       7
                                                   ||    ||    ||                          SB:      10
   PEAK HOUR                                       ||          ||                          EB:      13
   FACTOR:    0.75                                 8     5     13                          WB:      12

                                                      EMBARCADERO
```

*** 15-MINUTE PERIOD TOTALS ***

		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	VOLUME
07:00 AM -	07:15 AM	0	0	3	0	2	0	0	0	0	0	0	0	5
07:15 AM -	07:30 AM	2	0	2	0	2	0	0	0	0	1	0	2	9
07:30 AM -	07:45 AM	4	3	4	0	2	0	0	0	0	1	0	0	14
07:45 AM -	08:00 AM	2	2	4	0	0	1	0	0	0	2	3	0	14
08:00 AM -	08:15 AM	0	0	1	0	0	0	0	0	0	0	1	0	2
08:15 AM -	08:30 AM	1	0	1	0	1	1	0	0	0	0	1	0	5
08:30 AM -	08:45 AM	0	0	0	0	3	0	0	0	0	1	0	1	5
08:45 AM -	09:00 AM	1	1	5	0	1	1	0	0	0	0	1	2	12
09:00 AM -	09:15 AM	2	2	5	0	0	0	0	0	1	0	2	2	14
09:15 AM -	09:30 AM	1	1	3	0	0	0	0	0	0	3	0	1	9
09:30 AM -	09:45 AM	3	1	0	0	0	0	0	0	0	3	0	0	7
09:45 AM -	10:00 AM	3	3	1	0	2	0	0	0	1	0	0	0	10

*** HOURLY TOTALS ***

		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
From	To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	VOLUME
07:00 AM -	08:00 AM	8	5	13	0	6	1	0	0	0	4	3	2	42
07:15 AM -	08:15 AM	8	5	11	0	4	1	0	0	0	4	4	2	39
07:30 AM -	08:30 AM	7	5	10	0	3	2	0	0	0	3	5	0	35
07:45 AM -	08:45 AM	3	2	6	0	4	2	0	0	0	3	5	1	26
08:00 AM -	09:00 AM	2	1	7	0	5	2	0	0	0	1	3	3	24
08:15 AM -	09:15 AM	4	3	11	0	5	2	0	0	1	1	4	5	36
08:30 AM -	09:30 AM	4	4	13	0	4	1	0	0	1	4	3	6	40
08:45 AM -	09:45 AM	7	5	13	0	1	1	0	0	1	6	3	5	42
09:00 AM -	10:00 AM	9	7	9	0	2	0	0	0	2	6	2	3	40

```
                                              CUSTOM SPREADSHEET DESIGN
********************************************   Traffic Data Collection   ********************************************
```

```
*******************************************  INTERSECTION TURN MOVEMENT SUMMARY  **************************************

PROJECT:    PORT OF OAKLAND         ^          0      3      0       INTERSECTION:
DATE:       DECEMBER 13, 1993      ^N^         ||            ||      N/S:          EMBARCADERO
DAY OF WK:  MONDAY                  |          ||     ||     ||      E/W:          M.L. KING
                                    |          ||     ||     ||
                                            <<===     ||    ===>>                      PEAK PERIOD
   SURVEY HOURS:                      AA              VV           AA                 APPROACH VOL
  From      7:00 AM             0 =====||                          ||=====     2        NB:      3
  To        10:00 AM                                                                    SB:      3
                                2   =====>>                     <<=====        2        EB:      2
                                                                                        WB:     13
   PEAK HOUR:                   0 =====||                          ||=====     9
  From      08:00 AM                  VV              AA           VV                  PEAK PERIOD
  To        09:00 AM                        <<===     ||    ===>>                     DEPARTURE VOL
                        M.L. KING              ||     ||     ||                         NB:      2
                                               ||     ||     ||                         SB:     12
   PEAK HOUR                                   ||            ||                         EB:      4
   FACTOR:     0.41                            1      0      2                          WB:      3

                                           EMBARCADERO
```

*** 15-MINUTE PERIOD TOTALS ***

From	To	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	VOLUME
07:00 AM -	07:15 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
07:15 AM -	07:30 AM	1	0	0	0	0	0	0	0	0	2	0	0	3
07:30 AM -	07:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	2
07:45 AM -	08:00 AM	0	0	1	0	0	0	0	0	0	1	0	0	2
08:00 AM -	08:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
08:15 AM -	08:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	4
08:30 AM -	08:45 AM	0	0	2	0	3	0	0	1	0	2	1	2	11
08:45 AM -	09:00 AM	1	0	0	0	0	0	0	1	0	2	1	0	5
09:00 AM -	09:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
09:15 AM -	09:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
09:30 AM -	09:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
09:45 AM -	10:00 AM	0	1	1	0	1	1	1	0	0	2	1	0	8

*** HOURLY TOTALS ***

From	To	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	VOLUME
07:00 AM -	08:00 AM	1	0	1	0	2	0	0	0	0	4	0	1	9
07:15 AM -	08:15 AM	1	0	1	0	0	0	0	0	0	5	0	1	8
07:30 AM -	08:30 AM	0	0	1	0	0	0	0	0	0	7	0	1	9
07:45 AM -	08:45 AM	0	0	3	0	3	0	0	1	0	8	1	2	18
08:00 AM -	09:00 AM	1	0	2	0	3	0	0	2	0	9	2	2	21
08:15 AM -	09:15 AM	1	1	2	0	3	0	0	2	0	8	2	2	21
08:30 AM -	09:30 AM	1	1	3	0	3	0	0	2	0	4	2	2	18
08:45 AM -	09:45 AM	1	1	2	0	0	0	0	1	0	2	1	0	8
09:00 AM -	10:00 AM	0	2	3	0	1	1	1	0	0	2	1	0	11

CUSTOM SPREADSHEET DESIGN

** Traffic Data Collection **

VEHICLE CLASSIFICATION SUMMARY

PROJECT: PORT OF OAKLAND
DATE: FEBRUARY 4, 1993
DAY OF WK: THURSDAY
LOCATION: EASTBOUND SEVENTH ST
E/O SEVENTH ST EXT

SURVEY HOURS:
From 3:00 PM
To 6:00 PM

PEAK HOUR:
From 03:30 PM
To 04:30 PM

PEAK HOUR
FACTOR: 0.91

NOTES: PERCENTAGE OF TOTAL VEHICLES BY VEHICLE CLASSIFICATION

TIME PERIOD		TRUCKS	TRUCKS	TRUCKS			AUTOS
From	To	5-5+ AX	4 AX	3 AX	2 AX	/PANEL	VANS
03:00 PM	03:15 PM	10.71%	0.00%	5.36%	4.46%	6.25%	73.21%
03:15 PM	03:30 PM	5.70%	0.00%	5.70%	4.43%	13.29%	70.89%
03:30 PM	03:45 PM	12.00%	0.00%	5.14%	2.29%	4.57%	76.00%
03:45 PM	04:00 PM	21.80%	1.50%	7.52%	1.50%	12.03%	55.64%
04:00 PM	04:15 PM	13.50%	0.00%	7.98%	3.07%	15.34%	60.12%
04:15 PM	04:30 PM	12.50%	0.00%	5.36%	2.98%	15.48%	63.69%
04:30 PM	04:45 PM	10.00%	0.00%	2.94%	4.71%	17.65%	64.71%
04:45 PM	05:00 PM	15.15%	0.00%	6.06%	6.06%	19.19%	53.54%
05:00 PM	05:15 PM	7.74%	0.00%	1.19%	1.79%	27.38%	61.90%
05:15 PM	05:30 PM	4.82%	0.00%	2.41%	3.61%	15.66%	73.49%
05:30 PM	05:45 PM	10.11%	0.00%	2.25%	3.37%	22.47%	61.80%
05:45 PM	06:00 PM	1.35%	0.00%	1.35%	6.76%	29.73%	60.81%

*** 15-MINUTE PERIOD TOTALS ***

From	To	TRUCKS 5-5+ AX	TRUCKS 4 AX	TRUCKS 3 AX	TRUCKS 2 AX	PICK-UP /PANEL	AUTOS							TOTAL VOLUME
03:00 PM -	03:15 PM	12	0	6	5	7	82	0	0	0	0	0	0	112
03:15 PM -	03:30 PM	9	0	9	7	21	112	0	0	0	0	0	0	158
03:30 PM -	03:45 PM	21	0	9	4	8	133	0	0	0	0	0	0	175
03:45 PM -	04:00 PM	29	2	10	2	16	74	0	0	0	0	0	0	133
04:00 PM -	04:15 PM	22	0	13	5	25	98	0	0	0	0	0	0	163
04:15 PM -	04:30 PM	21	0	9	5	26	107	0	0	0	0	0	0	168
04:30 PM -	04:45 PM	17	0	5	8	30	110	0	0	0	0	0	0	170
04:45 PM -	05:00 PM	15	0	6	6	19	53	0	0	0	0	0	0	99
05:00 PM -	05:15 PM	13	0	2	3	46	104	0	0	0	0	0	0	168
05:15 PM -	05:30 PM	4	0	2	3	13	61	0	0	0	0	0	0	83
05:30 PM -	05:45 PM	9	0	2	3	20	55	0	0	0	0	0	0	89
05:45 PM -	06:00 PM	1	0	1	5	22	45	0	0	0	0	0	0	74

*** HOURLY TOTALS ***

From	To	TRUCKS 5-5+ AX	TRUCKS 4 AX	TRUCKS 3 AX	TRUCKS 2 AX	PICK-UP /PANEL	AUTOS							TOTAL VOLUME
03:00 PM -	04:00 PM	71	2	34	18	52	401	0	0	0	0	0	0	578
03:15 PM -	04:15 PM	81	2	41	18	70	417	0	0	0	0	0	0	629
03:30 PM -	04:30 PM	93	2	41	16	75	412	0	0	0	0	0	0	639
03:45 PM -	04:45 PM	89	2	37	20	97	389	0	0	0	0	0	0	634
04:00 PM -	05:00 PM	75	0	33	24	100	368	0	0	0	0	0	0	600
04:15 PM -	05:15 PM	66	0	22	22	121	374	0	0	0	0	0	0	605
04:30 PM -	05:30 PM	49	0	15	20	108	328	0	0	0	0	0	0	520
04:45 PM -	05:45 PM	41	0	12	15	98	273	0	0	0	0	0	0	439
05:00 PM -	06:00 PM	27	0	7	14	101	265	0	0	0	0	0	0	414

*** VEHICLE CLASSIFICATION SUMMARY ***

PROJECT: PORT OF OAKLAND
DATE: FEBRUARY 4, 1993
DAY OF WK: THURSDAY
LOCATION: SOUTHBOUND MARITIME ST
S/O GRAND AVENUE RAMPS

SURVEY HOURS:
From 3:00 PM
To 6:00 PM

PEAK HOUR:
From 03:00 PM
To 04:00 PM

PEAK HOUR
FACTOR: 0.73

NOTES: PERCENTAGE OF TOTAL VEHICLES BY VEHICLE CLASSIFICATION

TIME PERIOD From	To	TRUCKS 5-5+ AX	TRUCKS 4 AX	TRUCKS 3 AX	2 AX	/PANEL	AUTOS VANS
03:00 PM	03:15 PM	16.43%	1.43%	2.86%	3.57%	8.57%	67.14%
03:15 PM	03:30 PM	15.69%	0.00%	3.92%	0.98%	6.86%	72.55%
03:30 PM	03:45 PM	25.74%	0.00%	6.93%	0.00%	7.92%	59.41%
03:45 PM	04:00 PM	11.69%	1.30%	14.29%	1.30%	9.09%	62.34%
04:00 PM	04:15 PM	14.46%	1.20%	12.05%	1.20%	4.82%	66.27%
04:15 PM	04:30 PM	10.49%	0.00%	4.90%	1.40%	4.90%	78.32%
04:30 PM	04:45 PM	20.63%	1.59%	4.76%	1.59%	14.29%	57.14%
04:45 PM	05:00 PM	8.00%	2.00%	2.00%	4.00%	6.00%	78.00%
05:00 PM	05:15 PM	6.45%	4.84%	8.06%	1.61%	1.61%	77.42%
05:15 PM	05:30 PM	5.77%	0.00%	5.77%	0.00%	3.85%	84.62%
05:30 PM	05:45 PM	9.38%	1.56%	12.50%	1.56%	1.56%	73.44%
05:45 PM	06:00 PM	5.41%	0.00%	5.41%	2.70%	5.41%	81.08%

*** 15-MINUTE PERIOD TOTALS ***

From	To	TRUCKS 5-5+ AX	TRUCKS 4 AX	TRUCKS 3 AX	TRUCKS 2 AX	PICK-UP /PANEL	AUTOS							TOTAL VOLUME
03:00 PM -	03:15 PM	23	2	4	5	12	94	0	0	0	0	0	0	140
03:15 PM -	03:30 PM	16	0	4	1	7	74	0	0	0	0	0	0	102
03:30 PM -	03:45 PM	26	0	7	0	8	60	0	0	0	0	0	0	101
03:45 PM -	04:00 PM	9	1	11	1	7	48	0	0	0	0	0	0	77
04:00 PM -	04:15 PM	12	1	10	1	4	55	0	0	0	0	0	0	83
04:15 PM -	04:30 PM	15	0	7	2	7	112	0	0	0	0	0	0	143
04:30 PM -	04:45 PM	13	1	3	1	9	36	0	0	0	0	0	0	63
04:45 PM -	05:00 PM	4	1	1	2	3	39	0	0	0	0	0	0	50
05:00 PM -	05:15 PM	4	3	5	1	1	48	0	0	0	0	0	0	62
05:15 PM -	05:30 PM	3	0	3	0	2	44	0	0	0	0	0	0	52
05:30 PM -	05:45 PM	6	1	8	1	1	47	0	0	0	0	0	0	64
05:45 PM -	06:00 PM	2	0	2	1	2	30	0	0	0	0	0	0	37

*** HOURLY TOTALS ***

From	To	TRUCKS 5-5+ AX	TRUCKS 4 AX	TRUCKS 3 AX	TRUCKS 2 AX	PICK-UP /PANEL	AUTOS							TOTAL VOLUME
03:00 PM -	04:00 PM	74	3	26	7	34	276	0	0	0	0	0	0	420
03:15 PM -	04:15 PM	63	2	32	3	26	237	0	0	0	0	0	0	363
03:30 PM -	04:30 PM	62	2	35	4	26	275	0	0	0	0	0	0	404
03:45 PM -	04:45 PM	49	3	31	5	27	251	0	0	0	0	0	0	366
04:00 PM -	05:00 PM	44	3	21	6	23	242	0	0	0	0	0	0	339
04:15 PM -	05:15 PM	36	5	16	6	20	235	0	0	0	0	0	0	318
04:30 PM -	05:30 PM	24	5	12	4	15	167	0	0	0	0	0	0	227
04:45 PM -	05:45 PM	17	5	17	4	7	178	0	0	0	0	0	0	228
05:00 PM -	06:00 PM	15	4	18	3	6	169	0	0	0	0	0	0	215

*** CSD TRAFFIC DATA ***

```
******************************************* VEHICLE CLASSIFICATION SUMMARY ******************************************

PROJECT:    PORT OF OAKLAND
DATE:       FEBRUARY 4, 1993
DAY OF WK:  THURSDAY
LOCATION:   NORTHBOUND MARITIME ST                   NOTES:    PERCENTAGE OF TOTAL VEHICLES BY VEHICLE CLASSIFICATION
            S/O GRAND AVENUE RAMPS
    SURVEY HOURS:                                      TIME PERIOD     TRUCKS   TRUCKS TRUCKS              AUTOS
  From      3:00 PM                                   From       To    5-5+ AX   4 AX   3 AX   2 AX  /PANEL  VANS
  To        6:00 PM                                 **************************************************************
                                                     03:00 PM 03:15 PM    6.75%  0.84%  2.95%  1.27%  6.75% 81.43%
                                                     03:15 PM 03:30 PM    2.03%  0.41%  4.07%  0.00%  4.07% 89.43%
    PEAK HOUR:                                       03:30 PM 03:45 PM    7.68%  0.00%  0.88%  1.10%  3.51% 86.84%
  From      03:30 PM                                 03:45 PM 04:00 PM   11.93%  0.41%  5.76%  1.23%  2.47% 78.19%
  To        04:30 PM                                 04:00 PM 04:15 PM    9.72%  0.35%  7.29%  0.69%  0.69% 81.25%
                                                     04:15 PM 04:30 PM    9.47%  0.28%  4.46%  0.56%  1.39% 83.84%
                                                     04:30 PM 04:45 PM    6.88%  0.00%  3.67%  0.46%  1.38% 87.61%
    PEAK HOUR                                        04:45 PM 05:00 PM    7.73%  0.00%  3.09%  0.00%  1.03% 88.14%
    FACTOR:     0.74                                 05:00 PM 05:15 PM    2.08%  0.00%  0.00%  0.42%  0.42% 97.08%
                                                     05:15 PM 05:30 PM    2.53%  0.63%  0.00%  0.63%  1.90% 94.30%
                                                     05:30 PM 05:45 PM    5.88%  0.00%  2.35%  1.18%  0.00% 90.59%
                                                     05:45 PM 06:00 PM    5.13%  0.00%  1.28%  0.00%  1.28% 92.31%
*** 15-MINUTE PERIOD TOTALS ***

                         TRUCKS   TRUCKS TRUCKS TRUCKS  PICK-UP                                                  TOTAL
  From          To       5-5+ AX   4 AX   3 AX   2 AX   /PANEL    AUTOS                                          VOLUME

03:00 PM - 03:15 PM          16      2      7      3       16      193      0      0      0      0      0      0    237
03:15 PM - 03:30 PM           5      1     10      0       10      220      0      0      0      0      0      0    246
03:30 PM - 03:45 PM          35      0      4      5       16      396      0      0      0      0      0      0    456
03:45 PM - 04:00 PM          29      1     14      3        6      190      0      0      0      0      0      0    243
04:00 PM - 04:15 PM          28      1     21      2        2      234      0      0      0      0      0      0    288
04:15 PM - 04:30 PM          34      1     16      2        5      301      0      0      0      0      0      0    359
04:30 PM - 04:45 PM          15      0      8      1        3      191      0      0      0      0      0      0    218
04:45 PM - 05:00 PM          15      0      6      0        2      171      0      0      0      0      0      0    194
05:00 PM - 05:15 PM           5      0      0      1        1      233      0      0      0      0      0      0    240
05:15 PM - 05:30 PM           4      1      0      1        3      149      0      0      0      0      0      0    158
05:30 PM - 05:45 PM           5      0      2      1        0       77      0      0      0      0      0      0     85
05:45 PM - 06:00 PM           4      0      1      0        1       72      0      0      0      0      0      0     78

*** HOURLY TOTALS ***

                         TRUCKS   TRUCKS TRUCKS TRUCKS  PICK-UP                                                  TOTAL
  From          To       5-5+ AX   4 AX   3 AX   2 AX   /PANEL    AUTOS                                          VOLUME

03:00 PM - 04:00 PM          85      4     35     11       48      999      0      0      0      0      0      0  1,182
03:15 PM - 04:15 PM          97      3     49     10       34    1,040      0      0      0      0      0      0  1,233
03:30 PM - 04:30 PM         126      3     55     12       29    1,121      0      0      0      0      0      0  1,346
03:45 PM - 04:45 PM         106      3     59      8       16      916      0      0      0      0      0      0  1,108
04:00 PM - 05:00 PM          92      2     51      5       12      897      0      0      0      0      0      0  1,059
04:15 PM - 05:15 PM          69      1     30      4       11      896      0      0      0      0      0      0  1,011
04:30 PM - 05:30 PM          39      1     14      3        9      744      0      0      0      0      0      0    810
04:45 PM - 05:45 PM          29      1      8      3        6      630      0      0      0      0      0      0    677
05:00 PM - 06:00 PM          18      1      3      3        5      531      0      0      0      0      0      0    561

********************************************         CSD TRAFFIC DATA         ******************************************
```

```
PORT-AM.CMD             Tue Dec 28, 1993 09:59:04                 Page 3-1
---------------------------------------------------------------------------
                        Port of Oakland - L.O.S Analysis
                        AM Peak Peak - Existing Condition
                              Dowling Associates
---------------------------------------------------------------------------
                             Impact Analysis Report
                                Level Of Service

Intersection                                Base           Future        Change
                                          Del/   V/       Del/   V/        in
                                      LOS Veh     C   LOS Veh     C
# 10 Market / 3rd                      A   0.0 0.000   A   0.0 0.000   + 0.000 V/C

# 20 Market / Embarcadero              A   1.3 0.080   A   1.3 0.080   + 0.000 V/C

# 21 M. L. King / Embarcadero          A   1.1 0.018   A   1.1 0.018   + 0.000 V/C

# 22 Jefferson / Embarcadero           A   0.0 0.000   A   0.0 0.000   + 0.000 V/C


---------------------------------------------------------------------------
Arterial                                     Base           Future        Change
                                             Trvl   Avg.      Trvl   Avg. in Avg.
                                     Dir LOS Time  Speed LOS Time  Speed  Speed
```

```
PORT-AM.CMD             Tue Dec 28, 1993 09:59:03                 Page 1-1
---------------------------------------------------------------------------
                        Port of Oakland - L.O.S Analysis
                        AM Peak Peak - Existing Condition
                              Dowling Associates
---------------------------------------------------------------------------
                            Turning Movement Report


Volume    Northbound      Southbound       Eastbound       Westbound     Total
Type   Left Thru Right Left Thru Right  Left Thru Right Left Thru Right Volume

#10 Market / 3rd
Base      8    6    15   55   25   225    14   64    10   15  171    25    633
Added     0    0     0    0    0     0     0    0     0    0    0     0      0
Total     8    6    15   55   25   225    14   64    10   15  171    25    633

#20 Market / Embarcadero
Base      5   56     2    3   61     4     5    0     4    1    1     3    145
Added     0    0     0    0    0     0     0    0     0    0    0     0      0
Total     5   56     2    3   61     4     5    0     4    1    1     3    145

#21 M. L. King / Embarcadero
Base      0    2     0    9    2     2     0    3     0    1    0     2     21
Added     0    0     0    0    0     0     0    0     0    0    0     0      0
Total     0    2     0    9    2     2     0    3     0    1    0     2     21

#22 Jefferson / Embarcadero
Base      0    0     0    4    3     2     0    6     1    8    5    13     42
Added     0    0     0    0    0     0     0    0     0    0    0     0      0
Total     0    0     0    4    3     2     0    6     1    8    5    13     42

  Traffix System Version 6.7   (c) 1992 DA      Licensed to Dowling Associates
```

```
2000-AM.CMD              Tue Dec 28, 1993 15:27:42                  Page 5-1
--------------------------------------------------------------------------------
                        Port of Oakland - L.O.S Analysis
            AM Peak Peak - Existing + Project + Cumulative Year 2000
                               Dowling Associates
--------------------------------------------------------------------------------

                             Impact Analysis Report
                                Level Of Service

Intersection                                  Base          Future       Change
                                           Del/   V/       Del/   V/       in
                                       LOS Veh    C    LOS Veh    C
# 10 Market / 3rd                      F   0.0 0.000   F   0.0 0.000   + 0.000 V/C

# 20 Market / Embarcadero              A   2.0 0.209   A   2.1 0.225   + 0.016 V/C

# 21 M. L. King / Embarcadero          A   1.2 0.045   A   1.2 0.049   + 0.005 V/C

# 22 Jefferson / Embarcadero           A   0.0 0.000   A   0.0 0.000   + 0.000 V/C


--------------------------------------------------------------------------------
Arterial                                   Base              Future        Change
                                           Trvl   Avg.       Trvl   Avg.  in Avg.
                                   Dir LOS Time  Speed  LOS  Time  Speed   Speed
```

```
2000-AM.CMD              Tue Dec 28, 1993 15:27:41                  Page 3-1
--------------------------------------------------------------------------------
                        Port of Oakland - L.O.S Analysis
            AM Peak Peak - Existing + Project + Cumulative Year 2000
                               Dowling Associates
--------------------------------------------------------------------------------
                            Turning Movement Report


Volume    Northbound        Southbound       Eastbound        Westbound      Total
Type    Left Thru Right   Left Thru Right  Left Thru Right  Left Thru Right Volume

#10 Market / 3rd
Base      21   16    39    143   65   585    36  166    26    39  445    65   1646
Added      0    0     0      0   10     0     0    0     2     6    0     0     17
Total     21   16    39    143   75   585    36  166    28    45  445    65   1663

#20 Market / Embarcadero
Base      13  146     5      8  159    10    13    0    10     3    3     8    377
Added      0    0     0      0   17     0     0    0     0     2    0     0     19
Total     13  146     5      8  176    10    13    0    10     5    3     8    396

#21 M. L. King / Embarcadero
Base       0    5     0     23    5     5     0    8     0     3    0     5     55
Added      0    0     0      0    0     0     0    0     0     0    2     0      2
Total      0    5     0     23    5     5     0    8     0     3    2     5     57

#22 Jefferson / Embarcadero
Base       0    0     0     10    8     5     0   16     3    21   13    34    109
Added      0    0     0      0    0     0     0    0     0     0    2     0      2
Total      0    0     0     10    8     5     0   16     3    21   15    34    111

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```

```
2000-AM.CMD               Tue Dec 28, 1993 15:27:41                 Page 4-1
-------------------------------------------------------------------------------
                       Port of Oakland - L.O.S Analysis
             AM Peak Peak - Existing + Project + Cumulative Year 2000
                              Dowling Associates
-------------------------------------------------------------------------------
                              Link Volume Report

Volume        NB Link            SB Link            EB Link            WB Link      Total
Type      In  Out  Total    In  Out  Total    In   Out  Total    In  Out  Total Volume

#10 Market / 3rd
Base      75  130    205   793  117    910   229  1050   1279   549  348    897   3292
Added      0   17     17    10    0     10     2     0      2     6    0      6     34
Total     75  147    223   803  117    920   231  1050   1281   554  348    903   3326

#20 Market / Embarcadero
Base     164  172    335   177  166    343    23    26     49    13   13     26    754
Added      0   19     19    17    0     17     0     0      0     2    0      2     38
Total    164  191    354   194  166    360    23    26     49    15   13     28    792

#21 M. L. King / Embarcadero
Base       5    8     13    34   10     44     8     5     13     8   31     39    109
Added      0    0      0     0    0      0     0     2      2     2    0      2      4
Total      5    8     13    34   10     44     8     7     15    10   31     41    113

#22 Jefferson / Embarcadero
Base       0   31     31    23   34     57    18    18     36    68   26     94    218
Added      0    0      0     0    0      0     0     2      2     2    0      2      4
Total      0   31     31    23   34     57    18    20     38    70   26     96    222
```

```
2000-AM.CMD               Tue Dec 28, 1993 15:27:41                 Page 2-1
-------------------------------------------------------------------------------
                       Port of Oakland - L.O.S Analysis
             AM Peak Peak - Existing + Project + Cumulative Year 2000
                              Dowling Associates
-------------------------------------------------------------------------------
                           Trip Distribution Report

                               Percent Of Trips

               To Gates
           1     2     3     4
 Zone    ----- ----- ----- -----

   1     50.0  30.0  10.0  10.0




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```

```
-----------------------------------------------------------------------------
                   Port of Oakland - L.O.S Analysis
                  AM Peak Peak - Existing + Project
                         Dowling Associates
-----------------------------------------------------------------------------

                       Impact Analysis Report
                          Level Of Service

Intersection                                  Base          Future      Change
                                            Del/  V/      Del/  V/        in
                                        LOS Veh    C  LOS Veh    C
# 10 Market / 3rd                        A   0.0 0.000  A  0.0 0.000  + 0.000 V/C

# 20 Market / Embarcadero                A   1.3 0.080  A  1.4 0.086  + 0.006 V/C

# 21 M. L. King / Embarcadero            A   1.1 0.018  A  1.1 0.019  + 0.002 V/C

# 22 Jefferson / Embarcadero             A   0.0 0.000  A  0.0 0.000  + 0.000 V/C


-----------------------------------------------------------------------------
Arterial                                      Base             Future     Change
                                             Trvl  Avg.       Trvl  Avg. in Avg.
                                        Dir LOS Time  Speed LOS Time  Speed  Speed
```

```
-----------------------------------------------------------------------------
                   Port of Oakland - L.O.S Analysis
                  AM Peak Peak - Existing + Project
                         Dowling Associates
-----------------------------------------------------------------------------
                      Turning Movement Report


Volume    Northbound      Southbound      Eastbound       Westbound     Total
Type   Left Thru Right  Left Thru Right  Left Thru Right  Left Thru Right Volume

#10 Market / 3rd
Base      8    6    15    55   25   225    14   64    10    15  171    25    633
Added     0    0     0     0   10     0     0    0     2     6    0     0     17
Total     8    6    15    55   35   225    14   64    12    21  171    25    650

#20 Market / Embarcadero
Base      5   56     2     3   61     4     5    0     4     1    1     3    145
Added     0    0     0     0   17     0     0    0     0     2    0     0     19
Total     5   56     2     3   78     4     5    0     4     3    1     3    164

#21 M. L. King / Embarcadero
Base      0    2     0     9    2     2     0    3     0     1    0     2     21
Added     0    0     0     0    0     0     0    0     0     0    2     0      2
Total     0    2     0     9    2     2     0    3     0     1    2     2     23

#22 Jefferson / Embarcadero
Base      0    0     0     4    3     2     0    6     1     8    5    13     42
Added     0    0     0     0    0     0     0    0     0     0    2     0      2
Total     0    0     0     4    3     2     0    6     1     8    7    13     44
```

```
PRJT-AM.IN                 Tue Dec 28, 1993 10:51:38                 Page 4-1
--------------------------------------------------------------------------------
                           Port of Oakland - L.O.S Analysis
                           AM Peak Peak - Existing + Project
                                  Dowling Associates
--------------------------------------------------------------------------------
                                  Link Volume Report

Volume         NB Link            SB Link            EB Link            WB Link     Total
Type       In  Out  Total     In  Out  Total     In  Out  Total     In  Out  Total Volume

#10 Market / 3rd
Base       29   50     79    305   45    350     88  404    492    211  134    345   1266
Added       0   17     17     10    0     10      2    0      2      6    0      6     34
Total      29   67     96    315   45    360     90  404    494    217  134    351   1300

#20 Market / Embarcadero
Base       63   66    129     68   64    132      9   10     19      5    5     10    290
Added       0   19     19     17    0     17      0    0      0      2    0      2     38
Total      63   85    148     85   64    149      9   10     19      7    5     12    328

#21 M. L. King / Embarcadero
Base        2    3      5     13    4     17      3    2      5      3   12     15     42
Added       0    0      0      0    0      0      0    2      2      2    0      2      4
Total       2    3      5     13    4     17      3    4      7      5   12     17     46

#22 Jefferson / Embarcadero
Base        0   12     12      9   13     22      7    7     14     26   10     36     84
Added       0    0      0      0    0      0      0    2      2      2    0      2      4
Total       0   12     12      9   13     22      7    9     16     28   10     38     88
```

```
PRJT-AM.IN                 Tue Dec 28, 1993 10:51:38                 Page 2-1
--------------------------------------------------------------------------------
                           Port of Oakland - L.O.S Analysis
                           AM Peak Peak - Existing + Project
                                  Dowling Associates
--------------------------------------------------------------------------------
                               Trip Distribution Report

                                   Percent Of Trips

             To Gates
          1     2     3     4
Zone    ----- ----- ----- -----

  1     50.0  30.0  10.0  10.0
```

```
-------------------------------------------------------------------------------------
                           Port of Oakland - L.O.S Analysis
                           AM Peak Peak - Existing Condition
                                  Dowling Associates
-------------------------------------------------------------------------------------
                          Level Of Service Computation Report
                             1985 HCM Unsignalized Method
                                Base Volume Alternative
*************************************************************************************
Intersection #10 Market / 3rd
*************************************************************************************
                                           Level Of Service:                 A
*************************************************************************************
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||--------------
Control:        Stop Sign         Stop Sign        Uncontrolled      Uncontrolled
Rights:           Include           Include           Include           Include
Lanes:        0  1  0  1  0     1  0  2  1  0     0  0  1! 0  0     0  0  1! 0  0
------------|---------------||---------------||---------------||--------------
Volume Module:
Base Vol:         8     6    15    55    25   225    14    64    10    15   171    25
Growth Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:      8     6    15    55    25   225    14    64    10    15   171    25
User Adj:      1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:       1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:       8     6    15    55    25   225    14    64    10    15   171    25
Reduct Vol:       0     0     0     0     0     0     0     0     0     0     0     0
Final Vol.:       8     6    15    55    25   225    14    64    10    15   171    25
------------|---------------||---------------||---------------||--------------
Adjusted Volume Module:
Grade:               0%                0%                0%                0%
% Cycle/Cars:     xxxx  xxxx        xxxx  xxxx        xxxx  xxxx        xxxx  xxxx
% Truck/Comb:     xxxx  xxxx        xxxx  xxxx        xxxx  xxxx        xxxx  xxxx
PCE Adj:       1.10  1.10  1.10  1.10  1.10  1.10  1.10  1.00  1.00  1.10  1.00  1.00
Cycl/Car PCE:     xxxx  xxxx        xxxx  xxxx        xxxx  xxxx        xxxx  xxxx
Trck/Cmb PCE:     xxxx  xxxx        xxxx  xxxx        xxxx  xxxx        xxxx  xxxx
Adj Vol.:         9     7    17    61    28   248    15    64    10    17   171    25
------------|---------------||---------------||---------------||--------------
Critical Gap Module: >> Population: 0 << >> Run Speed(E/W): 30 MPH <<
RT Rad/Ang:    20.0 ft/90.0 deg 20.0 ft/90.0 deg 20.0 ft/90.0 deg 20.0 ft/90.0 de
Critical Gp:    6.5   6.0   5.5   6.5   6.0   5.5   5.0 xxxx xxxxx   5.0 xxxx xxxxx
------------|---------------||---------------||---------------||--------------
Capacity Module:
Cnflict Vol:    544   294    69   308   287   184   196 xxxx xxxxx    74 xxxx xxxxx
Potent Cap.:    459   710  1000   628   717   907   982 xxxx xxxxx  1000 xxxx xxxxx
% Used Cap.:    1.9   0.9   1.7   9.6   3.8  27.3   1.6 xxxx xxxxx   1.7 xxxx xxxxx
Impedance:     xxxx  1.00  0.99  xxxx  0.98  0.80  0.99 xxxx xxxxx  0.99 xxxx xxxxx
Actual Cap.:    353   697  1000   610   703   907   982 xxxx xxxxx  1000 xxxx xxxxx
------------|---------------||---------------||---------------||--------------
Level Of Service Module:
Unused Cap.:    344   690   984   550   676   659   966 xxxx xxxxx   984 xxxx xxxxx
LOS by Move:      *     *     *     A     A     *     A     *     *     A     *     *
Movement:       LT  - LTR  - RT    LT  - LTR  - RT    LT  - LTR  - RT    LT  - LTR  - RT
Shared Cap.:    447  xxxx   889  xxxx  xxxx   881  xxxx  xxxx xxxxx  xxxx  xxxx xxxxx
Unused Cap.:    432  xxxx   866  xxxx  xxxx   606  xxxx  xxxx xxxxx  xxxx  xxxx xxxxx
Shared LOS:       A     *     A     *     *     A     *     *     *     *     *     *
```

```
-------------------------------------------------------------------------------
                      Port of Oakland - L.O.S Analysis
                      AM Peak Peak - Existing Condition
                             Dowling Associates
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
                            4-Way Stop Method
                         Base Volume Alternative
*******************************************************************************
ntersection #20 Market / Embarcadero
*******************************************************************************
ycle (sec):           1              Critical Vol./Cap. (X):        0.080
ss Time (sec):        0              Average Delay (sec/veh):         1.3
ptimal Cycle:         0              Level Of Service:                  A
*******************************************************************************
pproach:     North Bound      South Bound      East Bound       West Bound
ovement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
ontrol:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
ights:          Include          Include          Include          Include
anes:       0  0  1! 0  0    0  1  0  1  0    0  0  1! 0  0    0  0  1! 0  0
-----------|---------------||---------------||---------------||---------------|
olume Module:
ase Vol:       5   56     2     3   61     4     5    0     4     1    1     3
rowth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
nitial Bse:    5   56     2     3   61     4     5    0     4     1    1     3
ser Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
HF Volume:     5   56     2     3   61     4     5    0     4     1    1     3
educt Vol:     0    0     0     0    0     0     0    0     0     0    0     0
educed Vol:    5   56     2     3   61     4     5    0     4     1    1     3
CE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
LF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
inal Vol.:     5   56     2     3   61     4     5    0     4     1    1     3
-----------|---------------||---------------||---------------||---------------|
aturation Flow Module:
at/Lane:     783  783   783   539  539   539   242  242   242    96   96    96
djustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
anes:       0.08 0.89  0.03  0.09 1.79  0.12  0.56 0.00  0.44  0.20 0.20  0.60
inal Sat.:    62  696    25    48  967    63   134    0   108    19   19    58
-----------|---------------||---------------||---------------||---------------|
apacity Analysis Module:
ol/Sat:     0.08 0.08  0.08  0.06 0.06  0.06  0.04 0.00  0.04  0.05 0.05  0.05
rit Moves:       ****                   ****              ****       ****
-----------|---------------||---------------||---------------||---------------|
evel Of Service Module:
elay/Veh:    1.4  1.4   1.4   1.3  1.3   1.3   1.2  1.0   1.2   1.2  1.2   1.2
elay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
djDel/Veh:   1.4  1.4   1.4   1.3  1.3   1.3   1.2  1.0   1.2   1.2  1.2   1.2
ueue:       xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
*******************************************************************************
```

```
--------------------------------------------------------------------------------------
                         Port of Oakland - L.O.S Analysis
                         AM Peak Peak - Existing Condition
                                Dowling Associates
--------------------------------------------------------------------------------------
                         Level Of Service Computation Report
                                4-Way Stop Method
                              Base Volume Alternative
**************************************************************************************
Intersection #21 M. L. King / Embarcadero
**************************************************************************************
Cycle (sec):            1                 Critical Vol./Cap. (X):        0.018
Loss Time (sec):        0                 Average Delay (sec/veh):         1.1
Optimal Cycle:          0                 Level Of Service:                  A
**************************************************************************************
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|----------------||----------------||----------------||----------------
Control:        Stop Sign         Stop Sign         Stop Sign         Stop Sign
Rights:          Include           Include           Include           Include
Lanes:        0  0  2  0  0     0  0  1! 0  0     0  0  1  0  0     0  0  1! 0  0
------------|----------------||----------------||----------------||----------------
Volume Module:
Base Vol:       0    2     0     9    2     2     0    3     0     1    0     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    2     0     9    2     2     0    3     0     1    0     2
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    2     0     9    2     2     0    3     0     1    0     2
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    2     0     9    2     2     0    3     0     1    0     2
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    2     0     9    2     2     0    3     0     1    0     2
------------|----------------||----------------||----------------||----------------
Saturation Flow Module:
Sat/Lane:     351  351   351   736  736   736   236  236   236   203  203   203
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 2.00  0.00  0.70 0.15  0.15  0.00 1.00  0.00  0.33 0.00  0.67
Final Sat.:     0  702     0   510  113   113     0  236     0    68    0   135
------------|----------------||----------------||----------------||----------------
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.02 0.02  0.02  0.00 0.01  0.00  0.01 0.00  0.01
Crit Moves:       ****              ****              ****        ****
------------|----------------||----------------||----------------||----------------
Level Of Service Module:
Delay/Veh:    1.0  1.0   1.0   1.1  1.1   1.1   1.0  1.0   1.0   1.1  1.0   1.1
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   1.0  1.0   1.0   1.1  1.1   1.1   1.0  1.0   1.0   1.1  1.0   1.1
Queue:       xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
**************************************************************************************
```

```
)RT-AM.CMD            Wed Dec 22, 1993 12:52:36                 Page 5-1
---------------------------------------------------------------------------
                    Port of Oakland - L.O.S Analysis
                   AM Peak Peak - Existing Condition
                          Dowling Associates
---------------------------------------------------------------------------
                   Level Of Service Computation Report
                      1985 HCM Unsignalized Method
                        Base Volume Alternative
***************************************************************************
itersection #22 Jefferson / Embarcadero
***************************************************************************
                                    Level Of Service:                  A
***************************************************************************
oproach:     North Bound      South Bound      East Bound       West Bound
ovement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
----------|---------------||---------------||---------------||---------------|
ontrol:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
ights:         Include          Include          Include          Include
anes:       0  0  1! 0  0    0  0  1! 0  0    0  0  0  1  0    0  0  1! 0  0
----------|---------------||---------------||---------------||---------------|
olume Module:
ase Vol:       0    0     0     4    3     2     0    6     1     8    5    13
rowth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
itial Bse:     0    0     0     4    3     2     0    6     1     8    5    13
ser Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
[F Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
[F Volume:     0    0     0     4    3     2     0    6     1     8    5    13
educt Vol:     0    0     0     0    0     0     0    0     0     0    0     0
inal Vol.:     0    0     0     4    3     2     0    6     1     8    5    13
----------|---------------||---------------||---------------||---------------|
djusted Volume Module:
rade:             0%                0%               0%                0%
 Cycle/Cars:   xxxx xxxx        xxxx xxxx        xxxx xxxx        xxxx xxxx
 Truck/Comb:   xxxx xxxx        xxxx xxxx        xxxx xxxx        xxxx xxxx
CE Adj:     1.10 1.10  1.10  1.10 1.10  1.10  1.10 1.00  1.00  1.10 1.00  1.00
ycl/Car PCE:   xxxx xxxx        xxxx xxxx        xxxx xxxx        xxxx xxxx
rck/Cmb PCE:   xxxx xxxx        xxxx xxxx        xxxx xxxx        xxxx xxxx
j Vol.:        0    0     0     4    3     2     0    6     1     9    5    13
----------|---------------||---------------||---------------||---------------|
ritical Gap Module: >> Population: 0 << >> Run Speed(E/W): 30 MPH <<
 Rad/Ang:   20.0 ft/90.0 deg 20.0 ft/90.0 deg 20.0 ft/90.0 deg 20.0 ft/90.0 deg
ritical Gp:  6.5  6.0   5.5   6.5  6.0   5.5   5.0 xxxx xxxxx   5.0 xxxx xxxxx
----------|---------------||---------------||---------------||---------------|
apacity Module:
nflict Vol:   38   33     7    27   27    12    18 xxxx xxxxx     7 xxxx xxxxx
tent Cap.:   883  961  1000   894  968  1000  1000 xxxx xxxxx  1000 xxxx xxxxx
 Used Cap.:  0.0  0.0   0.0   0.5  0.3   0.2   0.0 xxxx xxxxx   0.9 xxxx xxxxx
npedance:   xxxx 1.00  1.00  xxxx 1.00  1.00  1.00 xxxx xxxxx  1.00 xxxx xxxxx
ctual Cap.:  883  961  1000   894  968  1000  1000 xxxx xxxxx  1000 xxxx xxxxx
----------|---------------||---------------||---------------||---------------|
evel Of Service Module:
nused Cap.:  883  961  1000   889  965   998  1000 xxxx xxxxx   991 xxxx xxxxx
S by Move:     *    *     *     *    *     *     *    *     *     A    *     *
ovement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
hared Cap.: xxxx xxxx xxxxx  xxxx  940 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
nused Cap.: xxxx    0 xxxxx  xxxx  930 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
hared LOS:     *    *     *     *    A     *     *    *     *     *    *     *

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```

```
--------------------------------------------------------------------------------
                    Port of Oakland - L.O.S Analysis
       AM Peak Peak - Existing + Project + Cumulative Year 2000
                          Dowling Associates
--------------------------------------------------------------------------------

                  Level Of Service Computation Report
                     1985 HCM Operations Method
                      Base Volume Alternative
********************************************************************************
Intersection #10 Market / 3rd
********************************************************************************
Cycle (sec):          60              Critical Vol./Cap. (X):          0.841
Loss Time (sec):       8              Average Delay (sec/veh):          13.1
Optimal Cycle:        63              Level Of Service:                    B
********************************************************************************
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||-------------
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  1  0  1  0    1  0  2  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||-------------
Volume Module:
Base Vol:       8    6    15   55   25   225   14   64    10   15  171    2
Growth Adj:  2.60 2.60  2.60 2.60 2.60  2.60 2.60 2.60  2.60 2.60 2.60  2.6
Initial Bse:   21   16    39  143   65   585   36  166    26   39  445    6
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.0
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.0
PHF Volume:    21   16    39  143   65   585   36  166    26   39  445    6
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   21   16    39  143   65   585   36  166    26   39  445    6
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.0
MLF Adj:     1.00 1.00  1.00 1.00 1.05  1.00 1.00 1.00  1.00 1.00 1.00  1.0
Final Vol.:    21   16    39  143   68   585   36  166    26   39  445    6
------------|---------------||---------------||---------------||-------------
Saturation Flow Module:
Sat/Lane:    1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800  180
Adjustment:  0.58 0.58  0.85 0.81 1.00  0.85 0.67 0.67  0.67 0.88 0.88  0.8
Lanes:       0.57 0.43  1.00 1.00 2.00  1.00 0.16 0.73  0.11 0.07 0.81  0.1
Final Sat.:   593  451  1530 1458 3600  1530  190  875   137  113 1284   18
------------|---------------||---------------||---------------||-------------
Capacity Analysis Module:
Vol/Sat:     0.04 0.04  0.03 0.10 0.02  0.38 0.19 0.19  0.19 0.35 0.35  0.3
Crit Moves:                             ****                       ****
Green/Cycle: 0.45 0.45  0.45 0.45 0.45  0.45 0.41 0.41  0.41 0.41 0.41  0.4
Volume/Cap:  0.08 0.08  0.06 0.22 0.04  0.84 0.46 0.46  0.46 0.84 0.84  0.8
------------|---------------||---------------||---------------||-------------
Level Of Service Module:
Delay/Veh:    7.0  7.0   7.0  7.5  6.9  16.8 10.2 10.2  10.2 18.8 18.8  18.
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.0
ProgAdjFctr: 0.85 0.85  0.85 1.00 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.8
AdjDel/Veh:   6.0  6.0   5.9  7.5  5.9  14.3  8.7  8.7   8.7 16.0 16.0  16.
Queue:          1    1     1    1    6    11    3    3     3   10   10    1
********************************************************************************


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------------------------------------------------------------------------------
                    Port of Oakland - L.O.S Analysis
        AM Peak Peak - Existing + Project + Cumulative Year 2000
                          Dowling Associates
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               Level Of Service Detailed Computation Report
                        1985 HCM Operations Method
                          Base Volume Alternative
******************************************************************************
tersection #10 Market / 3rd
******************************************************************************
proach:      North Bound      South Bound      East Bound       West Bound
vement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
----------|---------------||---------------||---------------||---------------|
M Ops Adjusted Lane Utilization Module:
nes:        0  1  0  0  1    1  0  2  0  1    0  0  1! 0  0    0  0  1! 0  0
ne Group:   LT   LT    R     L    T     R    LTR  LTR   LTR   LTR  LTR   LTR
nsInGrps:     1    1     1     1    2     1     1    1     1     1    1     1
----------|---------------||---------------||---------------||---------------|
M Ops Input Saturation Adj Module:
ne Width:    12   12    12    12   12    12    12   12    12    12   12    12
Hev Veh:          0                0                0                0
ade:             0%               0%               0%               0%
rking/Hr:        No               No               No               No
s Stp/Hr:         0                0                0                0
ea Type:    < < < < < < < < < < < < < < Other > > > > > > > > > > > > > > >
ft Ped/Hr:        0                0                0                0
clusiveRT:     Include          Include          Include          Include
RT Prtct:         0                0                0                0
----------|---------------||---------------||---------------||---------------|
M Ops f(rt) and f(lt) Adj Case Module:
rt) Case:  xxxx xxxx     2  xxxx xxxx     2     7    7     7     7    7     7
lt) Case:     5    5  xxxx     2 xxxx  xxxx     7    7     7     7    7     7
----------|---------------||---------------||---------------||---------------|
M Ops Saturation Adj Module:
 Wid Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
v Veh Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
ade Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
rking Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  1.00 1.00  1.00
s Stp Adj: xxxx xxxx  1.00  xxxx xxxx  1.00  1.00 1.00  1.00  1.00 1.00  1.00
ea Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
 Adj:      xxxx xxxx  0.85  xxxx xxxx  0.85  0.89 0.89  0.89  0.88 0.88  0.88
 Adj:      0.58 0.58 xxxxx  0.81 xxxx xxxxx  0.75 0.75  0.75  1.00 1.00  1.00
M Sat Adj: 0.58 0.58  0.85  0.81 1.00  0.85  0.67 0.67  0.67  0.88 0.88  0.88
r Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
F Sat Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
l Sat Adj: 0.58 0.58  0.85  0.81 1.00  0.85  0.67 0.67  0.67  0.88 0.88  0.88
----------|---------------||---------------||---------------||---------------|
ogresssion Adjustment Factor Module:
gnal Type:  < < < < < < < < < < < <    Actuated    > > > > > > > > > > > > >
lume/Cap:  0.08 0.08  0.06  0.22 0.04  0.84  0.46 0.46  0.46  0.84 0.84  0.84
rivalType:         3                3                3                3
ogAdjFctr: 0.85 0.85  0.85  1.00 0.85  0.85  0.85 0.85  0.85  0.85 0.85  0.85
```

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MITIG8                    Tue Dec 28, 1993 15:42:46                    Page 1-1
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                     Port of Oakland - L.O.S Analysis
         AM Peak Peak - Existing + Project + Cumulative Year 2000
                           Dowling Associates
-------------------------------------------------------------------------------
                   Level Of Service Computation Report
                     Circular 212 Planning Method
                       Future Volume Alternative
*******************************************************************************
Intersection #10 Market / 3rd
*******************************************************************************
Cycle (sec):          47              Critical Vol./Cap. (X):         0.607
Loss Time (sec):       0              Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        47              Level Of Service:                   B
*******************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||------------
Control:        Permitted        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0
Lanes:       0  1  0  1  0    1  0  2  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|----------------||----------------||----------------||------------
Volume Module:
Base Vol:      8    6    15   55   25   225   14   64    10   15  171    2
Growth Adj: 2.60 2.60  2.60 2.60 2.60  2.60 2.60 2.60  2.60 2.60 2.60  2.6
Initial Bse:  21   16    39  143   65   585   36  166    26   39  445    6
Added Vol:     0    0     0    0   10     0    0    0     2    6    0
Initial Fut:  21   16    39  143   75   585   36  166    28   45  445    6
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.0
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.0
PHF Volume:   21   16    39  143   75   585   36  166    28   45  445    6
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  21   16    39  143   75   585   36  166    28   45  445    6
PCE Adj:    1.11 1.00  1.00 1.00 1.00  1.00 1.57 1.00  1.00 1.21 1.00  1.0
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.0
Final Vol.:   23   16    39  143   75   585   57  166    28   54  445    6
------------|----------------||----------------||----------------||------------
Saturation Flow Module:
Sat/Lane:   1425 1425  1425 1425 1425  1425 1425 1425  1425 1425 1425  142
Adjustment: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.0
Lanes:      0.57 0.43  1.00 1.00 2.00  1.00 0.23 0.66  0.11 0.10 0.79  0.1
Final Sat.:  851  649  1500 1425 2850  1425  341  992   167  144 1184   17
------------|----------------||----------------||----------------||------------
Capacity Analysis Module:
Vol/Sat:    0.02 0.02  0.03 0.10 0.03  0.41 0.11 0.17  0.17 0.31 0.38  0.3
Crit Moves: ****           ****            ****                  ****
Green/Cycle: 0.04 0.04 0.04 0.17 0.21  0.21 0.17 0.28  0.28 0.52 0.62  0.6
Volume/Cap: 0.61 0.61  0.64 0.61 0.13  1.99 0.61 0.61  0.61 0.61 0.61  0.6
*******************************************************************************




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10 Base.

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ITIG8                  Tue Dec 28, 1993 15:42:34                  Page 1-1
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                     Port of Oakland - L.O.S Analysis
         AM Peak Peak - Existing + Project + Cumulative Year 2000
                           Dowling Associates
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
                       Circular 212 Planning Method
                          Base Volume Alternative
*******************************************************************************
ntersection #10 Market / 3rd
*******************************************************************************
ycle (sec):          46            Critical Vol./Cap. (X):           0.599
oss Time (sec):       0            Average Delay (sec/veh):          xxxxxx
ptimal Cycle:        46            Level Of Service:                      A
*******************************************************************************
pproach:      North Bound      South Bound       East Bound       West Bound
ovement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
ontrol:         Permitted        Protected        Permitted        Permitted
ights:           Include          Include          Include          Include
in. Green:     0     0     0    0     0     0    0     0     0    0     0     0
anes:        0  1  0  1  0    1  0  2  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
olume Module:
ase Vol:       8     6    15   55    25   225   14    64    10   15   171    25
rowth Adj:  2.60  2.60  2.60 2.60  2.60  2.60 2.60  2.60  2.60 2.60  2.60  2.60
nitial Bse:   21    16    39  143    65   585   36   166    26   39   445    65
ser Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
HF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
HF Volume:    21    16    39  143    65   585   36   166    26   39   445    65
educt Vol:     0     0     0    0     0     0    0     0     0    0     0     0
educed Vol:   21    16    39  143    65   585   36   166    26   39   445    65
CE Adj:     1.08  1.00  1.00 1.00  1.00  1.00 1.57  1.00  1.00 1.21  1.00  1.00
LF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
inal Vol.:    23    16    39  143    65   585   57   166    26   47   445    65
------------|---------------||---------------||---------------||---------------|
aturation Flow Module:
at/Lane:    1425  1425  1425 1425  1425  1425 1425  1425  1425 1425  1425  1425
djustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
anes:       0.57  0.43  1.00 1.00  2.00  1.00 0.23  0.67  0.10 0.08  0.80  0.12
inal Sat.:   851   649  1500 1425  2850  1425  343  1000   157  127  1198   175
------------|---------------||---------------||---------------||---------------|
apacity Analysis Module:
ol/Sat:     0.02  0.02  0.03 0.10  0.02  0.41 0.10  0.17  0.17 0.31  0.37  0.37
rit Moves:  ****             ****                   ****        ****
reen/Cycle: 0.04  0.04  0.04 0.17  0.21  0.21 0.17  0.28  0.28 0.51  0.62  0.62
olume/Cap:  0.60  0.60  0.63 0.60  0.11  1.97 0.60  0.60  0.60 0.60  0.60  0.60
*******************************************************************************



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Appendix D
AIR QUALITY

■ ■ ■

CALINE-4 AIR QUALITY MODELING

The CALINE-4 model is a fourth-generation line source air quality model that is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway.[1] Given source strength, meteorology, site geometry and site characteristics, the model predicts pollutant concentrations for receptors located within 150 meters of the roadway. The CALINE-4 model allows roadways to be broken into multiple links that can vary in traffic volume, emission rates, height, width, etc.

A screening-level form of the CALINE-4 program was used to predict concentrations.[2] The intersection mode of the screening model was employed, which superimposes the worst case concentrations of the two intersecting roadways. Normalized concentrations for each roadway size (2 lanes, 4 lanes, etc.) are adjusted for the two-way traffic volume and emission factor. Calculations were made for distances of 25 feet from the roadway curbline.

Emission factors were derived from the California Air Resources Board EMFAC-7F computer model. Average vehicle speed at each intersection was assumed to be 5 MPH.

The CALINE-4 model calculates the local contribution of nearby roads to the total concentration. The other contribution is the background level attributed to more distant traffic. The 1-hour background level was taken as 4.6 PPM in 1995 and 3.7 PPM in 2000.

To calculate 8-hour concentrations from the 1-hour output of the CALINE-4 model, a persistence factor of 0.65 was employed, which was the ratio of 8-hour to 1-hour annual maximum concentrations measured at the Oakland monitoring station in 1992.

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[1] California Department of Transportation, *CALINE-4- A Dispersion Model for Predicting Air Pollutant Concentrations Near Roadways,* Report No. FHWA/CA/TL-84-15, 1984.

[2] Bay Area Air Quality Management District, *Air Quality and Urban Development-Guidelines,* November 1985, Revised 1991.

METHODOLOGY FOR ESTIMATING REGIONAL EMISSIONS

Employee Travel

Estimates of regional emissions generated by project employees were made using a program called URBEMIS-3. URBEMIS-3 estimates the emissions based on trip generation that would result from various land use development projects.

URBEMIS-3 contains default values for much of the information needed to calculate emissions. However, project-specific, user-supplied information can also be used when it is available.

The following is a description of the parameters that were used in the regional air quality analysis of the proposed project:

Ambient Temperature: 60 degrees F.

Trip Lengths:

Work	11.2 miles
Non-Work	4.7 miles

Year of Analysis: 1995

Average Speed: 35 miles per hour for all trip types.

Ships and Tugs

The peak day emission calculation assumed 1 ship movement. It was assumed that the ship would travel 1.5 hours within the air basin, with one 3600-horsepower tug providing assistance over a 1.0 hour period. The ship was assumed to be in the cruise mode, while the tug was assumed to be operating at two-thirds of capacity. While moored at the wharf, two diesel shipboard 500 Kw generators were assumed to be in use at 25 percent load.

The total fuel usage was calculated for each of these sources. The tugboat fuel usage rate was assumed to be 170 gallons/hour, the ship fuel usage rate was assumed to be 200 gallons/hour, and the ship generators were assumed to use 12.3 gallons per hour each.[3] The fuel usage was multiplied by emission factors for each source published by the U. S. Environmental Protection Agency.[4]

Truck Travel

The daily increase in Vehicle Miles Travelled for trucks was calculated based upon the maximum daily truck generation resulting from the project. Local trips were assumed to involve 50 miles of travel within the San Francisco Bay air basin. Intermodal trips were assumed to result in an average of 5 miles of travel within the San Francisco Bay air basin. The total daily VMT estimated for all new truck travel within the air basin was 88,890.

The emissions associated with this truck travel was estimated by multiplying the VMT by emission factors for heavy duty diesel trucks generated by the EMFAC-7F model, the current emissions model for vehicles in California. The analysis was carried out assuming a 1995 vehicle fleet, an average temperature of 75 degrees, and an average vehicle speed of 45 miles per hour.

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[3] Environmental Science Associates, *USS-POSCO Industries Environmental Assessment*, January 1991.

[4] U. S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors*, Volume II, AP-42, Fourth Edition, 1985.

Appendix E
HAZARDOUS MATERIALS

■ ■ ■

Charles P. Howard Terminal Expansion
Administrative Draft EIR

Summary Report
Previous Investigative Activities and Results At and Near Howard Terminal Site
Port of Oakland

April 14, 1994

Prepared for
Port of Oakland
Oakland, California

Prepared by
Uribe & Associates
Oakland, California

Summary Report of Previous Investigative Activities and Results At and Near Howard Terminal Site, Port of Oakland

Contents

1 INTRODUCTION

This report summarizes the scope and results of various investigative activities completed at and near the Howard Terminal Site, Port of Oakland, California (Figure 1), between about July 1985 and March 1994. This summary is submitted in response to a request from the Port of Oakland (Port) to provide 1) a convenient reference that collects into one document an accounting of the environmental investigations and their results; and 2) a discussion of the perceived environmental significance of those results.

For the purpose of this report, the Howard Terminal Site is divided into two parcels, referred to as the Howard Terminal Site-West (HTS-W) and the Howard Terminal Site-East (HTS-E). The parcels are separated by a southwestward "extension" of the current Market Street. The HTS-W is bounded on the north by the Embarcadero and on the west by property occupied by the Schnitzer Steel Products company. The HTS-E is bounded on the north by the irregularly-shaped PG&E "Gas Load Center" and on the east by Martin Luther King, Jr., Way. Both parcels are bounded on the south by the Oakland Inner Harbor (Figure 2).

This summary is based on the information contained within:

1. A report of an "Investigation of Soil Contamination at the Howard Terminal Site, Oakland, California," dated May 27, 1986, prepared by ERM-West of Walnut Creek, California. A copy of this report was provided by the Port.

   The ERM-West report documents the results of a site assessment involving the drilling of a series of 25 soil borings on the northern half of the HTS-E (Figure 2). Four of the borings were completed as groundwater monitoring wells. The report summarizes the results of laboratory analysis of soil and groundwater samples collected from the borings and wells. ERM-West undertook the investigation because of the concern the Port had regarding the past use of the property and implications for planned development activities.

2. A "Preliminary Endangerment Assessment Report for PG&E's Former Manufactured Gas Plant Sites" (Volumes 1 and 2), dated September 1991, prepared by Ebasco Environmental of San Francisco, California. A copy of this report was provided by the Port. Included in the report is a heath risk assessment.

   The Ebasco report documents the results of assessments at PG&E's "Gas Loading Center," located adjacent to the HTS-E on its north side, and electric generating facility "Station C," located to the northeast of the HTS-E across the Embarcadero (Figure 2). The assessments involved the collection and laboratory analysis of a) a series of 8 surface samples (referred to by Ebasco as "background" samples); b) samples collected from 8 shallow holes augered by hand from 0.5 to 5.0 feet below ground surface (bgs); c) samples collected between 0.5 and 10.5 bgs from 7 drilled soil borings; and d) groundwater samples collected from two monitoring wells completed in two of the drilled borings.

3. Several U&A memoranda to the Port plus recent sample location and analytical results information submitted to the Port by Riedel Environmental Services, Inc. (Riedel), of Richmond, California.

   The U&A memoranda refer to soil and groundwater sampling requested by the Port and resulting laboratory analytical data following collection of a) soil samples from trenches excavated at the scales on the HTS-W; b) soil samples from an excavation stockpile formerly located at the southern-most end of the parking area between the PG&E Gas Loading Center and the Embarcadero; and c) groundwater "grab" samples collected from former trench pits excavated along the southern edge of the same parking area.

   The Riedel information relates to soil samples collected at the Port's request from trenches excavated at the HTS-W scales.

4. A collection of engineering plan sheets entitled "Charles P. Howard Terminal, Construction of Dike, Fill and Concrete Wharf, Oakland, California," dated June 26, 1980. These sheets were prepared for the Port by Santa Fe-Jordan/Avent (address unknown).

   The Port provided copies of the sheets to U&A with the request that the dredging, excavation, and filling of the southern portion of the Howard Terminal Site, as indicated on the plans, be accounted for in this report. Figure 3 of this report indicates the portion of the Howard Terminal Site (extending across both the HTS-W and HTS-E) where the dredging and filling was completed. An inquiry to Mr. Jerry Serventi, of the Port's Engineering Design Department, revealed the filling was begun in December 1980 and was completed in July 1981. The filling was accomplished by the placement of clean fill material (mostly sand) imported from locations within the San Francisco Bay Area.

   The engineering plan sheets also indicate that PG&E facilities occupied at least the eastern portion of the HTS-W (in addition to the HTS-E) at the time the plans were drawn. Past use of this portion of the Howard Terminal Site by PG&E was not accounted for in either the ERM-West or Ebasco reports.

2 SITE HISTORY

The site history information summarized in this section is taken mainly from the May 27, 1986, report by ERM-West with additional information taken from the 1991 report by Ebasco.

Development of at least the portion of the HTS-E investigated by ERM-West dates to around the turn of the century. The Oakland Gas, Light and Heat Company owned and operated the property until the formation of the Pacific Gas and Electric Company (PG&E) in 1905. The property was the former location of a manufactured gas plant that went into operation in 1903 and produced gas from crude oil. The gasification process produced a by-product known as "lampblack." Lampblack is a sooty substance, formed of nearly pure carbon, that is produced from the incomplete combustion of carbonaceous materials such as crude oil. Lampblack was used as boiler fuel. Surplus lampblack was made into briquettes for use as an alternative fuel to coal. Large quantities of lampblack (as much as 50,000 tons) were stockpiled on the property for drying prior to use. Wastes typically associated with such plants include tar residues, sludges, spent oxide wastes, and ash materials:

- Tar sludges were formed from residual heavy hydrocarbons in the coke feedstock or when oil was injected into the gas by-product. Tars were often sold for refining into various products such as creosote and fuel. The chemical constituents found in tars are primarily polynuclear aromatic hydrocarbons (PAHs).

- Oxide box wastes were generated from the use of iron oxide as a purifier to remove hydrogen sulfide from the gas product. These wastes usually contain high concentrations of sulfur, cyanide, and ammonia compounds.

- Emulsions and contaminated liquors were formed during cleaning of the gas product, especially as excess water vapor was condensed.

- Ash and clinkers were generated from the ash in the coke or coal feed. These materials are relatively inert although some leaching of trace elements may have occurred.

The former gas plant facilities included crude oil tanks, lampblack separators (assumed by ERM-West to be where the lampblack was stockpiled and allowed to dry), gas holders, purifiers, a boiler house, a station meter house, and several pump houses. Ebasco reported the plant was dismantled in 1961. Based on the engineering plans supplied by the Port, it is likely the manufactured gas plant activities, if not related facilities, extended to include portions of the HTS-W in addition to the HTS-E. These activities may have included the stockpiling of the lampblack. In fact, Mr. Serventi also indicated that during construction activities undertaken by the Port in 1980 and 1981, either lampblack or a sludge-like material was encountered in trenches excavated near the southeast corner of the portion of the HTS-W, near the area of dredging and filling referred to above (Figure 3).

3 SUMMARY

The summary that follows is organized chronologically. Each section briefly describes the scope and results of the investigation by the respective consulting firm. The locations where soil and groundwater samples were collected, including borings and wells, are indicated on Figure 2 and are differentiated by consultant. The results of the soil and groundwater sample analyses are summarized in data tables included in a "Tables" section. Following the summary is a discussion of the environmental significance of the results of the investigations.

PRIOR TO AUGUST 2, 1985: ERM-WEST

As a preliminary screening step to subsequent investigations, including a "reconnaissance soil gas survey," soil boring and soil sampling, and monitoring well installation and sampling, ERM-West examined soil boring logs prepared by Woodward-Clyde Consultants of Pleasant Hill, California. The logs were generated as a result of a geotechnical investigation of the property comprising the HTS-E. On the basis of the logs, three samples stored by Woodward-Clyde were selected by ERM-West for laboratory analysis. The ERM-West report did not contain any information about either the manner of the storage or the length of time the samples were stored prior to analysis. Also, ERM-West did not report the locations of the geotechnical borings from which the samples were selected. However, the depths of the three samples were indicated as between 2.5 and 8.5 feet bgs.

The three samples were composited into one for analysis of PAHs. The results of the analysis were reported to the Port by ERM-West in a letter dated August 2, 1985. ERM-West reported the total PAH concentration at 22,480 mg/kg. The results of individual PAH constituents are summarized in Table 1 of this report. No laboratory analytical reports or chain-of-custody form(s) accompanied the copy of the August 2, 1985, letter.

Because several of the detected PAHs are known or suspected carcinogens, ERM-West recommended: "any planned activity at this site (i.e., that portion of the HTS-E) be restricted to minimize direct contact to humans to these subsurface materials." The August 2, 1985, letter did not address the portion of the Port property referred to here as the HTS-W.

APRIL 1986: ERM-WEST

ERM-West reported that its investigation in April 1986 was conducted in two phases. The first phase included a reconnaissance soil gas survey. However, no detailed documentation regarding the survey was included in the May 27, 1986, report except for a) it was conducted on April 2, 1986; b) a portable soil gas sensor was used for the detection of hydrogen sulfide and mercaptan compounds to indicate localized areas of elevated gas concentrations; and c) results of the survey were briefly noted on four of the boring logs (B1 through B4) generated during the second phase of the investigation.

The second phase of the ERM-West investigation included drilling and sampling 25 soil borings (B1 through B25) on April 8 through 10, 1986, to depths between 10 and 11.5 feet bgs. Four of these borings (B2, B5, B8, and B14) were completed as 2-inch-diameter groundwater monitoring wells. The other 21 borings were backfilled with drill cuttings. The locations of the borings and wells, all on the HTS-E, are indicated on Figure 2 of this report.

Analysis of 22 of the 26 soil samples collected from the borings (representing 21 of the 25 boring locations) indicated detectable concentrations of semi-volatile organic compounds, including PAHs, volatile organic compounds (VOCs), and non-priority organic pollutants. Total PAH concentrations ranged from 0.9 to 6,370 mg/kg. The highest PAH concentrations were found in samples collected from the borings drilled in the central and south-central portions of the area investigated. Samples collected from B4, B7, B19, and B25 (Figure 2) were analyzed for VOCs, including benzene, toluene, ethylbenzene, and total xylenes (BTEX), and the non-priority pollutants. Only the sample from B19 did not indicate any detectable concentrations of BTEX. In the other samples, benzene ranged from 0.13 to 0.72 mg/kg. Toluene ranged from 0.009 to 0.30 mg/kg. Ethylbenzene ranged from 0.22 to 0.33 mg/kg. Total xylenes ranged from 0.078 to 0.49 mg/kg. The analytical results are summarized in Table 2 of this report.

ERM-West reported that the 25 borings were drilled in and around the former locations of lampblack separators and stockpiles. These facilities were associated with the historic use, dating back to the early 1900s, of what is now the Howard Terminal Site as a manufactured gas plant. The subsurface materials encountered during the drilling of the borings included 1) a layer of "surface rubble" to approximately 2 to 3 feet bgs; and 2) a 0.5- to 3-foot layer of "sludge-like" material between approximately 3 and 7 feet bgs (between 9 and 10 feet bgs in one boring). The sludge-like material was described as black and extremely dense and tarry, with a strong asphalt-like hydrocarbon odor. This layer was encountered mainly in the borings located within the central portion of the area investigated.

During the drilling, groundwater was encountered from 3.7 to 9 feet bgs and stabilized in the wells at about 4 feet bgs. ERM-West assumed a groundwater flow direction toward the Inner Harbor to the south-southwest.

Laboratory analysis of groundwater samples collected from the wells installed in B2, B5, B8, and B14 indicated low mg/l concentrations of PAH, BTEX, and a non-priority pollutant organic compound (styrene). Total PAH concentrations ranged from 0.10 to 12.0 mg/l (B8). Concentrations of one or more of the BTEX compounds were detected in the samples from three (B2, B8, and B14) of the wells and ranged from 0.008 to 12.0 mg/l (B2 and B8). This was the same range of concentrations for benzene. The analytical results are summarized in Table 3 of this report. ERM-West reported the highest concentrations of the constituents detected in the groundwater samples coincided with the area of highest concentrations of the constituents detected in the soil boring samples. Neither the ERM-West report nor its appended laboratory analytical reports and chain-of-custody forms indicated the groundwater samples were filtered prior to analysis. No standard operating procedures, including sample collection and preparation, were included with the report.

The ERM-West report did not address the HTS-W portion of the Port property.

MARCH 1991: EBASCO ENVIRONMENTAL

The sampling activities conducted by Ebasco for the Preliminary Endangerment Assessment included a) surface soil sampling and shallow subsurface soil sampling by hand auger at PG&E's Station C; b) soil boring and sampling and groundwater monitoring well installation and sampling at PG&E's Gas Load Center; and c) "background" surface soil sampling at four different parcels located to the north and northeast of the Gas Load Center (Figure 2). None of Ebasco's sampling locations were at either the HTS-W or HTS-E.

The depths of the soil samples collected from the 8 hand-augered borings ranged from 0.5 to 5.0 feet bgs. The depths of the soil samples collected from the 7 borings drilled for soil sampling and the monitoring wells ranged from 0.5 to 10.5 feet bgs, depending on where groundwater was encountered. During the drilling, groundwater was encountered between 4 and 7 feet bgs. On the basis of incomplete information, Ebasco inferred the direction of groundwater flow to be toward the southwest. All borings not completed as wells were abandoned by backfilling with cement grout.

The materials of the subsurface encountered during the drilling included 4 to 6 feet of fill, described as consisting of silty to gravely sand with occasional fragments of wood, steel, concrete and brick. Encountered below the fill, extending to approximately 8 feet bgs, was a fine, silty sand with discontinuous clayey zones. Between approximately 8 and 19 feet bgs, the materials primarily consisted of fine silty sand to sandy silt. Black staining and/or black liquid (either lampblack or sludge?) was noted as shallow as approximately 2 feet bgs to as deep as between 16.5 and 18 feet bgs (boring for well MW-OAK-1).

The soil and groundwater samples collected for the Preliminary Endangerment Assessment were analyzed for:

- PAH compounds
- VOCs, including BTEX
- Total petroleum hydrocarbons, characterized as gasoline (TPH-G), diesel (TPH-D), kerosene (TPH-K), and motor oil (TPH-MO)
- Metals (CAM 17)
- Ammonia and total cyanides
- Sulfides and total phenols
- Acidity (pH)

In addition, selected samples collected from the borings augered by hand at Station C were analyzed for polychlorinated biphenols (PCBs). The "background" samples were analyzed only for PAHs and metals.

The following subsections summarize the analytical results as reported by Ebasco:

PG&E Station C and "Background" Surface Soils

As indicated by Ebasco, the areas including and surrounding the Howard Terminal Site are zoned as Heavy and General Industrial and exposed soils in the vicinity "are typical of an area with an industrial history such as Oakland."

The laboratory results for the Station C and "background" surface soil samples are summarized in Table 4 of this report.

PAH Compounds

Total PAH concentrations detected in the Station C surface soil samples ranged from 1.98 to 5.26 mg/kg. Total PAH concentrations detected in the "background" samples ranged from 1.3 to 41.8 mg/kg.

BTEX

Concentrations of one or more of the BTEX compounds were detected in all the surface soil samples collected at Station C. Benzene ranged from 0.015 to 0.12 mg/kg. Toluene ranged from 0.008 to 0.05 mg/kg. Ethylbenzene ranged from below the method detection limit to 0.01 mg/kg. Total xylenes ranged from 0.006 to 0.03 mg/kg.

TPH

Of the four TPH characterizations, only TPH-MO was detected above the method detection limits in the surface samples from Station C. These concentrations ranged from 24 to 310 mg/kg.

Metals

With the exception of cadmium, Ebasco reported that the metals detected in the Station C surface soil samples were all less than or within the range of concentrations detected in the "background" samples. Cadmium was detected in one Station C surface sample, but not in any "background" sample.

Ammonia and Cyanides

Ammonia and total cyanides were detected in all the Station C surface soil samples at concentrations ranging from 7.5 to 107 mg/kg and 0.11 to 0.12 mg/kg, respectively.

Sulfides and Phenols

Concentrations of sulfides were below the method detection limit in all the Station C surface soil samples. Total phenols were detected in only one sample at 1.1 mg/kg.

Shallow Subsurface Soils - PG&E Station C

To ease comparison of the results, Ebasco grouped the shallow boring samples (i.e., 0.5 to 5.0 feet bgs) according to where at Station C the borings were augered 1) the property's easement area (surrounding Station C); 2) a graveled area, coinciding with former purifier locations; and 3) the paved area within the station's yard. The laboratory results for the shallow subsurface soil samples from Station C are described below and summarized in Table 5 of this report.

PAH Compounds

Total PAH concentrations detected in the easement samples ranged from 0.12 to 2.6 mg/kg. Ebasco reported that these concentrations were comparable to those detected in the surface soil samples collected from adjacent locations and were within the range of concentrations detected in the "background" samples.

Total PAH concentrations detected in the paved-area samples ranged from 0.01 to 51.8 mg/kg. The highest PAH concentrations were detected in the graveled-area samples ranging from 7.3 to 2,760 mg/kg.

BTEX

Concentrations of one or more of the BTEX compounds were detected in auger samples collected from all three of the Station C sampling areas indicated above. Benzene ranged from 0.003 to 1.1 mg/kg. Toluene ranged from 0.005 to 0.53 mg/kg. Ethylbenzene ranged from below the method detection limit to 0.006 mg/kg. Total xylenes ranged from 0.003 to 0.084 mg/kg. The highest BTEX concentrations were detected in the samples collected from the graveled area.

TPH

Of the four TPH characterizations, only TPH-D and TPH-MO were detected above the method detection limits in the shallow subsurface samples from Station C. These concentrations ranged from 500 to 530 mg/kg and 30 to 6,300 mg/kg, respectively. Consistent with Ebasco's observations for PAHs and VOCs, the highest TPH concentrations were found in the graveled-area samples.

Metals

Particularly for arsenic, mercury, and nickel, the distribution of metals was consistent with the distribution of organic compounds. The highest concentrations were detected in the graveled-area samples.

Ebasco reported that the metals concentrations detected in the easement-area samples were within the range of concentrations detected in the "background" samples.

Ammonia and Cyanides

The concentrations of ammonia were consistent with the other observations of analyses. They were highest in the graveled-area samples. These concentrations ranged from 5.9 to 126 mg/kg. Ammonia ranged from 0.5 to 18 mg/kg in the easement-area samples and was below the method detection limit in the paved-area samples.

The highest concentration of total cyanides was also detected in a graveled-area sample and ranged from 0.11 to 20.7 mg/kg. Concentrations in the easement-area samples ranged from 0.3 to 12.0 mg/kg. Concentrations in the paved-area samples ranged from 0.11 to 9.3 mg/kg.

Sulfides and Phenols

Concentrations of sulfides were below the method detection limit in all the shallow subsurface samples from Station C. Total phenols were detected in only one sample, directly below the pavement, at 3.8 mg/kg.

PCBs

Selected samples from Station C were analyzed for PCBs because of the concern that oil-filled electrical equipment is housed there, including transformers, oil circuit breakers, regulators, and capacitors. However, Ebasco reported there is no history of oil or PCB spills at Station C.

Concentrations of all PCB compounds tested (Aroclor series) were below the method detection limits in all samples selected for this analysis. The samples selected were the shallowest collected from all the graveled-area borings and one of the paved-area borings.

Borings Drilled for Soil Samples and Groundwater Monitoring Wells - PG&E Gas Load Center

To ease comparison of the results, Ebasco grouped the soil boring samples (collected between 0.5 and 10.5 bgs) according to where at the Gas Load Center the borings were drilled 1) the pavement area within the Gas Load Center yard; and 2) the pipeline easement area paralleling the Embarcadero. The laboratory results for the drilled-boring soil samples from the Gas Load Center are described below and summarized in Table 6 of this report.

PAH Compounds

Concentrations of PAH compounds were detected in all the Gas Load Center soil boring samples ranging from 0.004 to 880 mg/kg. The highest concentrations were detected in samples collected from boring MW-OAK-1, completed as a monitoring well and located on the southeast side of the Gas Load Center yard (Figure 2). This location is reportedly near the locations of former gas holders. Ebasco reported observing "product" during both the drilling and development of the well installed in MW-OAK-1. Ebasco reported that no apparent relationship existed between the detected PAH concentrations and sample depth, but cautioned this observation was conditioned by the fact that shallow groundwater precluded deeper sampling.

BTEX

Concentrations of one or more of the BTEX compounds were detected in the majority of the Gas Load Center soil boring samples. The highest concentrations for all the BTEX compounds were detected in samples collected from MW-OAK-1 between 3.5 to 6.0 feet bgs. For all samples benzene ranged from 0.003 to 2,600 mg/kg, toluene ranged from 0.003 to 430 mg/kg, ethylbenzene ranged from 0.004 to 870 mg/kg, and total xylenes ranged from 0.005 to 460 mg/kg.

Concentrations of all the other VOCs tested, including chlorobenzene and 1,2-, 1,3-, and 1,4-dichlorobenzene, were below the method detection limits in each of the soil boring samples selected for VOC analysis.

TPH

Of the four TPH characterizations, only TPH-D and TPH-MO were detected above the method detection limits in the soil boring samples collected at the Gas Load Center. These concentrations ranged from 1.8 to 130,000 mg/kg and 53 to 5,000 mg/kg, respectively. Consistent with Ebasco's observations for PAHs and VOCs, the highest TPH-D concentrations were found in samples collected from MW-OAK-1. The highest TPH-MO concentration was found in a sample collected from B-OAK-4. Analysis of samples collected from the four borings drilled within the Gas Load Center yard (B-OAK-

1 through -3 and MW-OAK-1) indicated concentrations of TPH-MO ranging from 170 to 4,700 mg/kg.

Metals

Ebasco reported that relatively high arsenic concentrations were detected in samples collected from B-OAK-4 (2.9 to 14 mg/kg) and B-OAK-5 (2.8 to 19.7 mg/kg) and that the highest concentrations of total lead and mercury were detected in samples collected from B-OAK-4 (at 534 and 11.9 mg/kg, respectively).

Ammonia and Cyanides

Detected concentrations of ammonia ranged from 0.54 to 36 mg/kg. The highest concentrations were found in samples collected from B-OAK-1 drilled in the northeast corner of the Gas Load Center yard. Detected concentrations of total cyanides ranged from 0.18 to 106 mg/kg. The highest concentrations were found in samples collected from B-OAK-4. Ebasco reported this trend agreed with those observed for arsenic, lead, and mercury as indicated above.

Sulfides and Phenols

Concentrations of sulfides ranged from 200 to 300 mg/kg. Ebasco reported they exhibited no apparent spatial trend. The highest sulfide concentration was detected in a sample collected from B-OAK-3. Concentrations of total phenols, ranging from 1.4 to 9.9 mg/kg, were detected only in samples collected from MW-OAK-1.

Groundwater Samples - PG&E Gas Load Center

Only two groundwater monitoring wells were installed at the Gas Load Center (MW-OAK-1 and MW-OAK-2). Well MW-OAK-1 was installed at the southeast end of the Gas Load Center yard and MW-OAK-2 was installed near the southern end of the pipeline easement (Figure 2). Except where noted otherwise, the results summarized below apply only to the samples (initial and duplicate) collected from MW-OAK-1. The laboratory results for the Gas Load Center groundwater samples are summarized in Table 7 of this report. Neither the Ebasco report nor its appended laboratory analytical reports and chain-of-custody forms indicated whether or not the groundwater samples were filtered prior to analysis. No standard operating procedures, including sample collection and preparation, were included with the report. However, Ebasco did state that all their sampling activities were conducted according to a "Final Oakland PEA Work Plan," submitted to the California Department of Health Services on March 6, 1991. A copy of the Work Plan was not available for review by U&A.

Analysis of the samples collected from MW-OAK-2 indicated that concentrations of all the constituents of interest (Ebasco's "manufactured gas plant-related constituents," including PAHs, BTEX, TPH, and metals) were below the respective method detection limits. On this basis, Ebasco suggested MW-OAK-2 may be in an up-gradient position.

PAH Compounds

Of all the PAH compounds tested for, only naphthalene was detected in the samples collected form MW-OAK-1 (at 7.1 and 8.8 mg/kg).

BTEX

Concentrations of the BTEX compounds were detected in the samples collected from MW-OAK-1 at 60 and 67 mg/kg for benzene, 7.2 and 8.6 for toluene, 3.2 and 3.6 for ethylbenzene, and 3.5 and 4.0 mg/kg for total xylenes.

Concentrations of all the other VOCs tested, including chlorobenzene and 1,2-, 1,3-, and 1,4-dichlorobenzene, were below the method detection limits.

TPH

Of the four TPH characterizations, only TPH-G was detected above the method detection limit in the samples collected from MW-OAK-1 (at 100 mg/kg and at 120 mg/kg in a duplicate sample). In addition, the laboratory indicated that "unknown heavy hydrocarbons" were detected in the sample collected from MW-OAK-1 (at 23 mg/kg).

Despite the statement above that the constituents of interest were below the method detection limits in the sample collected from MW-OAK-2, the laboratory indicated that "light hydrocarbons which do not have a gasoline pattern" were detected in the sample collected from this well (at 88 mg/kg). This result tends to call into question Ebasco's suggestion that MW-OAK-2 may be in an up-gradient position.

Metals

The metals detected in the samples collected from MW-OAK-1 were barium at 0.043 and 0.040 mg/kg, chromium at 0.025 and 0.085 mg/kg, manganese at 0.735 and 0.765 mg/kg, vanadium at 0.013 and 0.010 mg/kg, and zinc at 0.016 and 0.030 mg/kg. Ebasco reported: "Of these constituents, only chromium in the MW-OAK-1 duplicate sample (0.085 mg/l) exceeds the corresponding EPA or DHS MCL."

Ammonia and Cyanides

Detected concentrations of ammonia were 4.5 and 5.4 mg/kg. Detected concentrations of total cyanides were 0.23 and 0.57 mg/kg.

Sulfides and Phenols

Concentrations of sulfides were below the method detection limit. Concentrations of total phenols were 0.15 mg/kg in both samples.

DECEMBER 1992 TO MARCH 1994: URIBE & ASSOCIATES

Summarized below are the five rounds of sampling conducted by U&A from December 1992 to March 1994. The majority of the sampling involved collection of soil samples. These included samples from stockpiles and trenches. Three water samples were also collected from groundwater that had filled holes excavated for light poles.

The samples were analyzed for TPH-G, TPH-D, TPH-K, TPH-MO, total recoverable petroleum hydrocarbons (TRPH), PAH compounds, purgeable organic compounds (including BTEX), and total metals (Title 22). One trench sample (TR1-C-2) and one stockpile composite sample (S-Composite) were also analyzed for concentrations of lead by both the STLC and waste extraction test (WET) methods.

Composite Soil Sample - December 1992

Four discrete soil samples were collected from a pile of soil that had been excavated from a trench being dug for power lines. The samples were composited into one ("S-1 Composite) for analysis of PAHs only. Constituent concentrations ranged from 1.6 mg/kg (acenaphthene) to 75 mg/kg (naphthalene).

The laboratory results for the S-1 Composite sample are summarized in Table 8 of this report.

Groundwater Samples - December 1992

Water samples W-1, W-2, and W-4 were analyzed for PAHs only. Constituent concentrations ranged from below the method detection limits to 5,600 mg/kg (naphthalene) in W-2. Sample W3 was not analyzed due to an error in sample handling at the laboratory. The water samples collected by U&A were not filtered prior to analysis.

The laboratory results for the water samples are summarized in Table 9 of this report.

Composite Soil Sample - February 1993

Four discrete soil samples were collected from the same stockpile that was sampled in December 1992. The samples were composited into one ("S-Composite") for analysis of TRPH , PAHs, total metals, and lead by the STLC method (the sample had a total lead concentration of 100 mg/kg). The only purgeable organic compound detected was benzene at 0.014 mg/kg. Concentrations of all other such constituents were below the method detection limits. The concentration of TRPH was 1,300 mg/kg. Concentrations of PAHs ranged from below the method detection limits to 28 mg/kg (pyrene). Concentrations of total metals ranged from below the method detection limits to 150 mg/kg (zinc). The concentration of lead by the STLC method was 5.7 mg/l. The STLC level for lead is 5.0 mg/l.

The laboratory results for the S-Composite sample are summarized in Table 8 of this report.

Trench Soil Samples - March 1994

Four soil samples were collected from two trenches near the HTS scales. Two samples (TR2-C-1 and TR2-C-2) were collected from a north-south-trending trench, located west of the weigh station, and two samples (TR1-C-1 and TR1-C-2) were collected from an east-west-trending trench, located south of the weigh station. The samples were analyzed for TPH-G, TPH-K, TPH-D, TPH-MO, PAHs, and total metals. In addition, sample TR1-C-2 was analyzed for lead by the STLC method (the sample had a total lead concentration of 210 mg/kg).

Concentrations of TPH-G ranged from below the method detection limit to 530 mg/kg (TR1-C-2). Concentrations of TPH-K were below the method detection limit in TR2-C-1 and TR2-C-2. For TR1-C-1 and TR1-C-2, the laboratory indicated the kerosene-range hydrocarbon concentrations were not reported due to overlapping peaks. Concentrations of TPH-D ranged from 370 to 20,000 mg/kg (TR1-C-1). Concentrations of TPH-MO ranged from 2,500 to 25,000 mg/kg (TR1-C-1). However, the laboratory stated that the chromatograms did not resemble fuel patterns, except perhaps somewhat for TR2-C-2. The laboratory attributed the high concentrations of TPH-D and TPH-MO to the high levels of PAHs in the samples.

Concentrations of PAHs ranged from below the method detection limits to 3,900 mg/kg for pyrene in TR1-C-1. Total metal concentrations ranged from below the method detection limits to 210 mg/kg for lead in TR1-C-2. In this sample, the concentration of lead by the STLC method was 6.1 mg/l.

The laboratory results for the trench samples are summarized in Table 8 of this report.

Aggregate Base Samples - March 1994

Three samples (AG-1, AG-2, and AG-3) were collected from a stockpile of aggregate base that had been excavated at the HTS. The samples were analyzed for TPH-G, TPH-K, TPH-D, TPH-MO, PAHs, and total metals.

Concentrations of TPH-G, TPH-K, and TPH-D were all below the method detection limit. Concentrations of TPH-MO ranged from 140 to 380 mg/kg (AG-3).

Concentrations of PAHs ranged from below the method detection limits to 1,300 mg/kg for pyrene in AG-3. Total metal concentrations ranged from below the method detection limits to 110 mg/kg for zinc in AG-3. The concentrations of metals did not appear to be elevated. Total lead concentrations ranged from 15 to 19 mg/kg (AG-1).

The laboratory results for the aggregate base samples are summarized in Table 8 of this report.

MARCH 1994: RIEDEL ENVIRONMENTAL SERVICES, INC.

Scale Excavation Pit Soil Samples

Four soil samples (Scale-4E, Scale-4W, Scale-7E, and Scale-7W) were collected from two scale excavation pits at the HTS-W. The samples were analyzed for TRPH and PAHs. Only Scale-4W was analyzed for total metals. All four samples were analyzed for STLC metals.

Concentrations of TRPH ranged from 150 to 2,500 mg/kg (Scale-7W).

Concentrations of PAHs ranged from below the method detection limits to 69 mg/kg for benzo(g,h,i)perylene in Scale-7W. Total PAH concentrations ranged from 76 to 385 mg/kg (Scale-7W). Total metal concentrations ranged from below the method detection limits to 92 mg/kg for zinc. The total lead concentration was 50 mg/kg. Concentrations of the STLC metals ranged from below the method detection limits to 5.6 mg/kg for zinc in Scale-7E. Concentrations of lead by the STLC method ranged from 0.2 to 2.8 mg/kg (Scale-7W).

The laboratory results for the scale excavation pit samples are summarized in Table 8 (total and STLC metals) and Table 10 (TRPH and PAHs) of this report.

4 DISCUSSION

4.1 Summary

1. Analysis of soil samples collected from locations on the HTS-W portion of the Port property indicated detectable concentrations of PAH compounds, total petroleum hydrocarbons, and metals.

2. Analysis of soil and groundwater samples collected from locations on the HTS-E indicated detectable concentrations of PAHs, BTEX, and other VOCs.

3. Analysis of soil and groundwater samples collected from locations near the HTS-E indicated detectable concentrations of PAHs, BTEX and other VOCs, total petroleum hydrocarbons, metals, ammonia and cyanides, and sulfides and phenols.

The differences between these three areas in terms of what constituents were detected is mainly a function of the laboratory analyses that were selected, rather than a function of concentration, since not all samples were analyzed for the same constituents. Table 11 summarizes the range of sample depths, categories of analyses, and detected constituents differentiated by area HTS-W, HTS-E, and near the HTS-E.

The amount of analytical data collected to date for the HTS-W portion of the Port property is limited by the few sample locations and shallow depths of the investigations. In spite of this, the results of the various analyses indicate contamination is present in the HTS-W subsurface and that it is, at least, similar in kind to the contamination indicated by the earlier investigations conducted on the HTS-E and PG&E properties. This similarity of the detected constituents and the similarity of subsurface materials encountered during the drilling of the soil borings by both ERM-West and Ebasco indicates the contamination found at and adjacent to the HTS-E may extend under the portions of the HTS-E not yet investigated (i.e., to the south of the area investigated by ERM-West). This contamination may also extend under the HTS-W portion of the terminal property. This latter possibility is also suggested by the observation, made by Port employee Mr. Serventi, that either lampblack or a sludge-like material was encountered in trenches excavated on the HTS-W in 1981.

4.2 Soil Contamination

From the available information, U&A considers it likely the layer of "sludge-like" material, found by ERM-West in soil borings (between approximately 3 and 7 feet bgs and between 9 and 10 feet bgs in one boring) extends for some distance beneath the portions of the HTS-W and HTS-E adjacent to the area investigated by ERM-West. This is substantiated by the past observations of at least one Port employee (Mr. Serventi). How far the (approximately 0.5- to 3.0-foot thick) layer actually extends and how thick it may be can only be determined by further investigation. However, because the area south of the 1981 limit of filling was filled in after the manufactured gas plant activities ceased, contamination is not expected to extend beyond the limit of the fill that borders the Howard Terminal Site (Figure 3).

The PAH, BTEX, cyanide, phenol, and hexavalent chromium contamination detected in soil samples collected from the HTS-W and HTS-E may exist beneath portions of the Howard Terminal Site north of the limit of fill and not yet investigated. The contamination may be in concentrations sufficient to cause concern regarding possible exposure should future activities there (such as excavations, trenching, or drilling) disturb the surface and increase the potential for contact either with the skin or by inhalation of particulates and/or vapors. For this reason, the implications of the health risk assessment prepared by Ebasco as part of the Preliminary Endangerment Assessment for the PG&E properties are directly applicable to the Howard Terminal Site as a whole.

Thus, all future activities that involve disturbing the Site's surface and subsurface should be planned such that workers' exposure to contamination is limited to the greatest degree possible, including equipping trained workers with personal protective equipment to be used under the provisions of approved site heath and safety plans. Such personal protective equipment would include respirators (with cartridges for organic vapors and particulate filters) as well as gloves and other clothing to prevent direct contact with the skin. In addition, any materials brought to the surface will require screening by laboratory analysis to determine the manner of proper disposal.
Maintenance of capping of the Site by asphalt and/or concrete should provide adequate protection from exposure to the toxic and/or hazardous materials underlying potentially large portions of the Howard Terminal Site.

4.3 Groundwater Contamination

All the groundwater samples referred to in this report were collected from locations either at or the near the former location of the manufactured gas plant. So far as U&A is aware, no groundwater monitoring wells exist and no samples of groundwater have been collected downgradient of the wells installed ERM-West (i.e., from locations toward and/or adjacent to the Inner Harbor). Thus, it is not possible to say whether or not, or in what concentrations, the constituents detected in the groundwater have migrated either near or to the Inner Harbor, including beneath the material placed as fill at the Site in 1980 and 1981. Despite this lack of downgradient information, it must be recalled that the detected constituents appear to have remained in the soil since at least 1961 and potentially for the past 90 years. This is particularly true for the sludge-like layer.

Given the age of the historical uses of the properties, the available analytical data, and the proximity to the Inner Harbor of the locations investigated, U&A considers it likely that BTEX and naphthalene have reached the waters of the Inner Harbor, at least to some degree. In addition, U&A considers it likely these constituents will continue to reach the Inner Harbor until the residual sources of contamination, such as the sludge-like layer, are either remediated or are sufficiently degraded by natural processes.

So far as is known, none of the groundwater samples collected from the wells were filtered prior to analysis. Thus, it is possible that some of the concentrations reflect constituents that adhered to soil or sediment particles, rather than dissolved concentrations.

In its report, Ebasco indicated a number of constituents exceeded the respective state-promulgated maximum contaminant levels and/or federal EPA health advisory levels and California Department of Health Services applied action levels. These included the PAHs (especially naphthalene), BTEX, ammonia, cyanides, phenols, hexavalent chromium, and manganese.

As Ebasco reported, groundwater beneath the Howard Terminal Site, as well the surrounding areas of the Port and City of Oakland, is not used as a resource for any purpose. Thus, the contamination found within the shallow groundwater should not pose a threat of exposure as a result of "producing" this groundwater to the surface such as by means of wells. However, protection from exposure to the groundwater should be afforded all workers for whom there is a potential of coming into contact with the groundwater as part of their work, including workers who may continue with subsurface investigations at the Howard Terminal Site. Such protection would also include personal protective equipment, to be used under the provisions of site health and safety plans, including respirators, gloves, fully-covering clothing, and face shields to protect against "incidental splash."

Figure 1

Source: California State Automobile Association, 1992; Brady and Associates, 1994

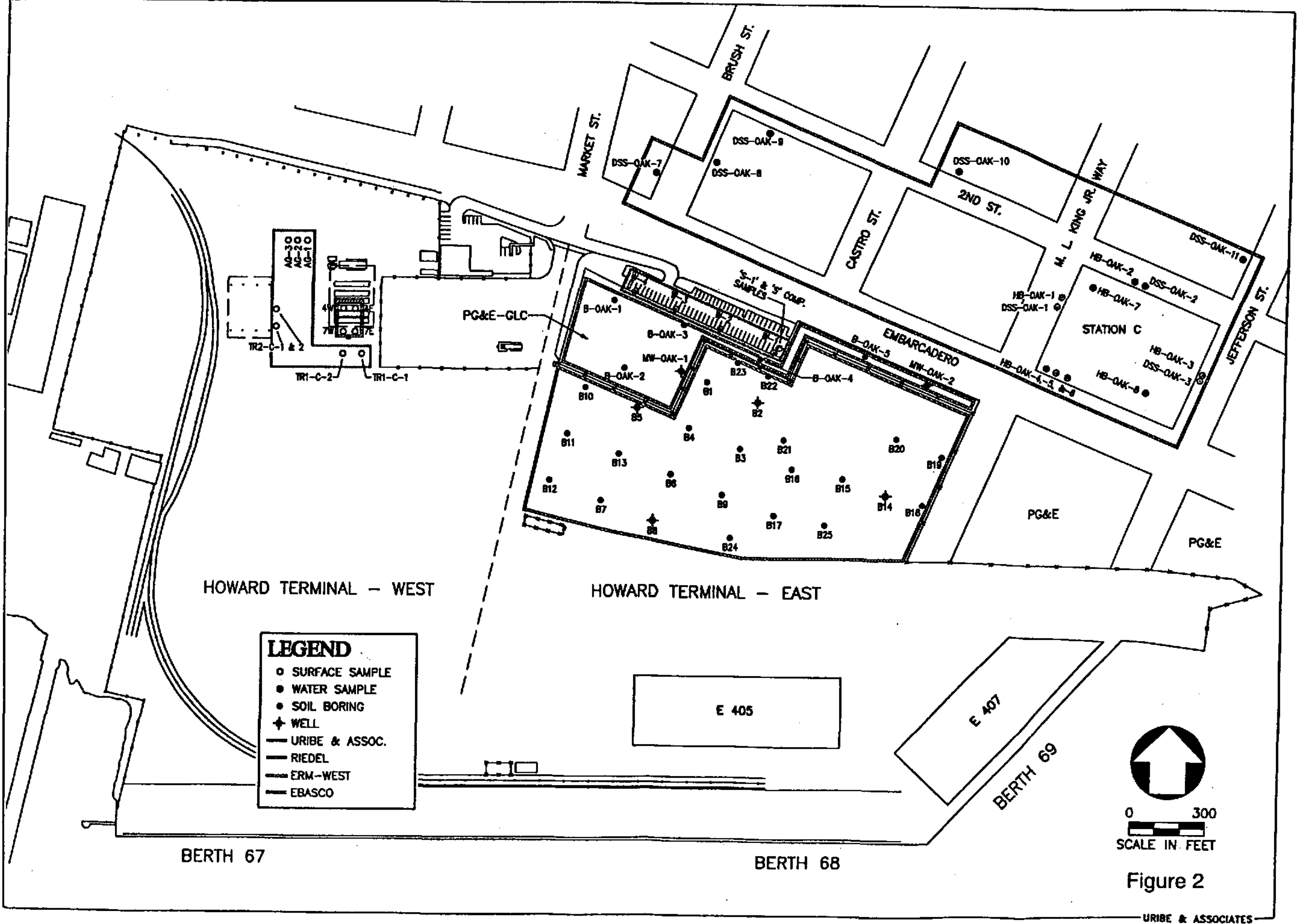
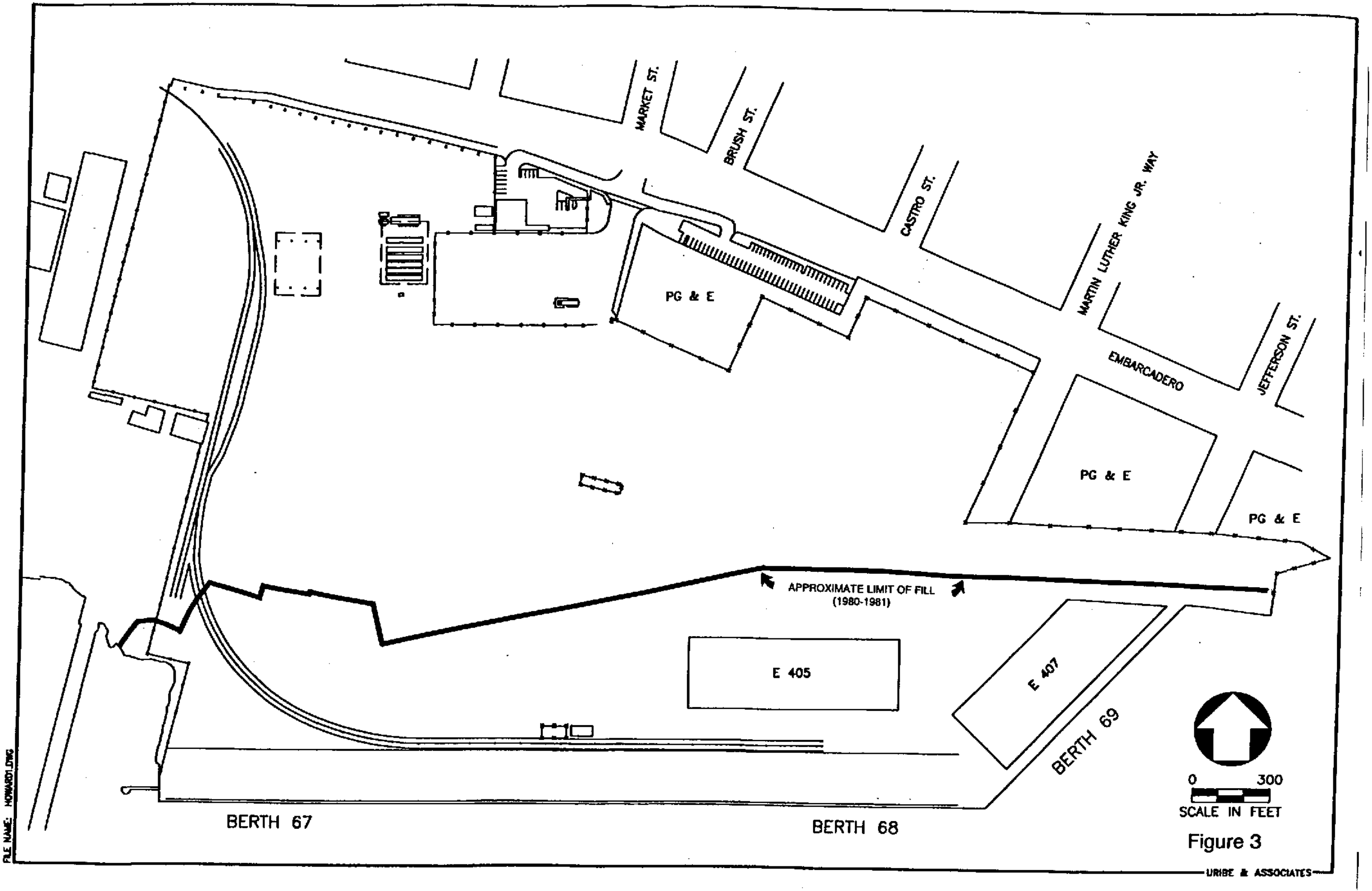


Figure 2

URIBE & ASSOCIATES

FILE NAME: HOWARD2.DWG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BRUSH ST.
CASTRO ST.
MARTIN LUTHER KING JR. WAY
JEFFERSON ST.
EMBARCADERO
PG & E
PG & E
PG & E
APPROXIMATE LIMIT OF FILL
(1980-1981)
E 405
E 407
BERTH 67
BERTH 68
BERTH 69
0
300
SCALE IN FEET
FILE NAME: HOWARD1.DWG
URIBE & ASSOCIATES

Figure 3

TABLE 1
Polynuclear Aromatic Hydrocarbons

	mg/kg
Acenaphthene	50
Acenaphthylene	1400
Anthracene	850
Benzo (a) anthracene	660
Benzo (a) pyrene	1000
Benzo (b) flouranthene	1000
Benzo (k) flouranthene	900
Dibenzo (a, h) anthracene	380
Flourene	340
Flouranthene	3000
Naphthalene	5500
Phenanthrene	3800
Pyrene	3600
Total (PAHs)	22,480

Source: ERM-West, "Investigation of Soil Contamination at the Howard Terminal Site, Oakland, California" May 27, 1986

Table 2 Polynuclear Aromatic Hydrocarbons (PAH) Detected in Subsurface Soil Samples
Results in mg/kg (ppm)

Constituent (mg/kg)	B1 7'7"-8"6"	B2 10'7"-11'6"	B3 8'1"-9'0"	B4 8'1"-9'0"	B5 8'6"-9'6"	B6 3'6" 4'6"	B6 9'0"-10'0"	B7 7'0"-7'10"	B8 9'2"-10'0"	B9 8'2"-9'0"	B10 9'0"-10'0"	B11 3'0"-3'6"	B12 5'6"-6'6"
acenaphthene	90					430				<30			
naphthalene	310	<30[1]	900	700		3400	2800	210	260	480		<30	
benzo(a)pyrene						<300			37	90		53	
benzo(b)fluoranthene						<300			40	90		53	
benzo(k)fluoranthene													
2-chloronaphthalene													
chrysene	33	<30							33	67		40	
acenaphthylene	87		<300				<300		50	53		<30[1]	
anthracene	33								<30	47		<30	
benzo(ghi)perylene		<30							33	77			
fluorene	33								<30	33			
phenanthrene	170	40	630	<300		970	470	67	160	340		37	
indeno(1,2,3-cd)-pyrene									<30	63		43	
pyrene	130	47	470			700	330	47	120	260	4	150	
fluoranthene	110	37	400			630		37	100	230	3.3	120	
2-methylnaphthalene[2]	<30		300				<300		<30				
TOTAL PAHs [3]	996	124	2700	700	ND	6130	3600	361	833	1830	7.3	496	ND

NOTES:

1. "Less than" indicates that the presence of the compound was verified by analytical instrumentation but insufficient amounts wer present to allow specific quantification.
2. This is the only PAH found which is not considered a priority pollutant.

Table 2 (continued)

Constituent (mg/kg)	B13 5'0"- 6'0"	B14 3'0"- 4'0"	B15 4'0"- 5'0"	B16 6'6"- 7'6"	B17 7'1"- 8'0"	B18 10'0"- 11'0"	B19 5'0"- 6'0"	B20 5'0"- 6'0"	B21 4'0"- 5'0"	B22 7'0"- 8'0"	B23 5'0"- 6'0"	B24 4'0"- 4'6"	B25 5'0"- 5'10"
acenaphthene										<30			<300
naphthalene	1700	0.87	4.3		800	700	<3			33	<30	2900	2000
benzo(a)pyrene	<300	<0.3	21		<300		11	0.43	<300			<300	330
benzo(b)fluoranthene	<300	<0.3	24		<300		13	0.47	<300	<30		<300	370
benzo(k)fluoranthene										<30			
2-chloronaphthalene		<0.3											
chrysene		<0.3	13		<300		8					<300	<300
acenaphthylene			<3				<3					470	<300
anthracene			<3[1]									<300	<300
benzo(ghi)perylene	<300	<0.3	23		<300		12	<0.3		<30		<300	<300
fluorene												<300	
phenanthrene	800	0.97	9		870		9			<30	<30	1300	1600
indeno(1,2,3-cd)-pyrene		<0.3	19				10	<0.3					<300
pyrene	600	0.8	36		670		19	<0.3	330	57	<30	800	1100
fluoranthene	470	0.67	28		630		14	<0.3	<300	50		600	970
2-methylnaphthalene[2]													
TOTAL PAHs[3]	3570	3.31	177.3	ND	2970	700	96	0.9	330	140	<30	6070	6370

Table 2 (continued)

RESULTS OF PRIORITY POLLUTANT ANALYSIS OF FOUR SELECT SUBSURFACE SOILS

Constituent (mg/kg)	B4 8'1"-9'0"	B7 7'0"-7'10"	B19 5'0"-6'0"	B25 5'0"-5'10"
Volatile Organics				
benzene		0.72		0.13
chlorobenzene	0.017			
ethylbenzene	0.220	0.33		
methylene chloride	0.006			
toluene	0.009	0.30		0.065
Non-Priority Pollutant Volatile Organics				
2-butanone			0.046	
4-methyl-2-pentanone	0.010			
xylene isomers	0.22	0.49		0.078

Extractable Organics

The only extractable organics found in soil samples were the PAHs listed in Table 1

TABLE 3
ORGANIC PRIORITY POLLUTANTS DETECTED IN SHALLOW GROUNDWATER

Constituent (mg/l)	Borings Completed as Shallow Groundwater Monitoring Wells			
Extractable Organics	**B2**	**B5**	**B8**	**B14**
acenaphthene	0.02			
fluoranthene	0.02	0.020		
naphthalene	0.20		12.0	0.10
phenanthrene	0.024	0.020		
pyrene	0.026	0.020		
TOTAL PAH	0.27	0.060	12.0	0.10
Volatile Organics				
benzene	12		12.0	0.008
ethylbenzene	11			
toluene	0.012			
Non-Priority Pollutant Volatile Organics				
styrene	0.005			
xylene isomers	0.059			

Table 4

SURFACE SOIL SAMPLE RESULTS: ORGANIC ANALYSES
PG&E OAKLAND SITE (EB-CN-OAK 1)

	ON SITE SURFACE SOILS				OFF SITE 'BACKGROUND' SURFACE SOILS			
Location:	DSS OAK 1	DSS-OAK-2	DSS-OAK-3	DSS-OAK-7 6	DSS-OAK-8-6	DSS-OAK-9-6	DSS-OAK-10 6	DSS OAK 11 6
Depth (ft):	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Date Sampled:	3/18/91	3/18/91	3/18/91	3/11/91	3/11/91	3/11/91	3/11/91	3/11/91
PARAMETER (units) Laboratory No.:	25	24	23	01	02	03	04	05
PNAs (mg/kg) /1/								
Acenaphthene	<0.900	<0.900	<0.90	<0.900	<9.000	<9.000	<0.090	<0.900
Acenaphthylene	<0.500	<0.500	<0.50	<0.500	<5.000	<5.000	<0.050	<0.500
Anthracene	<0.040	0.040	<0.04	0.041	0.740	0.700	0.005	<0.040
Benzo(a)anthracene*	0.082	0.110	<0.04	0.130	<0.400	1.700	0.027	0.047
Benzo(a)pyrene*	0.230	0.210	<0.04	0.240	0.510	2.900	0.160	0.570
Benzo(b)fluoranthene*	0.180	0.200	<0.04	0.200	0.410	2.200	0.081	0.140
Benzo(e)pyrene	<0.300	<0.300	<0.30	<0.300	<3.000	3.000	0.100	<0.300
Benzo(g,h,i)perylene	0.240	0.260	<0.13	0.240	<1.300	4.700	0.270	0.900
Benzo(k)fluoranthene*	0.067	0.073	<0.04	0.081	<0.400	1.000	0.048	<0.040
Chrysene*	0.095	<0.040	<0.04	0.170	<0.400	2.200	0.036	0.085
Dibenzo(a,h)anthracene*	0.990	0.080	<0.04	0.150	<0.400	1.700	0.089	1.700
Fluorene	<0.090	<0.090	<0.09	<0.090	<0.900	<0.900	<0.009	<0.090
Fluoranthene	0.250	0.260	<0.09	0.310	1.100	6.300	0.130	0.091
Indeno(1,2,3-cd)pyrene*	0.260	0.280	<0.09	0.250	<0.900	3.000	0.250	1.700
Naphthalene	2.400	<0.700	<0.70	<0.700	<7.000	<7.000	<0.070	<0.700
Phenanthrene	0.140	0.160	<0.07	0.170	0.840	5.000	0.039	0.100
Pyrene	0.330	0.310	<0.13	0.320	<1.300	7.400	0.087	<0.130
Total Detected PNAs (ppm):	5.264	1.983	ND	2.302	3.600	41.800	1.322	5.333
Total Carcinogenic PNAs	1.900	0.950	ND	1.221	0.920	11.700	0.591	4.240
Total Noncarcinogenic PNAs	3.360	1.030	ND	1.081	2.680	30.100	0.730	1.090
AROMATIC VOLATILE ORGANIC COMPOUNDS (mg/kg) /2/								
Benzene	0.031	0.120	0.015	NA	NA	NA	NA	NA
EthylBenzene	<0.003	0.008	<0.003	NA	NA	NA	NA	NA
Toluene	0.019	0.046	0.008	NA	NA	NA	NA	NA
Total Xylenes	0.006	0.029	<0.003	NA	NA	NA	NA	NA
Total Detected VOCs (ppm):	0.056	0.203	0.023	NA	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBONS (mg/kg) /3/								
Gasoline	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Diesel	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Kerosene	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA
Motor Oil	310	160	24	NA	NA	NA	NA	NA
Other Hydrocarbons	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA

NOTE:

/1/ PNAs were analyzed using EPA Method 8310. *: Denotes carcinogenic PNA as defined in text Section 5.0

/2/ Aromatic volatile organic compounds (VOCs) were analyzed using EPA Method 8020.

/3/ Total petroleum hydrocarbons (TPH) were analyzed using EPA Method 8015/8020

ND= Not Detected, NA= Not Analyzed

[ ] Boxed values are maximum concentrations

[illegible]

Lab ID Report No. [illegible] and [illegible] (Volume 2)

Table 4 (continued)

SURFACE SOIL SAMPLE RESULTS: INORGANIC ANALYSES
PG&E OAKLAND SITE (EB-CN-OAK-1)

	ON-SITE SURFACE SOILS			OFF-SITE 'BACKGROUND' SURFACE SOILS				
Location:	DSS-OAK-1	DSS-OAK-2	DSS-OAK-3	DSS-OAK-7-6	DSS-OAK-8-6	DSS-OAK-9-6	DSS-OAK-10-6	DSS-OAK-11-6
Depth (ft):	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Date Sampled:	3/18/91	3/18/91	3/18/91	3/11/91	3/11/91	3/11/91	3/11/91	3/11/91
PARAMETER (units) Laboratory No.:	25	24	23	01	02	03	04	05
METALS (mg/kg) /1/								
Antimony	<10.00	<10.00	<10.00	<10.00	<10.00	<10.00	<10.00	<10.00
Arsenic	1.50	1.50	1.50	<1.00	1.50	1.80	1.00	4.10
Barium	42.90	54.50	52.80	45.90	84.10	58.60	53.30	94.50
Beryllium	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Cadmium	1.10	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Chromium (III)	40.80	30.80	39.30	69.00	56.80	55.60	47.10	179.00
Chromium (VI)	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Cobalt	3.30	5.00	6.40	5.00	5.00	6.00	3.50	11.60
Copper	9.60	10.10	8.90	14.70	14.90	48.70	9.70	70.50
Lead	24.40	33.70	31.90	74.50	133.00	104.00	22.70	41.10
Mercury	0.12	0.15	0.13	<0.10	0.14	0.18	0.21	0.29
Molybdenum	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	25.90
Nickel	28.00	21.50	29.00	24.90	23.70	39.60	21.60	168.00
Selenium	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Silver	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Thallium	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vanadium	21.30	21.90	21.10	36.60	31.80	29.30	23.80	38.80
Zinc	33.10	35.60	29.00	106.00	214.00	90.50	28.90	117.00
OTHER ANALYTES (mg/kg) /2/								
Ammonia	107.00	14.90	7.50	NA	NA	NA	NA	NA
Cyanides, total	0.12	0.11	0.12	NA	NA	NA	NA	NA
Phenols, total	<1.00	<1.00	1.10	NA	NA	NA	NA	NA
Sulfides	<200.00	<200.00	<200.00	NA	NA	NA	NA	NA
pH (standard units)	7.58	8.75	9.40	NA	NA	NA	NA	NA

NOTE:

/1/ Arsenic and mercury were analyzed using EPA Methods 7060 and 7471, respectively. Remaining (ICP/AES, Title 22) metals were analyzed using EPA Method 6010.

/2/ Ammonia, cyanides, phenols and sulfides were analyzed using EPA Methods 350.3, 9010, 420.1, and 9030, respectively.

NA= Not Analyzed; ND= Not Detected

☐ - Boxed values are maximum concentrations within the sampling region

TABLEB-2.WR1

Lab ID Report No. 9103085 and 9103116 (Volume 2)

		EASEMENT SOILS			GRAVELED AREA									
	Location:	HB-OAK-1	HB-OAK-2	HB-OAK-3	HB-OAK-4-1	HB-OAK-4-1	HB-OAK-4-1	HB-OAK-5-1	HB-OAK-5-1	HB-OAK-5-1	HB-OAK-6-1	HB-OAK-6-1	HB-OAK-6-2	HB-OAK-6-1
	Depth (ft):	1.5/2.0	1.5/2.0	1.5/2.0	0.5/1.0	2.0/2.5	2.5/3.0	1.0/1.5	2.5/3.0	4.5/5.0	1.0/1.5	2.0/2.5	2.0/2.5	2.5/2.8
	Date Sampled:	3/13/91	3/13/91	3/13/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91
PARAMETER (units)	Laboratory No.:	01	02	03	20	21	22	17	18	19	13	14	15	16
PNAs (mg/kg) /1/														
Acenaphthene		<0.090	<0.090	<0.090	22	<9.0	<9.0	<9.0	<4.50	<0.900	<9.0	<9.0	<9.0	<9.0
Acenaphthylene		<0.050	<0.050	<0.050	140	<5.0	6.7	<5.0	<2.50	<0.500	6.6	98.0	19.0	9.0
Anthracene		<0.004	0.058	<0.004	80	1.9	6.9	1.6	0.30	0.072	10.0	61.0	23.0	8.1
Benzo(a)anthracene*		0.036	0.130	0.003	100	10.0	21.0	7.2	1.20	0.320	32.0	100.0	63.0	19.0
Benzo(a)pyrene*		0.007	0.300	0.010	200	17.0	53.0	18.0	3.10	0.740	64.0	240.0	170.0	42.0
Benzo(b)fluoranthene*		0.005	0.210	0.009	150	16.0	47.0	15.0	2.50	0.650	55.0	200.0	130.0	35.0
Benzo(e)pyrene		<0.030	0.160	<0.030	120	21.0	40.0	14.0	2.30	0.620	45.0	160.0	110.0	30.0
Benzo(g,h,i)perylene		0.034	0.330	0.022	20	11.0	63.0	5.5	<0.65	0.200	79.0	74.0	66.0	13.0
Benzo(k)fluoranthene*		0.006	0.080	0.004	43	6.9	15.0	5.3	0.89	0.240	19.0	46.0	39.0	12.0
Chrysene*		0.015	0.150	0.006	120	12.0	27.0	8.4	1.40	0.390	35.0	120.0	74.0	23.0
Dibenzo(a,h)anthracene*		0.012	0.090	0.010	31	7.3	22.0	7.8	1.30	0.330	24.0	80.0	57.0	15.0
Flouranthene		0.016	0.270	0.012	360	20.0	88.0	27.0	4.80	1.100	130.0	350.0	260.0	87.0
Fluorene		0.014	0.012	<0.009	35	<0.9	1.4	<0.9	<0.45	<0.090	1.4	21.0	4.5	2.1
Indeno(1,2,3-cd)pyrene*		<0.009	0.330	0.025	80	13.0	62.0	16.0	2.90	0.600	170.0	160.0	170.0	34.0
Naphthalene		<0.070	<0.070	<0.070	480	<7.0	20.0	<7.0	<3.50	<0.700	19.0	400.0	29.0	25.0
Phenanthrene		0.018	0.180	0.009	190	10.0	64.0	14.0	2.90	0.490	75.0	180.0	140.0	69.0
Pyrene		0.025	0.310	0.013	480	33.0	120.0	37.0	6.70	1.500	170.0	470.0	350.0	120.0
Total Detected PNAs (ppm):		0.188	$\boxed{2.610}$	0.123	2,651.0	179.1	657.0	176.8	30.29	7.252	935.0	$\boxed{2,760.0}$	1,704.5	543.2
AROMATIC VOLATILE ORGANIC COMPOUNDS (mg/kg) /2/														
Benzene		0.020	0.017	0.003	0.150	0.018	1.1	0.061	<0.002	<0.002	0.033	0.073	0.350	0.04
Ethylbenzene		0.005	<0.003	<0.003	<0.003	0.005	<0.025	0.006	<0.002	<0.002	<0.013	<0.013	<0.002	<0.013
Toluene		0.040	0.088	0.070	0.036	0.024	0.530	0.012	<0.002	<0.002	<0.013	0.041	0.094	<0.013
Total Xylenes		<0.003	<0.003	<0.003	0.020	0.059	0.084	0.014	<0.002	<0.002	<0.013	0.023	0.079	<0.013
Total Detected VOCs (ppm):		0.065	$\boxed{0.105}$	0.073	0.206	0.104	$\boxed{1.714}$	0.093	ND	ND	0.033	0.137	0.523	0.04
TOTAL PETROLEUM HYDROCARBONS (mg/kg) /3/														
Gasoline		<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<5.0
Diesel		<1.0	<1.0	<1.0	<20	<10	<10	<10	<1	<1	<10	$\boxed{530}$	500	<10
Kerosene		<1.0	<1.0	<1.0	<20	<10	<10	<10	<1	<1	<10	<10	<10	<10
Motor Oil		<10	$\boxed{100}$	30	$\boxed{6,300}$	1,100	1,400	570	150	130	1,300	3,300	3,300	1,900
Other Hydrocarbons		NA	NA	NA	10	4.8	5.4	2.2	<1.0	<1.0	1.6	$\boxed{18}$	8.7	2.4
PCBs (ug/kg) /4/														
Aroclor-1016, -1221, -1232, -1242, and -1248		NA	NA	NA	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
Aroclor-1254 and -1260		NA	NA	NA	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
OTHER ANALYTES /5/														
Phenols, total (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
pH (standard units)		5.53	6.7	10.6	8.04	8.24	7.82	8.28	8.28	8.33	8.03	8.26	8.36	7.79

TABLE B-3.WR1
Lab ID Report No. 9103105 and 9103116 (Vol. 2)

☐ : Boxed values are maximum concentrations within the sampling region.

Table 5

STATION C HAND AUGER SAMPLE RESULTS: ORGANIC ANALYSES
PG&E OAKLAND SITE (EB-CN-OAK-1)
page 1 of 2

PARAMETER (units)	EASEMENT SOILS			GRAVELED AREAS									
Location:	HB-OAK-1	HB-OAK-2	HB-OAK-3	HB-OAK-4-1	HB-OAK-4-1	HB-OAK-4-1	HB-OAK-5-1	HB-OAK-5-1	HB-OAK-5-1	HB-OAK-6-1	HB-OAK-6-1	HB-OAK-6-2	B-OAK-6-1
Depth (ft):	1.5/2.0	1.5/2.0	1.5/2.0	0.5/1.0	2.0/2.5	2.5/3.0	1.0/2.5	2.5/3.0	4.5/5.0	1.0/1.5	2.0/2.5	2.0/2.5	2.5/2.8
Date Sampled:	3/13/91	3/13/91	3/13/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91
Laboratory No.:	01	02	03	20	21	22	17	18	19	13	14	15	16
METALS (mg/kg) /1/													
Antimony	<10.0	<10.00	<10.0	<10.0	<10.00	<10.0	<10.0	<10.00	<10.00	<10.00	<10.00	<10.0	<10.00
Arsenic	1.5	$\boxed{1.60}$	1.4	2.9	2.50	4.7	2.9	1.90	1.70	2.70	4.80	3.4	$\boxed{11.80}$
Barium	$\boxed{61.8}$	48.30	49.4	134.0	101.00	$\boxed{149.0}$	76.5	52.40	46.60	140.00	98.20	102.0	135.00
Beryllium	<1.0	<1.00	<1.0	<1.0	<1.00	<1.0	<1.0	<1.00	<1.00	<1.00	<1.00	<1.0	<1.00
Cadmium	<1.0	<1.00	<1.0	1.2	1.30	<1.0	1.8	1.50	<1.00	1.40	1.10	$\boxed{1.9}$	1.30
Chromium (III)	$\boxed{43.7}$	28.80	36.5	23.0	35.30	27.7	30.9	$\boxed{42.10}$	24.60	21.40	30.40	25.5	22.90
Chromium (VI)	<1.0	<1.00	<1.0	<1.0	<1.00	<1.0	<1.0	<1.00	<1.00	<1.00	<1.00	<1.0	<1.00
Cobalt	$\boxed{8.4}$	4.40	3.4	7.2	3.50	8.3	6.0	6.40	6.10	9.00	8.70	8.4	8.90
Copper	$\boxed{17.3}$	8.10	6.1	38.3	23.70	41.4	24.6	12.20	10.80	40.80	33.60	42.3	$\boxed{49.20}$
Lead	15.6	$\boxed{29.60}$	8.0	$\boxed{294.0}$	237.00	193.0	101.0	34.30	23.10	130.00	120.00	110.0	197.00
Mercury	<0.1	$\boxed{0.14}$	<0.1	$\boxed{1.7}$	0.36	0.5	0.3	0.41	0.47	0.56	0.33	0.3	0.86
Molybdenum	<2.0	<2.00	<2.0	<2.0	<2.00	<2.0	<2.0	<2.00	<2.00	<2.00	<2.00	<2.0	<2.00
Nickel	$\boxed{39.4}$	20.10	25.5	111.0	40.60	153.0	58.0	32.10	23.70	219.00	$\boxed{261.00}$	169.0	207.00
Selenium	<1.0	<1.00	<1.0	<1.0	<1.00	<1.0	<1.0	<1.00	<1.00	<1.00	<1.00	<1.0	<1.00
Silver	<2.0	<2.00	<2.0	<2.0	<2.00	<2.0	<2.0	<2.00	<2.00	<2.0	<2.00	<2.0	<2.00
Thallium	<1.0	<1.00	<1.0	<1.0	<1.00	<1.0	<1.0	<1.00	<1.00	<1.00	<1.00	<1.0	<1.00
Vanadium	$\boxed{30.7}$	22.10	23.3	59.8	38.90	$\boxed{90.3}$	31.8	26.50	20.30	43.30	46.30	46.4	35.20
Zinc	27.7	$\boxed{549.00}$	21.6	109.0	86.10	122.0	75.1	42.30	28.50	113.00	115.00	$\boxed{157.0}$	146.00
OTHER ANALYTES (mg/kg) /2/													
Ammonia	$\boxed{18.00}$	14.0	0.5	5.90	19.30	6.60	<5.00	13.30	8.10	<5.00	<5.00	8.00	$\boxed{126.00}$
Cyanides, total	0.28	$\boxed{12.0}$	0.3	0.11	0.12	$\boxed{20.70}$	0.12	0.11	0.73	0.12	0.11	0.11	0.11
Sulfides	<200.00	<200.0	<200.0	<200.00	<200.00	<200.00	<200.00	<200.00	<200.00	<200.00	<200.00	<200.00	<200.00
pH (standard units)	5.53	6.7	10.6	8.04	8.34	7.82	8.28	8.28	8.33	8.03	8.26	8.36	7.79

☐ : Boxed values are maximum concentrations.

NOTE:

/1/ Arsenic and mercury were analyzed using EPA Methods 7060 and 7471, respectively. Remaining (ICP/AES, Title 22) metals were analyzed using EPA Method 6010.

/2/ Ammonia, cyanides, phenols and sulfides were analyzed using EPA Methods 353.3, 9010, 420.1, and 9030, respectively.

TABLES-4.WR1

Lab ID Report No. 9103105 and 9103116 (Volume 2)

Table 5 (continued)

STATION C HAND AUGER SAMPLE RESULTS: INORGANIC ANALYSES
PG&E OAKLAND SITE (EB-CN-OAK-1)

page 1 of 2

	Location:	HB-OAK-7-1	HB-OAK-7-2	HB-OAK-7-1	HB-OAK-7-1	HB-OAK-8-1	HB-OAK-8-1
	Depth (ft):	0.5/1.0	0.5/1.0	1.5/2.0	4.5/5.0	0.5/1.0	1.0/1.5
	Date Sampled:	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91
PARAMETER (units)	Laboratory No.:	09	10	11	12	17	18
PNAs (mg/kg)							
Acenaphthene		<9.0	<9.0	<9.0	<0.090	<9.0	<9.00
Acenaphthylene		<5.0	<5.0	<5.0	<0.050	<5.0	<5.00
Anthracene		2.4	1.9	0.8	<0.004	1.5	0.54
Benzo(a)anthracene*		4.1	3.7	3.9	<0.004	3.9	1.00
Benzo(a)pyrene*		7.9	7.3	9.6	0.007	8.1	1.70
Benzo(b)fluoranthene*		7.5	7.0	8.2	0.006	7.4	1.70
Benzo(e)pyrene		5.8	5.5	7.6	<0.030	6.7	<3.00
Benzo(g,h,i)perylene		21.0	19.0	9.3	<0.013	7.5	5.60
Benzo(k)fluoranthene*		2.5	2.4	2.9	<0.004	2.6	0.64
Chrysene*		4.6	4.2	4.4	<0.004	4.2	1.20
Dibenzo(a,h)anthracene*		3.4	3.1	4.2	<0.004	3.2	0.86
Flouranthene		19.0	16.0	12.0	<0.009	14.0	3.30
Fluorene		<0.9	<0.9	<0.9	<0.009	<0.9	<0.9
Indeno(1,2,3-cd)pyrene*		9.1	9.1	11.0	<0.009	9.1	5.00
Naphthalene		7.4	<7.0	<7.0	<0.070	<7.0	<7.0
Phenanthrene		20.0	16.0	4.3	<0.007	5.4	2.40
Pyrene		21.0	19.0	17.0	0.013	18.0	3.90
Total Detected PNAs (ppm):		$\boxed{135.7}$	114.2	95.2	0.026	91.6	27.84
AROMATIC VOLATILE ORGANIC COMPOUNDS (mg/kg)							
Benzene		0.037	0.015	0.009	<0.003	0.011	0.012
Ethylbenzene		0.006	0.004	0.003	<0.003	<0.002	0.003
Toluene		0.046	0.046	0.025	0.005	0.008	0.008
Total Xylenes		0.031	0.022	0.039	<0.003	<0.002	0.003
Total Detected VOCs (ppm):		$\boxed{0.120}$	0.087	0.076	0.005	0.019	0.026
TOTAL PETROLEUM HYDROCARBONS (mg/kg)							
Gasoline		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Diesel		<20	<30	<10	<1.0	<10	<10
Kerosene		<20	<30	<10	<1.0	<10	<10
Motor Oil		1,000	1,500	500	<10	770	$\boxed{3,100}$
Other Hydrocarbons		4.9	2.4	2.0	<1.0	1.6	4.1
PCBs (ug/kg)							
Aroclor-1016, -1221, -1232, -1242, and -1248		<40	<40	NA	NA	NA	NA
Aroclor-1254 and -1260		<80	<80	NA	NA	NA	NA
OTHER ANALYTES							
Phenols, total (mg/kg)		<1.0	<1.0	<1.0	<1.0	$\boxed{3.8}$	<1.0
pH (standard units)		9.21	9.94	9.39	7.78	9.21	9.46

TABLE B-3.WR1

Lab ID Report No. 9103105 and 9103116 (Vol. 2)

☐ : Boxed values are maximum concentrations within the sampling region.

NOTE:

/1/

PNAs were analyzed using EPA Method 8310. *Denotes carcinogenic PNA as defined in text Section 5.0.

/2/

Aromatic volatile organic compounds (VOCs) were analyzed using EPA Method 8020.

/3/

Total petroleum hydrocarbons (TPH) were analyzed using EPA Method 8015.

NA: Not Analyzed

ND: Not Detected

Table 5 (continued)

STATION C HAND AUGER SAMPLE RESULTS: ORGANIC ANALYSES

PG&E OAKLAND SITE (EB-CN-OAK-1)

page 2 of 2

		PAVED					
	Location:	HB-OAK-7-1	HB-OAK-7-2	HB-OAK-7-1	HB-OAK-7-1	HB-OAK-8-1	HB-OAK-8-1
	Depth (ft):	0.5/1.0	0.5/1.0	1.5/2.0	4.5/5.0	0.5/1.0	1.0/1.5
	Date Sampled:	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91	3/18/91
PARAMETER (units)	Laboratory No.:	09	10	11	12	17	18
METALS (mg/kg) /1/							
Antimony		<10.00	<10.00	<10.00	<10.00	<10.00	<10.00
Arsenic		3.60	3.70	$\boxed{6.00}$	<1.00	1.90	3.80
Barium		78.50	103.00	116.00	52.90	119.00	$\boxed{159.00}$
Beryllium		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Cadmium		1.50	<1.00	1.10	<1.00	1.50	$\boxed{1.80}$
Chromium (III)		36.70	41.20	34.40	$\boxed{47.30}$	36.50	29.40
Chromium (VI)		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Cobalt		$\boxed{9.10}$	8.90	9.00	6.20	9.10	9.00
Copper		20.90	33.60	$\boxed{50.30}$	6.30	43.40	21.50
Lead		93.30	103.00	155.00	5.00	$\boxed{166.00}$	145.00
Mercury		0.19	0.19	0.21	0.12	$\boxed{0.35}$	0.26
Molybdenum		<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Nickel		60.70	$\boxed{62.30}$	62.10	32.40	53.80	52.60
Selenium		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Silver		<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Thallium		<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vanadium		37.60	39.70	37.10	25.90	$\boxed{42.70}$	39.90
Zinc		66.80	85.00	135.00	24.40	$\boxed{225.00}$	195.00
OTHER ANALYTES (mg/kg) /2/							
Ammonia		<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
Cyanides, total		<0.10	6.70	0.11	0.12	$\boxed{9.30}$	<0.10
Sulfides		<200.00	<200.00	<200.00	<200.00	<200.00	<200.00
pH (standard units)		9.21	9.94	9.39	7.78	9.21	9.46

☐ : Boxed values are maximum concentrations.

TABLEB-4.WR1

Lab ID Report No. 9103105 and 9103116 (Volume 2)

Table 5 (continued)

STATION C HAND AUGER SAMPLE RESULTS: INORGANIC ANALYSES
PG&E OAKLAND SITE (EB-CN-OAK-1)

page 2 of 2

	Location:	B-OAK-1-1	B-OAK-1-1	B-OAK-1-1	B-OAK-2-1	B-OAK-2-1	B-OAK-2-1	B-OAK-3-1	B-OAK-3-1	B-OAK-3-1	B-OAK-4-1	B-OAK-4-2	B-OAK-4-1
	Depth (ft):	0.5/2.5	2.5/4.0	4.0/6.0	0.5/2.0	2.0/4.0	5.5/6.2	0.5/2.0	2.0/4.0	4.0/5.5	2.5/4.5	2.5/4.5	4.0/6.0
	Date Sampled:	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/18/91	3/18/91	3/18/91
PARAMETER (units)	Laboratory No.:	01	02	03	04	05	06	07	08	09	04	05	06
PNAs (mg/kg)													
Acenaphthene		<9.0	<9.0	<0.09	<0.09	<9.0	<9.0	<9.0	<9.0	<9.0	<9.0	<9.0	<9.0
Acenaphthylene		5.6	<5.0	<0.05	<0.05	<5.0	<5.0	<5.0	<5.0	<5.0	6.5	14.0	41.0
Anthracene		28.5	4.0	0.008	0.020	3.30	2.1	4.9	<0.4	6.800	16.0	28.0	66.0
Benzo(a)anthracene*		56.0	4.9	0.091	<0.004	6.70	5.3	13.0	<0.4	14.000	44.0	66.0	83.0
Benzo(a)pyrene*		84.0	11.0	0.025	<0.004	16.00	15.0	31.0	1.300	34.000	75.0	130.0	130.0
Benzo(b)fluoranthene*		58.0	7.3	0.020	0.036	11.00	11.0	21.0	0.790	23.000	73.0	120.0	110.0
Benzo(e)pyrene		54.0	8.0	<0.03	0.050	11.00	10.0	19.0	<3.0	18.000	67.0	100.0	94.0
Benzo(g,h,i)perylene		44.0	10.0	0.023	0.053	17.00	14.0	330.0	1.400	27.000	10.0	15.0	14.0
Benzo(k)fluoranthene*		24.5	3.0	0.063	<0.004	4.40	4.0	8.4	<0.4	9.200	26.0	39.0	38.0
Chrysene*		60.0	6.5	0.012	0.061	7.70	6.5	15.0	0.460	15.000	52.0	75.0	89.0
Dibenzo(a,h)anthracene*		19.0	4.2	0.028	<0.004	6.30	6.1	11.0	0.640	11.000	27.0	45.0	39.0
Fluoranthene		160.0	17.0	0.040	0.079	22.00	16.0	46.0	1.400	54.000	140.0	240.0	310.0
Fluorene		5.2	2.0	<0.009	<0.009	0.96	<0.9	1.4	1.000	1.800	4.0	"7.3	25.0
Indeno(1,2,3-cd)pyrene*		54.0	9.9	0.016	<0.009	16.00	15.0	31.0	<0.9	30.000	66.0	140.0	85.0
Naphthalene		31.5	16.0	<0.07	<0.07	<7.0	<7.0	<7.0	9.000	12.000	21.0	31.0	320.0
Phenanthrene		100.0	1.4	0.033	0.074	14.00	7.5	3.3	1.200	29.000	86.0	130.0	170.0
Pyrene		200.0	20.0	0.033	0.038	29.00	20.0	59.0	1.700	61.000	190.0	300.0	370.0
Total Detected PNAs (ppm):		*984.3*	*125.2*	*0.392*	*0.411*	*165.4*	*132.5*	*594.0*	*18.9*	*345.8*	*903.5*	*1,480*	*1,984*
AROMATIC VOLATILE ORGANIC COMPOUNDS (mg/kg)													
Benzene		1.900	0.100	60.0	0.003	0.034	0.310	<0.002	0.160	<0.088	0.010	0.011	0.090
Ethylbenzene		0.330	0.051	1.9	0.004	0.027	0.031	<0.002	0.099	0.098	<0.003	<0.002	0.008
Toluene		0.058	<0.003	<0.63	0.003	0.026	0.032	0.015	0.016	<0.088	0.011	0.010	0.016
Total Xylenes		0.036	0.019	<0.63	0.014	0.055	0.014	<0.002	0.023	<0.088	0.005	0.007	0.030
Total Detected VOCs (ppm):		*2.32*	*0.17*	*61.9*	*0.024*	*0.142*	*0.387*	*0.015*	*0.298*	*0.098*	*0.026*	*0.028*	*0.144*
TOTAL PETROLEUM HYDROCARBONS (mg/kg)													
Gasoline		<10	<1.0	<250	<1.0	<1.0	<5.1	<1.0	<1.0	<35	<1.0	<1.0	<1.0
Diesel		<100	<100	1.8	83.0	<5.0	<25	<5.0	<1.0	<130	<20	<20	<10
Kerosene		<100	<100	<1.0	<5.0	<5.0	<25	<5.0	<1.0	<130	<20	<20	<10
Motor Oil		4,700	3,700	<10.0	350	850	3,000	1,300	170	4,600	4,900	5,000	2,300
Other Hydrocarbons		13.0	<1.0	<1.0	5.4	3.3	5.5	24.0	2.0	68.0	<1.0	1.2	<1.0
OTHER ANALYTES													
Phenols, total (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
pH (standard units)		9.32	8.60	8.61	10.62	8.98	8.98	8.78	8.47	9.20	5.07	4.92	4.84

☐ Boxed values are maximum concentrations.

Table 6

SOIL BORING SAMPLE RESULTS: ORGANIC ANALYSES
PG&E OAKLAND SITE (EB-CN-OAK-1)
page 1 of 2

PARAMETER (units)	Location:	B-OAK-1-1	B-OAK-1-1	B-OAK-1-1	B-OAK-2-1	B-OAK-2-1	B-OAK-2-1	B-OAK-3-1	B-OAK-3-1	B-OAK-3-1	B-OAK-4-1	B-OAK-4-2	B-OAK-4-1
	Depth (ft):	0.5/2.5	2.5/4.0	4.0/6.0	0.5/2.0	2.0/4.0	5.5/6.2	0.5/2.0	2.0/4.0	4.0/5.5	2.5/4.5	2.5/4.5	4.0/6.0
	Date Sampled:	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/14/91	3/18/91	3/18/91	3/18/91
	Laboratory No.:	01	02	03	04	05	06	07	08	09	04	05	06
METALS (mg/kg)													
Antimony		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic		2.1	<1.0	<1.0	2.7	1.5	1.3	3.9	3.5	3.5	2.9	14.0	8.0
Barium		95.7	47.7	85.6	144	123	61.4	113	119	122	156	162	165
Beryllium		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	1.8	1.3
Chromium (III)		20.9	21.6	31.2	22.9	30.7	4	24.8	31.6	31	13.8	17.6	21.4
Chromium (VI)		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cobalt		9.6	2.9	3.4	10.8	$\boxed{10.9}$	5.3	7.3	7.9	7.8	6.9	8.3	5.7
Copper		96.3	9.3	15.1	34.5	21.5	58.8	43.7	53.4	99.6	98.3	95.5	$\boxed{180}$
Lead		359	15.8	422	8.4	24.7	45.3	390	373	333	414	357	$\boxed{534}$
Mercury		0.71	0.11	<0.1	0.14	0.25	<0.1	0.11	1.0	0.68	2.7	2.4	11.9
Molybdenum		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.2	3.0	<2.0	<2.0	<2.0
Nickel		$\boxed{557}$	12.8	13.9	34.7	66.3	402	58.5	45.8	59.1	81.2	84.1	77.5
Selenium		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium		$\boxed{103}$	14.7	21.1	53.2	24.9	23.3	35.6	29	41.7	47.2	45.1	68.8
Zinc		244	16.8	37.2	62.4	61.1	75.7	182	163	216	249	273	167
OTHER ANALYTES (mg/kg)													
Ammonia		19	25	$\boxed{36}$	0.62	3.9	0.77	0.54	2.6	0.58	<5.0	<5.0	<5.0
Cyanides, total		0.46	0.47	0.3	0.26	2.6	0.48	1.2	0.3	0.9	$\boxed{106}$	80.9	<0.1
Sulfides		<200	<200	<200	<200	200	<200	<200	$\boxed{320}$	<200	<200	<200	<200
pH (standard units)		9.32	8.6	8.61	10.62	8.98	8.98	8.78	8.47	9.02	5.07	4.92	4.84

☐ : Boxed values are maximum concentrations.

TABLEB-6.WR1
Lab Report ID No. 9103085, 9103090, 9103104 and 9103105 (Volume 2)

Table 6 (continued)

SOIL BORING SAMPLE RESULTS: INORGANIC ANALYSES /1/
PG&E OAKLAND SITE (EB-CN-OAK-1)
page 1 of 2

PARAMETER (units)	Location:	B-OAK-5-1	B-OAK-5-1	B-OAK-5-1	MW-OAK-1-1	MW-OAK-1-1	MW-OAK-1-1	MW-OAK-2-1	MW-OAK-2-1	MW-OAK-2-1
	Depth (ft):	1.0./2.5	2.5/4.0	4.0/4.1	3.5/4.5	5.0/6.5	6.5/8.0	5.5/7.0	7.0/9.0	9.0/10.5
	Date Sampled:	3/18/91	3/18/91	3/18/91	3/12/91	3/12/91	3/12/91	3/13/91	3/13/91	3/13/91
	Laboratory No.:	01	02	03	03	04	05	04	05	06
PNAs (mg/kg)										
Acenaphthene		<0.9	<0.09	<9.0	64	<9.0	160	<0.09	<0.09	<0.09
Acenaphthylene		<0.5	<0.05	<5.0	270	81.0	13	0.14	<0.05	<0.06
Anthracene		0.052	0.022	1.5	360	41.0	55	0.67	0.004	0.009
Benzo(a)anthracene*		.0.17	0.062	3.5	150	70.0	41	2.10	0.005	0.012
Benzo(a)pyrene*		0.34	0.15	8.7	93	240.0	98	3.60	0.014	0.024
Benzo(b)fluoranthene*		<0.04	0.14	8.0	150	130.0	39	4.10	0.008	0.016
Benzo(e)pyrene		0.39	0.16	7.6	27	130.0	64	3.80	<0.03	<0.03
Benzo(g,h,i)perylene		1.10	0.13	1.5	110	74.0	50	4.80	<0.013	0.019
Benzo(k)fluoranthene*		0.13	0.048	2.6	180	44.0	19	0.66	0.004	0.007
Chrysene*		0.23	0.078	4.0	170	84.0	42	2.40	0.006	0.015
Dibenzo(a,h)anthracene*		0.09	0.086	4.2	50	110.0	21	2.20	0.005	0.009
Fluoranthene		0.64	0.19	11.0	120	260.0	170	4.30	0.014	0.027
Fluorene		<0.09	<0.009	<0.9	300	1.7	32	0.07	<0.009	<0.009
Indeno(1,2,3-cd)pyrene*		0.49	0.18	11.0	48	68.0.	52	7.30	0.010	0.010
Naphthalene		<0.7	<0.07	<7.0	72	590.0	670	0.95	<0.07	<0.07
Phenanthrene		0.31	0.12	6.1	260	170.0	140	1.70	0.013	0.023
Pyrene		0.72	0.27	15.0	91	31.0	200	6.30	0.019	0.037
Total Detected PNAs (ppm):		*4.66*	*1.64*	*84.7*	$\boxed{3,215}$	*2,115*	*1,866*	*45.09*	*0.102*	*0.208*
AROMATIC VOLATILE ORGANIC COMPOUNDS (mg/kg)										
Benzene		<0.003	<0.003	0.022	2600	900	92	0.011	<0.002	<0.002
Ethylbenzene		<0.003	<0.003	0.006	59	870	120	<0.003	<0.002	<0.002
Toluene		0.015	0.004	0.018	210	430	55	<0.003	<0.002	<0.002
Total Xylenes		<0.003	<0.003	0.020	130	460	59	<0.003	<0.002	<0.002
Total Detected VOCs (ppm):		0.015	0.004	0.066	$\boxed{2,999}$	2,660	326	0.011	ND	ND
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
Gasoline		<1.0	<1.0	<1.0	<10,000	<4,000	<990	<1.0	<1.0	<1.0
Diesel		<10	<1.0	<10	$\boxed{130,000}$	84,000	320	<1.0	<1.0	<1.0
Kerosene		<10	<1.0	<10	<1200	<900	<6.0	<1.0	<1.0	<1.0
Motor Oil		530	53	1,700	<12,000	<9,000	<60	120	<10.0	<10.0
Other Hydrocarbons		3	<1.0	<1.0	$\boxed{15,000}$	11,000	2,000	NA	NA	NA
OTHER ANALYTES										
Phenols, total (mg/kg)		1.4	<1.0	<1.0	$\boxed{9.9}$	6.0	8.1	<1.0	<1.0	<1.0
pH (standard units)		9.47	9.27	9.27	10.3	8.96	8.58	9.08	8.96	7.89

NOTE:
/1/
PNAs were analyzed using EPA Method 8310.
*Denotes carcinogenic PNA as defined in Section 5.0.
/2/
Aromatic volatile organic compounds (VOCs) were analyzed using EPA Method 8020.
/3/
Total petroleum hydrocarbons (TPH) were analyzed using EPA Method 8015.

NA: Not Analyzed
ND: Not Detected

TABLEB-5.WR1
Lab ID Report No. 9103085, 9103090, 9103104
and 9103105 (Volume 2)

☐ : Boxed values are maximum concentrations.

Table 6 (continued)

SOIL BORING SAMPLE RESULTS: ORGANIC ANALYSES
PG&E OAKLAND SITE (EB-CN-OAK-1)
page 2 of 2

	Location:	B-OAK-5-1	B-OAK-5-1	B-OAK-5-1	MW-OAK-1-1	MW-OAK-1-1	MW-OAK-1-1	MW-OAK-2-1	MW-OAK-2-1	MW-OAK-2-1
	Depth (ft):	1.0./2.5	2.5/4.0	4.0/4.1	3.5/4.5	5.0/6.5	6.5/8.0	5.5/7.0	7.0/9.0	9.0/10.5
	Date Sampled:	3/18/91	3/18/91	3/18/91	3/12/91	3/12/91	3/12/91	3/13/91	3/13/91	3/13/91
PARAMETER (units)	Laboratory No.:	01	02	03	03	04	05	04	05	06
<u>METALS (mg/kg)</u>										
Antimony		<10	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic		10.5	$\boxed{19.7}$	2.8	1.1	5.6	<1.0	2	<1.0	1.8
Barium		104	77.4	136	26.3	$\boxed{852}$	35.8	91	59.2	47.2
Beryllium		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium		1.2	1.5	$\boxed{1.9}$	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chromium (III)		39	2.6	$\boxed{41.4}$	7.1	17.6	27.4	25.3	33.2	38.2
Chromium (VI)		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cobalt		10.2	8.0	9.4	4.1	4.4	3.6	3.1	2.8	3.3
Copper		31.8	43.3	114	237	$\boxed{248}$	16.0	73.9	24.9	15.8
Lead		128	225	445	50.9	201	4.1	156	8.3	37.5
Mercury		0.3	0.56	0.64	<0.1	3.3	<0.1	0.29	<0.1	<0.1
Molybdenum		<2.0	$\boxed{5.0}$	<2.0	<2.0	3.6	2.5	<2.0	<2.0	<2.0
Nickel		85.8	11.5	61.1	84.8	13.0	24.5	28	12.1	15.9
Selenium		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Thallium		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium		30.2	30.1	43.3	44.1	24.1	26.3	18.9	18.8	21.1
Zinc		170	340	236	104	$\boxed{376}$	29.4	86.1	21.8	21.5
<u>OTHER ANALYTES (mg/kg)</u>										
Ammonia		<5.0	<5.0	9.8	0.77	<0.1	0.22	4.9	8.4	2.9
Cyanide		<0.1	<0.1	<0.1	0.52	0.89	0.18	3.9	0.23	0.44
Sulfides		<200	<200	<200	<200	<200	<200	<200	200	<200
pH (standard units)		9.47	9.27	8.45	10.3	8.96	8.58	9.08	8.96	7.89

☐ : Boxed values are maximum concentrations.

<u>NOTE:</u>

/1/

For specific analytical methods, see Notes 3 through 7 in Table 4-1.

TABLEB-6.WR1
Lab Report ID No. 9103085, 9103090, 9103104 and 9103105 (Volume 2)

Table 6 (continued)
SOIL BORING SAMPLE RESULTS: INORGANIC ANALYSES /1/
PG&E OAKLAND SITE (EB-CN-OAK-3)
page 2 of 2

Table 7

SUMMARY OF CONSTITUENTS DETECTED IN GROUNDWATER SAMPLES
PG&E OAKLAND SITE (EB-CN-OAK-1)

page 1 of 1

Location: Date Sampled: PARAMETER (units)	MW-OAK-1-1 3/20/91	MW-OAK-1-2 3/20/91 -01 Duplicate	MW-OAK-2-1 3/20/91	Range of Sample QLs (mg/l)	EPA /2/ MCL	EPA /2/ MCLG	CA DOHS /3/ MCL or Action Level
PNAs (mg/L)							
Naphthalene	7.1	8 8	<0 01	0.005 - 0.1	-	-	0 02 (DHS AAL)
AROMATIC VOLATILE ORGANIC COMPOUNDS (mg/L)							
Benzene	60.0	67.0	<0 0005	0.0005	0.005	0	0 001
Toluene	7 2	8 6	<0 0005	0.0005	0.7*	0 7*	0.68
Ethylbenzene	3 2	3 6	<0 0005	0.0005	2 0*	2 0*	0 1
Total Xylenes	3 5	4 0	<0 0005	0.0005	-	-	1 75
Total VOCs (ppm):	73.9	83.2	ND				
TOTAL PETROLEUM HYDROCARBONS (mg/L)							
Gasoline	100	120	<0 05	0.05	-	-	-
Other (Light) Hydrocarbons	NA	NA	88	0.05	-	-	-
METALS (mg/L)							
Barium	0.043	0.040	0 059	0.01	1 0	5.0*	1 0
Chromium (VI)	0.025	0.085	<0 010	0.01	0.05	0.10*	0 05
Manganese	0 735	0.765	1 31	0.01	-	-	0 05
Vanadium	0 013	0 010	<0 010	0 01	-	-	-
Zinc	0 016	0 030	0 018	0.01	-	-	5 0
OTHER ANALYTES (mg/l)							
Ammonia, as N	4 5	5 4	<0 05	0 05	-	-	
Cyanides, total	0.25	0.57	<0 01	0.01	-	-	.154 (EPA Health Advisory)
Phenols, total	0 15	0 15	<0 01	0 01	-	-	0 005

*All units in mg/l, roughly equivalent to ppm.

: Analyte exceeds DHS MCL or other drinking water guidance.

NOTE:

/1/

Appendix Table B-7 presents results for all analytes, including non-detects, and describes analytical methods.

/2/

MCL - EPA Maximum Contaminant Level

MCLG - EPA Maximum Contaminant Level Goal

Asterisked values indicate that guideline is proposed; levels are scheduled for promulgation in March 1992.

/3/

California Department of Health Services (CDHS) Action Level or Final MCL.

Table 8: Summary of Organic Analyses for Soil Samples Collected 3/7/94, 3/15/94, 12/17/92, 2/1/93 (mg/kg)

(Only compounds that were detected are listed below)

Analyte	TR1-C-1	TR1-C-2	TR2-C-1	TR2-C-2	AG-1	AG-2	AG-3	S-1 Composite	S- Composite
Pet. Hydrocarbons[1]									
TRPH (418.1)	na	na	na	na	na	na	na	na	1,300
TVH-gasoline	8	530	6	<1	<5.0	<5.0	<5.0	na	na
TEH-kerosine	*	*	<200	<200	<5.0	<5.0	<5.0	na	na
TEH-diesel	20,000	16,000	1,200	370	<5.0	<5.0	<5.0	na	na
TEH-motor/waste oil	25,000	18,000	5,100	2,500	160	140	380	na	na
PNAs[2]									
Naphthalene	220	1,700	<30	<3	<100	110	230	75	4
2-Methylnaphthalene	60	90	<30	<3	nr	nr	nr	nr	<2
Acenaphthylene	540	440	<30	<3	<200	<200	<200	5.6	<
Acenaphthene	<30	<30	<30	3	<200	<200	<200	1.6	<2
Dibenzofuran	detected (20)	<30	<30	<3	nr	nr	nr	nr	<2
Fluorene	150	90	<30	<3	<20	<20	<20	1.8	<
Phenanthrene	2,400	1,600	60	8	<50	150	330	13	14
Anthracene	350	160	<30	detected (2)	<50	55	160	7.0	3
Fluoranthene	1,800	1,100	110	20	210	540	1,200	19	24
Pyrene	3,900	2,500	160	38	240	640	1,300	20	28
Benzo-(a)anthracene	800	240	40	7	74	150	330	4.4	8
Chrysene	1,100	640	50	9	100	180	450	9.5	12
Benzo(b)fluoranthene	630	190	detected (27)	6	100	230	580	14	17
Benzo(k)fluoranthene	140	120	detected (29)	6	50	120	260	5.9	12
Benzo(a)pyrene	980	180	40	8	140	270	650	12	23
Dibenz(a,h)anthracene	<30	<30	<30	<3	80	180	330	2.4	4
Benzo(g,h,i)perylene	<30	100	detected (20)	5	140	360	910	11	27
Indeno(1,2,3-c,d)pyrene	<30	90	detected (20)	4	180	370	810	7.9	19

na = not analyzed nr = not reported

* Kerosene range not reported due to overlap of hydrocarbon ranges. Note: The laboratory stated that the chromatograms for the TR samples did not resemble fuel patterns, except perhaps somewhat for sample TR2-C-2. The laboratory attributed the high concentrations of these constituents to the PAHs in the samples.

[1] TRPH by Method 418.1; other petroleum hydrocarbons by 8015M.

[2] TR and S-composite samples by EPA Method 8270.
AG and S-1 composite samples by EPA Method 8310.

Table 8 cont'd.: Summary of Metals Analyses for All Soil Samples

Sample ID Constituent	TR1-C-1	TR1-C-2	TR2-C-1	TR2-C-2	AG-1	AG-2	AG-3	Scale 4E	Scale 4W	Scale 7E	Scale 7W	S-Composite
Total Metals (mg/kg)												
Antimony	4.6	8.6	6.2	5.4	<10	<10	<10	na	<1.00	na	na	6
Arsenic	2.9	25	2.8	2.7	7.5	6.2	6.8	na	<0.25	na	na	18
Barium	67	99	67	60	83	90	80	na	63	na	na	79
Beryllium	0.15	0.16	0.18	0.18	0.48	0.53	0.41	na	1.2	na	na	<0.1
Cadmium	<0.25	<0.25	<0.25	<0.25	3.3	<2.5	<2.5	na	<0.05	na	na	0.9
Cobalt	4.8	3.5	5.4	5.8	7.6	6.9	7.1	na	13	na	na	10
Chromium	19	14	23	25	20	23	23	na	19	na	na	14
Copper	110	66	47	34	22	22	73	na	59	na	na	99
Lead	86	210	33	49	19	15	18	na	50	na	na	100
Mercury	0.20	0.15	0.16	<0.1	0.39	0.30	0.27	na	0.1	na	na	0.2
Molybdenum	<1.5	<1.5	<1.5	<0.7	<9.8	<9.8	<9.8	na	<0.25	na	na	1
Nickel	22	15	29	28	15	18	19	na	25	na	na	46
Selenium	<2.5	3.7	<2.5	<2.5	<0.25	<0.25	<0.25	na	<0.50	na	na	<1
Silver	<0.50	<0.5	<0.5	<0.5	<2.5	<2.5	<2.5	na	<0.25	na	na	<0.5
Thallium	<2.5	<2.5	<2.5	<2.5	<50	<50	<50	na	<2.00	na	na	<1
Vanadium	16	21	21	20	37	39	30	na	20	na	na	18
Zinc	180	73	72	75	100	74	110	na	92	na	na	150
WET Metals (mg/l)												
Antimony	na	na	na	na	na	na	na	<0.20	<0.20	<0.20	<0.20	na
Arsenic	na	na	na	na	na	na	na	0.06	<0.05	0.05	<0.05	na
Barium	na	na	na	na	na	na	na	3.7	1.8	3.3	2.5	na
Beryllium	na	na	na	na	na	na	na	<0.01	<0.01	<0.01	<0.01	na
Cadmium	na	na	na	na	na	na	na	0.01	<0.01	0.02	<0.01	na
Cobalt	na	na	na	na	na	na	na	0.10	<0.10	0.1	0.1	na
Chromium	na	na	na	na	na	na	na	0.2	<0.10	<0.10	<0.10	na
Copper	na	na	na	na	na	na	na	1.2	1.0	2.8	2.3	na
Lead	na	6.1	na	na	na	na	na	2.6	0.2	2.1	2.8	5.7
Mercury	na	na	na	na	na	na	na	<0.005	<0.005	<0.005	<0.005	na
Molybdenum	na	na	na	na	na	na	na	<0.05	<0.05	<0.05	<0.05	na
Nickel	na	na	na	na	na	na	na	<0.20	<0.20	<0.20	0.2	na
Selenium	na	na	na	na	na	na	na	<0.10	<0.10	<0.10	<0.10	na
Silver	na	na	na	na	na	na	na	<0.05	<0.05	<0.05	<0.05	na
Thallium	na	na	na	na	na	na	na	0.3	<0.10	<0.10	<0.10	na
Vanadium	na	na	na	na	na	na	na	<0.1	<0.10	<0.10	0.1	na
Zinc	na	na	na	na	na	na	na	5.5	0.78	5.6	1.7	na

Table 9: Summary of Analyses of Water Samples Collected 12/17/92 (ug/l)
Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Analyte	W-1	W-2	W-4
Naphthalene	30	5,600	2,300
Acenaphthylene	<50	<500	<1,000
Acenaphthene	<20	<200	<400
Fluorene	<5	140	100
Phenanthrene	15	900	1,000
Anthracene	<5	350	300
Fluoranthene	30	870	1,900
Pyrene	70	840	1,800
Benzo-(a)anthracene	20	170	440
Chrysene	20	280	640
Benzo(b)fluoranthene	30	200	630
Benzo(k)fluoranthene	10	90	260
Benzo(a)pyrene	30	280	700
Dibenz(a,h)anthracene	7	40	90
Benzo(g,h,i)perylene	10	190	410
Indeno(1,2,3-c,d)pyrene	70	150	350

Table 10: Summary of Organic Analyses, Soil Samples Collected 3/12/94 (mg/kg)

(Only compounds that were detected are listed below)

Analyte	Scale-7W	Scale-7E	Scale-4W	Scale-4E
TRPH (418.1)	2,500	150	1,400	1,800
PNAs (EPA Method 8270)				
Total PNAs	385	208	128	76
Naphthalene	1.1	<1.0	<1.0	<1.0
2-Methylnaphthalene	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	3.9	2.9	1.8	1.2
Acenaphthene	<1.0	<1.0	<1.0	<1.0
Fluorene	<1.0	<1.0	<1.0	<1.0
Phenanthrene	11	6.2	4.1	4.4
Anthracene	2.2	2.7	<1.0	1.2
Fluoranthene	54	22	19	9.9
Pyrene 78	32	24	14	
Benzo(a)anthracene	15	9.5	6.9	3.6
Chrysene	20	9.1	8.8	<1.0
Benzo(b)fluoranthene	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	24	12	10	3.2
Benzo(a)pyrene	55	32	8.9	12
Dibenz(a,h)anthracene	<1	7.6	5.0	1.4
Benzo(g,h,i)perylene	69	40	18	19
Indeno(1,2,3-c,d)pyrene	51	28	21	6.4
Dibenzofuran	<1.0	<1.0	<1.0	<1.0

Table 11: Summary of Data for Howard Terminal Site

Location	Study	PAHs	BTEX	VOCs	Metals	STLC Metals	Cr(VI)	TPH	PCBs	NH_4, Cyanides	Sulfide, Phenols
HTS-E	ERM-West	x	x	x							
Near HTS-E	EBASCO	x	x		x		x	x	x	x	x
HTS-W	U&A	x			x	x		x			
HTS-W	Riedel	x			x	x		x			

Location	Study	Number and Type of Samples	Depth	Analyses/Analytes Detected
HTS-E	ERM-West	25 soil samples	3.0 to 11.5 feet	PAHs ND to 6,370 mg/kg
		4 soil samples	5.0 to 9.0 feet	BTEX ND to 1.35 mg/kg VOCs 0.046 to 0.49 mg/kg
		4 groundwater samples	NA	BTEX 0.008 to 23.071 mg/L PAHs 0.060 to 120 mg/l
Near HTS-E	EBASCO[1]	3 soil samples	surface	BTEX 0.023 to 0.23 mg/kg PAHs ND to 5.264 mg/kg TPH 24 to 160 mg/kg Cr(VI) <1.0 mg/kg
		19 soil samples	0.5 to 5.0 feet	BTEX ND to 1.714 mg/kg PAHs 0.026 to 2,760 mg/kg TPH 30 to 6,310 mg/kg PCBs ND Phenols ND to 3.8 mg/kg Cr(VI) <1.0 mg/kg Pb 5.0 to 294 mg/kg
		15 soil samples	0.5 to 10.5 feet	BTEX ND to 2,999 mg/kg PAHs 0.102 to 3,215 mg/kg TPH ND to 15,000 mg/kg Phenols ND to 9.9 mg/kg Cr(VI) <1.0 mg/kg Pb 4.1 to 534 mg/kg
		3 groundwater samples	NA	BTEX ND to 83.2 mg/l PAHs ND to 8.8 mg/l TPH 88 to 120 mg/l Phenols ND to 0.15 mg/l Cr(VI) ND to 0.085 mg/L
HTS-W	U&A[2]	7 soil samples	surface	PAHs 116 to 13,090 mg/kg TPH 140 to 45,000 mg/kg Pb 15 to 210 mg/kg
		1 soil sample; WET extract	surface	Pb 5.7 and 6.1 mg/l
		3 groundwater samples	NA	PAHs 0.342 to 10.92 mg/l
HTS-W	Riedel[3]	4 soil samples	surface	PAHs 76 to 385 mg/kg TPH 150 to 2,500 mg/kg
		1 soil sample	surface	Pb 50 mg/kg
		4 soil samples; WET extract	surface	Pb 0.2 to 2.8 mg/L

[1] Soil samples collected by EBASCO were analyzed for the full suite of CAM 17 metals; only lead is reported here. Groundwater samples collected by EBASCO were also analyzed for Ba, Mn, V, Zn, Ammonia, and Cyanides. Background surface samples collected off site are not included in this summary.

[2] Soil samples collected by U&A were analyzed for the full suite of CAM 17 metals; only lead is reported here

[3] One soil sample collected by Reidel was analyzed for the full suite of CAM 17 metals; only lead is reported here. WET extracts of samples collected by Reidel were analyzed for the full suite of CAM 17 metals; only lead is reported here.

Appendix F
SEDIMENT CHARACTERIZATION
PORT OF OAKLAND, 1994

■ ■ ■

Table 1. STLC METALS

Analyte	Detection level	6901	6902	6903	6904	6905	6906	6907	6908	6909	6910	6911	6912	6913	6914	6915	6916
STLC	Mg/L																
Antimony	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	0.1	1.1	1.4	1.5	1.5	1	1.9	2.3	2.5	1	1.1	2.3	2.3	1.6	1.4	1.1	2
Beryllium	0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	0.05	<0.05	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	0.1	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.5	0.3	0.4	0.5	0.4	0.5	0.4	0.3	0.5
Cobalt	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hex. Chromium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.1	0.6	0.6	0.6	0.5	0.4	0.4	0.1	0.4	0.5	0.4	0.2	<0.1	0.3	0.8	1	0.7
Mercury	0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.008	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Molybdenum	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	0.1	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.2
Selenum	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Thallium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Vanadium	0.1	0.6	0.6	0.6	0.6	0.5	0.4	0.7	0.8	0.6	0.6	0.8	0.8	0.8	0.6	0.6	0.7
Zinc	0.1	1.6	1.7	1.8	1.7	1.3	1	1	1.5	1.8	1.8	1.2	0.6	2.2	2.3	2.5	2.1
		6917	6918	6919	6920	6921	6922	6923	6924	6925		Mean	S.D.				
STLC	Mg/L																
Antimony	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	0.00				
Arsenic	0.05	<0.05	<0.05	0.09	<0.05	0.17	<0.05	<0.05	<0.05	<0.05		0.06	0.00				
Barium	0.1	1.3	1.8	1.2	1.1	1.5	1.7	1.2	1.2	2.3		1.57	0.48				
Beryllium	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	0.00				
Cadmium	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	0.00				
Chromium	0.1	0.3	0.5	0.3	0.3	0.4	0.4	0.3	0.4	0.4		0.38	0.08				
Cobalt	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	0.00				
Copper	0.1	0.3	0.4	<0.1	<0.1	<0.1	0.2	0.1	<0.1	0.4		0.28	0.13				
Hex. Chromium	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	0.00				
Lead	0.1	2.2	2.6	1	1	2	2.3	2.1	0.8	2.8		1.01	0.83				
Mercury	0.006	<0.006	0.007	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006		<0.006	0.00				
Molybdenum	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	0.00				
Nickel	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3		0.22	0.05				
Selenum	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	0.00				
Silver	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	0.00				
Thallium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	0.00				
Vanadium	0.1	0.6	0.8	0.6	0.6	0.7	0.7	0.6	0.5	1		0.66	0.13				
Zinc	0.1	4.1	5.3	2.5	2.4	4.3	4.7	3.5	2.3	6.2		2.46	1.43				

TABLE 2. ORGANIC ANALYSIS RESULTS (A)

									SAMPLE NUMBER								
Analyte	Detection level Mg/KG	6901	6902	6903	6904	6905	6906	6907	6908	6909	6910	6911	6912	6913	6914	6915	6916
EPA 8015/8020																	
Benzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	0.007	ND	ND
Ethylbenzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0008	ND	0.007	ND	ND
Toluene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.027	ND	ND
o-Xylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.009	ND	ND
p,m-Xylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.028	ND	ND
Gasoline	0.3	ND	ND	ND	ND	ND	ND	0.4a	ND	ND	ND	0.3a	2.5a,b	ND	0.8a	ND	ND
TPH-Diesel	1	290a	250a	340a	290a	220a	200a	830a	830a	650a	250a	260a	1000a	510a	340a	860a	320a
EPA 8080 (TCLP)	Mg/L																
Aroclor 1016	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1221	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1232	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1242	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1248	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1254	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1260	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlordane	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lindane	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EPA 8270 (TCLP)	Mg/L																
m,p-Cresol	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Cresol	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cresol (total)	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorobenzene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Ttrichlorophenol	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

					TABLE 2. ORGANIC ANALYSIS RESULTS (A)								
	Detection				SAMPLE NUMBER								
Analyte	level	6917	6918	6919	6920	6921	6922	6923	6924	6925		Mean	S.D.
	Mg/KG												
EPA 8015/8020													
Benzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND		<0.005	NA
Ethylbenzene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND		<0.005	NA
Toluene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND		<0.005	NA
o-Xylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND		<0.005	NA
p,m-Xylene	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND		<0.005	NA
Gasoline	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND		<0.3	NA
TPH-Diesel	1	190a	500a	220a	250a	390a	380a	200a	120a	1000a		427.6	270.8
EPA 8080 (TCLP)	Mg/L												
Aroclor 1016	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Aroclor 1221	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Aroclor 1232	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Aroclor 1242	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Aroclor 1248	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Aroclor 1254	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Aroclor 1260	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Chlordane	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Endrin	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Heptachlor	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Heptachlor													
epoxide	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Lindane	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Methoxychlor	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
Toxaphene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND		NA	NA
EPA 8270 (TCLP)	Mg/L												
m,p-Cresol	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
o-Cresol	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Cresol (total)	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,4-Dichlorobenzene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,4-Dichlorobenzene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Hexachlorobenzene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Hexachlorobutadiene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Hexachloroethane	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Nitrobenzene	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Pentachlorophenol	200	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Pyridine	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,4,5-Ttrichlorophenol	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,4,6-Trichlorophenol	50	ND	ND	ND	ND	ND	ND	ND	ND	ND			

						TABLE 2. ORGANIC ANALYSIS RESULTS (C)											
4-chloro-3-methylphenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dichlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dimethylphenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-dinitrophenol	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl phenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-methyl phenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl-4,6-dinitrophenol	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-nitrophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nitrophenol	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
phenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-trichlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-trichlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenapthene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) anthracene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (ghi) perylene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzoic Acid	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl alcohol	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzylbutylphthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis-(2-chloroethoxy) methane	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis-(2-chloroethyl) ether	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis-(2-chloroisopropyl) ether	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis-(2-ethylhexyl)phthalate	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-bromophenylphenylether	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-chloroaniline	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chloronaphthalene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenylphenylether	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo (a,h) anthracene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3-dichlorobenzidine	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

					TABLE 2. ORGANIC ANALYSIS RESULTS (D)								
4-chloro-3-methylphenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-chlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,4-dichlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,4-dimethylphenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,4-dinitrophenol	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-methyl phenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
4-methyl phenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-methyl-4,6-dinitrophenol	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-nitrophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
4-nitrophenol	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Pentachlorophenol	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND			
phenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,4,5-trichlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,4,6-trichlorophenol	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Acenapthene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Acenaphthylene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Anthracene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzidine	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzo (a) anthracene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzo (a) pyrene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzo (b) fluoranthene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzo (ghi) perylene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzoic Acid	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzo (k) fluoranthene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzyl alcohol	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Benzylbutylphthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Bis-(2-chloroethoxy) methane	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Bis-(2-chloroethyl) ether	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Bis-(2-chloroisopropyl) ether	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Bis-(2-ethylhexyl)phthalate	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND			
4-bromophenylphenylether	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
4-chloroaniline	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-chloronaphthalene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
4-Chlorophenylphenylether	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Chrysene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Dibenzo (a,h) anthracene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Dibenzofuran	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,2-dichlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,3-dichlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,4-dichlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
3,3-dichlorobenzidine	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Diethyl phthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Dimethyl phthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Di-n-butylphthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			

TABLE 2. ORGANIC ANALYSIS RESULTS (E)

2,4-dinitrotoluene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-dinitrotoluene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadine	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ideno(1,2,3-cd) pyrene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-methyl napthalene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09	ND	ND	ND	ND
Napthalene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-nitroaniline	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-nitroanailine	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-nitroanailine	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-nitrosodi-n-propylamine	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-nitrosodiphenylamine	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-trichlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EPA 8240 (TCLP)	Mg/L																
Acetone	0.1	0.4a	0.4a	ND	ND	ND	ND	ND	ND	ND	0.4a	ND	ND	0.1a	0.1a	0.1a	0.1a
Benzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinyl ether	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichlorobenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

					TABLE 2. ORGANIC ANALYSIS RESULTS (F)								
2,4-dinitrotoluene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2,6-dinitrotoluene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Di-n-octylphthalate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Fluoranthene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Fluorene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Hexachlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Hexachlorobutadiene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Hexachlorocyclopentadine	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Hexachloroethane	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Ideno(1,2,3-cd) pyrene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Isophorone	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-methyl napthalene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Napthalene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-nitroaniline	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND			
3-nitroanailine	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND			
4-nitroanailine	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Nitrobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
N-nitrosodi-n-propylamine	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
N-nitrosodiphenylamine	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Phenanthrene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Pyrene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,2,3-trichlorobenzene	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
EPA 8240 (TCLP)	Mg/L												
Acetone	0.1	0.1a	0.1a	0.1a	0.1a	0.1a	0.1a	0.1a	0.2a	0.1a			
Benzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Bromodichloromethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Bromoform	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Bromomethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-Butanone	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Carbon disulfide	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Carbon tetrachloride	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Chlorobenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Chloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-Chloroethylvinyl ether	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Chloroform	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Chloromethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Dibromochloromethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,2-dichlorobenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,3-dichlorobenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,4-dichlorobenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,1-dichloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,2-dichloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,1-dichloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
cis-1,2-dichloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			

TABLE 2. ORGANIC ANALYSIS RESULTS (G)

trans-1,2-dichloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloropropane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-dichloropropene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-dichloropropene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-hexanone	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-methyl-2-pentanone	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-tetrachloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-trichloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl acetate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-xylene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p,m-xylene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

					TABLE 2. ORGANIC ANALYSIS RESULTS (H)								
trans-1,2-dichloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,2-dichloropropane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
cis-1,3-dichloropropene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
trans-1,3-dichloropropene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Ethylbenzene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Freon 113	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
2-hexanone	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Methylene chloride	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND			
4-methyl-2-pentanone	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Styrene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,1,2,2-tetrachloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Tetrachloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Toluene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,1,1-trichloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1,1,2-trichloroethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Trichloroethene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Trichlorofluoromethane	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Vinyl acetate	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Vinyl chloride	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
o-xylene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			
p,m-xylene	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND			