EXHIBIT C - CHEVRON

STATEMENT OF FINDINGS

These findings on the Chevron Long Wharf Marine Terminal Project (Project) proposed by Chevron U.S.A. ("the Applicant") are made by the California State Lands Commission (CSLC), pursuant to the *Guidelines* for the California Environmental Quality Act (the CEQA) (California Code of Regulations, Title 14, section 15091). All significant adverse impacts of the Project in California identified in the Final Environmental Impact Report (EIR) are included herein and organized according to the resource affected.

The CEQA Findings are numbered in accordance with the impact and mitigation numbers identified in the Mitigation Monitoring Program in the EIR (see Section 6.0 of the Draft EIR, with revisions in Section 4.0 of the Finalizing Addendum). The CEQA Finding numbers are not numbered sequentially because some of the impacts were adverse but less than significant (Class III) or a beneficial impact (Class IV).

For discussion of impacts, significance is classified according to the following definitions:

- **Class I -** Significant adverse impact that remains significant after mitigation;
- **Class II -** Significant adverse impact that can be eliminated or reduced below an issue's significance criteria;
- **Class III -** Adverse impact that does not meet or exceed an issue's significance criteria; or
- **Class IV -** Beneficial impact.

Class III and Class IV impacts require neither mitigation nor findings.

For each significant impact, i.e. Class I or II, a finding has been made as to one or more of the following, as appropriate:

a) "Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR."

b) "Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency."

c) "Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR."

A discussion of the facts supporting them follows the findings.

Whenever Finding (b) occurs, the agencies with jurisdiction have been specified. These agencies, within their respective spheres of influence, have the ultimate responsibility to adopt, implement, and enforce the mitigation discussed within each type of impact that could result from project implementation. However, under the CEQA (Public Resources Code section 21081.6), the CSLC, as the CEQA Lead Agency, has the responsibility to ensure that the mitigation measures contained are effectively implemented. Other specified State, local, regional, and Federal public agencies include, but are not necessarily limited to the following:

- California Department of Fish and Game, Office of Oil Spill Prevention and Response (CDFG-OSPR);
- California Coastal Commission (CCC);
- San Francisco Bay Regional Water Quality Control Board (SFRWQCB);
- San Francisco Bay Conservation and Development Commission (BCDC);
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries);
- Department of the Army, U.S. Corps of Engineers (Corps);
- U.S. Coast Guard (USCG);
- U.S. Environmental Protection Agency (EPA);
- U.S. Fish and Wildlife Service (USFWS); and
- Bay Area Air Quality Management District (BAAQMD).

Whenever Finding (c) is made, the CSLC has determined that, even after implementation of all feasible mitigation measures, there will or could be an unavoidable significant adverse environmental impact due to the Project. The Statement of Overriding Considerations applies to all such unavoidable impacts as required by the State CEQA *Guidelines* sections 15092 and 15093.

During preparation of the Draft EIR, the CSLC's Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) were in the process of development, public review and comment, and finalization. As such, the Draft EIR contained several mitigation measures that reflected information/conclusions contained in the proposed MOTEMS.

The MOTEMS were approved by the California Building Standards Commission on January 19, 2005, and became effective on February 6, 2006. The MOTEMS are

codified as Chapter 31F (Marine Oil Terminals), Title 24, California Code of Regulations, Part 2, California Building Code. The standards apply to all existing and new marine oil terminals in California, and include criteria for inspection, structural analysis and design, mooring and berthing, geotechnical considerations, fire, piping, mechanical and electrical systems. Because the MOTEMS became effective during the public review period for the Draft EIR, such mitigation measures included in the DEIR, were eliminated within the Finalizing Addendum as they were duplicative of provisions within the MOTEMS. The affected mitigation measures are:

- OS-3a
- OS-3d
- OS-5
- OS-6a
- GEO-6
- SOC-1

CEQA Finding No. OS-3

POTENTIAL FOR SPILLS AND RESPONSE CAPABILITY FOR CONTAINMENT OF CLASS I-IV OIL SPILLS FROM TERMINAL DURING TRANSFER OPERATIONS

Impact: **OS-3: Chevron's response capability for containment of spills during transfer operations would result in adverse and significant impacts for spills greater than 50 bbls. Consequences would range from spills that can be contained during first response efforts with rapid cleanup, to those complex spills that result in a significant impact with residual effects after mitigation.**

Class: I and II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

The Chevron Long Wharf currently meets all federal and state requirements for response capabilities. In most cases, Chevron's response capability is considered adequate to contain a spill of up to 50 bbls and prevent it from spreading over a wide area, thus either preventing or mitigating significant impacts (Class II). However, the Long Wharf will not be able to contain and recover all the oil from a release of greater than 50 bbls and even with implementation of mitigation measures, impacts may remain significant (Class I).

Mitigation Measures for OS-3: The following shall be completed by Chevron within 12 months of lease implementation, unless otherwise specified.

OS-3b: Install tension-monitoring devices at Berth 1 to monitor mooring lines and avoid excessive tension or slack conditions that could result in spills. An alarm system (visual and sound) that incorporates communication to the control-building operator shall also be a part of the system. In addition, if any vessel drifts (surge or sway) more than 7 feet from its normal manifold or loading arm position at any other terminal berth, Chevron shall install, within 6 months after the incident, tension-monitoring devices at such berth.

OS-3c: Install Allision Avoidance System (AAS) at the terminal to prevent damage to the pier and/or vessel during docking operations. Prior to implementing this

measure, Chevron shall consult with the San Francisco Bar Pilots, the U.S Coast Guard, and the staff of the CSLC and provide information that would allow the CSLC to determine, on the basis of such consultations and information regarding the nature, extent and adequacy of the existing berthing system, the most appropriate application and timing of an AAS at the Chevron Long Wharf.

Tension monitoring enables loading to continue in marginal weather conditions, high velocity current conditions, or other conditions where the limits of strain on the mooring lines could result in movement of the vessel resulting in damage to the wharf and/or vessel. These devices will minimize the potential for excessive surge or sway of the vessel (motion parallel or perpendicular to the wharf), or the parting of mooring lines, or breaking of loading arms, which could result in an oil spill. Such monitoring mechanisms would ensure that the design limits of the mooring would not be exceeded and reduce or eliminate this potential contribution to a potential oil spill.

At present, the docking system relies on the pilot's judgment to determine the vessel's approach speed and angle to the Long Wharf. An Allision Avoidance System would help to prevent damage to the wharf and vessel by monitoring the speed, approach angle, and distance from the dock of the approaching vessel and providing warning if the monitored parameters fall outside preset limits indicating an allision, that is the vessel dashing against or striking the wharf, could occur. The application of this type of system would augment the professional experience and training of pilots responsible for docking vessels at the Long Wharf and would provide an additional tool to significantly reduce or eliminate potential damage to the vessel and the wharf, each of which, independently or in concert, could contribute to an oil spill incident.

These measures help to reduce the potential for spills and their associated impacts. However, the impacts associated with the consequences of larger spills, greater than 50 bbls, could remain significant (Class I).

CEQA FINDING NO. OS-4

GROUP V OILS

Impact: **OS-4: Group V oils have a specific gravity greater than 1 and do not float on the water; instead, they will sink below the surface into the water column or possibly to the bottom. Chevron states in their Spill Preparedness and Emergency Response Plan that no reasonable technology currently exists for a Group V response in the San Francisco Bay. Thus, a release of a Group V oil could result in significant impacts.**

Class: I

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

OSPR regulations stipulate that all facilities that transfer Group V oil must identify equipment that can be used to monitor and/or recover it. To satisfy OSPR regulations, Chevron has identified several dredging companies that may be able to assist in the event of a spill. These companies can provide dredges, pumps, detection devices (fathometers with frequencies high enough to identify submerged oil), and silt curtains (silt curtains must be ordered from out of the area). It is difficult to monitor and predict the movement of Group V oils and to recover the oil while it is in the water. Consistent with the findings of the DEIR Section 4.3, Water Quality, a Group V oil spill would be a significant, adverse (Class I) impact.

<u>Mitigation Measures for OS-4:</u>

OS-4: Chevron shall confer with the California State Lands Commission (CSLC) regarding Group V oil spill response technology including potential new response equipment and techniques that may be applicable for use at the Long Wharf. Chevron shall work with the CSLC in applying these new technologies, as agreed upon, if recommended for this facility**.**

This measure would provide require periodic examination of developments in spill response and clean up technologies regarding spills of Group V oils and would provide flexibility during the lease term to apply updated response capabilities for such oils.

This measure may, during the lease term, reduce the potential impacts from releases of Group V oils, but may not reduce the impact to a level below its significance criteria. Thus, the residual impact could remain significant (Class I).

CEQA FINDING NO. OS-5

TERMINAL SPILLS FROM PIPELINES DURING NON-TRANSFER PERIODS

Impact: **Spills from the terminal during non-transfer periods would be associated with pipelines and are considered a significant impact if spills are less than 50 bbls, or significant impacts for spills greater than 50 bbls.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Chevron has an extensive pipeline inspection program in place (DEIR Section 2.3.2, Physical Description of Long Wharf). The existing conditions and stability of the Long Wharf are addressed in DEIR Section 4.11.1, Environmental Setting, and conclude that the comprehensive wharf upgrade program completed in 2000 would prevent expected seismic events from causing significant damage to the wharf, which could contribute to oil and/or petroleum product releases. It was concluded that the wharf pipelines are flexible enough to withstand some movement from an earthquake without failure. It was also concluded that the pipeway on which the pipelines rest is in very good condition. Specialty paints or mastic also provide external corrosion protection for pipelines, pipeline laterals, and DCMA loading arms.

Should leakage from a pipeline, or oil containment or recovery system occur during routine piping and loading/unloading operations, impacts would be considered significant (Class II) impacts if spills are less than 50 bbls, or significant (Class I) impacts for spills greater than 50 bbls.

Although MOTEMS establishes preventive maintenance requirements that include periodic inspection of all components related to transfer operations to reduce the potential for equipment failures that could result in an oil spill incident, the impacts associated with the consequences of larger spills could remain significant (Class I).

CEQA FINDING NO. OS-6

POTENTIAL FOR FIRES AND EXPLOSIONS AND RESPONSE CAPABILITY

Impact: **OS-6: Public areas are beyond the hazard footprint boundary; thus fires and explosions would not cause a public safety risk. However, the Wharf's Operations Manual does not address fire emergency procedures, and a fire and/or explosion could lead to a release of oil. A significant adverse impact has been identified.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

The Long Wharf is equipped with the following fire detection and extinguishing equipment:

- A fire water line throughout the entire wharf is pressurized and available at all times. Fire water manifolds, quick-attack hose boxes, and individual hose hydrants are regularly spaced along the wharf;
- A suction line at the south end of Berth No. 4 can be lowered into the water to take water directly from the Bay if necessary;
- All cargo-handling berths are provided with stores of fire-fighting foam. The foam is aqueous film-forming foam (AFFF), suitable for oil and petroleum-product fires;
- Each personnel shelter, one for each berth, is equipped with a dry chemical fire extinguisher, located near the door of the individual shelter; and
- Chevron also maintains its own fire/emergency response department with full-time trained personnel at the Refinery. These personnel are trained in fighting petroleum fires and fires at the Long Wharf. The Long Wharf can access the Refinery Fire Department via radio, emergency hot line, or Refinery phone. The Richmond Fire Department will provide mutual aid upon request from the Chevron Fire Department.

Chevron completed a major upgrade to their fire protection system. It replaced approximately 2,000 feet of 8-inch fire water pipeline with 10-inch pipe on the main wharf, installed a new diesel engine-driven fire water pump, and installed 250 feet of 12-inch fire main and new distribution piping connections to existing equipment. Fire flow meets MOTEMS' requirements.

The first line of defense for a fire onboard a tanker or tank barge is the onboard fire protection system. Federal regulations (46 CFR 34) require tankers to have comprehensive firefighting systems that include fire pumps, piping, hydrants, and foam systems. Tank barges are required to have only portable fire extinguishers, while some are equipped with built-in systems. The tank vessel crews are trained in the use of the firefighting equipment. The onboard firefighting equipment is sufficient to extinguish most fires.

To improve response capability in fighting shipboard and wharf fires, Chevron recently retrofitted the Long Wharf fire-fighting vessel *Phoenix* to provide foam firefighting capability at up to 7,000 Gallons Per Minute (gpm) from the front monitor. Also, the San Francisco Fire Department has the ability to send two fire boats with 30,000 gpm capacity.

The USCG Marine Fire Fighting Contingency Plan assesses fire risk based on damage potential, management of response efforts, and available response resources and provides guidelines for coordinating resources in the event of a tanker fire (USCG 2000).

Chevron's manuals do not presently contain procedures to deal with tank vessel fires or associated emergency response or for conducting fire drills. However, since MOTEMS became effective on February 6, 2006, Chevron is required to be consistent with the requirements of sections 3102F3.8 and 3108F2.2 of 24 CCR, Part 2, California Building Code, Chapter 31F for a MOT Fire Plan and its contents. However, the Plan is not required to be submitted until 90 days after lease implementation.

Mitigation Measures for OS-6:

OS-6b. Chevron shall develop a set of procedures and conduct training and drills for dealing with tank vessel fires and explosions for tankers berthed at the Long Wharf. The procedures should include the steps to follow in the event of a tank vessel fire and describe how Chevron and the vessel will coordinate activities. The procedures shall also identify other capabilities that can be procured if necessary in the event of a major incident. The procedures shall be submitted to the U.S. Coast Guard and California State Lands Commission within 90 days of lease renewal.

Chevron's Operations Manual presently has no discussion or procedures for dealing with tank vessel fires or emergency response. Procedures, training, and drills need to be in place in planning for emergency response, so that the wharf operations crew follows appropriate steps to ensure that emergency response measures are implemented without incident in an emergency situation. The requirement that such a plan be prepared and be submitted within 90 days of lease approval would address present deficiencies in a timely manner and afford greater protection to vessels, the wharf, and affected personnel by providing a timely and coordinated response to vessel fires/ explosions and thereby reducing the potential for an oil spill incident.

CEQA FINDING NO. OS-7

RESPONSE CAPABILITY FOR ACCIDENTS IN BAY AND OUTER COAST

Impact: **OS-7: Spills from accidents in the Bay could result in impacts to water quality or biological resources that could be significant adverse impacts for those that can be contained during first response efforts; or significant adverse impacts that would have residual impacts. While Chevron does not have legal responsibility for tankers it does not own, it does have responsibility to participate in improving general response capabilities.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Tank Vessel Spills Within the Bay

Response to a spill from a tanker is the responsibility of the vessel owner/operator. As a result of OPA 90, each vessel is required to have an oil plan that identifies the worst-case spill (defined as the entire contents of the vessel) and the assets that will be used to respond to the spill. Chevron, which owns and/or operates many of tankers that call at the Long Wharf, has developed its plans in response to OPA 90. Chevron is a member of the Marine Spill Response Corporation (MSRC), which can supply the resources required by the USCG/OPA 90. The response capability of other tanker companies and barge companies is less known, but must be documented in their oil spill response manuals. All tanker companies operating within California waters, must demonstrate by signed contract to the USCG and CDFG that they have, either themselves or under contract, the necessary response assets to respond to a worst case release as defined under Federal and State regulations.

Response to a vessel spill would consist of containment (deploying booms), recovery (deploying skimmers), and protection of sensitive resources. If the oil were to reach the

shore and/or foul wildlife, the shoreline and wildlife would be cleaned. MSRC would make their local equipment and manpower available. If required, additional equipment and manpower would be made available from local contractors, OSROs, and MSRC at other locations.

While MSRC can provide the equipment and manpower required by OPA 90 and OSPR, it is unlikely that they could prevent a large spill from causing significant contamination of the shoreline. The Regional Resource Manual and the Area Contingency Plan identify sensitive resources within the Bay Area and methodologies for protecting and cleaning up those areas. A large spill from a tank vessel can be classified as a significant, adverse (Class I) impact depending on spread of the spill and resources impacted as presented in other resources sections of the DEIR.

Tank Vessel Spills Outside the Bay

Again, the vessel owner/operator is responsible for cleaning up spills and must be able to identify what assets will be used. MSRC can provide the required response resources outside the Bay.

The MSRC Oil Spill Contingency Plan and Area Contingency Plan identify sensitive resources along the outer coast and measures to be used in protecting these resources.

Response to spills outside the Bay would be somewhat different from that inside the Bay. First, the environment outside the Bay may be more difficult to work in because of sea conditions. Booms become less effective as wave heights increase, losing much of their effectiveness once waves exceed 6 feet. There may be conditions when it would be impossible to provide any response actions. However, when wave energy is such that it is impossible to deploy response equipment, the wave energy causes the oil to be dispersed much more rapidly.

Second, it may not be necessary to try to contain and clean up a spill if it does not threaten the shoreline or a sensitive area. In this case, the spiller would monitor the trajectory of the spill in accordance with methodologies presented in the Area Contingency Plan.

If the spill could affect the shoreline or sensitive area, then the response efforts would consist of containing and cleaning as much oil as necessary, and protecting sensitive areas.

The MSRC large response vessels are located inside the Bay. It would take the vessels a minimum of 2 hours to get underway and exit the Bay, and 24 hours to reach the Fort Bragg area. Again, additional resources would be available from other response cooperatives and other MSRC sites. While the response capability meets the minimum requirements of OPA 90 and OSPR, a large spill could still result in significant, adverse impacts (Class I) to sensitive resources as described in other resources sections of the DEIR.

Mitigation Measures for OS-7:

OS-7a: Chevron shall participate in an analysis to determine the adequacy of the existing VTS in the Bay Area, if such a study is conducted by a federal, state, or local agency during the life of the lease. Agencies such as the San Francisco Bay Harbor Safety Committee often conduct studies of safety issues within the Bay Area. As vessel traffic increases in and around the Bay Area and as technology improves, it may be necessary and feasible to upgrade and expand the VTS in and around the Bay Area. Chevron shall participate in this analysis and contribute a pro-rata share toward the upgrade and expansion of the system, if required to do so by the CSLC.

OS-7b: Chevron shall respond to any spill from a vessel traveling to or from the wharf, moored at its wharf, related in any way to the wharf, or carrying cargo owned by Chevron, as if it were its own, without assuming liability, until such time as the vessel's response organization can take over management of the response actions in a coordinated manner.

As a participant in any analysis to examine upgrades to the VTS, Chevron can help to improve transit issues and response capabilities which, in general, will help to reduce the potential for incidents and the consequences of spills within the Bay.

As presented above, a tanker owner/operator has responsibility for spills from their tanker. And Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for other tankers. For a spill near the Long Wharf, Chevron is more suited to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. Such action may result in the quicker application of oil spill equipment to a nearby spill, and thereby improve the control and recovery of such spill. Even with these measures, however, the consequences of a spill could result in significant, adverse impacts (Class I).

CEQA FINDING NO. WQ-2

SEGREGATED BALLAST WATER DISCHARGE COULD IMPAIR WATER QUALITY

Impact: **WQ-2:** Discharge of ballast water that contains harmful microorganisms could impair several of the project area's beneficial uses, including commercial and sport fishing, estuarine habitat, fish migration, preservation of rare and endangered species, water contact recreation, non-contact water recreation, fish spawning, and wildlife habitat. Therefore discharge of segregated ballast water is determined to have a potentially significant impact to water quality.

Class: I

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Ballast water is used to provide stability to tankers and barges. Ballast water is taken to compensate for the lightering of vessels bringing crude oil or feed products to the Refinery. Segregated ballast water is kept in tanks that are segregated from oily cargo. Sometimes, however, ballast may be taken into cargo holds where it will come in contact with oil. Non-segregated ballast water is considered a hazardous waste in California and cannot be discharged to Bay or coastal waters.

One discharge from vessels associated with the Long Wharf to the receiving waters of the Bay is segregated ballast water. All other liquid wastes, including non-segregated ballast water, cargo tank washwater, bilge water, and sanitary wastewater, are sent to the Refinery via numerous pipelines for treatment and ultimate discharge through the deep-water outfall to San Pablo Bay.

Ballast water from segregated ballast tanks may be discharged from vessels to San Francisco Bay as vessels take on product from the Refinery or during transfer of product from a larger vessel to a smaller vessel or barge at Anchorage No. 9. Organisms in ballast water may have significant adverse impacts to biological resources and water quality. Impacts to biological resources are discussed in the DEIR, Section 4.3, Biological Resources. Release of segregated ballast water could have a significant adverse impact to water quality if viruses, toxic algae or other harmful microorganisms

were released. Release of harmful microorganisms would violate the water quality objective for toxicity in the San Francisco Bay Basin Plan (RWQCB 1995). This objective states that waters be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms. Harmful algal blooms have been associated with such adverse effects as mass mortalities of pelicans and sea lions (attributed to the toxin domoic acid produced by the diatom *Pseudo-nitzchia australis*) off coastal California (Committee on Environment and Natural Resources 2000). Ballast water discharges have been implicated as one mechanism for the spread of harmful algae. In addition, ballast water may contain pathogens causing public health concerns (Falkner 2003).

California's Marine Invasive Species Act prohibits vessels entering California waters after operating outside the United States Exclusive Economic Zone (EEZ) from discharging ballast water into State waters unless the vessel has carried out a mid-ocean ballast water exchange procedure, or is using an environmentally sound alternative shipboard treatment technology approved by the CSLC. Beginning March 22, 2006, vessels operating within the Pacific Coast Region are required to manage ballast water taken on within the Pacific Coast Region, by exchanging ballast water in near-coastal water before entering state waters, retaining all ballast water on board, using an approved, environmentally-sound treatment method, or discharging to an approved reception facility. Qualifying vessels must report the time and place ballast water was taken on and released during the voyage. Vessels docking at the Long Wharf comply with these requirements. (D. Kinkela, Chevron, pers. comm. 2005). Every ship entering State waters is required to submit a ballast exchange plan, including the co-ordinates of the location where ballast exchange takes place.

Mid-ocean exchange of ballast water is considered an interim measure to reduce the introduction of exotic species until effective treatment technologies are developed (Falkner 2003). Mid-ocean exchange reduces the introduction of exotic organisms, but is not completely effective. One study of the ballast water of ships that had conducted mid-ocean exchange showed that ships that exchanged ballast water had five percent of the number of organisms and half the number of species compared to ships that did not exchange (Cohen 1998). Another study showed that 14 of 32 ships that conducted mid-ocean ballast exchange retained significant amounts of sediment and dinoflagellate cysts. Therefore, because mid-ocean exchange of ballast water is not completely effective, discharge of segregated ballast water is determined to have a potentially significant impact to water quality.

Mitigation Measures for WQ-2:

WQ-2: Following the adoption of the Mitigation Monitoring Program for the proposed Project, Chevron will advise both agents and representatives of shipping companies having control over vessels that have informed Chevron of plans to call at the Long Wharf about the California Marine Invasive Species Act. Chevron will ensure that a Questionnaire containing the following questions is provided to the Vessel Operator, and inform the Vessel Operator that the Questionnaire should be completed on behalf of the vessel, by its Captain or

authorized representative, and provided to the California State Lands Commission's Marine Facilities Division's Northern California Field and Sacramento Offices, either electronically or by facsimile, prior to the vessel's entry into San Francisco Bay or in the alternative, at least 24 hours prior to the vessel's arrival at the Long Wharf.

The questionnaire shall solicit the following information:

1. Does the vessel intend to discharge ballast water in San Francisco Bay, the Carquinez Strait or any other location(s) in a Bay waterway on its transit to the Chevron Richmond Long Wharf?

2. Does the vessel intend to discharge ballast water at the Chevron Richmond Long Wharf?

3. Which of the following means specified in the California Marine Invasive Species Act (MISA) or Title 2, Division 3, Chapter 1, Article 4.6. has the vessel operator used or intend to use on the current voyage to manage the vessel's ballast water: a mid-ocean exchange (as defined in Section 71200(g)); a near-coastal exchange (as defined in Section 71201(b)); retain all ballast on board; or discharge the ballast water at the same location (as defined in Section 71204.2(c)(2)) where ballast originated, provided ballast water was not mixed with ballast water taken on in an area other than mid-ocean waters?

Chevron has indicated that it is not feasible to treat segregated ballast water in the Refinery's effluent treatment system and that it would not be economically feasible to construct a system for treating ballast water to remove exotic species. Furthermore, effective systems for the treatment of ballast water to remove all associated organisms have not yet been developed. The measure provides an interim tracking mechanism until a feasible system to kill organisms in ballast water is developed. Until an effective treatment system is developed, the discharge of ballast water to San Francisco Bay will remain a significant adverse impact. Mid-ocean exchange reduces the introduction of exotic species, but is not completely effective.

Until a feasible system to kill organisms in ballast water is developed, the discharge of ballast water from segregated tanks to San Francisco Bay will remain a significant adverse impact (Class I).

CEQA FINDING NO. WQ-5

NON-SEGREGATED BALLAST WATER

Impact: **WQ-5: Non-segregated ballast water that is sent to the treatment facility may include non-indigenous organisms. Treatment at the facility does not include any specific procedures to prevent organisms that may be in ballast water from being discharged to Bay waters. Discharge of harmful microorganisms would be a significant adverse impact.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Non-segregated ballast water that is sent to the treatment facility may include non-indigenous organisms. Treatment at the facility does not include any specific procedures to prevent organisms that may be in ballast water from being discharged to Bay waters. Furthermore, the NPDES permit for the discharge does not include limitations on the discharge of organisms or requirements for monitoring of organisms. Filtration of process water at the Chevron facility would prevent the introduction of larger organisms. However, the potential exists for harmful microorganisms such as viruses, bacteria, and toxic algae to be discharged. Chevron indicates that it has not received non-segregated ballast water at its treatment facilities for several years (Kinkela, Chevron, pers. comm. 2005). Discharge of harmful microorganisms would be a significant adverse impact (Class II).

Mitigation Measures for WQ-5:

WQ-5. Chevron shall not discharge any non-segregated ballast water received at the Long Wharf to San Francisco Bay. If Chevron needs to unload unsegregated ballast water, it shall be unloaded into a tanker truck or other suitable waste-handling vehicle and disposed of at an appropriate facility.

The handling of non-segregated ballast water at the Chevron Refinery is a relatively rare event. Chevron indicates that it has not received any unsegregated ballast water at its facilities in the last several years. However, the transport of non-segregated ballast water to an appropriate disposal facility, should it be necessary to receive such water at the Long Wharf, would eliminate the potential introduction of harmful microorganisms that may be in this water into the Bay. Impacts would be reduced to a level that is below the significance criteria.

CEQA FINDING NO. WQ-7

WATER QUALITY DEGRADATION FROM ANTI-FOULING PAINTS

Impact: **WQ-7: Marine anti-fouling paints are highly toxic containing copper, sodium, zinc, and tributyltin (TBT) and their use on vessels associated with the Long Wharf is considered to be a significant adverse impact to water quality that cannot be mitigated to less than significant.**

Class: I

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Marine anti-fouling paints are used to reduce nuisance algal and marine growth on vessel hulls. These marine growths can significantly affect the drag of the vessel through the water and thus its fuel economy. Anti-fouling paints are biocides that contain copper, sodium, zinc, and TBT as the active ingredients. All of these are meant to be toxic to marine life that would settle or attach to the hull of ships. At a November 1997 session of the IMO Assembly in London, a resolution was approved that calls for the elimination of organotin biocides after 2003. The resolution language bans the application of tin biocides as anti-fouling agents on ships by January 1, 2003, and prohibits the presence of tin biocides after September 17, 2008. The Marine Environment Protection Committee of the IMO is developing a legal instrument to enforce the ban of TBT on vessels (Lewis 2001). Much concern has been raised about TBT effects on non-target marine species. New types of bottom paints that do not contain metal-based biocides are being developed and tested. Some of these coatings, such as self-polishing coatings, are now in use. Because of the high toxicity of organotins to marine organisms, the use of these substances on vessels associated with the Long Wharf is considered to be a significant adverse impact to water quality that cannot be mitigated to less than significant (Class I).

<u>Mitigation Measures for WQ-7</u>:

WQ-7. Following the adoption of the Mitigation Monitoring Program for the proposed Project, Chevron will advise both agents and representatives of shipping companies having control over or representing vessels that have informed

Chevron of plans to call at the Long Wharf about the requirements of the 2008 International Maritime Organization (IMO) prohibition of TBT applications to vessel hulls. Following the effective date of the IMO prohibition, Chevron will ensure that the Master (Captain) or authorized representative of vessels intending to call at the Long Wharf certify that their vessel is in compliance and provide a copy of such certification to the California State Lands Commission's Marine Facilities Division's Northern California Field and Sacramento Offices, either electronically or by facsimile, prior to the vessel's entry into San Francisco Bay or in the alternative, at least 24 hours prior to the vessel's arrival at the Long Wharf.

Until all TBT is phased out by 2008, vessels with old applications of TBT on their hulls will visit the Long Wharf. Although it is reasonable for Chevron to require vessels to document no new TBT applications (per IMO mandate), Chevron cannot feasibly require vessels to remove TBT from their hulls until the IMO mandate prohibiting the presence of TBT on ship hulls comes into effect in 2008. Therefore, until all TBT is gone from vessels using the Long Wharf, impacts of organotins will remain significant. Prior to the effective date of the IMO mandate, the mitigation measure has Chevron advise agents of shipping companies about the future requirements; after the effective date of the IMO mandate, Chevron will certify that visiting vessels are in compliance and submit copies to CSLC. This will help to reduce impact to water quality by eliminating organotins, and also eliminate toxicity to marine organisms. Until the hulls of vessels using the Long Wharf are devoid of anti-fouling paints, impacts of organotins will remain significant (Class I).

CEQA FINDING NO. WQ-8

WATER QUALITY DEGRADATION FROM ROUTINE TANKER MAINTENANCE

Impact: **WQ-8: Routine vessel maintenance would have the potential to degrade water quality due to chronic spills during transfers of lubricating oils, resulting in adverse significant impacts.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Minor repair and routine maintenance of vessels occur at the Long Wharf. Most of these repairs have little effect on water quality. Vessels may take on lubricating oils from trucks at the Long Wharf, which have a potential to spill into the water. All transfer areas, i.e., work areas around risers, loading arms, hydraulic systems etc., are protected by berms and drain to sumps that operate on level control and transfer their liquid to the Refinery waste handling systems for treatment. The potential impact of chronic spills is adverse and significant (Class II).

Mitigation Measures for WQ-8:

WQ-8: MM WQ-9 applies, which addresses preparation of Best Management Practices (BMPs) in a SWPPP for the Long Wharf.

Aggressive implementation of BMPs specifically developed for the Long Wharf would reduce or eliminate the potential input of lubricating oils to the Bay from minor operations and routine maintenance operations on vessels at the Long Wharf and thereby reduce water quality degradation at the terminal to a level below the significance criteria.

CEQA FINDING NO. WQ-9

WATER DEGRADATION FROM WHARF STORMWATER RUNOFF

Impact: **WQ-9: Stormwater runoff from the Long Wharf may contribute pollutants to the Bay in concentrations that may adversely affect some benthic species within the local area, resulting in a significant adverse impact to water quality.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Stormwater runoff is the largest contributor of pollutants to San Francisco Bay (Davis et. al. 2000). Hydrocarbons and other contaminants that accumulate on surfaces of the Long Wharf will runoff to the ocean during storms. As described in the DEIR Section 2.3.3, Operational Procedures, Operational Procedures, Chevron has several Best Management Practices (BMPs) in place to prevent the spill of oily liquids during transfer operations. The transfer area of each berth is impounded by a raised berm. Drip pans are located under all piping manifolds at the berth areas and are designed to collect drips from bolted flanges, fittings and expansion joints. Collected oil and water are drained to sumps along the inside face of the Long Wharf and pumped to oil tanks at the Refinery. Chevron employs vacuum trucks to empty drip pans that do not drain to sumps. However, there is the potential for contaminants to accumulate on the Long Wharf surface from routine vehicle use, maintenance activities, and other operations. For example, oil spills reported by Chevron include a couple of small spills of hydraulic fluid during maintenance or testing of hydraulic hoses. Most of the spilled hydraulic oil was contained on the dock. However, some oily residue may have remained on the dock and been washed off during the next storm. Oily residue is the contaminant most likely to be present in runoff from the Long Wharf. Although Chevron has a number of BMPs in place at the Long Wharf, it has no formal stormwater management plan for the facility.

Concentrations of a number of contaminants within the sediment under the Long Wharf are at levels that exceed the ER-L, indicating that there may be some adverse biological effects on species sensitive to contaminants (see DEIR Tables 4.2-5 and 4.2-6). With a few exceptions, contaminant concentrations under the Long Wharf were within the Ambient Sediment Concentration thresholds for relatively unpolluted areas of San Francisco Bay (Gandesbery et al. 1999). Therefore, contamination from the Long Wharf does not appear to be creating a toxic “hot spot” with highly elevated sediment contaminant concentrations compared to other areas of the Bay. Some PAH compounds and some metals episodically exceed Ambient Sediment Concentration thresholds perhaps indicating occasional small leaks or spills. Because contaminant levels in the vicinity of the Long Wharf exceed criteria, inputs from runoff from the Long Wharf are

considered to have a significant adverse impact to water quality that may be mitigated to less than significant (Class II).

Mitigation Measures for WQ-9:

WQ-9: Chevron shall coordinate with the Regional Water Quality Control Board to develop, within 12 months of lease implementation, a Stormwater Pollution Prevention Plan specifically for the Long Wharf to reduce the input of chemicals to the Bay from the marine terminal. BMPs for consideration shall include (at a minimum) (1) conducting all vehicle maintenance on land not over water or marshland, (2) berming all areas on the pier where maintenance activities are being conducted and cleaning up all spilled contaminants before berms are removed, (3) when necessary, washing the surface of the pier to the extent practical and directing washwater into sumps, (4) maintenance of sumps, and (5) posting signs to educate all workers to the importance of keeping contaminants from entering the Bay. These and other BMPs shall be detailed in a Stormwater Pollution Prevention Plan that Chevron shall prepare specifically for the Long Wharf.

No Stormwater Pollution Prevention Plan (SWPPP) presently exists for the Long Wharf. The requirement to develop measures specific to Long Wharf Operations in the Chevron SWPPP and the implementation of those measures will help reduce the input of contaminants into the Bay from the Long Wharf. Aggressive implementation of these BMPs to address stormwater runoff from the Long Wharf would reduce Chevron's input of these chemicals to a level below the significance criteria.

CEQA FINDING NO. WQ-11

OIL AND PRODUCT LEAKS AND SPILLS AT THE LONG WHARF

Impact: **WQ-11: Potential impacts on water quality can result from leaks or spills. Small leaks or spills (less than 50 bbl) related to Long Wharf operations could result in significant impacts, while large spills (greater than 50 bbl) could result in significant adverse impacts.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

A wide range of crude oil, feed stocks, additives, and processed petroleum products are transferred through the Long Wharf between vessels and the Refinery and vice versa. The Long Wharf typically receives about 98 million bbls of crude oil, diesel fuel oil, gasoline components, diesel blend stock, and dirty diesel/flush stock annually. Of this amount, approximately 80 million bbls per year are crude oil of both domestic and foreign origin. The Long Wharf typically ships approximately 35 million bbls annually of gasoline, gasoline components, aviation fuel, jet fuel, diesel fuel, and lubricating oils.

Crude oils vary widely in appearance and viscosity from field to field. Within the same field, the properties of crude oil vary greatly depending on the season and other environmental factors when the oil was extracted (Chambers Group 1994, NRC 2003).

Refiners control the mix of hydrocarbon types in particular products in order to give petroleum products distinct properties. Each of the hydrocarbons has distinctive characteristics and differs in density, vapor pressure, and solubility. Therefore, the fate of spilled oil in water varies significantly depending on the make up of the oil spilled.

The fate of spilled oil in the marine environment is determined by a variety of complex and interrelated physical, chemical, and biological transformations. The physical and chemical processes involved in the “weathering” process of spilled oil include evaporation, dissolution and vertical mixing, photochemical oxidation, emulsification, and sedimentation (NRC 2003). The rate of these weathering processes is influenced by a variety of abiotic factors (e.g., water temperature, suspended particulates, water

clarity), physical-chemical properties inherent to the oil itself (e.g., vapor pressure, solubility, aromatic, asphaltene, and wax content), and the relative composition of the hydrocarbon source matrix (e.g., crude oil or refined products). The mass fraction of aromatic present in a crude oil is an important indicator of potential toxicity of a spill, because aromatics are considered the most toxic hydrocarbons in oil (Galt et al. 1991). The asphaltene and wax content determines water-in-oil emulsion formation and is an indicator of how well crude oil will form a stable emulsion or mousse in seawater.

The biological processes involved in the weathering of spilled oil include microbial degradation and uptake of hydrocarbons by larger organisms and its subsequent metabolism. The biodegradation of petroleum by microorganisms is one of the principal mechanisms for removal of petroleum from the marine environment. Enhancement of natural biodegradation processes by microbes may be one of the least ecologically damaging ways of removing oil from the marine environment. Uptake of hydrocarbons by large organisms usually has adverse impacts in the biota because of the toxicity of petroleum hydrocarbons.

The duration of potential impacts to water quality is variable and depends on the type of oil spilled. The most toxic period for crude oil spilled is the first few days due to volatile, low molecular weight hydrocarbons (BLM 1979). Product spills of gasoline and fuels may evaporate faster than crude oil, but are generally more toxic and more soluble. Toxicity tests performed on oil by the EPA have shown that aromatic constituents are the most toxic, naphthenes and olefins are intermediate in toxicity, and straight chain paraffins are the least toxic (Chambers Group 1988).

A significant impact to marine water quality (Class I or II impact) would result from changes in water chemistry from an accidental spill of crude oil or oil product at the Long Wharf. Spill probabilities are presented in DEIR Section 4.1, Operational Safety/Risk of Accidents. Long Wharf operations have the greatest potential for small spills (less than 50 bbl), while the larger spills would more typically result from ships in transit. The containment and cleanup capability at the Long Wharf is detailed in the DEIR Section 4.1, Operational Safety/Risk of Accidents, Impact OS-3.

Physical properties affected by an oil spill include reduced wind stress and thus reduced water surface mixing which limits the exchange of dissolve oxygen between the water and the atmosphere, reduced light transmissivity, and reduced solar warming of the sea surface. The total sea surface area affected by a spill depends on the volume of oil released and the prevailing meteorological conditions, particularly winds.

Most small leaks or spills (less than 50 bbl) related to operation of the Long Wharf could result in significant, adverse (Class II) impacts that can be mitigated to less than significant, because they could be easily contained. However, the severity of impact from larger leaks or spills (greater than 50 bbl) at the Long Wharf depends on: (1) spill size, (2) oil composition, (3) spill characteristics (instantaneous vs. prolonged discharge), (4) the effect of environmental conditions on spill properties due to weathering, and (5) the effectiveness of cleanup operations. In the event of an oil spill, the initial impacts would be

to the quality of surface waters and the water column, followed by potential impacts to sedimentary and shoreline environments. Following an oil spill, hydrocarbon fractions would be partitioned into different regimes and each fraction would have a potential impact on water quality. Large spills (greater than 50 bbl) at the Long Wharf could result in significant, adverse (Class I) impacts on water quality.

Most tanker spills/accidents and larger spills that cannot be quickly contained either in the Bay or along the outer coast would result in significant, adverse (Class I) impacts.

Mitigation Measures for WQ-11:

WQ-11: MM OS-3b and OS-3c (Operational Safety/Risk of Upset) and MM OS-4 shall be implemented.

Per MM OS-3b, tension monitoring enables loading to continue in marginal weather conditions, high velocity current conditions or other conditions where the limits of strain on the mooring lines could result in movement of the vessel resulting in damage to the wharf and/or vessel. These devices will minimize the potential for excessive surge or sway of the vessel (motion parallel or perpendicular to the wharf), which could lead to an oil spill or the parting of mooring lines, or breaking of loading arms. Monitoring would provide the knowledge that the design limits of the mooring are not being exceeded. This permits cost effective use of both the mooring and tankers.

At present, the docking system relies on the pilot's judgment to determine the vessel's approach speed and angle. MM OS-3c would install an Allision Avoidance System to help prevent damage to the wharf and vessel by monitoring the speed, approach angle, and distance from the dock of the approaching vessel and providing warning if the monitored parameters fall outside preset limits indicating an allision could occur.

MM OS-4 would provide flexibility in the lease to continually update mitigation requirements and improve response capabilities for response to Group V oils by requiring Chevron to implement the latest response technologies.

CEQA FINDING NO. WQ-12

OIL SPILLS FROM VESSELS IN TRANSIT IN BAY OR ALONG OUTER COAST

Impact: **WQ-12: A significant impact to water quality (Class I or II impact) could result from leaks or an accidental spill of crude oil or oil product from a vessel spill along tanker routes either in San Francisco Bay or outer coast waters.**

Class: I and II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

The fate and water quality impacts of oil from a spill associated with vessels servicing the Long Wharf would be similar to the impacts described above for a spill at the Long Wharf. A significant impact to water quality (Class I or II) would result from an accidental spill of crude oil or oil product from a vessel transiting San Francisco Bay or outer coast waters. A larger oil spill is more likely from accidents associated with vessels in transit than a spill at the Long Wharf. Most tanker spills/accidents and larger spills that cannot be quickly contained either in the Bay or along the outer coast would result in significant, adverse impacts (Class I).

Mitigation Measures for WQ-12:

WQ-12: The Long Wharf shall implement MM OS-7a and OS-7b addressing potential participation in VTS upgrade evaluations, and Chevron response actions for spills at or near the Long Wharf.

The tanker owner/operator has responsibility for spills from their tanker. Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for other tankers. As a participant in any analysis to examine upgrades to the VTS (MM OS-7a), Chevron can help to improve transit issues and response capabilities in general, which help to reduce the potential for incidents and the consequences of spills within the Bay.

For a spill near the Long Wharf (MM OS-7b), Chevron is more equipped to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. Such action will result in a quicker application of oil spill equipment to any spill and improve control and recovery of such spill.

CEQA FINDING NO. BIO-3

MAINTENANCE DREDGING

Impact: **BIO-3: Loss of juvenile Dungeness crabs and young Chinook salmon would be a significant, adverse impact because dredging at the time when juveniles are moving through the area could disrupt the migration patterns of these species.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Dredging can affect plankton in the vicinity of these operations from turbidity generated by resuspension of sediments and from the resuspension of any pollutants associated with those sediments. Turbidity can affect plankton populations by lowering the light available for phytoplankton photosynthesis and by clogging the filter-feeding mechanisms and respiratory organs of zooplankton. The sediment at the Long Wharf is comprised almost entirely of silt and clay-sized particles. Fine sediments suspended by dredging operations can stay suspended for several hours and can create plumes for a distance of several thousand feet down current of the dredging site. Similar plumes are expected if the sediment is discharged to an aquatic disposal site. Sediment from previous dredging operations at the Long Wharf has been discharged at the Alcatraz dredged material disposal site. For this analysis, it was assumed that future dredging operations at the Long Wharf would discharge material to that site.

Epifaunal benthic species of concern in the vicinity of the Long Wharf include Dungeness crabs. Maintenance dredging would disturb individuals of these species within the dredging area. Some individuals may be collected by the dredge; others would leave the area. Juvenile Dungeness crab are common in Central Bay; particularly in late spring, and could easily be entrained by the dredge (USACE, EPA, BCDC, SF-RWQCB, and SWRCB 1998). Loss of juvenile Dungeness crabs would be a significant, adverse impact because dredging at the time when juveniles are moving through the area could disrupt the migration patterns of the species (Class II).

Increased turbidity from maintenance dredging can disrupt Pacific herring spawning activities or reduce the survival of herring eggs, which are attached to hard surfaces and eelgrass blades along the Central Bay shoreline (USACE, EPA, BCDC, SF-RWQCB, and SWRCB 1998). Herring spawning areas are located in the immediate vicinity of the Long Wharf, including the Long Wharf itself and near the Alcatraz disposal site. Dredging and disposal are likely to have some impact on herring eggs within the local area of the activities. Adverse effects on eggs or early larval forms could result from either the physical or chemical nature of the sediments that become suspended,

including interference with attachment, fertilization, or respiration (Lebednik 2004). Because the location of herring spawning within the Bay varies from year to year, there is the chance that dredging at the Long Wharf could adversely effect a significant portion of the herring spawning success if dredging occurred in a year when major spawning activity occurred in the vicinity of the Long Wharf. The loss of a substantial portion of a year class of Pacific herring in the Bay is considered a significant adverse impact (Class II).

Rare, threatened, or endangered species that occur in the vicinity of the Long Wharf include the winter run of the Chinook salmon (federal endangered, State endangered), the spring run of the Chinook salmon (federal threatened, State threatened), and the California brown pelican (federal and State endangered). Chinook salmon may be disturbed during maintenance dredging, primarily due to turbidity, although there is some potential that juvenile salmon could be entrained by the dredge. Juvenile salmon have been found to be entrained by dredges in low numbers in studies in Canada and Washington (Lebednik 2004). Turbidity during dredging is expected to occur only in the immediate vicinity of the dredging activity. However, because young Chinook salmon are known to occur in the vicinity of the Long Wharf and because the winter and spring runs are so reduced, the impacts of maintenance dredging would be potentially significant (Class II).

The impacts to biological resources of enlarging Berth No. 4 would be similar to the impacts of maintenance dredging discussed for routine operations. Dredging the sediments to widen the berth would subject organisms to temporary localized turbidity in the vicinity of Berth No. 4 as well as at the disposal site. In general these impacts are adverse, but less than significant (Class III). However, if dredging occurred during the most sensitive periods, impacts to juvenile Dungeness crab, Pacific Herring and Chinook salmon have the potential to be significant (Class II).

Mitigation Measures for BIO-3:

BIO-3a: The Long Wharf shall schedule dredging to avoid the months of May and June when juvenile Dungeness crabs are most abundant in the Project area.

In the event that, due to circumstances beyond lessee's control, dredging must occur in May and June to maintain a depth for safe navigation and operation of the terminal, lessee shall consult with the California Department of Fish and Game (CDFG) regarding the potential effects of such dredging on juvenile Dungeness crabs and Chinook salmon smolts. Such consultation may occur directly with CDFG personnel in Region 3 or with CDFG personnel during the consideration of lessee's application to the Dredged Material Management Office (DMMO). If the CDFG concurs with dredging as proposed by the lessee, documentation of which shall be provided to Lessor, it shall be conclusively presumed that juvenile Dungeness crabs and salmon smolts will not be significantly affected, and dredging may proceed as provided herein.

BIO-3b: To avoid impacts to Pacific herring reproduction, the Long Wharf shall schedule dredging to avoid the herring spawning season of December through February and into March.

BIO-3c: Although chances of entrainment of salmon is relatively low, to protect the salmon, the Long Wharf shall schedule dredging in June through November when winter and spring run Chinook salmon smolt activity is lowest.

Avoidance of the times of the year when Dungeness crab, Pacific herring spawning and salmon smolts are present would reduce potential impacts to a level below the significance criteria. These dredging windows are consistent with those of the Management Plan for the LTMS Placement of Dredged Material in the San Francisco Bay Region (USACE, USEPA, BCDC, SFBRWQCB 2001). If dredging cannot be conducted during the required dredging windows for Dungeness crabs and Chinook salmon smolts, then Chevron's consultation with the California Department of Fish and Game (CDFG), and CDFG's concurrence therein, shall constitute a conclusive presumption that juvenile Dungeness crabs and Chinook salmon smolts will not be significantly affected.

CEQA FINDING NO. BIO-4

INTRODUCTION OF NON-INDIGENOUS SPECIES

Impact: **BIO-4: Invasive organisms/introduction of non-indigenous species in ballast water released in the Bay could have significant impacts to plankton, benthos, fishes, and birds.**

Class: I

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Ballast water from segregated ballast tanks may be discharged from vessels to San Francisco Bay as vessels take on product from the Refinery or during transfer of product from a larger vessel to a smaller vessel or barge at Anchorage No. 9. Segregated ballast water is expected to be relatively free of chemical pollutants, but the ballast water may harbor exotic species that upon release may cause problems in the estuary's ecosystem. Tankers servicing the Long Wharf comply with California's Marine Invasive Species Act. California's Marine Invasive Species Act prohibits vessels entering California water after operating outside the United States Exclusive Economic Zone (EEZ) from discharging ballast water into State waters unless the vessel has carried out a mid-ocean ballast water exchange procedure, or is using an environmentally sound alternative shipboard treatment technology approved by the CSLC. Qualifying vessels must report the time and place ballast water was taken on and released during the voyage. Vessels docking at the Long Wharf comply with these requirements. (D. Kinkela, Chevron, pers. comm. 2005). Every ship entering State waters is required to submit a ballast exchange plan, including the co-ordinates of the location where ballast exchange takes place. Beginning March 22, 2006, vessels operating within the Pacific Coast Region are required to manage ballast water by exchanging ballast water in near-coastal water before entering state waters, retaining all ballast water on board, using an approved, environmentally-sound treatment method, or discharging to an approved reception facility.

Mid-ocean exchange of ballast water is considered an interim measure to reduce the introduction of exotic species until effective treatment technologies are developed

(Falkner 2003). Mid-ocean exchange reduces the introduction of exotic species but is not completely effective.

Exotic organisms have had a devastating effect on almost all components of the estuary ecosystem (Carlton 1979; Cohen 1998). For example, the Asian clam *Potamocorbula amurensis*, thought to have been introduced in ballast water, has depleted phytoplankton populations in Suisun Bay by its intensive feeding (San Francisco Estuary Project 1997). Furthermore, introduced zooplankton species such as *Sinocalanus doerri* and *Pseudodiaptomus forbesi* appear to have outcompeted native species in Suisun Bay and the western Delta (Herbold et al. 1991). If a foreign species were introduced that could flourish in the Bay, impacts to the existing planktonic communities could be significant (Class I).

Introduction of exotic species, including the Asian clam *Potamocorbula amurensis* introduced in 1986, has had a profound effect on the benthic community of the estuary. Almost all of the dominant benthic invertebrate species in San Francisco estuary are introduced. As discussed in existing conditions, the rate of invasions is increasing. The recently introduced green crab, for example, could affect benthic communities by preying on bivalves and outcompeting Dungeness crabs. Invasive organisms in ballast water could have a significant impact to the benthic community (Class I). In addition to the introduction of invasive non-native species in ballast water, exotic fouling organisms can be introduced to San Francisco Bay by fouling on ship's hulls. Many species are thought to have been introduced to San Francisco Bay via ships' hulls (Carlton 2001). The phasing out of tributyltin based paints to control ship fouling may increase the introduction of fouling species transported on vessel hulls. The introduction of exotic species to San Francisco Bay via ship traffic has not only devastated the San Francisco Bay ecosystem, it has resulted in the spread of exotic species to other areas of the west coast (Wasson et al. 2001). For example, San Francisco Bay is suspected of being an important source of introduction of exotic species to Elkhorn Slough (Wasson et al. 2001). The Australian reef-forming tubeworm (*Ficopomatus enigmaticus*), the European green crab, and the western Pacific tortellini snail (*Philine auriformis*) all invaded San Francisco Bay, probably via international ship traffic, before spreading along the California coast.

The introduction of non-indigenous species in ballast water discharges or by hull fouling could have a number of adverse effects on fish populations in San Francisco Bay. The eggs, larvae, or adults of non-native fishes may be present in ballast water discharges. Non-native species compete with native fishes. In addition, non-indigenous aquatic species such as the Asian clam tend to destabilize food webs. Asian clams feed voraciously at multiple levels in the food chain, ultimately reducing the food available for fishes (Cohen and Carlton 1995). Non-native species are implicated as one of the reasons for the recent declines in the populations of Delta smelt and other fish species (Bay Institute 2005). Furthermore, because of the ability of Asian clams to filter large volumes of water, this species tends to concentrate pollutants such as selenium and organotins in its tissues (Periera et al. 1999). Fishes that feed on the Asian clam have the potential to ingest large quantities of toxins. Finally, ballast water may introduce

harmful algae. Harmful algal blooms have caused fish kills in a number of places (Committee on Environment and Natural Resources 2000). Introduction of non-indigenous species has the potential to have a significant adverse impact on fishes (Class I).

The introduction of non-indigenous species by ballast water discharges or hull fouling could have adverse effects on bird populations in San Francisco Bay. Some waterfowl, especially diving ducks, consume large numbers of Asian clams. Because they filter large amounts of water, Asian clams may have high concentrations of contaminants in their tissues (Pereira et al. 1999). Birds that feed on this species thus may ingest large quantities of such harmful substances as selenium. In addition, toxic algae may be introduced in ballast water discharges. For example, more than 100 cormorants and California brown pelicans died in Monterey Bay in 1991 from domoic acid poisoning produced by the diatom *Pseudo-nitzchia* (Committee on Environment and Natural Resources 2000). The introduction of non-indigenous species from operations at the Long Wharf has the potential to have a significant adverse impact on water-associated birds in San Francisco Bay (Class I).

Introduction of non-indigenous species in ballast water discharges associated with the Long Wharf could have adverse effects on marine mammals. For example, marine mammals have been killed by toxins associated with harmful algal blooms. Over 400 California sea lions died during a 1998 *Pseudo-nitzchia* bloom off Monterey (Committee on Environment and Natural Resources 2000).

Sensitive species have the potential to be adversely affected by the introduction of non-indigenous species introduced through ballast water discharges or hull fouling. As discussed in the preceding sections, potential adverse impacts include direct competition, destabilization of aquatic food webs, exposure to toxins concentrated in the tissues of the filter-feeding Asian clam, and exposure to disease organisms or harmful algae. The impacts of non-indigenous species that may be introduced from operations at the Long Wharf on sensitive species is potentially significant (Class I).

Tankers servicing the Long Wharf do not discharge unsegregated ballast water to the Bay. Unsegregated ballast water may be sent to the Chevron wastewater treatment facility. Non-segregated ballast water that is sent to the treatment facility may include non-indigenous organisms. Treatment at the facility does not include any specific procedures to prevent organisms that may be in ballast water from being discharged to Bay waters. Furthermore, the NPDES permit for the discharge does not include limitations on the discharge of organisms or requirements for monitoring of organisms. Filtration of process water at the Chevron facility would prevent the introduction of larger organisms. However, the potential exists for harmful microorganisms such as viruses, bacteria, and toxic algae to be discharged. Chevron indicates that it has not received non-segregated ballast water at its treatment facilities for several years (Kinkela, Chevron, pers. comm. 2005). Discharge of harmful microorganisms would be a significant adverse impact (Class II).

Mitigation Measures for BIO-4:

BIO-4: Implement MM WQ-2, in Water Quality, that requires that Chevron comply with the California Marine Invasive Species Act and related California State Lands Commission requirements and the Ballast Water Management for Control of Non-Indigenous Species Act and fill out a questionnaire to enable the CSLC to better track the management of ballast water. Implement Mitigation Measure WQ-5 requiring segregated ballast water be unloaded to a suitable waste handling vehicle and disposed of at an appropriate facility rather than being treated at the Chevron facility shall apply.

Adherence to this measure addresses procedures for ballast water management Chevron must follow for tracking the compliance of vessels visiting the Long Wharf. The measure is a tracking measure only, and does not reduce the level of impact, as the problem is a regional/ Bay-wide problem. Chevron shall not treat and discharge any unsegregated ballast water at its wastewater treatment facility, because current treatment methods may not remove all marine organisms.

Until a feasible system to kill all organisms in ballast water is developed, the discharge of ballast water to San Francisco Bay will remain a significant adverse (Class I) impact.

CEQA FINDING NO. BIO-6

OIL SPILLS AT LONG WHARF OR ALONG TANKER ROUTES

Impact: **BIO-6: The impacts of a spill on the biota at or near the Long Wharf have the potential to spread throughout much of San Francisco Bay. Vulnerable biota are plankton, benthos, eelgrass, fishes, marshes, birds, and mammals. Per the DEIR Section 4.1, Operational Safety/Risk of Accidents, small spills at the Long Wharf (less than 50 bbls) should be able to be contained. However, spills larger than 50 bbls may not be able to be contained and the Long Wharf may not have adequate boom to protect all the sensitive areas at the most risk that could be oiled within 3 hours of a spill from the Long Wharf. Impacts from large spills are considered to be significant adverse impacts. A significant impact to biological resources could result from spills of crude oil or product from a vessel in transit along tanker routes either in San Francisco Bay or outer coast waters.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

b) Such changes or alterations are within the responsibility and jurisdiction of the CDFG and USFWS (for MM BIO-6e and BIO-6f) and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

<u>Approach to Impact Assessment</u>

This assessment of oil spill impacts relied on documented biological damages to resources from historic spill events as well as computer modeling to determine the vulnerability of the biological resources within the Bay, near the Long Wharf, and along the outer coast. Impacts to biological resources from historic spills were based on the literature review in the EIR for Consideration of a New Lease for the Operation of a Crude Oil and Petroleum Product Marine Terminal at Unocal's San Francisco Refinery

at Oleum (Chambers Group 1994). The range of documented impacts from historic spills on various biological resources is briefly summarized in the Long Wharf DEIR. The Unocal EIR contains a more detailed discussion of the scientific literature on the observed effects of spills. The Unocal EIR also used computer modeling to analyze the potential impacts of spills from tankers servicing the Unocal Terminal. Because Chevron tankers are expected to use the same routes as Unocal tankers, the results of the modeling of tanker spills from the Unocal EIR are summarized in the DEIR to determine the likely impact of spills along tanker routes in the Bay and along the northern part of the outer coast. For the outer coast south of San Francisco, oil spill modeling done for the GTC Gaviota Marine Terminal Final Supplemental EIR/EIS (Aspen Environmental Group 1992) is summarized.

As discussed in the DEIR, Section 4.1, Operational Safety/Risk of Accidents, the greatest risk of oil spills from the continuation of Long Wharf operations is at the Long Wharf itself. To determine the impact of spills at the Long Wharf and in the approach channel, oil spill modeling was conducted for this DEIR. The results of oil spill models for various spills at the Long Wharf were superimposed on the distribution of sensitive biological resources to describe the likely impacts of a spill at the Long Wharf. It should be recognized that a spill from the Long Wharf, or from tankers visiting the Long Wharf, has the potential to impact biological resources anywhere in San Francisco Bay, as well as along the open coast outside the Golden Gate. Details of the spill modeling are included in the DEIR Section 4.0, Existing Environment and Impacts Analysis.

General Discussion of Impacts of Oil on Biological Resources

Documented biological damage from an oil spill has ranged from little apparent damage in the Apex Galveston Bay spill (Greene 1991) to widespread and long-term damage, such as the 1969 West Falmouth spill (Sanders 1977). Some of the factors influencing the extent of damage caused by a spill are the dosage of oil, type of oil, local weather conditions, location of the spill, time of year, methods used for cleanup, and the affected area's previous exposure to oil. Other levels of concern are the possibility of food chain contamination by petroleum products and the impact of an oil spill on the structure of biological communities as a whole.

Oil spilled into marine waters gradually changes in chemical and physical makeup as it is dissipated by evaporation, dissolution and mixing, or dilution in the water column. Various fractions respond differently to these processes, and the weathered residue behaves differently from the material originally spilled.

Laboratory tests have demonstrated the toxicity of petroleum hydrocarbons for many organisms. Soluble aromatic compounds in crude oil are generally toxic to marine organisms at concentrations of 0.1 to 100 ppm. Planktonic larval stages are usually the most sensitive. Very low levels of petroleum, below 0.01 mg/L, can affect such delicate organisms as fish larvae (NRC 1985). Concentrations as low as 0.4 ppb caused premature hatching and yolk-sac endema in Pacific herring eggs exposed to weathered Alaska crude oil (NRC 2003).

Biological impacts of oil spills include lethal and sublethal effects and indirect effects resulting from habitat alteration and/or destruction or contamination of a population's food supply. Direct, lethal effects may be chemical (such as poisoning by contact or ingestion) or physical (such as coating or smothering with oil). A second level of interaction is sublethal effects. Sublethal effects are those which do not kill an individual but which render it less able to compete with individuals of the same and other species.

Plankton

Impacts to plankton from oil pollution could range from direct lethal effects caused by high concentrations of oil in the surface layers of the water column after a major spill to a variety of sublethal effects such as decreased phytoplankton photosynthesis and abnormal feeding and behavioral patterns in zooplankton. Because plankton distribution and abundance are so variable in time and space, evidence of damage might be very difficult to document, even if it did occur.

Plankton populations on the outer coast are expected to have low vulnerability to an oil spill due to rapid replacement by individuals from adjacent waters and rapid regenerations time of phytoplankton cells (9 to 12 hours). The impacts to plankton of a spill from Chevron tankers on the outer coast are expected to be adverse, but less than significant (Class III).

Within the San Francisco Bay estuary, however, it is possible that an oil spill could have more severe impacts on plankton. Because the San Francisco Bay is a semi-enclosed system, plankton might be exposed to the oil for a longer period of time than on the open coast. Furthermore, recruitment from adjoining unoiled areas might be less available. Plankton communities in San Pablo and Suisun Bays might be particularly vulnerable to an oil spill because these areas are most isolated from recruitment from open ocean plankton populations. The impacts to plankton of a spill within the San Francisco Bay estuary have the potential to be significant (Class I). The most sensitive area for plankton within the San Francisco Bay estuary is in the entrapment zone where phytoplankton populations and important zooplankton species, such as the opossum shrimp, tend to concentrate. During periods of low river flow, the entrapment zone is located in the eastern part of Suisun Bay and the western Delta. During periods of high flow, it is located throughout Suisun Bay and into Carquinez Strait. Plankton populations in eastern San Pablo Bay and Suisun Bay would be more vulnerable to an oil spill than populations in Central and South Bay because recruitment from the Pacific Ocean would occur less readily in the eastern bays than it would in the Central Bay and the northern part of South Bay.

<u>Impacts to Plankton from a Spill at the Long Wharf</u>

A spill at the Long Wharf is unlikely to significantly oil the eastern parts of the San Francisco estuary where plankton is most vulnerable. Five oil spill scenarios from the

Long Wharf were analyzed in detail. In four of these, the oil largely affected Central Bay and the southern portion of San Pablo Bay. In one scenario (South-East San Pablo Bay), the oil spread as far as the western end of Carquinez Strait where phytoplankton concentrations and sensitive zooplankton species might be in years of high Delta outflow. In summary, most spills from the Long Wharf would not contact the most vulnerable plankton areas. Plankton populations in the San Francisco estuary are not likely to suffer a significant, adverse impact from a spill at the Long Wharf. However, under certain conditions in the spring of high outflow years, significant impacts could occur (Class I).

Impacts to Plankton of a Spill from Chevron Tankers

Based on trajectory modeling done for the Unocal EIR, spills from tankers operating within the Bay have the greatest probability of contacting waters near the ship channels through central and northern San Francisco Bay and San Pablo Bay. Suisun Bay, which has the most vulnerable plankton populations and where the entrapment zone is located during years of normal rainfall, has a relatively low (less than six percent chance of medium or heavy oiling and about an 11 percent chance of contact with oil) chance of being affected by a tanker spill. Carquinez Strait, where the entrapment zone may be during periods of heavy outflow, has a very high risk of oiling.

Of the tanker oil spill scenarios analyzed in the Unocal EIR, one scenario, a 100,000-bbl crude oil spill near Alcatraz in March, was determined to have significant impacts to plankton. This spill would affect almost all of Central Bay and San Pablo Bay during the spring phytoplankton bloom. At this time of year of potentially high outflow, the entrapment zone could be located in western Carquinez Strait or even the east end of San Pablo Bay. This spill could have a major impact on phytoplankton populations during the year following the spill. It is possible that, particularly in San Pablo Bay, which is a considerable distance from the open ocean, plankton populations might take several years to recover. In this situation, impacts to plankton would be detectable over natural variability and would be significant (Class I).

Benthos

The impacts of an oil spill on the benthos within San Francisco Bay has the potential to be pervasive and long-lasting because oil can become entrapped within the semi-enclosed system of the Bay and repeatedly redistributed into the sediments. An oil spill would be likely to selectively affect more sensitive species such as amphipods, increasing the domination of exotic species. Impacts to soft substrate benthos within San Francisco Bay would be most severe in intertidal mudflats where oil would wash ashore and become incorporated into the sediments. Rocky intertidal communities within the Bay might also be especially vulnerable to oil spill impacts because wave action would not remove the oil as it does along the outer coast. An oil spill within San Francisco Bay has the potential to cause significant impacts to the benthos (Class I).

Impacts of an oil spill on the intertidal and subtidal benthic communities of the outer

coast could range from widespread destruction to undetectable. The habitat most likely to suffer damage from a spill from tankers along the outer coast is the rocky intertidal zone. Impacts of an oil spill on the intertidal zone of the outer coast would be significant (Class I).

Impacts of an outer coast oil spill on the subtidal populations of California's coast would be even more difficult to predict than those on the intertidal biota. The most severe impacts on the subtidal benthos would probably occur if oil reached any of the unique subtidal populations that occur off the California coast. For example, oil could have a significant impact if it reached the populations of the hydrocoral *Allopora californica* on Cordell Bank in northern California or Farnsworth Bank of Catalina Island in southern California. This species only occurs in certain areas and does not recruit widely. Therefore, an affected population might not recover for many years. This oil spill could, in a worst case, have a significant impact (Class I) in the subtidal benthos of the open coast.

Oil is not expected to have a significant direct impact on north coast kelp beds. Even if damage did occur, as was observed to bull kelp in the *Tenyo Maru* spill in Washington State (Thom et al. 1993), recovery would be rapid. *Macrocystis* is extremely fast growing and *Nereocystis* is an annual. An oil spill off the open coast, then, is expected to have adverse but less than significant impacts on kelp because of the expected rapid recovery time of the kelp if damage occurred (Class III).

Impacts to Benthic Organisms from a Spill at the Long Wharf

The risk of sensitive benthic resources to a spill at the Long Wharf was predicted by analyzing the areas contacted by 100 randomly generated scenarios of a 1,000-bbl spill at the Long Wharf. The area of highest risk from a spill at the Long Wharf is the east-central Bay. In this analysis, east-central Bay rocky features, including Red Rock, Castro Rocks, the Brothers, and Point San Pablo, would be at very high risk from a spill. The area of second highest risk is the Brooks Island/Richmond area. Significant rocky shoreline within this area includes Brooks Island, which would be at high risk from a spill at the Long Wharf. Rocky shorelines at Treasure Island and Yerba Buena Island in the Berkeley/Emeryville area are at moderate risk from a spill. Significant rocky shoreline near the Golden Gate, Marin or San Francisco Peninsula, and Richardson Bay are at low to very low risk from a spill at the Long Wharf.

For the soft bottom benthos, assemblages in intertidal mudflat are most vulnerable to a spill within the Bay. The most extensive areas of intertidal mudflat occur along the shores of San Pablo Bay and South Bay, although some intertidal mudflat occurs in all segments except San Francisco Peninsula and Marin county. Intertidal mudflat along southeast San Pablo Bay has about a 23 percent chance of being contacted by a spill from the Long Wharf and about an eight percent chance of being contacted by anything greater than trace amounts of oil. Therefore, intertidal mudflats in southeast San Pablo Bay are at moderate risk from a spill at the Long Wharf. Extensive intertidal mudflats west of San Pablo Bay and north San Pablo Bay have a relatively low chance (10

percent) of contact by oil. The chance of oil contact in the large mudflat areas in South Bay is very low (two percent).

The most sensitive benthic invertebrate resource that would be at risk from a Long Wharf oil spill is the Dungeness crab. Based on the 100 modeled scenarios of a Long Wharf spill, southeast San Pablo Bay and East Central Bay have a moderate and high risk, respectively, of being oiled. Both areas have consistently high numbers of juvenile Dungeness crabs. An oil spill could have significant, adverse impacts on Dungeness crabs because a spill at the time when juvenile Dungeness crabs are moving through San Francisco Bay would interfere with migration patterns and because a large spill could substantially affect a year class and result in a population decline (Class I or II).

Another marine resource within San Francisco Bay that would be particularly vulnerable to oil spill impacts is eelgrass. Many studies on the biological impacts of oil spills have documented impacts to marine grasses. For example, eelgrass growth and reproduction appear to have been impaired by oil contamination from the Exxon Valdez spill (Holloway 1991). The eelgrass beds between Point San Pablo and Point Richmond would be at very high risk from a spill. The largest eelgrass bed north of San Pablo Point has a 23 percent chance of being contacted by oil from a spill at the Long Wharf and about an eight percent chance of being contacted by greater than trace amounts of oil, thus it is at moderate risk from a Long Wharf spill. Other eelgrass beds at Alameda and Richardson Bay are unlikely to be contacted by a spill from the Long Wharf. Eelgrass beds in San Francisco Bay are at relatively high risk from a spill at the Long Wharf, but some beds are unlikely to be contacted.

Impacts to Benthic Organisms of a Spill from Chevron Tankers

Risks to sensitive benthic resources in San Francisco Bay would occur from a spill originating from tankers servicing the Long Wharf. Such a spill would have a greater than five percent probability of subjecting over 50 percent of the rocky intertidal habitat in San Pablo Bay and the northern part of Central Bay to medium or greater doses of oil. The receptor mode analysis conducted for the Unocal EIR showed that Castro Rocks would have as much as a 28.5 percent chance of contact with oil from a tanker spill and Yerba Buena Island would have up to a 25.7 percent chance. Therefore, a spill from Chevron tankers poses a high risk to rocky intertidal areas in San Pablo Bay and the northern part of Central Bay. An oil spill originating from tankers would have a greater than five percent probability of contacting between 10 and 50 percent of the rocky intertidal habitat in the southern part of Central Bay with medium or greater quantities of oil. Therefore, tanker spills pose a moderate risk to the diverse rocky intertidal communities of south Central Bay. Overall, Chevron tankering poses substantial risk to the rocky intertidal communities of the San Francisco Bay estuary.

A spill from a tanker poses moderate risk to the intertidal mudflats of Carquinez Strait and San Pablo Bay. Most of the mudflats along the southern shore of San Pablo Bay and in the western end of Carquinez Strait would have a greater than five percent probability of being hit by medium or greater doses of oil from a spill originating from

tankers servicing the Long Wharf. Chevron tankering, therefore, poses substantial risk to the intertidal mudflats of these portions of the estuary but a low risk to mudflats in other areas.

Juvenile Dungeness crabs in Central Bay and San Pablo Bay would have greater than a five percent probability that greater than 50 percent of the areas where they are most numerous could be contacted by at least medium doses of oil from a spill originating from tankers. Juvenile crabs in these bays would be at high risk from an oil spill from Chevron tankers. Juvenile crabs in Carquinez Strait would have a greater than five percent probability that between 10 and 50 percent of the area where they have been collected would be subjected to medium oiling from a tanker spill. Tankers are judged to pose a moderate risk to juvenile Dungeness crabs in Carquinez Strait.

A tanker spill would have a greater than five percent probability of subjecting more than 50 percent of the eelgrass in the northern part of Central Bay to medium or greater doses of oil (Chambers Group 1994). Between 10 and 50 percent of the eelgrass in southern Central Bay and San Pablo Bay would have a greater than five percent probability of being hit by moderate or greater doses of oil from a tanker spill. The eelgrass bed north of San Pablo Point would have between a 12 and 17.5 percent probability of being contacted by a medium or greater dose of oil (up to a 45.8 percent chance of contact with oil), but the eelgrass in South Bay would have less than a two percent probability of being contacted by a medium or heavy dose of oil. The eelgrass at the Alameda Naval Air Station (NAS) had up to a four percent chance of contact with oil in the receptor analysis run. Overall, a spill from tankering poses moderate risk to eelgrass in the San Francisco Bay estuary.

In the two 100,000-bbl oil spill scenarios from a tanker near Alcatraz modeled in the Unocal EIR, oil contacted a substantial portion of the natural rocky shore (54.6 percent and 31.2 percent), juvenile Dungeness crab (67.5 percent and 21.4 percent), and eelgrass (58.5 percent and 27.7 percent) habitat in San Francisco Bay. Oiling of intertidal mudflat was less extensive in these spill scenarios. A total of 18.2 percent of the intertidal mudflat in the Bay was contacted by oil in Scenario 9 and 8.8 percent was contacted in Scenario 10. The two modeled 1,000-bbl spills from a tanker at Anchorage 9 in South Bay contacted no natural rocky shore or eelgrass and only 2.9 percent and 1.2 percent of the Dungeness crab area. However, because of the large amount of intertidal mudflat in South Bay, the percentage of mudflat contacted in these scenarios (8.6 percent and 12.4 percent) was similar to that contacted by the much larger spill scenarios near Alcatraz.

To evaluate the relative risk to benthic resources on the outer north coast of California from tankers servicing the Long Wharf, those significant biological areas at highest relative risk (greater than a 1.5 percent probability) of medium oiling from a tanker spill were identified based on the analysis in the Unocal EIR. An oil spill from tankers traveling from San Francisco Bay would have the greatest probability of moderately oiling the shoreline between the Point Reyes area and Santa Cruz. Significant intertidal and subtidal areas in northern California most at risk include Bodega Head, Bird Rock

Area of Special Biological Significance (ASBS), Point Reyes Headland, Limantour Marine Reserve, Double Point ASBS, Duxbury Reef, James V. Fitzgerald Marine Reserve and ASBS and Año Nuevo Point. Analysis in the GTC Gaviota Marine Terminal EIR/EIS (Aspen Environmental Group 1992) showed that significant rocky habitat along the shores of the northern Channel Islands was at relatively high risk from an oil spill from tankers off central and southern California.

Fishes

Vulnerable fish populations off the outer coast would be species that use estuaries or coastal streams for part of their early life histories. Impacts of an oil spill to fishes which use estuaries on coastal streams have the potential to be significant (Class I). Impacts to open ocean and coastal species would be adverse, but less than significant (Class III).

Particularly sensitive fish species within the San Francisco Bay estuary include those with a restricted distribution, such as the federal and state threatened Delta smelt, and the anadromous fishes that pass through the northern reach on their way to the Delta to spawn. All these species are at particular risk not only because a large percentage of their populations might be contacted by a single oil spill, but also because their populations have been declining in recent years.

Fishes that spawn in the Bay also might be particularly vulnerable to an oil spill because the egg and larval stages are so sensitive to oil. Important fish species that spawn primarily in the Bay include Pacific herring, longfin smelt, yellowfin goby, plainfin midshipman, bay goby, and topsmelt. Impacts to Pacific herring, which lay thin eggs on the partially hard substrate within the estuary, would be particularly susceptible to oil and impacts of a spill in the Bay could be significant (Class I). Several studies documented lethal and sublethal effects of oil on the eggs and larvae of Pacific herring following the 1989 *Exxon Valdez* oil spill (Norcross et. al. 1996, McGurk and Brown 1996, Hose et. al. 1996). Similarly, impacts to longfin smelt, which spawn primarily in the fresh-water at the eastern end of the estuary, could be significant if oil moved into this part of the estuary (Class I).

<u>Impacts to Fishes from a Spill at the Long Wharf</u>

The risk to shallow water fish habitat from a spill at the Long Wharf was determined by evaluating the segments of the Bay contacted by 100 scenarios of a 1,000-bbl spill. Based on this analysis, Pacific herring spawning areas were at high risk in the east Central Bay and longfin smelt, which are most abundant in the southeastern part of San Pablo Bay, were at moderate risk. Analysis of five modeled scenarios resulted in oil spill impacts to Pacific herring spawning grounds ranging from less than significant to significant to adverse (Class I). Anadromous fish species most at risk from an oil spill associated with the Long Wharf include the federal and state endangered Chinook salmon, striped bass, American shad, and white sturgeon. Delta smelt, found primarily in Suisan Bay, are at almost no risk of contact by oil from a spill at the Long Wharf.

None of the scenarios of a spill at the Long Wharf resulted in oil entering Suisun Bay. However, if oil from Long Wharf operations did enter Suisun Bay, impacts to the Delta smelt population could be significant (Class I).

Risks and impacts of an oil spill to the federally threatened steelhead that spawn in the Sacramento and San Joaquin Rivers would be similar to those described above for Chinook salmon and could be substantial under certain conditions. Steelhead that spawn in creeks that enter San Pablo Bay, Central Bay, and South Bay are at relatively high risk from a spill from Long Wharf operations because there is a high probability that a spill would contact some habitat used by young steelhead migrating from their natal streams to the ocean. Impacts to striped bass would be significant (Class I) if the spill occurred when juvenile striped bass were migrating out of the Delta. A spill would not have as significant an impact on American shad (Class III) unless oil was transported into north San Pablo Bay when the young shad were migrating out of the Delta (Class I).

Impacts to Fishes of a Spill from Chevron Tankers

Based on the analysis of tanker spills within the Bay conducted for the Unocal EIR (Chambers Group 1994), longfin smelt, Pacific herring spawning areas, Chinook salmon, striped bass, and white sturgeon were all at moderate risk from a spill from tankers operating within the Bay. These species all had substantial portions of their preferred habitat with up to 17.5 percent probability of contact by medium or greater doses of oil from a tanker spill within the Bay. American shad populations were determined to be at low risk. The preferred habitat for American shad on the north side of San Pablo Bay and in Suisun Bay had between a zero and eight percent chance of moderate oiling from a tanker spill. Delta smelt are found primarily in the Suisan Bay. None of the four applicable tanker spill scenarios in the Unocal EIR resulted in oil contacting Suisan Bay.

Modeling was conducted for preferred fish habitat contacted by the four oil spill scenarios from tankers operating within the Bay. The worst-case tanker spill analyzed, a 100,000-bbl spill from a tanker near Alcatraz (Scenario 9), resulted in a substantial portion of the preferred habitat of sensitive fish species being contacted by oil. This spill occurred under conditions that spread the oil throughout Central Bay and up into San Pablo Bay and Carquinez Strait. In Scenario 10, another 100,000-bbl spill near Alcatraz, the oil stayed within Central Bay and much lower percentages of sensitive fish habitat were contacted by oil. Two other tanker spill scenarios (11 and 12), representing two 1,000-bbl spills from a tanker at Anchorage 9, contacted very little sensitive fish habitat. Therefore, impacts to sensitive fish resources from a tanker operating within San Francisco Bay could range from less than significant (Class III) to significant to adverse (Class I).

The risk of spill from tankers to Chinook salmon is moderate. Of the four applicable spill scenarios in the Unocal EIR, three affected less than one percent of the preferred habitat of Chinook salmon. Scenario 9, a 100,000-bbl spill from a tanker near Alcatraz,

contacted 41.6 percent of the preferred Chinook salmon habitat. Therefore, impacts to Chinook salmon from a tanker spill could range from highly significant (Class I) to negligible depending on the location of the spill and the weather and oceanographic conditions.

Marshes and Coastal Estuaries

Vegetated marshes within the San Francisco estuary and coastal estuaries along the outer coast are two of the habitats which would be most sensitive to an oil spill. In most oil spills that have contacted saltmarshes, damage has been noted to marsh vegetation (NRC 1985, 2003). The margins of the sea seem to be especially susceptible to the impacts of oil spills because when a large spill drifts ashore, tidal areas often are subjected to heavy oiling. In the case of saltmarshes, oil may become incorporated into sediments where it may persist for years. Documented recovery times for oiled marshes range from a few weeks to decades (NRC 2003). Clearly any saltmarsh or coastal estuary on the outer coast or in San Francisco Bay would be likely to suffer significant impacts if it was contacted by oil from a spill associated with the Long Wharf (Class I).

Impacts to Vegetated Marshes from a Spill at the Long Wharf

Based on the 100 modeled scenarios of a spill from the Long Wharf, marshes around Brooks Island and Richmond would be at greatest risk from a spill at the Long Wharf. Oil contacted this area in 58 of the spill scenarios. The Emeryville marshes also would be at considerable risk from a spill from the Long Wharf. About 25 of the 100 modeled scenarios resulted in oil contacting this area, and in 18 of the scenarios, the oiling was by greater than trace amounts. The San Pablo and Wildcat Creek marshes north of San Pablo Point also have about a 25 percent chance of being contacted by oil from a spill at the Long Wharf, but only about a seven percent chance of being contacted by greater than trace amounts of oil. These marshes, therefore, are at moderate risk. Marshes in north and west San Pablo Bay, west Central Bay, and South Bay are at relatively low risk from a spill from the Long Wharf. Ten or less of the 100 modeled spill scenarios resulted in oil contacting these areas.

Marsh sandwort has been recorded near the Golden Gate. Based on the 100 modeled scenarios of a spill at the Long Wharf, oil from a spill has a very low chance of contacting this population. Less than five of the 100 scenarios resulted in greater than a trace amount of oil contacting this area. Oil did not reach the Golden Gate area in any of the five selected Long Wharf spills.

Impacts to Vegetated Marshes of a Spill from Chevron Tankers

Based on the oil spill modeling done in the Unocal EIR, saltmarsh habitat at highest risk from a spill associated with tankering would be that at Benicia, San Pablo Point, and the northeast end of San Pablo Bay. Saltmarsh most at risk of medium or greater oiling from a tanker spill is around Benicia in Carquinez Strait and around San Pablo Point in southwest San Pablo Bay. These areas would have a 12 to 17.5 percent chance of

medium oiling from a tanker spill. Northeast San Pablo Bay marsh would have a six to 10 percent chance of medium oiling from a tanker spill. Vegetated marsh at Martinez and south Suisun Bay would have a two to four percent chance of medium oiling. Other marsh habitat in San Francisco Bay would have less than a two percent chance of medium oiling from a tanker spill. Less than five percent of the saltmarsh habitat in the San Francisco Bay estuary has greater than a five percent probability of being contacted by medium oil from a tanker spill. Spill analysis in the Unocal EIR shows that areas where the California seablite (state rare and federally endangered) is known to occur are at low risk from a tanker spill.

The Golden Gate area is at relatively high risk from a tanker spill because Chevron tankers pass through the Golden Gate regularly. The Unocal EIR analyzed four tanker spill scenarios that are applicable to Chevron tankers. Both scenarios of a 100,000-bbl tanker spill near Alcatraz contacted the area where marsh sandwort is found. Alternatively, neither of the 1,000-bbl spills from a tanker at Anchorage 9 contacted the marsh sandwort population. If oil contacted a population of this species, the impact would be significant (Class I).

The overall risk to marshes from a tanker spill is relatively low, although should a spill occur, at least some marsh habitat would be oiled. Furthermore, coastal estuaries on the outer coast are at relatively low risk from a tanker spill.

Birds

Oil spills can affect birds directly through oil contamination and indirectly through degradation of important habitat. The direct effect of oiling on birds is predominantly contamination of feathers, removing insulative qualities and reducing buoyancy (Holmes and Cronshaw 1977; Moskoff 2000). Oiling of feathers leads to elevated metabolic rate and hypothermia (Hartung 1967). Oiled birds may also ingest oil through preening of feathers or feeding on contaminated prey. Effects of ingested oil can range from acute irritation and difficulties in water absorption to general pathologic changes in some organs (e.g., Crocker et al. 1974; Fry 1987; Nero and Associates 1983). Ingestion of oil can also result in changes in yolk structure and reduction in number of eggs layed and egg hatchability (Hartung 1965; Grau et al. 1977). Oiled birds that are able to return to a nest can contaminate the exterior of eggs, reducing hatchability (e.g., Hartung 1965; Patten and Patten 1977).

Indirect effects result principally from contamination of habitat where feeding occurs. These effects may be significant in shallow waters of bays, mudflats, and estuaries where waterfowl, rails, wading birds, and shorebirds feed. For these birds, loss or reduction in food resources can affect survival during migration and success of nesting efforts.

Large migrant or wintering populations of loons, grebes, and scoters are found along the outer coast and in San Francisco and San Pablo bays from about October through March. Along the outer coast, loons, grebes, and scoters rest at night on nearshore

waters where they can be contacted in large numbers should a spill occur. In the bays, the migrant or wintering waterfowl also includes large populations of diving or dabbling ducks that spend most of their time on the water where they can be contacted by oil spills. The San Francisco Bay estuary is used by several hundred thousand waterfowl from late fall through spring as a critical feeding ground. Substantial mortality of wintering waterfowl or loss of essential habitat would likely result from oil spills and would constitute a significant impact (Class I).

In San Francisco-San Pablo bays, habitat of rails, terns, wading birds, and shorebirds could also be contacted by oil spills (e.g., the Shell Oil Refinery spill near Martinez in April 1988; Palawski and Takekawa 1988). Direct effects on these birds from oil spills are suspected but difficult to assess. Observations of oil-streaked shorebirds are common immediately following oil spills, but carcasses are rarely recovered (Larsen and Richardson 1990). It is likely that shorebirds and wading birds are able to avoid oiling to some extent by retreating from exposed habitat. Even if contacted, they may be able to avoid hypothermia from light oiling because they remain on land and may find some shelter in vegetation. Nevertheless, preening of oiled feathers would lead to ingestion of oil and resultant pathological effects. Another serious concern is secondary impacts from contamination of food resources on beaches and mudflats. Not only could oil ingestion take place during feeding, the presence of oil might substantially reduce the food available to sustain these populations. The San Francisco Bay estuary is used by up to one million shorebirds as a critical feeding area in the Pacific Flyway. Substantial mortality of wintering shorebirds or loss of essential habitat would likely result from oil spills and would constitute a significant impact (Class I).

Impacts to Birds from a Spill at the Long Wharf

To determine the risk to birds from a spill at the Long Wharf, the results of the 100 modeled scenarios of a 1,000-bbl spill at the Long Wharf were analyzed. East Central Bay is at highest risk of contact by oil from a spill at the Long Wharf. The most sensitive species in this segment is the double-crested cormorant, which has a large colony on the Richmond-San Rafael Bridge. Cormorants are most vulnerable during the spring-summer breeding season when they have strong ties to nesting colonies. Cormorants do not have the ability to store energy as fat and, consequently, must forage each day regardless of the presence of oil nearby. Therefore, if a spill from the Long Wharf occurred during the nesting season, the cormorant colony on the Richmond-San Rafael Bridge would be at very great risk. Although western gulls nest on rocks and structures in this segment, western gulls are not particularly vulnerable to an oil spill because they forage widely in the area, including on land, and do not spend a large portion of their time on the water. A relatively low number of waterfowl occurs in the east Central Bay segment.

The segment with the second highest risk of being contacted by a spill at the Long Wharf is the Brooks Island/Richmond segment. About 60 Caspian terns nest on a sand spit on Brooks Island. This colony would be at substantial risk from a spill at the Long Wharf. However, Caspian terns have a large and widespread nesting population in the

San Francisco Bay Area (approximately 1,409 nesting pairs), and impacts to this relatively small colony would not have a significant impact to the local Caspian tern population. Similarly, the 62 pairs of western gulls that nest in this segment would be at risk from a spill at the Long Wharf, but impacts to this widespread species would not be significant. A spill at the Long Wharf could contact the marsh habitat found in this segment and affect the endangered California clapper rail. Marsh habitat in the Brooks Island/Richmond segment comprises approximately 3.3 percent of the clapper rail habitat in San Francisco Bay. Waterfowl in this segment would be at high risk from a Long Wharf spill, but the number of waterfowl in the Brooks Island/Richmond area typically is relatively low. In addition, many California brown pelicans use Brooks Island as a roost during October through May. While somewhat protected from oil while on land, they are vulnerable to oiling as they forage in open water of Central Bay.

Based on the 100 modeled spill scenarios, bay segments at moderate risk from a spill at the Long Wharf include the Berkeley/Emeryville segment, the Tiburon/Angel Island area, southeast San Pablo Bay, and Treasure Island/Yerba Buena Island. Bird resources in those segments that are of particular concern include the double-crested cormorant colony on the Bay Bridge in the Berkeley/Emeryville segment and clapper rail habitat in the Berkeley/Emeryville segment and southeast San Pablo Bay. The double-crested cormorant colony on the Bay Bridge is the largest in the San Francisco estuary. If a spill occurred during the nesting season, cormorants might be oiled as they tried to forage near their colony.

Based on the 100 modeled spill scenarios, the rest of San Francisco Bay is at relatively low risk from a spill at the Long Wharf. Therefore, the high numbers of waterfowl found seasonally in north and west San Pablo Bay and in South Bay are unlikely to be contacted by oil from a Long Wharf spill. Most of the marshes that support California clapper rails are unlikely to be contacted by a spill at the Long Wharf.

Five representative scenarios were selected to analyze the range of impacts that could be expected from a spill at the Long Wharf. The mortality is based on estimated number of birds in each segment contacted by oil and an assumption that 17 percent of the birds contacted by oil could be rehabilitated. The South-East San Pablo Bay scenario, in which oil was carried north into southeast San Pablo Bay, had the greatest potential to affect waterfowl. The South-East San Pablo Bay scenario was predicted to result in a loss of up to 1.6 percent of the wintering waterfowl population of the Bay. None of the modeled spills reached the area of high winter waterfowl density in north San Pablo Bay. Therefore, none of the scenarios was predicted to result in a loss of a large proportion of the wintering waterfowl population of the Bay. Impacts to waterfowl of the five representative Long Wharf spills were adverse, but less than significant (Class III). Similarly, none of the five representative scenarios of a spill at the Long Wharf was predicted to result in a loss of a substantial portion of the shorebirds that use the tidal waters of San Francisco Bay. The West San Pablo Bay scenario, in which oil spread into the expansive mudflats of west San Pablo Bay, had the potential to affect the greatest number of shorebirds. Approximately 4.4 percent of the wintering shorebird population in the tidal areas of San Francisco Bay was predicted to be lost from contact

with oil in this scenario. The relatively low impacts to shorebirds predicted from a spill at the Long Wharf are a result of the fact that all of the five representative scenarios resulted in oil contacting less than 10 percent of the intertidal mudflat habitat in San Francisco Bay. Impacts to shorebirds in these five representative spill scenarios were adverse, but less than significant (Class III).

In all of the five scenarios, oil spread to the waters beneath the Richmond-San Rafael Bridge. Therefore, if a spill at the Long Wharf occurred during the nesting season, the large double-crested cormorant colony on this bridge would be at high risk. In two of the spill scenarios, the Berkeley/Emeryville scenario and the Brooks Island/Richmond scenario, oil was also carried to the waters below the Bay Bridge, where the largest double-crested cormorant colony in San Francisco Bay nests. Therefore, if a spill at the Long Wharf occurred during the breeding season and oil was carried southeast, almost all the nesting double-crested cormorants in San Francisco Bay would be at risk. Although some individuals might fly to unoiled areas to feed, it is highly likely that many birds would attempt to feed in oily waters and come in contact with the oil.

None of the five scenarios resulted in oil coming near the colony of the endangered California least terns at Alameda. The impacts to many types of marine birds from the modeled scenario of a spill at the Long Wharf resulted in adverse, but less than significant (Class III) impacts. However, it should be recognized that a large spill under the wrong weather conditions could impact sensitive bird habitats that were not affected by the modeled scenarios.

Impacts to Birds of a Spill from Chevron Tankers

Because of the widespread distribution of waterfowl, any oil spill from October through about April would probably contact some portion of the population. Based on the analysis in the Unocal EIR, greatest probabilities of contact from tanker spills within the San Francisco Bay occur near the ship channel through San Pablo Bay, and northern and central San Francisco Bay. Areas of San Pablo Bay where waterfowl are found at highest densities are subject to a 10 to 40 percent chance of contact; there is a six to eight percent chance of moderate oiling and a one to two percent chance of heavy oiling. Most waterfowl habitat in south San Francisco Bay is subject to a negligible chance of contact from tanker spills. The overall risk to waterfowl from a spill originating from Chevron tankers would, however, be relatively high because of the vulnerability of waterfowl in San Pablo Bay.

Based on the analysis in the Unocal EIR, intertidal mudflats critical to wintering shorebirds are at substantial risk of contact from a tanker spill. The likelihood of medium to heavy oiling is generally less than four percent, but may reach six to 12 percent along Contra Costa County from Point Richmond to Point San Pablo. Almost all intertidal mudflats in south San Francisco Bay are subject to a negligible chance of contact from oil spills from Chevron tankers (less than a one percent chance). Therefore, although a tanker spill would be unlikely to contact much of the tidal habitat

for shorebirds in San Francisco Bay, some mudflat areas are at high risk from a tanker spill.

Spills along the tanker route have a substantial chance of contacting all important seabird colonies, except those in south San Francisco Bay. Most of the important seabird colonies in San Francisco Bay, including the double-crested cormorant (California Species of Special Concern), California brown pelican (state and federal endangered), and the California least tern (state and federal endangered), have a greater than 10 percent chance of being contacted by a tanker spill and are considered to be at high risk. The common loon (California Species of Special Concern) is found in small numbers (<100) in deeper open water portions of the San Francisco Bay estuary in the winter; numbers migrating along the outer coast may reach several thousand during the spring. Based on the analysis in the Unocal EIR, reasonable worst-case oil spill scenarios showed that oil contact with common loons in the San Francisco Bay estuary resulted principally from large tanker spills and resulted in mortality rates ranging from 15.7 to 52.1 percent. The Unocal EIR also shows that large tanker spills have the potential to contact 27.7 to 42.9 percent of the population of Barrow's goldeneye, a California Species of Special Concern. Impacts to the common loon and Barrow's goldeneye are significant (Class I).

The other two tanker spill scenarios analyzed in the Unocal EIR were of a 1,000-bbl spill from Anchorage 9 (Scenarios 11 and 12). Both spills carried oil into intertidal mudflat habitat in the South Bay. Scenario 11 was predicted to result in mortality to 8.5 percent of the shorebird population in the Bay and Scenario 12 was predicted to result in mortality to 13 percent of the shorebird population. Therefore, both of these modeled tanker spills, like those modeled in Scenarios 9 and 10, could potentially have a significant, adverse impact on shorebirds (Class I). Scenario 12, which was a spill in August, would not affect wintering waterfowl. Scenario 11, a spill in November, was predicted to contact parts of the Bay in which about 4.1 percent of the wintering waterfowl population occurs. The estimated mortality to waterfowl in this spill scenario was 200 to 600 birds, which would be an adverse but less than significant impact (Class III). Spills 11 and 12 did not contact any of the major seabird colonies in the Bay.

Seabirds off the outer coast of California have colonies at over 200 locations. Colonies are not usually contacted directly by oil due to their elevation above the water. However, the density of birds on the water is greatest near the colonies and it is there that impacts are likely to be greatest. Therefore, colony location is used only as an indicator of important habitat. Oil spill modeling in the Unocal EIR showed that the probability of contact with one or more colonies along the outer coast, should a spill occur, is near certainty for cormorants and western gulls, and high for alcids, because colonies exist at a great many locations along the coast. For seabirds such as storm-petrels with colonies at only a few sites, the probability of contact from a tanker spill is less than 30 percent.

Marine Mammals

Marine mammals found in San Francisco and San Pablo bays include harbor seals, California sea lions, and harbor porpoises (gray whales and humpback whales occasionally wander into the bays but are not part of the typical fauna). Harbor seals in the bays may be subject to oil spill impacts because they breed and give birth to pups in the area. Harbor seals (particularly pups) may be at risk from oiling both on land and in the water. California sea lions in the bays are migrant adult males and juveniles that are present in relatively small numbers in the fall and winter. Because they are not known to be especially sensitive to oil impacts, and have a very large and expanding population off the outer coast, any impacts of oil spills in the bays would be adverse but less than significant (Class III). Harbor porpoises are rare in the bays, relative to numbers in the Gulf of the Farallones, are highly mobile and may avoid oil slicks, and are not known to be especially sensitive to oil contact. Therefore, impacts of oil spills are likely to be adverse, but less than significant (Class III).

The pinniped fauna of the outer coast includes, in addition to harbor seals, northern elephant seals, California sea lions, Steller sea lions (threatened), and northern fur seals. Guadalupe fur seals (threatened) may also be present offshore in very small numbers. Sea otters (federal threatened) have a restricted distribution and are very vulnerable to oil because of their fur. Impacts of a spill from a Chevron tanker on this species could be significant (Class I).

Impacts to Marine Mammals from a Spill at the Long Wharf

Based on the 100 modeled scenarios of a spill at the Long Wharf, the harbor seal haulout site at Castro Rocks has an 87 percent chance of being contacted by a spill at the Long Wharf. Harbor seal haulout sites at Yerba Buena Island and Angel Island are at moderate risk from a spill at the Long Wharf. These sites were contacted by oil in 20 and 22 of the 100 scenarios. All other harbor seal haulout sites in the Bay are at relatively low risk from a spill at the Long Wharf.

Impacts to Marine Mammals of a Spill from Chevron Tankers

The analysis in the Unocal EIR determined that the harbor seal haulout sites at Angel Island and Yerba Buena Island were at high risk (greater than 10 percent chance of contact by oil) from a tanker spill and sites at Tubbs Island, Castro Rocks, and California Point were at moderate risk (one to 10 percent chance of being contacted by oil). Therefore, within San Francisco Bay, harbor seals would be at substantial risk only from tanker transport past their haulout sites at Tubbs Island, Castro Rocks, the vicinity of California Point, Angel Island, and Yerba Buena Island. In combination, these sites provide habitat for resting and breeding for about 38 percent of the harbor seal population in the San Francisco Bay Area. All other haulout sites are at low risk should a tanker within the bay spill oil.

Two of the oil spill scenarios analyzed in the Unocal EIR represent reasonable worst-case scenarios for a tanker spill within San Francisco Bay. Scenario 9 modeled the fate of a very large spill from the tanker lane near Alcatraz Island. The oil from the 100,000-bbl release was carried north by March winds and a flood tide into San Pablo Bay producing light oiling, and south as far as Hunters Point and Alameda producing medium oiling. Most of the oil remained in north and central San Francisco Bay producing medium to heavy oiling of haulout sites in Richardson Bay, Angel Island, Yerba Buena Island, and Castro Rocks. The timing of the modeled spill was a worst case for harbor seals, in that March is the beginning of the pupping season and populations on land begin to increase. This spill could oil a substantial number of harbor seals, including pups; cleanup activities might cause additional impacts by displacing animals from important habitat. Impacts from such a spill could potentially affect about 35 percent of the local population (i.e., harbor seals in San Francisco Bay). If mortality was this great, a substantial portion of harbor seal numbers in San Francisco Bay would be lost (approximately 10 to 20 percent), but less than one percent of the estimated California population. A more serious consequence of such spills would be further degradation of the environment that provides a nursery for pups. Studies elsewhere suggest that protected waters of bays and estuaries are the preferred pupping grounds of harbor seals (Allen et al. 1989; Bonnell et al. 1991).

Scenario 10 was also a very large spill (100,000 bbls) near Alcatraz Island during the flood tide, but was acted upon by September winds. Oil heavily contaminated waters of the central San Francisco Bay from the Richmond-San Rafael Bridge in the north to about Hunters Point and Oakland International Airport in the south. Some oil entered Richardson Bay but did not contaminate the shore. Only haulout sites on Angel Island and Yerba Buena Island were contacted with oil. Such a spill in September would affect a sizable population of molting animals.

Along the outer coast, harbor seals haul out at a great many locations. Therefore, there is a very high probability that one or more sites would be contacted should a tanker spill occur. As was true of other biological resources, the greatest relative risk is to harbor seal habitat in the Gulf of the Farallones and southward toward Monterey Bay, as well as on the northern Channel Islands.

Other species of pinnipeds can contact oil spills in open waters where they feed or on land where they rest and breed. Sea lions generally forage each day within 20 to 30 km of their haulout sites. The likelihood of some of these waters being contacted by oil spills from the tanker lanes is a near certainty. The beaches and rocks used as haulout sites by California sea lions are many and widespread; therefore, there is also a high likelihood of one or more being contacted should a spill occur (86.5 percent conditional probability of contact). Northern elephant seals do not come and go daily from their haulout sites, nor do they forage close by. Typically, elephant seals remain on land for a month or more during the breeding season or for molting, and then disperse widely in the eastern North Pacific. They are most likely to be contacted at their colonies only when high surf can carry oil ashore; effects could be significant during the winter breeding season when pups might ingest oil during suckling. In the unlikely event of a

tanker spill, the probability of contact to one or more northern elephant seal colonies is 37.8 percent. Northern fur seals breed on San Miguel Island in the Santa Barbara Channel and have a large pelagic population offshore in the winter and spring. The tanker lanes pass through waters used by northern fur seals and, consequently, the chance of contact with oil spills is very high. San Miguel Island is also at substantial risk from a tanker spill (Aspen Environmental Group 1992).

A spill from a tanker traveling along the outer coast would contact habitat used by dolphins and porpoises, and if it occurred when gray whales were migrating, the probability is very high that oil would contact the migration path. However, because of the widespread distributions of these animals and the lack of documented effects of historical oil spills, significant impacts are unlikely.

Summary of Oil Spill Impacts

An oil spill of 1,000 bbls or greater could have significant, adverse impacts on biological resources (Class I). A spill between 50 and 1,000 bbls would also probably have significant biological impacts that might not be avoidable (Class I). A spill between one and 50 bbls would also have significant impacts but could be contained and/or cleaned up before such impacts occurred (Class II).

Based on the analysis, resources most likely to suffer substantial impacts from a spill at the Long Wharf include:

- Rocky intertidal habitat in the northern parts of Central Bay
- Juvenile Dungeness crabs
- Eelgrass beds
- Double-crested cormorants
- California brown pelicans

Resources most likely to suffer substantial impacts from a tanker spill include:

- Rocky intertidal habitat
- Juvenile Dungeness crabs
- Wintering waterfowl (if spill occurs in winter)
- Double-crested cormorants
- California clapper rails
- Marsh sandwort (if spill occurs near Golden Gate)
- California least terns
- California brown pelicans

Other species, such as the saltmarsh harvest mouse, might suffer a significant (Class I) impact from a Chevron oil spill because their status as a listed species makes any contact by oil significant; however, most of the population within the San Francisco Bay would probably not be affected.

Resources at Risk from Oiling in the First 24 Hours Following a Long Wharf Spill

The results of the analysis described above as well as the time series of oil movement in the five representative scenarios of a spill at the Long Wharf (see DEIR Appendix B-1) were used to identify sensitive resources that could be oiled within the first 24 hours following a spill. In addition, Chevron's Spill Preparedness and Emergency Response Plan (Chevron 2005) provided further information on the speed with which oil spilled at the Long Wharf could reach sensitive resources. Finally, the Area Contingency Plan for the California North Coast, San Francisco Bay and Delta and Central Coast (USCG and OSPR 2000) was consulted for recommendations on how to protect those resources as well as area-wide preparedness to respond to a spill from the Long Wharf.

Based on the oil spill analysis done for this EIR as well as the analysis done by Chevron (2005), the resources at the most immediate risk of oiling from a spill at the Long Wharf are Castro Rocks and the Richmond eelgrass beds. The oil spill modeling done by Chevron indicates that a spill from the Long Wharf could reach these areas within four hours. The Area Contingency Plan describes specific methodologies and equipment to protect those areas by the placement of booms. For the Richmond eelgrass beds the plan recommends the strategic deployment of 6,000 feet of boom to protect eelgrass, which is patchy in that area. For Castro Rocks, the Area Contingency Plan recommends placement of up to 9000 feet (1.7 miles) of boom to completely surround Castro Rocks.

Chevron's Emergency Response Plan (Chevron 2005) indicates that Chevron is well aware of the sensitivity of those resources. Chevron indicated that in the event of a spill, Chevron would place high priority on protecting Castro Rocks and Brooks Island (D. Kinkela, Chevron, personal communication, 2007). Chevron's first response would be to consider the currents at the time of the spill and to protect whichever of these areas was in the direction of the prevailing current. It should be considered, however, that tidal currents switch direction about every six hours. Therefore, oil headed towards Brooks Island may be directed toward Castro Rocks when the tide changes. Although Chevron is aware that the Richmond eelgrass beds are a sensitive resource with high priority for protection, it does not appear that a particular plan is in place to determine exactly how to protect those beds or that drills are done to deploy booms in the appropriate areas to protect eelgrass.

According to the Chevron Plan, Chevron has approximately 12,500 feet (2.4 miles) of boom at the Long Wharf. This boom may not be adequate to protect all the resources (Castro Rocks, Richmond eelgrass beds, Brooks Island) at immediate risk from a spill at the Long Wharf. Also, in the event of a large Long Wharf spill it may be crucial to simultaneously boom Castro Rocks and the Richmond eelgrass beds, resources that could be reached by oil in a few hours. It does not appear that Chevron has prepared for the rapid deployment of as much as 15,000 feet (2.8 miles) of boom.

The Castro Creek marshes, northeast of San Pablo Point, are at high risk from a spill from the Long Wharf when oil transport is northeasterly. The oil spill scenarios done for

this EIR as well as the analysis in Chevron's Plan indicate that oil could reach this area within 24 hours, but probably not within the first eight to 12 hours following a spill. The Area Contingency Plan recommends deploying 3,200 feet (0.6 miles) of harbor boom from the Pt. San Pablo Yacht Harbor to protect these marshes. This area may be best protected by MSRC rather than by Chevron, but Chevron should demonstrate that either MSRC or Chevron equipment can be mobilized and deployed to protect these marshes within 12 hours.

Finally, the scenarios developed for this EIR indicate that, under certain conditions, mudflats and marshes along the eastern shore of San Pablo Bay may be contacted by oil from the Long Wharf within 12 to 24 hours. The analysis in the Chevron Plan shows these marshes as being contacted within 48 hours. The Area Contingency Plan does not contain a strategy or equipment to protect the San Pablo Creek marshes. The Area Contingency does have a plan for protecting the Pinole Pt. marshes but the document states that the strategy has not been deployed or tested. Chevron should work with Clean Bay to test the deployment of equipment to protect these marshes.

Finally, double crested cormorants that nest on the Richmond-San Rafael Bridge are at especially high risk of contact with oil from a spill at the Long Wharf as they forage for food in Bay waters near their nesting site. Chevron should develop a plan approved by CDFG to flush cormorants from the area and also should have plans to procure qualified specialists to capture and rehabilitate oiled birds as quickly as possible.

Mitigation Measures for BIO-6:

BIO-6a: Implement MM OS-3b, MM OS-3c, and MM OS-4 in Operational Safety/Risk of Accidents to either lower the probability of an oil spill or increase response capability.

BIO-6b: Chevron shall demonstrate to the satisfaction of the California State Lands Commission (CSLC) that the Long Wharf can successfully implement its Oil Spill Response Plan and can deploy within three hours all boom necessary to simultaneously protect all the sensitive resources at risk of contact with oil within three hours from a spill at the Long Wharf. Sensitive resources close to the Long Wharf include Castro Rocks, eelgrass beds, and the double-crested cormorant breeding colony on the Richmond-San Rafael Bridge. Procedures for the protection of Castro Rocks and eelgrass beds are detailed in the Area Contingency Plan (USCG and OSPR 1997). Chevron shall obtain the 15,000 feet (2.8 miles) of boom necessary to protect the Richmond eelgrass beds and Castro Rocks simultaneously from a spill at the Long Wharf. Chevron shall survey for eelgrass annually in the Richmond area and identify the places where substantial amounts of eelgrass currently grow. Chevron shall implement drills specifically designed to deploy and anchor booms simultaneously to immediately protect Castro Rocks and the Richmond eelgrass beds from oil. Because a spill could reach these areas rapidly, Chevron should have immediate access to the equipment and personnel detailed in the Area Contingency Plan.

BIO-6c: Have procedures in place to flush double-crested cormorants from the waters contaminated by oil with capability to quickly bring expert bird rehabilitators to the site to rescue oiled birds. Provide the CSLC with copies of proof of existing arrangements with specialized wildlife handlers.

BIO-6d: Chevron shall ensure that adequate equipment and personnel are available to protect the Castro Creek marshes, San Pablo Creek marshes, Pinole Pt. marshes and the southeastern San Pablo Bay mudflats within eight hours of a spill at the Long Wharf. The strategy to protect each of these sensitive resources shall be tested with a field demonstration of deployment and placement of booms and other equipment in locations designated in the Area Contingency Plan to protect these sensitive habitats.

BIO-6e: When a spill occurs, develop procedures for clean up of any sensitive biological areas contacted by oil, in consultation with biologists from the California Department of Fish and Game and United States Fish and Wildlife Service, to avoid damage from clean up activities.

BIO-6f: Chevron shall work with the Natural Resource Damage Assessment (NRDA) team, as the team may request, to determine of the extent of damage and loss of resources, cleanup, restoration and compensation. Chevron shall keep the CSLC informed of their participation in such efforts, by providing copies of memos, meeting agendas, or other appropriate documentation, including e-mails.

BIO-6g: Chevron shall implement MM OS-7a and MM OS-7b in Operational Safety/Risk of Accidents addressing potential participation in VTS upgrade evaluations, and Chevron response actions for spills at or near the Long Wharf.

Sensitive areas that could be impacted within three hours of a spill are the greatest concern for immediate protection. These sensitive areas include Castro Rocks, eelgrass beds, and the double-crested cormorant breeding colony on the Richmond-San Rafael Bridge. Implementing MM OS-3 through MM OS-6 help increase response capability and reduce risk of accidents. Chevron has approximately 12,500 feet (2.4 miles) of boom at the Long Wharf. This amount of boom appears to be inadequate to simultaneously protect Castro Rocks and eelgrass beds in the event of a spill at the Long Wharf. In addition, Chevron does not have specific procedures to protect eelgrass beds in the immediate vicinity of the Long Wharf. Implementing MM BIO-6b will insure that Chevron is adequately prepared to protect the sensitive resources most immediately at risk from a spill at the Long Wharf. Chevron does not have a specific plan to deter double-crested cormorants from foraging in oiled areas should a spill occur. MM BIO-6c would insure that Chevron develops procedures and has in place expert bird rehabilitators to protect double-crested cormorants in case of a spill at the Long Wharf. MM BIO-6d ensures that equipment and personnel are available to protect the marshes by demonstrating to CSLC that the Long Wharf has the equipment and personnel to deploy protection within eight hours of a spill. MM BIO-6e insures that

consultation for cleanup actions with CDFG and USFWS will occur to avoid damage that can occur during cleanup operations. MM BIO-6f requires Chevron to cooperate with the NRDA to aid in the effectiveness of determining damage from oil spills, best methods of cleanup, restoration and compensation for damages. MM BIO-6e and MM BIO-6f both provide information for the continued evaluation of the effectiveness of cleanup actions and appropriate methods of cleanup and methods of data collection.

As a participant in any analysis to examine upgrades to the VTS (MM OS-7a), Chevron can help to improve transit issues and response capabilities in general, which help to reduce the potential for incidents and the consequences of spills within the Bay.

The tanker owner/operator has responsibility for spills from their tanker. Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for other tankers. For a spill near the Long Wharf (MM OS-7b), Chevron is more equipped to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. Such action will result in a quicker application of oil spill equipment to any spill and improve control and recovery of such spill.

Even with these measures, however, the consequences of a spill for large spills, oil is likely to contact sensitive resources and impacts would remain significant (Class I) even with mitigation.

CEQA FINDING NO. FSH-1

SPACE USE CONFLICTS BETWEEN LONG WHARF AND PACIFIC HERRING FISHING OPERATIONS

Impact: **FSH-1: Space use conflicts between Long Wharf routine operations and commercial herring fishing could occur resulting in interference or displacement of herring fishing activities.**

Class: II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

b) CDFG has responsibility and jurisdiction to adopt emergency regulations to protect fish and wildlife resources, public peace, health and safety, or general welfare.

FACTS SUPPORTING THE FINDING(S)

All Long Wharf operations occur in CDFG block 488 (see DEIR Figure 4.4-1). According to CDFG statistics, 80 percent of commercial landings in block 488 (years 1991 – 2000) were Pacific herring. Other landings included northern anchovy, halibut, white croaker, rockfish, yellowfin goby, salmon, Dungeness crab, and numerous other species.

The Long Wharf's routine operations could interfere with future herring fishing operations. The shoreline within 0.5 mile of the Long Wharf is spawning habitat (spawning occurred in the area in 2004 and 2005), and therefore, potential fishing area as well. The total amount of habitat area, including along the Long Wharf, is about 3.88 square miles. This spawning and l fishing area is 6.9 percent of the 55.83 square miles of existing herring fishing area in the Bay and 1.4 percent of the 268.36 square miles of spawning habitat. Over the proposed lease period, the impacts on Pacific herring fisheries would likely range from Class II to Class III for several reasons: (1) the uncertainty over the extent of herring spawning in the Long Wharf area; (2) the uncertainty over the amount of total fishing area; and (3) the ability to mitigate space use conflicts. If Berth No. 4 is enlarged to accommodate double-hulled tankers, impacts would be similar to those discussed above.

Mitigation Measures for FSH-1:

FSH-1: Chevron shall participate in the Pacific herring commercial fishery annual public scoping and hearing process, part of CDFG's annual review of herring

commercial fishing regulations. Because CDFG has the authority to modify or develop regulations to address space use conflicts between the fishery and Chevron's operations, Chevron shall abide by any future regulations CDFG may develop to reduce space use impacts.

Participation in the CDFG review of herring regulations will help keep Chevron officials up-to-date on space use conflict regulations and reduce or avoid potential conflicts between the Long Wharf and Pacific herring fishing operations. If the annual review does not adequately address space use conflicts and they occur or are expected to occur during a fishing season, CDFG has the authority to quickly act by adopting emergency regulations to protect fish and wildlife resources, public peace, health and safety, or general welfare (Fish and Game Code Section 240).

Therefore, space use conflicts with the Pacific herring commercial fishery would be reduced to a level below the significance criteria.

CEQA FINDING NO. FSH-2

SPACE USE CONFLICTS BETWEEN BAY HERRING FISHERY AND TRANSITING VESSELS

Impact: **FSH-2: Space use conflicts between transiting vessels serving the Long Wharf and commercial herring operators could occur, resulting in interference or displacement of herring fishing activities. A significant impact could result.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Herring fishing and shipping activities, in particular, would likely continue to result in space use conflicts because vessels serving the Long Wharf would pass through active fishing areas, thus interfering with or displacing herring fishing activities. CDFG works with concerned parties to minimize conflicts; however, some fishing areas may be inaccessible. Herring fishing currently occurs predominantly within CDFG blocks 488 (Central Bay) and 489 (South Bay). In block 488, the fishing area currently totals nearly 18 linear miles. Fishing in South Bay takes up more than double the amount of area, about 40 linear miles. In all, herring fishing areas occupy about 56 linear miles compared to spawning habitat that occupies about 268 linear miles. In any year, fishing could occur anywhere in the habitat areas.

In block 488, shipping corridors used by vessels calling at the Long Wharf pass through current herring fishing areas around Angel Island, off Alcatraz, and along portions of the Tiburon shore. In block 489, lightering operations at Anchorage 9 could continue to interfere with herring fishing operations. At any one time, a vessel would likely pass through about 10 percent of the fishing area for over half the time that fishing is occurring, and could result in significant impacts (Class II). In the future, impacts on herring fishing activities may vary because the fish change their spawning locations.

Mitigation Measures for FSH-2:

FSH-2: Chevron shall notify herring operators during the herring fishing season of vessel transits, through the CDFG Director's Herring Advisory Committee or other means. Chevron shall also participate MM FSH-1, the Pacific herring commercial fishery annual public scoping and hearing process, part of CDFG's annual review of herring commercial fishing regulations.

The use of notification during the three to four month herring season would serve as a warning system notifying herring operators of the transiting vessels. This would serve as an aid to avoid interactions between transiting vessels and herring fishing activities. Space use conflicts between commercial herring operators and vessels transiting to or from the Long Wharf would be reduced to a level below the significance criteria.

Participation in the CDFG review of herring regulations will help keep Chevron officials up-to-date on space use conflict regulations and reduce or avoid potential conflicts between the Long Wharf and Pacific herring fishing operations. If the annual review does not adequately address space use conflicts and they occur or are expected to occur during a fishing season, CDFG has the authority to quickly act by adopting emergency regulations to protect fish and wildlife resources, public peace, health and safety, or general welfare (Fish and Game Code Section 240). Space use conflicts between commercial herring operators and vessels transiting to or from the Long Wharf would be reduced to a level below the significance criteria.

CEQA FINDING NO. FSH-6

IMPACTS ON FISH AND HABITAT FROM DISCHARGE OF BALLAST WATER

Impact: **FSH-6: Fisheries depend on a healthy environment to survive and flourish. Invasive species discharged from ballast water could impair water quality (Impacts WQ-2 and WQ-5) and biological resources (Impact BIO-4). These impacts to fisheries resources would impair commercial and sport fishing activities in the Bay and along the outer coast, resulting in significant adverse impacts.**

Class: I

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

b) Such changes or alterations are within the responsibility and jurisdiction of the DWR and CDFG (MM FSH-6b), not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Impacts on fish and habitat will likely continue from discharges of ballast water. DEIR Section 4.2, Water Quality, (Impacts WQ-2 and WQ-5) concludes that segregated or non-segregated ballast water from tankers at the Long Wharf may contain harmful viruses, toxic algae or other harmful microorganisms. Biological Resources, Impact BIO-4 states that these invasive species impair estuarine habitat, benthic resources, destabilize food webs by out-competing Dungeness crabs, striped bass and other species, poison fish due to high concentrations of toxins, and cause fish kills. Recently expressed concern for the alarming declines of striped bass, longfin smelt and other pelagic organisms in the Bay-Delta implicates invasive species as a possible cause of those declines. The recently published Delta Smelt Action Plan states that ship ballast water is considered one of the major ways that foreign species are transported and spread throughout the Estuary (State of California 2005). Introduction of non-native invasive species, such as the Asian clam and cyclopoid copepod, may compete with native zooplankton and fishes, and may reduce available food for estuarine species. Asian clams also tend to concentrate pollutants such as selenium and organotins in its tissues. Fishes that feed on the Asian clam may have the potential to ingest quantities of toxins. The copepod may not only be a poor food source, it may be a predator of native copepods that are good food sources for other estuarine species in the food chain.

Fish depend on healthy habitats to survive and reproduce, and productive commercial and recreational fisheries are inextricably linked to healthy habitats (NMFS 2005). Invasive species' adverse effects on fish and habitat have the potential to impair sport and commercial fisheries in the Bay and on the outer coast and likely cause significant adverse impacts (Class I).

Mitigation Measure for FSH-6:

FSH-6a. Chevron shall: (1) carry out MM WQ-2 and MM WQ-5 for ballast water reporting, and for distributing advisories about the California Marine Invasive Species Control Act and proper disposal of non-segregated ballast water.

FSH-6b. Chevron shall participate and assist in funding ongoing and future actions related to invasive species and identified in the October 2005 Delta Smelt Action Plan (State of California 2005). The funding support shall be provided to the Pelagic Organism Decline Account or other account identified by the California Department of Water Resources and Department of Fish and Game, lead Action Plan agencies. The level of funding shall be determined through a cooperative effort between CSLC, and the Departments of Water Resources and Fish and Game and shall be based on criteria that establishes Chevron's commensurate share of the Plan's invasive species actions costs.

Chevron has indicated that it is not feasible to treat segregated ballast water in the Refinery's effluent treatment system and that it would not be economically feasible to construct a system for treating ballast water to remove exotic species. Furthermore, effective systems for the treatment of ballast water to remove all associated organisms have not yet been developed. The measure provides an interim tracking mechanism until a feasible system to kill organisms in ballast water is developed. Until an effective treatment system is developed, the discharge of ballast water to San Francisco Bay will remain a significant adverse impact. Mid-ocean exchange reduces the introduction of exotic species but is not completely effective.

The handling of non-segregated ballast water at the Chevron Refinery apparently is a relatively rare event. Chevron indicates that it has not received any unsegregated ballast water at its facilities in the last several years. However, the transport of non-segregated ballast water to an appropriate disposal facility, should it be necessary to receive such water at the Long Wharf, would eliminate the potential introduction of harmful microorganisms that may be in this water into the Bay. Impacts would be reduced to a level that is below the significance criteria.

MM FSH-6b allows Chevron to contribute to a solution to problems caused by invasive species. Chevron's participation in the Delta Smelt Action Plan will keep company officials up-to-date on the causes of pelagic fish declines and the results of related invasive species studies and actions. Chevron's financial contributions will go directly to actions that are seeking solutions to the problem of pelagic species declines attributed to introduction of invasive species.

The criteria for determining the amount of Chevron's contributions may include: (1) Chevron's percentage share of the marine terminals in San Francisco Bay that are serviced by vessels entering/exiting the Golden Gate (6.25 percent of 16 terminals [see DEIR Figure 4.2-1 Location of Major Bay Area Terminals – Figure 4.2-1]), or (2) Chevron's percentage share of vessels that enter through the Golden Gate and make calls at San Francisco Bay Area ports (3.99 percent [900 Long Wharf vessels] of 22,551 total vessels [excluding tows and tugs] in 2003), or (3) the percentage share, as calculated in (1) or (2), for example, of the cost of the Plan actions related to invasive species. The Action Plan estimates that the cost of invasive species actions range from $41.7+ million to $75.7+ million. The actual total cost is unknown as the costs of some actions have not been identified and the costs of other actions will be refined as studies are completed. Chevron's share of the costs may be reviewed and revised as new information more clearly defines the role of invasive species in the pelagic organism declines.

The cooperative effort between CSLC and the Departments of Water Resources and Fish and Game would acknowledge and take advantage of the responsibilities of the Action Plan lead agencies and the responsibility and expertise of CSLC in administering the Marine Invasive Species Act of 2003.

Transport of non-segregated ballast water to an appropriate disposal facility during the rare occasions when it is necessary to receive such water at the Long Wharf should be feasible.

CEQA FINDING NO. FSH-8

CONTINUING MAINTENANCE AND ANTICIPATED NEW DREDGING NEAR THE LONG WHARF

Impact: **FSH-8: Continuation of maintenance dredging at the Long Wharf is expected to cause impacts on herring spawning and fishing, Dungeness crab and salmon resources. New dredging to accommodate larger, double-hulled tankers is expected to cause impacts similar to those caused by routine operations at the Long Wharf.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Within the Long Wharf buffer, maintenance dredging will continue on a routine basis to ensure that adequate water depth is maintained for tankers and barges. Dredging during herring spawning and commercial fishing seasons (generally December, January, February and into March) may disrupt herring spawning and cause space use conflicts with fishing activities. Herring spawning has occurred recently in the vicinity of the Long Wharf and the wharf, shoreline and nearby eel grass beds will likely continue to be good spawning habitat. The area also supports Dungeness crab habitat and migrating salmon. Impact BIO-3 concludes that routine and new dredging (if Berth No. 4 is expanded) is expected to have significant impacts (Class II) on herring, Dungeness crab and salmon resources. Dredging can also cause space use conflicts during herring fishing season.

Mitigation Measures for FSH-8:

FSH-8. Chevron shall comply with MM BIO-3 which calls for scheduling dredging during times of the year to avoid juvenile Dungeness crab, spring run Chinook salmon and herring spawning activity. In the event that dredging must occur in May and June (times to avoid for crab and salmon resources), MM BIO-3 requires consultation with CDFG and notification to CSLC.

Avoidance of the times of the year when Dungeness crab, Pacific herring spawning and Chinook salmon smolts are present would reduce impacts to less than significant. These dredging windows are consistent with those of the Management Plan for the LTMS Placement of Dredged Material in the San Francisco Bay Region (USACE, USEPA, BCDC, SFBRWQCB 2001). If dredging cannot be conducted during the required dredging windows then Chevron shall consult with the resource agencies as

required by the LTMS Management Plan. Impacts would be reduced to less than significant.

CEQA FINDING NO. FSH-9

FISHERIES IMPACTS FROM ACCIDENTAL SPILLS AT THE LONG WHARF OR ALONG BAY TRANSIT ROUTES

Impact: **FSH-9: Shrimp, herring and sport fisheries in central and north San Francisco Bay, San Pablo Bay, Carquinez Strait and elsewhere in the estuary are at highest risk of spill contamination. Depending on spill location, size and water and weather conditions, areas upstream of the confluence of the Sacramento and San Joaquin rivers may also suffer harm. In addition marinas, launch ramps and fishing access points in the Bays may be threatened, contaminated or closed. Significant adverse impacts to Bay commercial and sport fisheries would result from oil spill accidents originating at the Long Wharf or from tankers transiting the coast that service the wharf.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.

b) Such changes or alterations are within the responsibility and jurisdiction of the OSPR (FSH-9c) and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

A significant impact to fisheries would likely result from an accidental spill of crude oil or crude oil product in San Francisco Bay. The severity of the impact would depend on the size and location of the spill, the composition of the oil, the characteristics of the spill (instantaneous vs. prolonged discharge; surface vs. subsurface spill), environmental conditions, the effect of weathering on spill properties, and the effectiveness of cleanup operations.

Fisheries would be affected by oil spills both quantitatively and qualitatively in many different ways. Depending on the affected fisheries and the extent of impacts, the impacts can be minor and localized or large and extend across whole regions. The length of time needed to clean up a spill is a factor, and based on data from actual spills, is variable and

difficult to predict. For these reasons, the quantitative impact assessment presents the minimum level of impacts that are expected. Qualitative factors would most likely increase the level of impacts.

Accident Conditions Within the Bay

This assessment of impacts from modeled oil spills compares the oil spill trajectories illustrated in Section 4.0, Existing Environment and Impacts Analysis, to fishing patterns illustrated in the DEIR Figures 4.4-1, 4.4-2, and 4.4-3. Commercial herring, recreational sturgeon, and salmon fisheries are seasonal; however, the modeled spills are not specific to any season. Therefore, for purposes of this analysis, it was assumed that the spills occurred during the fishing seasons. Rough estimates of the amount of commercial landings that could be lost are also calculated. For these calculations, catches are assumed to be evenly distributed throughout the mapped fishing areas.

The percentage of affected fishing area is compared to the 10 percent impact threshold. Preclusion, i.e., short-term, impacts are expected to last no more than one fishing season. Resource (biological) impacts as presented in the DEIR Water Quality, Section 4.3.4, Impacts Analysis and Mitigation Monitoring, are generally determined to be Class I and may last for more than one season. Dungeness crab habitat and eelgrass beds near the Long Wharf are expected to be at high to very high risk of being contaminated by spills in the Bay. Open water fishes and habitat would experience Class II impacts. Economic effects from impacts on Bay fisheries may also be long term, depending on public reaction, public education on the spill's effects, seafood markets, and other factors.

Impact Assessments

Oil spill scenarios were used as an indicator to evaluate potential impacts. Each scenario was modeled as a 1,000-bbl spill launched at the Long Wharf as described in DEIR Section 4.0, Existing Environment and Impacts Analysis, and detailed in DEIR Appendix B. The five spill scenarios demonstrate that given the size of the modeled spills and different wind and tidal conditions, released oil would generally travel within the area between the Carquinez Straits and Oakland and remain east of the Golden Gate Bridge. The spills would not travel much into the South Bay, and therefore generally avoid resources south of the San Francisco-Oakland Bay Bridge. For this reason, the small steelhead fishery in Alameda Creek and the shrimp fishery at the extreme south end would not be affected by the modeled spills.

<u>Berkeley/Emeryville Scenario</u>

The modeled spill travels as far south as the Oakland-San Francisco Bay Bridge, remains east of the Tiburon Peninsula, and travels north nearly to the mouth of the Carquinez Straits. The oil would contact herring fishing areas along the Bay Bridge and around Treasure and Angel Islands; however, only about 2 square miles (about 4 percent of the fishing area) would be affected by the spill and result in an adverse, but less than

significant impact (Class III). Conversely, about 47 square miles (18 percent) of herring spawning habitat would be affected, causing a significant, adverse impact (Class I). Only 0.05 square mile (less than 1 percent) of the shrimp fishing area in San Pablo Bay would be affected (Class III). By far, most of the impact would occur in CDFG block 488 (Central Bay and vicinity of Long Wharf). If the spill had occurred during the 1996 herring fishing season, about 49,320 pounds (4 percent of the 12.3 million in total landings for the season) would have been lost due to preclusion impacts.

The oil modeled in the scenario would cover about 170 square miles of 1,320 square miles of recreational fishing area, a significant impact (Class I). Impacts on individual fisheries would range from Class I to Class III and would occur south of the Bay Bridge, in Central Bay (Block 488), and San Pablo Bay. Most impacts would occur in Central and San Pablo Bays.

Fishing activities would be further affected by closures of 4 piers and 19 marinas, contamination of fish and their habitat, and loss or damage to fishing gear that comes in contact with the spilled oil. Pier and marina closures and loss or damage to fisheries and fishing gear would increase the impacts on fishing operations and angling activities. These impacts would range from Class I to Class III (depending on time needed to clean up the spill, effects on fish populations and habitat, and long and short term economic effects, including lost harvesting time) and would be in addition to the quantified impacts described above.

West Central Bay Scenario

The modeled spill covers the majority of the Bay from about five miles south of the Long Wharf to about 10 miles north of the Long Wharf. The spill would likely travel up the creeks and sloughs in north and south Marin County, including Corte Madera and San Rafael Creeks. Herring fishing and spawning areas in CDFG blocks 488 and 301 would be affected by the spill. The spill would cover 3.6 square miles of fishing and 16 square miles of spawning habitat, a significant, adverse (Class I) impact in block 488 and an adverse, but less than significant (Class III) impact in block 301 and for the Bay as a whole. The spill would cover about 5.9 square miles of the shrimp fishing area in block 301, a significant, adverse (Class I) impact in that block and in the Bay as a whole. If the spill had occurred during the 1996 herring season, 73,980 pounds of herring roe would have been lost (based on preclusion of 6 percent of total herring fishing area in the Bay). If the spill occurred during the 1995 shrimp fishing season, 60 percent or 151,816 pounds of shrimp would have been lost.

The modeled spill would also affect about 231 square miles of the 1,320 square mile area used by anglers, a significant, adverse (Class I) impact. Impacts on individual fisheries would range from Class I to Class III and would occur in Central and San Pablo Bays. Most impacts would occur in San Pablo Bay, except that most impacts on the shoreline fisheries would occur in Central Bay.

Fishing activities would be further affected by closures of five piers and 10 marinas and impacts on fishing gear and on fish and their habitat that comes in contact with the spilled oil. These impacts would range from Class I to Class III, and be in addition to the quantified impacts described above (see Berkeley/Emeryville section for more detail).

Brooks Island/Richmond Scenario

The modeled spill covers much of Central Bay, but avoids San Francisco and Sausalito, and affects most of the southern portion of San Pablo Bay. The spill would likely travel up creeks along the Berkeley and Richmond Shores, including Wild Cat and San Pablo Creeks. Herring spawning and fishing areas in CDFG blocks 301 and 488 would be covered by the spill; the spill would inundate over 8.5 square miles of fishing areas and nearly 60 square miles of spawning habitat, a significant, adverse (Class I) impact. Nearly half of the shrimp fishery in block 301 (4 square miles) would be covered, a significant, adverse (Class I) impact in the block and the Bay as a whole. If the spill had occurred during the 1996 herring season, 184,950 pounds of herring roe would have been lost (based on preclusion of 15 percent of total herring fishing area in the Bay). If the spill occurred during the 1995 shrimp fishing season, 10 percent or 101,210 pounds of shrimp would have been lost.

The spill would cover about 286 square miles of the 1,320 square miles of recreational fishing areas, a significant, adverse (Class I) impact. Most fisheries would suffer significant, adverse (Class I) impacts; shallow water fishing areas would experience an adverse but less than significant (Class III) impact. Significant, adverse impacts would occur in Central and San Pablo Bays; shoreline fisheries would suffer significant, adverse impacts only in Central Bay.

Fishing activities would be further affected by closures of 7 piers and 27 marinas, and impacts on fishing gear and on fish and their habitat that comes in contact with the spilled oil. These impacts would range from Class I to Class III, and be in addition to the quantified impacts described above (see Berkeley/Emeryville section for more detail).

West San Pablo Bay Scenario

This modeled spill hugs the Richmond and north Marin County shores, as well as the western portion of San Pablo Bay. The oil would likely travel up rivers and creeks such as the Petaluma River, and the Novato and San Rafael Creeks. The spill would affect about 13 square miles of herring spawning habitat along the Richmond shoreline in CDFG block 488, an adverse, but less than significant impact (Class III). However, the impact on the shrimp fishery in block 301 would be significant, because the oil would contact half the fishing area (5.3 square miles). If the spill had occurred during the 1996 herring season, 283,590 pounds of herring roe would have been lost (based on preclusion of 23 percent of total herring fishing area in the Bay). If the spill occurred during the 1995 shrimp fishing season, 14 percent or 141,695 pounds of shrimp would have been lost.

The spill would also affect about 192 square miles of the 1,320 square mile angling area, a significant, adverse (Class I) impact. Impacts on individual fisheries would range from Class I to Class III. The oil would affect fisheries in Central and San Pablo Bays only, a significant, adverse (Class I) impact; shoreline fisheries would suffer significant, adverse (Class I) impacts in block San Pablo Bay (see Berkeley/Emeryville section for more detail).

Fishing activities would be further affected by closures of 3 piers and 10 marinas, impacts on fishing gear, and impacts on fish and their habitat that comes in contact with the spilled oil. These impacts would range from Class I to Class III, and be in addition to the quantified impacts described above.

Southeast San Pablo Bay Scenario

This modeled spill hugs the northeastern shore from the Long Wharf into San Pablo Bay, up to the Carquinez Strait. The oil would likely travel up creeks such as Wild Cat and Refugio. About 10 square miles of spawning habitat would be covered with oil; a significant, adverse (Class I) impact in CDFG block 301 and an adverse, but less than significant (Class III) impact in block 488. Although block 301 would suffer Class I impacts, most of the affected (6.9 square miles) and unaffected (155.56 square miles) spawning area is located in block 488. If the spill had occurred during the 1996 herring season, 221,940 pounds of herring roe would have been lost (based on preclusion of 14 percent of total herring fishing area in the Bay).

The spill would affect 155 square miles of the 1,320 square mile recreational fishing area, a significant, adverse (Class I) impact. Impacts on individual fisheries range from Class I to Class III. Significant, adverse (Class I) impacts would occur in San Pablo Bay and adverse, but less than significant (Class III) impacts would occur in blocks San Pablo and Suisun Bays.

Fishing activities would be further affected by closures of 3 piers and 7 marinas, and impacts on fishing gear and on fish and their habitat that comes in contact with the spilled oil. These impacts would range from Class I to Class III, and be in addition to the quantified impacts described above (see Berkeley/Emeryville section for more detail).

Mitigation Measures for FSH-9:

FSH-9a. Implement MM OS-3, MM OS-4, MM OS-6, and MM OS-7 in Operational Safety/ Risk of Accidents, and MM BIO-6b and BIO-6d in Biological Resources, to lower the probability of any oil spill and increase response capability.

FSH-9b. Post notices at spill sites and marinas, launch ramps and fishing access points to warn fishing interests of locations of contaminated sites. Notices

shall be written in English, Vietnamese, Cantonese and Spanish, and be posted in areas most likely to be seen by fishing interests.

FSH-9c. If damages to fishing operations or related businesses occur, as a last resort, provide financial compensation. Any losses shall be documented as soon as possible after a spill using methods for determining damages established beforehand. Response for damage losses should include provisions for compensating operators and businesses as soon as possible.

FSH-9d. Following a spill, evaluate the effectiveness of oil spill mitigation measures used to respond to a spill caused at the Long Wharf or by tankers calling at the Wharf. Results of the evaluation would be available to public decision-makers to ensure refinement, and if necessary, modification of mitigation measures. Evaluation would be done only after an accident and would include monitoring using scientifically accepted protocols. Costs for the evaluation would be borne by Chevron for spills caused at the Long Wharf or by Chevron-owned tankers. Chevron shall contribute to independent public or private organizations for oil spill research. Contributions would be determined in cooperation with the evaluating organizations, agencies, and the CSLC.

Per MM OS-3b, tension monitoring enables loading to continue in marginal weather conditions, high velocity current conditions or other conditions where the limits of strain on the mooring lines could result in movement of the vessel resulting in damage to the wharf and/or vessel. These devices will minimize the potential for excessive surge or sway of the vessel (motion parallel or perpendicular to the wharf), which could lead to an oil spill or the parting of mooring lines, or breaking of loading arms, which could result in an oil spill. Such monitoring mechanisms would ensure that the design limits of the mooring would not be exceeded, and reduce or eliminate this potential contributor to an oil spill. This permits cost effective use of both the mooring and tankers.

At present, the docking system relies on the pilot's judgment to determine the vessel's approach speed and angle to the Long Wharf. Per MM OS-3c, an Allision Avoidance System would help to prevent damage to the wharf and vessel by monitoring the speed, approach angle, and distance from the dock of the approaching vessel and providing warning if the monitored parameters fall outside preset limits indicating an allision, that is, the vessel dashing against or striking the wharf, could occur. The application of this type of system would augment the professional experience and training of pilots responsible for docking vessels at the Long Wharf and would provide an additional tool to significantly reduce or eliminate potential damage to the vessel and the wharf, each of which, independently or in concert, could contribute to an oil spill incident.

MM OS-4 would provide require periodic examination of developments in spill response and clean up technologies regarding spills of Group V oils and provide flexibility in the lease to update mitigation requirements and response capabilities to Group V oils by requiring Chevron to implement the latest response technologies for response to such

oils. While this measure may, during the lease term, reduce the potential impacts from releases of Group V oils, it may not reduce the impact to below a level below of its significance criteria.

MM OS-6b would address the absence of certain elements in Chevron's Operations Manual, which presently has no discussion or procedures for dealing with tank vessel fires or emergency response. Procedures, training, and drills need to be in place in planning for emergency response, so that the wharf operations crew follows appropriate steps to ensure that emergency response measures are implemented without incident in an emergency situation. The requirement that Chevron prepare and submit a plan within 90 days of lease approval would address present deficiencies in a timely manner and afford greater protection to vessels, the wharf, and affected personnel by providing a timely and coordinated response to vessel fires/ explosions and thereby reducing the potential for an oil spill incident.

As a participant in any analysis to examine upgrades the VTS, Chevron can help to improve transit issues and response capabilities in general, which will help to reduce the potential for incidents and the consequences of spills within the Bay.

The tanker owner/operator has responsibility for spills from their tanker. Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for other tankers. For a spill near the Long Wharf, Chevron is more suited to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. MM OS-7 would require action that may result in a quicker application of oil spill equipment to any spill, and improve control and recovery of such spill. Even with these measures, however, the consequences of a spill could result in significant, adverse impacts (Class I).

MM OS-6 would help increase response capability and reduce risk of accidents. Chevron has approximately 12,500 feet (2.4 miles) of boom at the Long Wharf. This amount of boom appears to be inadequate to simultaneously protect Castro Rocks and eelgrass beds in the event of a spill at the Long Wharf. In addition, Chevron does not have specific procedures to protect eelgrass beds in the immediate vicinity of the Long Wharf. Implementing MM BIO-6b would insure that Chevron is adequately prepared to protect the sensitive resources most immediately at risk from a spill at the Long Wharf. Chevron does not have a specific plan to deter double-crested cormorants from foraging in oiled areas should a spill occur. MM BIO-6d ensures that equipment and personnel are available to protect the marshes by demonstrating to CSLC that the Long Wharf has the equipment and personnel to deploy protection within eight hours of a spill.

Containment of spills and protection of resources may reduce impacts to fisheries, but significant impacts will likely remain. Posting notices in multiple languages (MM FSH-9b) provides information to English and non-English speaking anglers to protect the public from contact with contaminated fish. Providing compensation (MM FSH-9c) helps to pay for the costs of cleanup and fishing business losses, and evaluations of the

effectiveness of mitigation measures (MM FSH-9d) and contribution to oil spill research would help to refine such measures to increase effectiveness for future spill events.

CEQA FINDING NO. FSH-10

FISHERIES IMPACTS FROM ACCIDENTAL SPILLS ALONG OUTER COAST TRANSIT ROUTES

Impact: **FSH-10: Significant adverse impacts to outer coast commercial and sport fisheries could result from oil spill accidents from the expected 900 transiting tankers calling at the Long Wharf. The level of impact would depend on the size of the spill, location, and fisheries occurring in the area of the spill.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.

b) Such changes or alterations are within the responsibility and jurisdiction of the OSPR (FSH-9c) and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Analysis for this section is taken from the Unocal EIR (Chambers Group, Inc. 1994) and the Getty Gaviota Marine Terminal EIR (Aspen Environmental Group 1992) and is incorporated by reference. To summarize, Chambers Group, Inc. (1994) assessed impacts from two crude oil spill scenarios, 100,000 bbls each, one launched in March off the Farallone Islands and the other launched in October, southwest of Punta Gorda. Impacts ranged from adverse and significant to adverse, but less than significant (Class I to Class III), depending on the location of the spills, location of the fisheries, and the number of harbors or shoreline access points affected. Impacts were assessed on commercial and recreational fisheries, aquaculture operations, and kelp harvesting activities in the area from Del Norte County to Monterey County.

Scenario 1 (Farallone Islands) caused significant adverse impacts (Class I) on commercial and recreational fisheries from Point Reyes to Monterey County and on aquaculture operations in Monterey Bay and off Santa Cruz. Significant adverse impacts that could be mitigated to less than significant (Class II) occurred to kelp harvesting from Point Montara to Monterey Bay. If vessels calling at the Long Wharf cause similar spills, impacts on aquaculture operations would be more severe. In 1994, 4 operations would have been affected; now, 10 operations in Marin, San Mateo, Santa Cruz, and Monterey Counties would be affected by a similar spill.

Scenario 2 (Punta Gorda) caused Class I and Class III impacts on commercial and recreational fisheries, no impacts on aquaculture operations, and Class II impacts on kelp harvesting. A similar spill from a tanker calling at the Long Wharf would likely cause similar impacts.

Aspen Environmental Group (1992) assessed coast wide impacts from two spill scenarios that launched spills from the Santa Barbara Channel and Santa Monica Bay; both were 100,000-bbl spills.

The Santa Barbara Channel spill caused significant adverse impacts (Class I) on commercial and recreational fisheries in the Channel and less than significant impacts on fisheries located off Morro Bay and Los Angeles.

The spill caused Class I impacts on aquaculture operations, Class II short-term impacts, and Class III long-term impacts on kelp harvesting. Impacts from a spill caused by a vessel calling at the Long Wharf are expected to be similar.

The Santa Monica Bay spill caused significant adverse impacts (Class I) on commercial fisheries off Los Angeles and on recreational fisheries off Santa Barbara, Ventura, and Los Angeles Counties. The spill caused Class II impacts on aquaculture operations off Los Angeles, Ventura, and Orange Counties. Kelp harvesting operations were significantly affected (Class II) over the short term. Over the long term, kelp plants would likely recover and harvesting would resume, resulting in adverse, but less than significant impacts (Class III). A similar spill caused by a tanker servicing the Long

Wharf would affect fewer aquaculture operations, because currently there is only one operation left off Los Angeles County and none off Orange County. However, the two operations in Ventura and the one in Los Angeles County would still be affected by the spill, resulting in Class II impacts. Chevron is only responsible for Chevron-owned vessels. Containment/response actions are discussed in Impact OS-7, Operational Safety/Risk of Upset.

Mitigation Measures for FSH-10:

FSH-10. Chevron shall implement MM OS-7 for VTS upgrade participation and to provide immediate spill response near/at the terminal. For spills from Chevron owned vessels Chevron officials shall implement FSH-9b through MM FSH-9d to notify fishing interests of possible contamination of fishing areas, to help offset the losses to fishing interests and businesses dependent on fishing activities, and to evaluate effectiveness of mitigation measures.

As an active participant in any analysis to examine upgrades to the VTS, Chevron can help to improve transit issues and response capabilities in general, which helps reduce the potential for incidents and the consequences of spills within the Bay.

MM OS-7b acknowledges that the tanker owner/operator has responsibility for spills from their tanker. Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for other tankers. For a spill near the Long Wharf, Chevron is more suited to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. MM OS-7 would require action that will result in a quicker application of oil spill equipment to any spill and improve control and recovery of such a spill. Even with these measures, however, the consequences of a spill could result in significant, adverse impacts (Class I).

Containment of spills and protection of resources may reduce impacts to fisheries, but significant impacts will likely remain. Posting notices in multiple languages (MM FSH-9b) provides information to English and non-English speaking anglers to protect the public from contact with contaminated fish. Providing compensation (MM FSH-9c) helps to pay for the costs of cleanup and fishing business losses, and evaluations of the effectiveness of mitigation measures (MM FSH-9d) and contribution to oil spill research would help to refine such measures to increase effectiveness for future spill events.

CEQA FINDING NO. LU-3

ACCIDENTAL RELEASES AT OR NEAR THE LONG WHARF

Impact: **LU-3: A number of recreational facilities (designated parks, wildlife preserves, open space, etc.) and recreational uses (nature viewing, boating, fishing, surfing, etc.) are within the potential area that could be impacted by the spread of oil. Shoreline and water-related uses would be disrupted by oil on the shoreline and in the water and could result in significant adverse impacts.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

b) Such changes or alterations are within the responsibility and jurisdiction of the U.S. Fish and Wildlife Service, California Department of Fish and Game, and California Department of Water Resources and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Impacts from oil releases could degrade the environment and preclude the use of shoreline land and associated recreational activities at the site of the release and the areas affected by the spread of the oil. The degree of impact, however, is influenced by many factors including, but not limited to, spill location, spill size, type of material spilled, prevailing wind and current conditions, the vulnerability and sensitivity of the resource, and response capability.

Spill risk is also presented in the DEIR Section 4.1, Operational Safety/Risk of Accidents. The greater risk of spills occurs at the Long Wharf, where small spills could occur during normal operations as well as from leaks at pipefittings and valves. There is less chance of a spill occurring from a tankering accident; however, such an event generally can result in a much larger and more severe spill. The oil spill modeling conducted for this project and presented in the DEIR Section 4.0, Existing Environment

and Impacts Analysis, and Appendix B was used to determine the potential consequences from accidental releases of oil. Applicable information from that modeling focuses on the tankering routes from the Golden Gate into the Central Bay Area near Richmond.

Crude oil and refined products would be shipped to/from the Long Wharf. Light product spills generally volatize relatively rapidly, and little remains within 24 to 48 hours after a spill. Heavy crude oil may disappear over a period of several days, with remaining heavy fractions lasting from several weeks to several months floating at or near the surface in the form of mousse, tarballs, or mats.

Affected areas on the East Bay north of the Long Wharf may include, but not be limited to, Castro Point, Point San Pablo Yacht Harbor, Point Pinole and the Point Pinole Regional Shoreline, Pinole Bayfront Park, San Pablo Bay Regional Park, and shoreline amenities heading into the mouth of Carquinez Strait. Affected areas south of the Long Wharf may include the Point Richmond shoreline, Keller Beach, Ferry Point, Brickyard Cove, Brooks Island Regional Preserve, Richmond Marina Bay, Marina Green, Point Isabel Regional Shoreline, and Point Isabel. Areas potentially affected on the West Bay shoreline across San Pablo Bay include Kiel Cove, Bluff Point, Tiburon Cove, Paradise Beach County Park, Paradise Cove, Corte Madera State Ecological Reserve, Point San Pedro, and McNears Beach. Additional analysis of impacts on sensitive shoreline biological resources is presented in the DEIR, Section 4.3, Biological Resources.

Shoreline and water-related uses would be disrupted by oil on the shoreline and in the water. For a spill at the Long Wharf, tankering would be stopped and operations at the Long Wharf would be slowed or stopped for a period of time depending on the amount of oil present and the amount of cleanup required.

Because it is impossible to predict with any certainty the potential consequences of spills, impacts are considered to be adverse and significant (Class I or II), because severe spills could have residual impacts that could affect shoreline and/or recreational uses. Any residual impacts remaining after first response efforts would be considered to be significant adverse impacts (Class I).

Mitigation Measures for LU-3:

LU-3: Mitigation measures for spills at the Long Wharf would be the responsibility of Chevron operations. Specific measures are those presented in Operational Safety/Risk of Upset; Water Quality; Biological Resources; and Commercial and Sport Fisheries.

Per MM-OS3b, implementation of tension monitoring would enable loading to continue in marginal weather conditions, high velocity current conditions, or other conditions where the limits of strain on the mooring lines could result in movement of the vessel resulting in damage to the wharf and/or vessel. These devices will minimize the potential for excessive surge or sway of the vessel (motion parallel or perpendicular to the wharf), or

the parting of mooring lines, or breaking of loading arms, which would result in an oil spill. Such monitoring mechanisms would ensure that the design limits of the mooring would not be exceeded and reduce or eliminate this potential contribution to a potential oil spill.

At present, the docking system relies on the pilot's judgment to determine the vessel's approach speed and angle to the Long Wharf. An Allision Avoidance System would help to prevent damage to the wharf and vessel by monitoring the speed, approach angle, and distance from the dock of the approaching vessel and providing warning if the monitored parameters fall outside preset limits indicating an allision, that is the vessel dashing against or striking the wharf, could occur. The application of this type of system would augment the professional experience and training of pilots responsible for docking vessels at the Long Wharf and would provide an additional tool to significantly reduce or eliminate potential damage to the vessel and the wharf, each of which, independently or in concert, could contribute to an oil spill incident.

MM OS-4 would provide flexibility in the lease to continually update mitigation requirements and improve response capabilities for response to Group V oils by requiring Chevron to implement the latest response technologies.

As a participant in any analysis to examine upgrades to the VTS, Chevron can help to improve transit issues and response capabilities in general, which help to reduce the potential for incidents and the consequences of spills within the Bay.

The tanker owner/operator has responsibility for spills from their tanker. Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for other tankers. For a spill near the Long Wharf, Chevron is more suited to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. Such action will result in a quicker application of oil spill equipment to any spill and improve control and recovery of such spill.

MM WQ-11 implements MM OS-3 and MM OS-4 to provide greater safety in preventing spills, improving response capability, and helping to reduce impacts to water quality to the maximum extent feasible. Small leaks or spills resulting from Long Wharf operations that can be easily contained would result in adverse but less than significant impacts.

MM WQ-12 implements MM OS-7a and OS-7b addressing potential participation in VTS upgrade evaluations, and Chevron response actions for spills at or near the Long Wharf.

Containment of small spills and protection of sensitive resources may reduce biological impacts to less than significant (Class III) for small spills. For large spills, significant impacts are likely. Sensitive areas that could be impacted within three hours of a spill are the greatest concern for immediate protection. These sensitive areas include Castro Rocks, eelgrass beds, and the double-crested cormorant breeding colony on the

Richmond-San Rafael Bridge Implementing MM OS-3 through MM OS-6 help increase response capability and reduce risk of accidents. Chevron has approximately 12,500 feet (2.4 miles) of boom at the Long Wharf. This amount of boom appears to be inadequate to simultaneously protect Castro Rocks and eelgrass beds in the event of a spill at the Long Wharf. In addition, Chevron does not have specific procedures to protect eelgrass beds in the immediate vicinity of the Long Wharf. Implementing MM BIO-6b will insure that Chevron is adequately prepared to protect the sensitive resources most immediately at risk from a spill at the Long Wharf. Chevron does not have a specific plan to deter double-crested cormorants from foraging in oiled areas should a spill occur. MM BIO-6c would insure that Chevron develops procedures and has in place immediate access to expert bird rehabilitators to protect double-crested cormorants in case of a spill at the Long Wharf. MM BIO-6d ensures that equipment and personnel are available to protect the marshes by demonstrating to CSLC that the Long Wharf has the equipment and personnel to deploy protection within 8 hours of a spill. MM BIO-6e insures that consultation for cleanup actions with CDFG and USFWS will occur to avoid damage that can occur during cleanup operations. MM BIO-6f requires the immediate documentation of any damage from oil spills, which is critical to the determination of compensation; and insures that sampling methods and design are planned as soon as a spill occurs so that further damage will not occur and so that post spill studies can commence; and provides a means to determine the effectiveness of documentation. MM BIO-6e and MM BIO-6f both provide information for the continued evaluation of the effectiveness of cleanup actions and appropriate methods of cleanup and methods of data collection.

Response capability for containment and cleanup of vessel spills while transiting the Bay or outer coast is not Chevron's responsibility. Nevertheless, as a participant in any analysis to examine upgrades to the VTS (MM OS-7a), Chevron can help to improve transit issues and response capabilities in general which help to reduce the consequences of spills within the Bay. For a spill near the Long Wharf, Chevron is more suited to provide immediate response (MM OS-7b) to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. Such action will result in a quicker application of oil spill equipment to any spill and improve control and recovery of such spill. Impacts to biological resources from spills near the Long Wharf caused by transiting vessels may be able to be reduced to less than significant with containment by Chevron with implementation of MM OS-7b.

MM FSH-10 implements MM-OS 7, which requires Chevron to participate in any analysis that will examine upgrades to the Bay VTS and to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. MM FSH-9 requires the posting of notices providing information to protect the public from contact with contaminated fish, providing compensation helps to pay for the costs of cleanup and fishing business losses, and evaluating the effectiveness of mitigation measures and contributing to oil

spill research helps to refine such measures to increase effectiveness for future spill events.

With implementation of those measures the risk to shoreline and recreational resources can be reduced to a level below the significance criteria. However, even with implementation of mitigation for oil spill impacts, land- and water-related recreational uses may be impacted from the large spills and impacts would remain significant (Class I).

CEQA FINDING NO. LU-4

LAND USE/RECREATIONAL IMPACTS OF OIL SPILLS FROM VESSELS IN TRANSIT

Impact: **LU-4: Spills that beach along sensitive land use areas or heavily used areas including recreational areas would limit or preclude such uses and result in significant adverse impacts, depending on the various characteristics of a spill and its residual effects.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Accidents within the Bay

Oil spill modeling for five scenarios conducted for this Project show that 1,000-bbl spills originating at the Long Wharf could affect the shoreline at or near the Long Wharf in the East Bay and along the west shoreline of the Bay given various wind and tide conditions. DEIR Section 4.0, Existing Environment and Impacts Analysis, describes the scenarios and presents figures depicting the shoreline areas oiled. These scenarios are representative and do not reflect the exact consequences that could result from other spill scenarios.

For these five scenarios, the number of piers, marinas, and shoreline recreational areas that would be affected by oiling are presented in Table 4.5-2 from the DEIR and presented herein. The length of shoreline that would be affected by beached oil is also presented. Beached oil on the shoreline would potentially affect all uses within the area of impact.

Table 4.5-2
Number of Piers, Marinas, and Shoreline
Recreational Areas Affected Based on Oil Spill Scenarios

Scenario	Piers	Marinas	Shoreline Recreation Areas	Length of Shoreline Affected (miles)
Berkeley/Emeryville No. 33	4	19	13	28.08
Brooks Island/Richmond No. 73	7	27	24	38.92
Southeast San Pablo Bay No. 93	3	7	9	19.26
West-Central Bay No. 68	5	10	11	22.70
West San Pablo Bay No. 91	3	10	11	22.03

Affected areas on the East Bay north of the Long Wharf may include, but not be limited to, Castro Point, Point San Pablo Yacht Harbor, Point Pinole and the Point Pinole Regional Shoreline, Pinole Bayfront Park, San Pablo Bay Regional Park, and shoreline amenities heading into the mouth of Carquinez Strait. Affected areas south of the Long Wharf may include the Point Richmond shoreline, Keller Beach, Ferry Point, Brickyard Cove, Brooks Island Regional Preserve, Richmond Marina Bay, Marina Green, Point Isabel Regional Shoreline, and Point Isabel. Areas potentially affected on the West Bay shoreline across San Pablo Bay include Kiel Cove, Bluff Point, Tiburon Cove, Paradise Beach County Park, Paradise Cove, Corte Madera State Ecological Reserve, Point San Pedro, and McNears Beach. Additional analysis of impacts on sensitive shoreline biological resources is presented in the DEIR Section 4.3, Biological Resources.

Other areas may also be contacted by oil given the right wind and current conditions, and the origin of the spill. For example, oil spill modeling conducted for the Unocal (now Conoco/Phillips) Marine Terminal (Chambers Group 1994) shows that a large spill (100,000 bbls) in the shipping lanes near Alcatraz Island could cause oil to spread and beach at almost all shoreline points within the Central Bay and San Pablo Bay areas, as well as affect portions of the South Bay and Carquinez Strait (Bay Scenarios No. 9 and No. 10, 100,000-bbl crude oil spills). Shoreline and water-related uses would be disrupted by oil on the shoreline and in the water.

A spill within the shipping lanes, depending on size and location, could affect tankering and other boating in the vicinity of the spill and its area of spread. In either case, depending on wind and current conditions and size of the spill, shoreline and land and water-recreation uses could be affected. Shoreline uses affected by a spill not only include marinas and park and recreation uses as discussed earlier, but also other marine terminals and port and harbor operations. Examples include passenger and

cargo vessels, commercial fishing vessels, and others that may have to slow, reroute, or halt operations during cleanup and containment. Nearshore uses may also be affected because they may be temporarily closed during cleanup operations for public safety purposes. Land access to coastal areas may also be affected by cleanup operations.

The capability to immediately respond and deploy appropriate containment booming would also influence the extent of affected shoreline. Response capability is analyzed in the DEIR Section 4.1, Operational Safety/Risk of Accidents.

Because it is impossible to predict with any certainty the potential consequences of spills, impacts are considered to be adverse and significant (Class I or II), because severe spills could have residual impacts that could affect shoreline and/or recreational uses.

Accidents Along the Outer Coast

Compared to the Bay, existing land uses and recreational areas along the outer coast are more diverse, ranging from heavily used areas to areas that are undeveloped and fairly inaccessible, especially along the northern coast. Spills that beach along heavily used areas and recreational points would limit or preclude such uses and result in significant (Class I or II) impacts, depending on the various characteristics of a spill and its residual effects. Oil that spreads to beaches, sand dunes, tidepools, shoreline reserves, harbors, marinas, and other recreational boating and fishing facilities would limit access to these areas where there is oil, containment equipment, or cleanup activities. Spills that reach the more remote portions of the shoreline may not necessarily decrease the availability of recreational uses because use may be minimal, but would result in other impacts to biological resources and water quality as discussed in other sections of this EIR. Portions of coastline would also be visually affected by spills as discussed in the DEIR Section 4.9, Visual Resources/Light and Glare.

Over the life of the proposed new lease, as more areas of the coastline are developed or made accessible to the public, the likelihood that an established land use or recreational amenity may be affected by a spill would also increase.

Because it is impossible to predict with any certainty the potential consequences of spills, impacts are considered to be adverse and significant (Class I or II), because severe spills could have residual impacts that could affect shoreline and/or recreational uses. Any residual impacts remaining after first response efforts would be considered to be significant adverse impacts (Class I).

Mitigation Measures for LU-4:

LU-4: Mitigation measures for accidents in the shipping lanes would not be Chevron's responsibility, but would fall to the vessel operator/owner, unless the vessels are owned by Chevron. Chevron shall implement measures OS-7a and OS-7b in Operational Safety/Risk of Upset.

The tanker owner/operator has responsibility for spills from their tanker. Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for

other tankers. As an active participant in any analysis to examine upgrades to the VTS (MM OS-7a), Chevron can help to improve transit issues and response capabilities in general, which will help to reduce the potential for incidents and the consequences of spills within the Bay. For a spill near the Long Wharf (MM OS-7b), Chevron is more equipped to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. Such action will result in a quicker application of oil spill equipment to any spill and improve control and recovery of such spill. Even with these measures, however, the consequences of a spill could result in significant, adverse impacts (Class I).

CEQA FINDING NO. N-1:

STATIONARY SOURCE NOISE CONSISTENCY WITH LOCAL STANDARDS, NOISE ELEMENTS AND ORDINANCES

Impact: **N-1: Because the Long Wharf already exists, it is considered part of the ambient noise environment. It is located in an industrial area, however sensitive receptors are located along the Pt. Richmond shoreline approximately 1 mile away. Over the lease period, no sensitive receptors are to be constructed proximate to the terminal. Occasional noise complaints from residential receptors result in Class I impacts.**

Class: I

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

b) Such changes or alterations are within the responsibility and jurisdiction of the city of Richmond and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDINGS(S)

Field noise monitoring indicates that most noise within the Project area is from sources other than Long Wharf operations. Noise readings obtained in the field study at the nearest residential location present an accurate accounting of the ambient noise, and are highly influenced by noise other than that from Long Wharf operations, most notably the lapping of waves on the beach. In actuality, the field study revealed that even with three ships at dock, noise from Long Wharf operations was, at most, barely audible at the most proximate residential locations. This is demonstrated though the calculation of spreading loss.

A reasonable worst-case scenario (four ships with the vapor recovery system) would be expected to produce an L_{50} of about 77 dBA and an L_{08} of about 78 dBA as measured at a distance of 50 feet.

The L_{50} and L_{08} values would be 36.5 and 37.5 dBA, respectively, as measured at the nearest residence, approximately 1 mile away. These levels are well below the 65 dBA daytime standard and the 50 dBA nighttime standard and are a less than significant (Class III) impact. It is noted, that on a calm, quiet night with still waters, this noise would be audible; however, it would not exceed the City's noise standards.

Local residents have, on occasion, complained of noise created by some of the ships that call on the Long Wharf. Discussion with Chevron personnel revealed that this noise could be due to the operation of onboard generators. Chevron also stated that these are ships are owned and operated by foreign entities and Chevron has no control over their internal operations. Furthermore, it was noted that due to power incompatibilities and the required amount of power necessary to sustain internal operations, "shore power" was not an option to these generators. Without actual data on these noise levels, based on the complaints of the residents, it was concluded that these operations result in an adverse, significant (Class I) impact.

Mitigation Measures for N-1**:**

N-1. As a lease condition, Chevron shall either retain an on-call noise consultant or train onsite personnel in the proper use of sound monitoring equipment. When a vessel berths at the Long Wharf that is perceived to have a noise problem, either by Chevron personnel or public notification (resulting from a history of local resident noise complaints), noise measurements shall be obtained to document the noise associated with these ships. If these ships are found to emit noise at a level that exceeds City standards at the residential property line, the vessels' operators shall be notified to determine if the problem can be corrected. If the owner/operator cannot or will not correct the problem, the following shall be implemented:

- Chevron shall berth these ships during all subsequent visits at the most distant berth from local receptors that can accept the class of ship and cargo; and

- During subsequent visits, these "noisy" ships shall not be allowed to hotel at the Long Wharf during the night beyond the time necessary to load/unload.

In actuality, this is a preempted noise source exempt from City regulation. However, for the purposes of this analysis, as a reasonable worst-case scenario, this noise has been linked with Long Wharf operations and subject to CEQA review. Chevron personnel recognize the problem, but because the ships are neither owned nor operated by them, they have no power to control these noise emissions. It would be neither practical nor desirable to the residents to line the beach with a sound wall to reduce the impact of this infrequent noise source. However, Chevron will determine if the noise associated with these ships exceeds ordinance levels and, if so, work with the ship operators to reduce or avoid noise issues.

CEQA FINDING NO. VR-2

VISUAL EFFECTS FROM ACCIDENTAL RELEASES OF OIL AT OR NEAR THE LONG WHARF

Impact: **VR-2: The visual impacts of a spill could last for a long period of time, depending on the level of physical impact and cleanup ability, and are considered to be adverse and significant (Class I or II).**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.

b) Such changes or alterations are within the responsibility and jurisdiction of the California Department of Fish and Game, U.S. Fish and Wildlife Service, and California Department of Water Resources, and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

This analysis considers the occurrence of accidental spills separate from normal operations. In general, the potential impacts resulting from such an occurrence would tend to degrade the visual quality of the water and shoreline. The degree of impact is influenced by factors not limited to location, spill size, type of material spilled, prevailing wind and current conditions, the vulnerability and sensitivity of the shoreline, and effectiveness of early containment and cleanup efforts.

The greatest risk of a spill is from small accidents at the Long Wharf during normal operations. While there is less risk of spill during tankering, the size of a spill that could result is much greater. Examples of spills and areas oiled at the Long Wharf, in the Bay, and for coast tankering lanes are presented in the DEIR Section 4.0, Existing Environment and Impacts Analysis, in the discussion of oil spill scenarios. The scenario and receptor mode modeling represents possible paths of migration under variously defined conditions, but does not represent every case that may occur. The following discusses the visual impacts expected to occur in the event of a spill.

Generally, small leaks and spills (50 through 100 bbls) would be easily contained with contingency measures employed at the Long Wharf. The Long Wharf is in an area of rapidly moving current. If a spill is not detected immediately, or if a moderate size spill would occur at a rate unable to be quickly contained due to the rapid current, then the spread of the spill over a large area could occur. For example, spills originating at the Long Wharf, approximately 1,000 bbls in size, would likely affect a good portion of the area between the Bay Bridge and the mouth of Carquinez Strait. The oil spill examples presented in the DEIR Section 4.0, Existing Environment and Impacts Analysis, indicate that a good portion of water area can be covered by this size of spill. Details of the spread of each of the five scenarios are presented in the DEIR Appendix B.

Visually, oiling conditions could range from light oiling, which appears as a surface sheen, to heavy oiling, including floating lumps of tar. Light product spills generally volatize relatively rapidly, and little remains within 24 to 48 hours after a spill. Heavy crude oil may disappear over a period of several days, with remaining heavy fractions lasting from several weeks to several months floating at or near the surface in the form of mousse, tarballs, or mats. Therefore, the presence of oil on the water would change the color and, in heavier oiling, textural appearance of the water surface. Oil on shoreline surfaces or nearshore marsh areas would cover these surfaces with a brownish-blackish, gooey substance.

Such oiling would result in a negative impression of the viewshed. The public, as they become aware of a spill, react negatively to the visual effects of a spill. Sensitivity becomes high and awareness of the negative change in the environment increases. Unless the spill can be contained by immediate booming and cleanup, the visual effects of even a small spill of about 500 bbls can be significant (Class I).

The impact of a spill could last for long periods of time, depending on the level of physical impact and cleanup ability. In events where light oiling would disperse rapidly, significant (Class II) impacts are expected. In events where medium to heavy oiling occurs over a widespread area, and where first response cleanup efforts are not effective, leaving residual effects of oiling, significant (Class I) impacts would be expected. The physical effort involved in cleanup itself, including the equipment used, would contribute to a negative impression of the environment and the visual impact.

The modeling indicates that spills from the Long Wharf generally would affect shoreline areas on the East Bay north of the Long Wharf that may include, but not be limited to, Castro Point, Point San Pablo Yacht Harbor, Point Pinole and the Point Pinole Regional Shoreline, Pinole Bayfront Park, San Pablo Bay Regional Park, and shoreline amenities heading into the mouth of Carquinez Strait. Areas south of the Long Wharf may include the Point Richmond shoreline, Keller Beach, Ferry Point, Brickyard Cove, Brooks Island Regional Preserve, Richmond Marina Bay, Marina Green, Point Isabel Regional Shoreline, and Point Isabel. Areas potentially affected on the West Bay shoreline across San Pablo Bay include Kiel Cove, Bluff Point, Tiburon Cove, Paradise Beach County Park, Paradise Cove, Corte Madera State Ecological Reserve, Point San Pedro, and McNears Beach.

Other areas may also be contacted by oil given the right wind and current conditions, and the size and origin of the spill. For example, the oil spill modeling results presented in the DEIR Section 4.0, Existing Environment and Impacts Analysis, show that if a large spill (100,000 bbls) were to occur in the shipping lanes near Alcatraz Island, oil could spread and beach at almost all shoreline points within the Central Bay and San Pablo Bay areas, as well as affect portions of the South Bay and Carquinez Strait (Bay Scenarios No. 9 and No. 10, 100,000-bbl crude oil spills).

The capability to immediately respond and deploy appropriate containment booming would also influence the extent of affected shoreline. Response capability is analyzed in the DEIR Section 4.1, Operational Safety/Risk of Accidents.

It is impossible to predict with any certainty the potential consequences of spills; therefore, visual impacts can be considered to be adverse and significant (Class I or II), depending on the effectiveness of first response containment and cleanup.

Accidents Along the Outer Coast

Spills along the outer coast could result in significant (Class I or II) impacts, where spills would be visible in the nearshore zone or at the shoreline. Spills would change the color and texture of water and shoreline conditions. The level of public sensitivity and expectations of views along the outer coast are more varied than within the Bay. Along many portions of the outer coast, public usage is low. In such areas, the public perception and expectations of viewers would not change as much as those areas where the public frequents. In high use areas, such as coastal park and beach areas, ecological preserve areas, communities and harbors, and other areas where a higher number of viewers would be present, visual sensitivity would be high where cleanup efforts and residual effects were occurring.

Mitigation Measures for VR-2:

VR-2: Mitigation measures for oil spill impacts include those measures for contingency planning and response as presented in Operational Safety/Risk of Upset and Biological Resources.

The tanker owner/operator has responsibility for spills from their tanker. Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for other tankers. Per MM OS-7, as a participant in any analysis to examine upgrades to the VTS, Chevron can help to improve transit issues and response capabilities in general, which help to reduce the potential for incidents and the consequences of spills within the Bay. For a spill near the Long Wharf, Chevron is more suited to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. Such action will result in a quicker application of oil spill equipment to any spill and improve control and recovery of such spill.

Containment of small spills and protection of sensitive resources may reduce biological impacts to less than significant (Class III) for small spills. For large spills, significant impacts are likely. Sensitive areas that could be impacted within three hours of a spill are the greatest concern for immediate protection. These sensitive areas include Castro Rocks, eelgrass beds, and the double-crested cormorant breeding colony on the Richmond-San Rafael Bridge Implementing MM OS-3 through MM OS-6 help increase response capability and reduce risk of accidents. Chevron has approximately 12,500 feet (2.4 miles) of boom at the Long Wharf. This amount of boom appears to be inadequate to simultaneously protect Castro Rocks and eelgrass beds in the event of a spill at the Long Wharf. In addition, Chevron does not have specific procedures to protect eelgrass beds in the immediate vicinity of the Long Wharf. Implementing MM BIO-6b will insure that Chevron is adequately prepared to protect the sensitive resources most immediately at risk from a spill at the Long Wharf. Chevron does not have a specific plan to deter double-crested cormorants from foraging in oiled areas should a spill occur. MM BIO-6c would insure that Chevron develops procedures and has in place expert bird rehabilitators to protect double-crested cormorants in case of a spill at the Long Wharf. MM BIO-6d ensures that equipment and personnel are available to protect the marshes by demonstrating to CSLC that the Long Wharf has the equipment and personnel to deploy protection within 8 hours of a spill. MM BIO-6e insures that consultation for cleanup actions with CDFG and USFWS will occur to avoid damage that can occur during cleanup operations. MM BIO-6f requires the immediate documentation of any damage from oil spills, which is critical to the determination of compensation; and insures that sampling methods and design are planned as soon as a spill occurs so that further damage will not occur and so that post spill studies can commence; and provides a means to determine the effectiveness of documentation. MM BIO-6e and MM BIO-6f both provide information for the continued evaluation of the effectiveness of cleanup actions and appropriate methods of cleanup and methods of data collection.

Those measures presented in other sections provide improved oil spill capabilities, oil spill containment measures and protection of resources. Those measures would help to minimize oil spills and maximize cleanup efforts, resulting in less impact to the visual environment. With implementation of those measures the risk to the visual environment can be reduced to a level below the significance criteria for small spills or spills that would be able to be contained and cleaned. However, even with the implementation of mitigation for oil spill impacts, the visual environment may be impacted from large spills and impacts would remain significant (Class I).

CEQA FINDING NO. VR-3

VISUAL EFFECTS OF OIL SPILLS FROM VESSELS IN TRANSIT

Impact: **VR-3: Spills would change the color and texture of water and shoreline conditions. The level of public sensitivity and expectations of viewers would result in a negative impression of the viewshed and result in significant adverse impacts, depending on the various characteristics of a spill and its residual effects.**

Class: I and II

Finding(s):

a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

c) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

Vessels transiting the shipping lanes also pose a risk of spills from accidents. A moderate to large spill has the potential to spread within a large area, with floating oil and oil contacting sensitive shoreline resources given the right wind and current conditions, and the size and origin of the spill. For example, oil spill modeling from the Unocal EIR (Chambers Group 1994) showed that if a large spill (100,000 bbls) were to occur in the shipping lanes near Alcatraz Island, oil could spread and beach at almost all shoreline points within the Central Bay and San Pablo Bay areas, as well as affect portions of the South Bay and Carquinez Strait (Bay Scenarios No. 9 and No. 10, 100,000-bbl crude oil spills from Unocal document). While spills would be significant, responsibility for spills for those vessels enroute to the Long Wharf would be the responsibility of the ship's operators/owners and not Chevron. Response capability is analyzed in DEIR Section 4.1, Operational Safety/Risk of Accidents.

Spills along the outer coast could result in significant adverse (Class I or II) impacts, where spills would be visible in the nearshore zone or at the shoreline. Spills would change the color and texture of water and shoreline conditions. The level of public sensitivity and expectations of views along the outer coast are more varied than within the Bay. Along many portions of the outer coast, public usage is low. In such areas, the public perception and expectations of viewers would not change as much as those areas where the public frequents. In high use areas, such as coastal park and beach areas, ecological preserve areas, communities and harbors, and other areas where a

higher number of viewers would be present, visual sensitivity would be high where cleanup efforts and residual effects were occurring.

It is impossible to predict with any certainty the potential consequences of spills; therefore, visual impacts can be considered to be adverse and significant (Class I or II), depending on the effectiveness of first response containment and cleanup. Response capability for spills from any ships in transit would defer to MSRC, as described in the project description.

Mitigation Measures for VR-3:

VR-3: Mitigation measures for accidents in the shipping lanes would be Chevron's responsibility only for Chevron-owned vessels. Responsibility for accidents for non-Chevron owned vessels would fall to the vessel operator/owner. Chevron shall implement measures OS-7a and OS-7b in Operational Safety/Risk of Upset.

Through MM OS-7a, Chevron, as a participant in any analysis to examine upgrades to the VTS, can help to improve transit issues and response capabilities which, in general, will help to reduce the potential for incidents and the consequences of spills within the Bay.

MM OS-7b acknowledges that a tanker owner/operator has responsibility for spills from their tanker. And Chevron has responsibility for Chevron-owned tankers, but does not have any legal responsibility for other tankers. For a spill near the Long Wharf, Chevron is more suited to provide immediate response to a spill using its own equipment and resources, rather than waiting for mobilization and arrival of the vessel's response organization. The Long Wharf staff is fully trained to take immediate actions in response to spills. MM OS-7b provides for such action that may result in the quicker application of oil spill equipment to a nearby spill, and thereby improve the control and recovery of such spill.

Impacts to the areas near the Long Wharf may be reduced to less than significant. Even with implementation of mitigation for oil spill impacts, however, visual impacts would potentially remain significant (Class I).

CEQA FINDING NO. GEO-4

TSUNAMI

Impact: **GEO-4: Long Wharf operators may not have adequate warning time to allow a vessel to depart from the Long Wharf to avoid damage to the vessel and/or the Long Wharf from a tsunami. Impacts are considered significant adverse impacts.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

A tsunami originating in the Pacific Ocean would lose much of its energy as it passed through San Francisco Bay. A far field tsunami generated 8.5 foot wave height at the Golden Gate would attenuate to 3.14 feet near the Long Wharf, and a near field tsunami generated 1.96 foot wave height at the Golden Gate, would attenuate to less than one foot near the Long Wharf. According to older design documents (Sverdrup & Parcel and Associates, Inc. 1979), the Long Wharf is designed for maximum wave heights of 5 feet. Still, the effects of a large tsunami wave on the Long Wharf could be significant (Class II). In addition, for near shore events that do not allow time for vessel departure, a moored vessel might damage both the Long Wharf and the vessel itself, and could result in a significant adverse impact (Class II).

Mitigation Measures for GEO-4:

GEO-4: As soon as possible, after notification of a tsunami, Long Wharf operators shall release the vessel from its mooring and the vessel shall move away from the Long Wharf, when the Captain determines that it is safe and feasible to do so.

Even with structural upgrades, the Long Wharf still has the potential to be damaged if a vessel is moored during a tsunami event. The cessation of operations, release of the vessel, and its departure from the wharf will protect both the vessel and the Long Wharf, to the greatest extent feasible, while still regarding the safety of vessel, crew, and terminal workers.

CEQA FINDING NO. EJ-1

ENVIRONMENTAL JUSTICE IMPACTS ASSOCIATED WITH CONTINUED OPERATION OF THE LONG WHARF

Impact: **EJ-1: The Long Wharf area of potential impact does not include an area identified as an MTC-Minority Zone and Area of Poverty, or an area of Meaningfully Greater Minority or Low-Income Population. However, preclusion of affected populations from fishing areas over an extended period of time could be considered disproportionate, particularly if such populations do not have the ability to go to uncontaminated areas nearby and depend on fishing as a food source.**

Class: II

Finding(s): a) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

FACTS SUPPORTING THE FINDING(S)

MTC Minority Zone and Areas of Poverty

The study area does not contain an area identified as having either a minority population of 70 percent or more, or an area with 30 percent of households having incomes at or below 200 percent of the poverty level. Therefore, the proposed Project's significant adverse impacts identified in other sections of this EIR in or near the study area would not have an effect on an MTC-identified Minority Zone or Area of Poverty.

Areas with Meaningfully Greater Minority or Low-Income Populations

The proposed Project area, Census block group 378000, Block Group 12 did not have a meaningfully greater minority or low-income population, when compared to those of the Communities of Comparison.

Based upon the analysis conducted for this EIR, significant adverse impacts resulting from the routine operation of the Long Wharf includes, Operational Safety/Risk of Upset, Water Quality, Biological Resources, and Visual Impacts. Overall, those impacts would effect resources used by the entire local community regardless of whether they minority, Hispanic Origin, or low-income. Therefore, no disproportionate impact would occur. In addition, because the Long Wharf area of potential impact does not include population segments identified as an MTC-Minority Zone and Areas of Poverty, or an area of Meaningfully Greater Minority or Low-Income Population, no impact resulting from the

proposed Project would have a disproportionate impact on a minority of low-income population.

The findings in DEIR Section 4.4.4.2, Oil Spills in the Estuary or Along the Outer Coast (in Section 4.4 Commercial and Sports Fisheries) indicate that the continued operations of the Long Wharf could result in spill contamination impacts to shrimp, herring, and sport fisheries in central and north San Francisco Bay, San Pablo Bay, Carquinez Strait and elsewhere. Fishing access points, launch ramps and marinas may be threatened or closed. With respect to local sport fisheries, the waters surrounding the Long Wharf harbor sport and charter boat fisheries, including sturgeon, striped bass, halibut, shark, smelt, and perch. The 0.5-mile buffer excludes less than five percent of the sport boat fishing area, and no shoreline fishing occurs within 0.5 mile of the Long Wharf. Impacts to fisheries near the Long Wharf were determined to be less than significant (Class III). Therefore, due to limited sport fishing, impacts to census tract 378000 would not be considered disproportionate.

However, should a spill affect areas beyond the 0.5 mile buffer, the potential exists for fisheries resources and fishing locations used by populations both within and outside of census tract 378000 for subsistence fishing to be adversely affected as described in Impact FSH-9: Fisheries Impacts from Accidental Spills at the Long Wharf or along the Bay Transit Routes. Preclusion of affected populations from fishing areas over an extended period of time could be considered disproportionate, particularly if such populations do not have the ability to go to uncontaminated areas nearby and depend on fishing as a food source.

Mitigation Measures for EJ-1:

EJ-1: Should an oil spill from the Long Wharf extend beyond 0.5 mile from the Terminal and preclude subsistence fishing by members of minority and/or low income communities for more than two days, Chevron U.S.A., Inc. shall contribute either funds or food stuffs to a local food bank in an amount sufficient, as determined in conjunction with the CSLC, to replace food sources that would have been supplied within the effective areas.

By contributing funds to a local food bank, Chevron would provide a fair share of support to the affected community by enabling such community to obtain food stuffs to replace the fish it would not be able to consume due to affects of an oil spill incident.