



US Army Corps  
of Engineers®

---

# **OAKLAND HARBOR TURNING BASINS WIDENING, CA**

## **NAVIGATION STUDY**

### **INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT**

#### **APPENDIX A07:**

#### **Avoidance and Mitigation Measures**

## **Avoidance and Minimization Measures/Mitigation Measures**

To reduce the potential impacts of the project alternatives on environmental resources, the analysis assumes the following or equivalent measures would be incorporated into the project as avoidance and minimization measures.

### **General Measures**

- Marine-based construction and dredging would occur during the in-water work window (June 1 through November 30). If in-water work is determined to need to occur at times other than the approved work window, the Port and USACE would re-consult with the National Marine Fisheries Service (NMFS), as necessary, to address potential impacts on special-status aquatic species. The USACE will also consult with the United States Fish and Wildlife Service (USFWS) in order to work outside of the Least Tern environmental window and implement required measures to do so.
- The Port and USACE would consult with NMFS, the USFWS and the California Department of Fish and Wildlife, as necessary, to address potential impacts on special-status aquatic species and habitats, and implement all requested actions to avoid impacts.
- A worker education program would be implemented for listed fish and shorebirds that could be adversely impacted by in-water construction activities. The program would include a presentation to all workers on biology, general behavior, distribution, habitat needs, sensitivity to human activities, legal protection status, and project-specific protective measures for each listed species. Workers would also be provided with written materials containing this information.
- Standard construction best management practices (BMPs), such as a stormwater pollution prevention plan, would be applied to protect species and their habitat(s) from pollution due to fuels, oils, lubricants, and other harmful materials. Vehicles and equipment that are used during the course of the project would be fueled and serviced in a manner that would not affect the aquatic environment.
- A Spill Prevention Control and Countermeasure (SPCC) plan would be prepared to address the emergency cleanup of any hazardous material and would be available on site during construction. The SPCC plan would incorporate hazardous waste, stormwater, and other emergency planning requirements.
- All dewatered groundwater is to be contained in storage tanks, tested, and discharged/disposed of at an appropriate location or facility.
- Silt curtains will be used where specific site conditions demonstrate that they will be practicable and will effectively minimize any potential adverse effects caused by the mobilization of material that may cause adverse water quality conditions or contain contaminants at levels in excess of applicable regulatory thresholds. Prior to in-water construction, a silt curtain will be deployed from the water's edge and pushed out to the deployed location to avoid entrapping aquatic wildlife species.

- Prior to construction, a sampling and analysis plan would be developed and implemented to characterize soils and sediments to be removed or exposed.
- All dredging and in-water construction activities would be consistent with the standards and procedures set forth in the Long-Term Management Strategy (LTMS) for dredging in the San Francisco Bay waters to guide the disposal of dredged materials in an environmentally sound manner. Prior to construction, a sampling and analysis plan would be developed and implemented to characterize soils and sediments to be removed or exposed. In addition, a dredge operations plan would need to be submitted to all regulatory agencies before the start of dredge operations.
- Piles would be removed by direct pull or vibratory means, where possible; piles that cannot be pulled would, to the extent feasible, be cut 2 feet below the mudline or 2 feet below the overdredge depth elevation if they are in a navigable waterway.
- No pilings or other wood structures that have been pressure-treated with creosote would be installed.
- A Water Quality Monitoring Plan would be developed that specifies sample locations, depths, constituents, and objectives during in-water construction work. The Water Quality Monitoring Plan would also specify when work would be suspended for water quality exceedances, and potential BMPs to comply with turbidity requirements stated in the 401 Certification.
- Should archeological resources, including human remains, be inadvertently exposed (i.e., accidentally discovered) during construction activities, all activities at the discovery site that may result in disturbance to the discovery would be required to cease until an archeologist has evaluated the finds and determined their significance. The archaeologist would evaluate the finds and determine the disposition in accordance with applicable laws and regulations.

#### **Dredging-Related Measures**

- Dredging would be conducted with a clamshell bucket dredger; there would be no hydraulic dredging. An environmental bucket would be used where technically feasible.
- No overflow or decant water would be allowed to be discharged from any barge, with the exception of spillage incidental to mechanical dredge operations, unless monitoring or relevant studies show the effects of such discharge are negligible.
- Multiple horizontal dredge cuts would be taken where a thick horizontal volume needs to be dredged to avoid overfilling the bucket and causing spillage.
- The load line on disposal barges used for mechanical dredging would be predetermined, and the barge would not be filled above this predetermined level. Before each disposal

barge is transported to a placement site, the dredging contractor and a site inspector would certify that it is filled correctly.

- The cycle time would be increased as needed to reduce the velocity of the ascending loaded bucket through the water column, which reduces potential to wash sediment from the bucket.
- Floating debris would be removed from the water and disposed of properly.
- A temporary noise barrier would be used as a minimization measure approximately 200 feet from the Oakland Inner Harbor Alameda side along the southern edge of the turning basin expansion area during dredging activities to lower the nighttime noise levels at the Mosley Avenue residences. Barriers are generally constructed with two layers of ½-inch thick plywood (with joints staggered), and K-rail or other support, or a limp mass barrier material weighing 2 pounds per square foot.

### **Pile-Driving–Related Measures**

- To the extent feasible, pile driving shall not occur during the bird breeding season of February 1 to August 15. If such activities must occur during the bird breeding season, work areas plus an appropriate buffer area determined by a qualified biologist shall be surveyed by a qualified biologist to verify the presence or absence of nesting raptors or other birds. Pre-construction surveys shall be conducted within 15 days prior to the start of pile-driving work during the bird breeding season. If the survey indicates the potential presence of nesting raptors or other nesting birds, the biologist shall determine an appropriately sized buffer around the nest in which no work will be allowed until the young have successfully fledged, so that nesting birds are not disturbed by the project activity. The size of the nest buffer will be determined by the biologist, in coordination with USFWS, and will be based to a large extent on the nesting species and its sensitivity to disturbance. In general, buffer sizes of 200 feet for raptors and 50 feet for other birds should suffice to prevent disturbance to birds nesting in the urban environment, but these buffers may be increased or decreased, as appropriate, depending on the bird species and the level of disturbance anticipated near the nest, as necessary to avoid disturbance of nesting birds.
- A Hydroacoustic and Biological Monitoring Plan would be prepared prior to the start of construction. This plan would provide details on the methods used to monitor and verify sound levels during pile-driving activities. The plan would include specific measures to minimize exposure of marine mammals and fish to high sound levels.
- Construction monitoring would be conducted by qualified observers familiar with marine mammal species and their behavior. An “exclusion zone,” defined as the area over which underwater sound levels may exceed Level A harassment thresholds for marine mammals, would be established during pile removal and installation work. The exclusion zone would be monitored for 15 minutes prior to any pile extraction and driving activities to ensure that the area is clear of any marine mammals. Pile extraction or driving would not commence until marine mammals have not been sighted within the exclusion zone for a 15 minute period. If a marine mammal enters the exclusion zone during pile replacement work, activity would continue, and the behavior of the animal would be

monitored and documented. If the animal appears disturbed by the pile replacement activity, work would stop until the animal leaves the exclusion zone.

- To the extent feasible, all pilings or similar in-water structures would be installed and removed with vibratory pile drivers only. An impact pile driver would only be used where necessary to complete installation of piles or in-water structures in accordance with seismic safety or other engineering criteria. If impact driving is needed for in-water pile installation, the following measures would be implemented:
  - Prior to the start of impact pile driving, the project applicant would prepare an NMFS-approved sound attenuation monitoring plan to protect fish and marine mammals.
  - Piles driven with an impact driver would employ a “soft start” technique to give fish an opportunity to move out of the area before full-powered impact driving begins. Only a single impact hammer would be operated at a time.
  - The impact hammer would be cushioned using a 12-inch-thick wood cushion block during all impact hammer pile-driving operations.
  - During impact pile-driving of steel piles, a bubble curtain would be used to attenuate underwater sound levels.
  - The Port and USACE would monitor and verify sound levels during pile-driving activities. The sound monitoring results would be made available to NMFS and other regulatory agencies as needed.
- The Port and USACE shall require the construction contractor to use noise-reducing pile-driving techniques if nearby structures are subject to pile-driving noise and vibration. These techniques shall include use of cushion blocks during pile installation activities within 1,500 feet of sensitive receptors in Oakland and Alameda. The pile hammer shall be cushioned using a 12-inch-thick wood cushion block or nylon blocks during all impact hammer pile driving operations. Construction contractors shall be required to use construction equipment with state-of-the-art noise shielding and muffling devices. In addition, at least 48 hours prior to pile-driving activities, USACE and Port shall notify building owners and occupants within 1,500 feet of the project site of the dates, hours, and expected duration of such activities.

### **Eelgrass-Related Measures**

Prior to the start of any in-water construction, the Port and USACE would conduct a NMFS-approved eelgrass survey, consistent with the measures described in the NMFS October 2014 California Eelgrass Mitigation Policy and Implementation Guidelines (CEMP) (NMFS 2014). The survey would include the following:

- Before in-water construction activities occur in the marine environment, eelgrass surveys would be conducted in the Action Area and an appropriate reference site(s). Surveys would take place within 60 days before the start of construction, consistent with the methods outlined in the CEMP.
- After construction, a post-action survey of the eelgrass habitat in the Action Area and at an appropriate reference site(s) would be completed. Surveys would take place within

30 days of completion of construction, or within the first 30 days of the next active growth period that follows completion of construction and occurs outside of the active growth period.

- Areas of direct and indirect impact would be determined from an analysis that compares the pre-action condition of eelgrass habitat with the post-action conditions from this survey, relative to eelgrass habitat change at the reference site(s), in accordance with the methods described in the CEMP.
- If impacts to eelgrass are known to occur prior to construction or observed to occur after construction, the Port and USACE would develop a mitigation plan to achieve no net loss in eelgrass function, following the steps recommended in the CEMP. Potential mitigation options include comprehensive management plans, in-kind mitigation, mitigation banks and in-lieu-fee programs, and out-of-kind mitigation, as defined in the CEMP.

### **Particulate Emissions Reduction Measures**

To reduce impacts from fugitive dust emissions during project construction, construction contractors shall be required to implement the following Basic and Additional Construction Mitigation Measures recommended by the Bay Area Air Quality Management District. These measures will reduce particulate emissions primarily during soil movement, grading, and demolition activities, but also during vehicle and equipment movement on unpaved project areas. Basic measures include:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure, Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Additional measures include:

- All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
- All excavation, grading, and/ or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
- If applicable, vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
- Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
- Minimize the idling time of diesel-powered construction equipment to 2 minutes.
- The project shall develop a plan demonstrating that the off-road equipment (more than 50 hp) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project-wide fleet-average 20 percent NO<sub>x</sub> reduction and 45 percent PM reduction compared to the most recent California Air Resources Board (CARB) fleet average. Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/ or other options as such become available.
- Use low-VOC (i.e., ROG) coatings beyond the local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
- Require that all construction equipment, diesel trucks, and generators be equipped with Best Available Control Technology for emission reductions of NO<sub>x</sub> and PM.
- Require that all contractors use equipment that meets CARB's most recent certification standard for off-road heavy-duty diesel engines.

#### **Best Available Control technology for Off-road Construction Equipment**

- Construction contractors shall be required to demonstrate that all heavy-duty off-road

construction equipment with engines greater than 25 horsepower used for construction activities shall be equipped with the most effective Verified Diesel Emissions Control Strategies (VDECS) available for the engine type. In this case, the best available VDECS would be the use of engines that meet the Tier 4 Final (Tier 4F) standards as certified by CARB and United States Environmental Protection Agency.

### **Traffic Control Measures**

The Port and USACE would require the project construction contractor to develop a comprehensive construction traffic control plan (TCP) that includes measures to minimize the effects of project-related construction traffic on overall circulation, including traffic, transit, bicycle, and pedestrian routes, safety, and emergency access. Measures in the construction TCP would include, but would not necessarily be limited to:

- Signage/striping and temporary traffic control devices to minimize conflicts, encourage use of detour or alternative routes (to avoid construction traffic), and ensure safety for all roadway users, particularly during periods of heavy hauling activity;
- Identification and enforcement of designated truck haul routes;
- Advance notification of neighboring residents, businesses, and other property owners, as well as affected jurisdictions and key stakeholders of any substantial increases in construction traffic (e.g., ramping up of hauling activity);
- Maintenance of adequate emergency access at the project sites and general access for neighboring properties, at all times; and
- Construction worker parking and transportation demand management (e.g., carpool/vanpool programs, and leased parking in remote/offsite parking facilities).