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STAFF REPORT: REGULAR CALENDAR

Application No.: 9-19-0386

Applicant: Morro Bay Oyster Company, LLC

Location: Morro Bay, San Luis Obispo County.

Project Description: Application for proposed six acre expansion of oyster aquaculture operations and removal and replacement of a 2,600 sq.ft. floating work platform as well as after-the-fact authorization for two nursery rafts, the floating work platform, and approximately 2.2 acres of oyster aquaculture operations on State water bottom lease M-614-01, Parcel 2.

Staff Recommendation: Approval with conditions.

SUMMARY

Morro Bay Oyster Company, LLC (MBOC) requests after-the-fact approval for the shellfish aquaculture operation it has carried out in Morro Bay since 2009. In 2009, MBOC took over a small existing operation by Tomales Bay Oyster Company on one of the three state aquaculture leases in Morro Bay. Tomales Bay Oyster Company did not have a coastal development permit for its operation and MBOC did not seek or receive a permit for its own. Since beginning its

business, MBOC has installed and used a variety of different types of shellfish cultivation equipment for the growth and harvest of non-native Pacific oysters within roughly two acres of intertidal mudflats and has moored and used a roughly 2,600 square foot floating work barge and two oyster nursery rafts. MBOC now seeks after-the-fact authorization for the installation and use of these structures. As part of its application, MBOC also proposes to continue using (or to replace) this existing aquaculture equipment and to expand its operations to include installation and use of new oyster cultivation gear (up to 140 210-foot-long elevated lines of hanging plastic mesh bags or baskets) within a roughly six acre area of intertidal mudflats that is not currently being used for shellfish cultivation. MBOC also proposes to convert an existing 1.8 acre oyster grow-out area from one cultivation method (40 floating longlines) to another (an equal number of elevated longlines with hanging cultivation bags). With the exception of the two oyster nursery rafts secured to docks near Morro Bay's embarcadero, the entirety of MBOC's existing and proposed shellfish cultivation operation in Morro Bay would be located within the state tidelands that MBOC leases (State Water Bottom Lease No. M-614-01, Parcel 2).

As a result of MBOC's failure to obtain the necessary authorizations prior to carrying out development activities, violations of the Coastal Act exist within the project area. These include, but are not limited to, installation and use of an approximately 2,600 square foot floating work platform; two oyster nursery rafts; untethered, floating and elevated bottom bags; and PVC post and cable systems to support floating and elevated longlines. In response to notification by Commission permitting and enforcement staff about these Coastal Act violations – as well as its desire to carry out additional proposed development - MBOC prepared and submitted this CDP application. Approval of this application pursuant to the staff recommendation, issuance of the permit, and the applicant's subsequent compliance with all terms and conditions of the permit will result in resolution of the above described violations going forward.

The key Coastal Act issues raised by the project are associated with its potential to result in adverse impacts to marine resources. The continued use of bottom bags, longlines and a floating work platform as well as the proposed installation and use of elevated cultivation lines would result in fill and disturbance to benthic habitat and its associated species. The presence of the gear and growth of the cultivated shellfish could: (1) contribute to excessive organic enrichment of the sediment; (2) limit or displace sensitive habitat and wildlife foraging opportunities; (3) alter the composition of the community of organisms that relies on the benthic habitat beneath and adjacent to the aquaculture equipment; and/or (4) contribute to disturbance, displacement, loss or injury to protected species such as harbor seals, sea otters, steelhead trout and tidewater gobies. In addition, the use of roughly 18,600 plastic mesh cultivation bags/baskets and floatation buoys along with nearly 4,000 PVC posts and stakes within Morro Bay has the potential to contribute to marine debris within the bay and larger environment. Some of this material could escape or disperse into and smother nearby areas of eelgrass or salt marsh, thus contributing to the displacement or loss of these sensitive habitats.

Commission staff recommends **Special Conditions 1** through **12** to reduce impacts to marine resources such that the project can be found consistent with the terrestrial and marine resources policies of the Coastal Act. **Special Condition 1** would establish a permit term limit to ensure that MBOC's operation continues to be carried out under a valid lease of state tidelands. **Special Condition 2** would require MBOC to demarcate the boundaries of specific cultivation areas in

order to prevent the displacement or movement of gear into nearby sensitive habitat areas such as eelgrass beds. **Special Conditions 3 and 7** would also help provide protection for eelgrass habitat by requiring MBOC to (1) avoid placement of structures or gear on or above eelgrass; and (2) develop and implement an access plan for these sites that includes establishment of vessel and personnel transit routes and landing sites outside of eelgrass beds, as well as updates to these routes if eelgrass habitat expands or shifts. **Special Condition 4** would require MBOC to develop and submit an annual report to the Executive Director with information about its operation and marine debris reduction and response efforts. **Special Condition 5** would require MBOC to implement a variety of marine debris reduction and response efforts, including participation in clean-up events and staff trainings, and marking its high-volume gear with its company name or other identification. **Special Conditions 6 and 8** would provide protection for sensitive wildlife species by requiring MBOC to: (1) avoid chasing, flushing, or directly disturbing marine mammals, waterfowl and shorebirds; (2) install screening on its intake systems that is consistent with CDFW and NMFS guidelines for the protection of salmonid fish such as steelhead. **Special Condition 9** would prevent the discharge of aquaculture debris and non-native fouling organisms into Morro Bay during shellfish cleaning, sorting, and harvest operations. **Special Condition 10** would require MBOC to carefully remove its floating work platform in a manner that minimizes the generation and dispersal of construction/demolition debris. **Special Conditions 11 and 12** would require MBOC to develop and implement a hazardous material spill prevention and response plan and to obtain all necessary regulatory approvals prior to implementing its proposed expansion.

Coastal Commission staff recommends **APPROVAL** of coastal development permit application 9-19-0386, as conditioned. The motion for this is on page 5. The standard of review is Chapter 3 of the Coastal Act.

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EXHIBITS

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[Exhibit 3 - Configuration of Existing and Proposed Elevated Longline Cultivation Beds](#)

[Exhibit 4 – California Department of Public Health Map of Approved Shellfish
Cultivation Areas](#)

[Exhibit 5 - Schematic Diagram of Work Platform](#)

I. MOTION AND RESOLUTION

Motion:

*I move that the Commission **approve** Coastal Development Permit 9-19-0386 subject to the conditions set forth in the staff recommendation specified below.*

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of Commissioners present.

Resolution:

The Commission hereby approves the Coastal Development Permit for the proposed project and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS

- 1. Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the applicant or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
- 2. Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
- 3. Interpretation.** Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.
- 4. Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
- 5. Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the applicant to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

1. **Permit Term Limit.** This permit shall expire on May 3, 2029. If the term of MBOC's lease (State Water Bottom Lease Nos. M-614-01, Parcel 2) – also currently set to expire on May 3, 2029 - is amended or a new lease is issued by the California Fish and Game Commission, MBOC may submit an application for a permit amendment requesting an extension of the permit term. MBOC shall, no less than 60 days prior to permit expiration or the cessation of its operations on Lease No. M-614-01 Parcel 2, submit a complete application to amend this permit to remove all cultivation equipment and accumulations of oyster shell and return the lease area to a natural condition.
2. **Bottom Bag Cultivation Areas.** The outer perimeter of MBOC's untethered bottom bag cultivation bed shown approximately on [Exhibit 2](#) shall be clearly marked. To prevent loss of bottom bags and displacement outside of this cultivation bed, placement of untethered bottom bags shall be limited to the area within these marked perimeters and all untethered bottom bags shall be stocked with no less than two gallons of large oysters. If bottom bags with lower volumes of oysters or smaller sizes are used, they shall be affixed to lines secured to the mudflats within the bottom bag cultivation bed.
3. **Cultivation Site Access Plan.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, MBOC shall submit, for Executive Director review and written approval, a Cultivation Site Access Plan that includes: (1) a map showing the travel routes and landing or cultivation bed access sites that MBOC's vessels and personnel shall use to access its various operation areas; (2) procedures (such as employee training, use of lookouts and/or speed restrictions) to limit herding or flushing of black brant, shorebirds, or marine mammals within Morro Bay; (3) procedures to avoid injury or disturbance to sensitive habitat areas such as eelgrass beds and marine mammal haul outs, including avoiding passage through and landing in such areas during lower tides and updates of vessel and personnel access routes if sensitive habitat areas expand or shift. Upon approval by the Executive Director, MBOC shall implement the Cultivation Site Access Plan.
4. **Annual Report.** By March 1 of each year, MBOC shall submit to the Executive Director an annual report with information regarding the results of the prior year's quarterly cleanup events carried out as described in **Special Condition 5** and the date of training, training materials, meeting minutes, and list of attendees from the Marine Debris Reduction Training described in **Special Condition 5(C)**. In addition, the annual report shall include information on the estimated number of cultivation bags and/or baskets lost, replaced, and recovered throughout the course of the year, as well as any design, management, or operational changes implemented to address issues that have arisen with the expanded use of elevated cultivation bags and/or baskets. The annual report shall also include a description of any significant changes to the type, quantity and configuration of cultivation equipment that are being considered and any resource or operational challenges that are emerging (such as bird roosting or changes to eelgrass habitat).
5. **Marine Debris Reduction and Management.** MBOC shall carry out operations consistent with the following marine debris reduction and management practices:

- A. Storm Damage and Debris.** As soon as safely and reasonably possible following storm or severe wind or weather events, MBOC shall patrol all of its active cultivation areas for escaped or damaged aquaculture equipment. All equipment that cannot be repaired and placed back into service shall be properly recycled or disposed of at an appropriate onshore facility. In addition, MBOC shall retrieve or repair any escaped or damaged aquaculture equipment that it encounters while conducting routine daily and/or monthly maintenance activities associated with shellfish culture (e.g. bed inspections, shellfish harvest and planting). If the escaped gear cannot be repaired and replaced on the shellfish bed, it shall be properly recycled or disposed of on land.
- B. Gear Marking and Replacement.** MBOC shall mark shellfish culture bags (bottom bags, floating bags and hanging bags), baskets, and floats in an easily identifiable manner with identification information including its company name. Markings shall be securely attached and robust enough to remain attached and legible after an extended period in the marine environment (e.g. heat transfer, hot stamp, etching, etc.). Existing cultivation bags and floats currently in use shall be marked or replaced with marked versions when replanted and all unmarked gear shall be replaced in this way WITHIN 18 MONTHS OF THE COMMISSION'S APPROVAL OF THIS COASTAL DEVELOPMENT PERMIT. MBOC shall also complete the replacement of all plastic wrapped Styrofoam block floats with crab floats (or similarly robust and durable buoys/floats) within 12 months of the Commission's approval of this permit. In the event that its shellfish culture gear or equipment becomes displaced or dislodged from culture beds, it shall be MBOC's responsibility to retrieve the material from the shoreline, open water, eelgrass beds, mudflat, or submerged bottom with minimal damage to the resources affected. Once located, such material shall be removed as soon as feasible and properly disposed of, recycled, or returned to use.
- C. Marine Debris Reduction Training.** WITHIN 30 DAYS OF ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, MBOC shall implement an employee training regarding marine debris issues, including covering how to identify culture gear or associated materials (marking stakes, support posts, longlines, label tags, clasps, etc.) that are loose or at risk of becoming loose, proper gear repair methods, and how to completely remove gear from out-of-production areas. Particular focus shall be placed on management and maintenance practices to reduce the loss of any gear type that is frequently lost or consistently found during bay cleanup and inspection activities. This training shall be repeated on an annual basis throughout the term of the permit. During trainings, MBOC's employees shall be encouraged to consider and implement field and management practices that reduce the amount of small plastic gear (such as zip-ties, tags and fasteners) and non-biodegradable material (such as PVC stakes and nylon or polypropylene rope) used in its operations.
- D. Cleanup Events.** MBOC shall carry out quarterly cleanup events in Morro Bay in coordination with other interested parties or organizations. Cleanup events shall include walking different portions of the bay and shorelines to pick up escaped shellfish gear and other trash (regardless of whether it is generated by the project). Particular focus shall be placed on the collection and removal of shellfish cultivation equipment (wires, stakes, etc.) abandoned within MBOC's lease area by prior operators. The volume and type of shellfish gear collected and the cleanup location

(marked on a map) and duration of cleanup activity shall be recorded and documented in the annual report submitted to the Executive Director. If persistent discoveries of certain gear types are made, MBOC shall evaluate (and if feasible, implement use of) alternative gear types or practices that would reduce these consistent sources of debris.

- E. Ongoing Operations.** MBOC shall not leave or temporarily store tools, loose gear, or construction materials on its leased tidelands or surrounding areas. All aquaculture gear installed on and in use in active cultivation sites shall be kept neat and secure and maintained in functional condition. MBOC shall carry out regular bed inspections and maintenance activities to help ensure that broken, collapsed, fallen, or buried gear is fixed or removed in a timely manner.
 - F. Bed Cleaning at Harvest.** At the time of harvest of each cultivation area, MBOC shall carry out a thorough inspection to locate and remove loose, abandoned or out of use equipment, tools, and accumulations of oysters from the surrounding substrate. Oyster shell shall not be intentionally placed or deposited within the lease outside of cultivation gear, and oysters or oyster shell accidentally spilled during cultivation or harvest shall be immediately collected and removed.
 - G. Excessive Gear Loss or Maintenance Failures.** If the Executive Director determines that MBOC is responsible for consistently extensive loss of aquaculture equipment (including bottom bags, cultivation baskets or floats) into the marine environment or is consistently failing to maintain its equipment in an intact and serviceable condition, MBOC shall, within 60 days of the Executive Director's written notification, submit a permit amendment to modify its cultivation equipment and/or operational practices to minimize equipment loss and mitigate impacts to affected habitat.
- 6. Wildlife Disturbance.** During vessel transit, harvest, maintenance, inspection, and planting operations, MBOC shall avoid approaching, chasing, flushing, or directly disturbing shorebirds, waterfowl, seabirds, or marine mammals.
- 7. Protection of Eelgrass Habitat.** No shellfish cultivation equipment, anchors, or other structures, gear or equipment shall be installed or placed on, in, or over eelgrass habitat, as determined by the Executive Director using the definition of eelgrass habitat in the National Marine Fisheries Service's October 2014 California Eelgrass Mitigation Policy (CEMP) or within any area identified by the National Marine Fisheries Service as important to eelgrass recovery in Morro Bay. Prior to placing or installing structures or equipment on any shellfish cultivation area not shown on [Exhibit 2](#) as an existing cultivation areas, MBOC shall submit, for Executive Director review and approval, information collected within the most recent eelgrass growing season (April through October) demonstrating that no eelgrass is present within the area in which installation or placement is proposed. If eelgrass is present or the Executive Director does not approve the information (for example, because it is inconclusive, out of date, of inadequate resolution, or improperly collected), MBOC shall retain the services of a qualified, independent third party to carry out an eelgrass survey of that area. The survey shall be carried out consistent with the methodology and protocols established in the CEMP and shall be carried out during the eelgrass growing season in which installation activities will occur (or the previous growing season if installation will

occur after the completion of one growing season and prior to the start of the next). Within 30 days of survey completion, the results of the eelgrass survey shall be provided to the Executive Director for review and approval along with a map or diagram showing the footprint and location of proposed cultivation structures and equipment relative to nearby eelgrass habitat and demonstrating that installation within eelgrass habitat, as defined in the CEMP, will not occur. While installation of shellfish cultivation structures and equipment shall be prohibited within eelgrass habitat, as defined in the CEMP, if such eelgrass habitat moves or expands into areas with existing fixed cultivation structures and/or equipment (elevated or floating longlines), MBOC may continue to maintain and use these areas for shellfish cultivation.

MBOC shall install all cultivation equipment (elevated longlines or floating longlines) within new cultivation beds using the configuration and spacing described in this report (and shown in [Exhibit 3](#); five feet between lines, ten feet between groups of three or four lines, 15 feet and 30 feet between cultivation beds). If the National Marine Fisheries Service identifies a wider spacing or reduced density of equipment that would promote eelgrass recovery, new cultivation beds shall be installed with that spacing and/or density.

- 8. Intake System Design.** All intake systems used by MBOC to supply water from Morro Bay for maintenance or shellfish cleaning, sorting or washing shall be designed with intake screens designed consistent with California Department of Fish and Wildlife and National Marine Fisheries Service guidelines for protection of juvenile salmonids by having: (a) mesh openings of no more than 3/32 inches; and (b) a maximum intake water velocity of 0.33 feet per second. **WITHIN 30 DAYS OF ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT,** MBOC shall provide, for Executive Director review and approval, evidence that intake screens meeting these standards have been installed on all intake systems used by MBOC to supply water from Morro Bay for its operations.
- 9. Discharge of Materials.** MBOC shall not intentionally dispose of or release any equipment or waste, including lines, buoys, cultivation bags, baskets, fasteners and other equipment, or living or dead shellfish, shells, or non-native fouling organisms into the marine environment. All biofouling organisms and biological materials removed during oyster cleaning, sorting, and packing operations shall be collected and disposed of at an appropriate upland facility. No direct discharge of wash water or biofouling materials into Morro Bay shall occur during maintenance, cleaning, sorting or packing operations.
- 10. Work Platform.** **WITHIN 12 MONTHS OF COMMISSION APPROVAL OF THIS COASTAL DEVELOPMENT PERMIT,** MBOC shall fully remove from Morro Bay its existing floating work platform and all associated barges, rafts and moorings. Demolition or deconstruction activities on the floating work platform (including removal of machinery and associated equipment) shall be limited to only those necessary to prepare the platform and its associated barges to be towed to the nearest appropriate marina or boat ramp and removed from the bay. All subsequent deconstruction, cleaning or demolition activities shall be carried out onshore at MBOC's facility, and all resulting debris and waste shall be properly recycled or transported to a certified waste disposal facility. No subsurface cleaning or scraping of the work platform rafts shall be carried out within Morro Bay. Within 30 days of the completion of floating work platform removal, MBOC shall provide, for Executive Director review and

approval, the results of a benthic survey carried out within the former footprint of the work platform. All aquaculture debris observed during this survey shall be removed by MBOC.

Placement or installation of a new or replacement floating work platform shall require an amendment to this coastal development permit and submittal of evidence that the Fish and Game Commission has approved operation of such a facility on State Water Bottom Lease No. M-614-01, Parcel 2.

- 11. Hazardous Material Spill Prevention and Response Plan.** WITHIN 60 DAYS OF ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, MBOC shall submit for Executive Director review and written approval, a project specific Spill Prevention and Response Plan (SPRP) for work vessels, barges, and gasoline powered machinery that will be used during project construction and operational activities. MBOC and its personnel shall be trained in, and adhere to, the emergency procedures and spill prevention and response measures specified in the SPRP during all project installation and operations. The SPRP shall provide for emergency response and spill control procedures to be taken to stop or control the source of the spill and to contain and clean-up the spill. The SPRP shall include, at a minimum: (a) identification of potential spill sources and quantity estimates of a project specific reasonable worst case spill; (b) identification of prevention and response equipment and measures/procedures that will be taken to prevent potential spills and to protect marine and shoreline resources in the event of a spill. Spill prevention and response equipment shall be kept onboard project vessels and barges at all times; (c) a prohibition on vessel fueling/refueling activities outside of designated fueling stations and limitation on equipment refueling to no more than five gallons, carried out with spill prevention and response protocols in place; and (d) emergency response and notification procedures, including a list of contacts to call in the event of a spill.
- 12. Other Agency Review and Approval.** PRIOR TO COMMENCEMENT OF PROPOSED CONSTRUCTION AND/OR INSTALLATION ACTIVITIES for new oyster cultivation beds, MBOC shall submit to the Executive Director written evidence that any necessary permits, permissions, approvals, and/or authorizations for the approved project have been granted, including those from the Regional Water Quality Control Board, California Fish and Game Commission and U.S. Army Corps of Engineers. Any changes to the approved project required by these agencies shall be reported to the Executive Director. No changes to the approved project shall occur without an amendment to this permit unless the Executive Director determines that no amendment is legally necessary. Proposed construction and/or installation activities shall not proceed if one or more authorizations from other agencies are not issued.

IV. FINDINGS AND DECLARATIONS

A. BACKGROUND AND PROJECT DESCRIPTION

The area dedicated to oyster cultivation in Morro Bay and its overall production has changed significantly over the past several decades. One of the primary drivers for these changes is the bay's water quality. Because oysters are filter feeders that can accumulate contaminants from the surrounding waters, the water quality of oyster cultivation areas is closely monitored and regulated by the California Department of Public Health (CDPH). Beginning in the late 1970s,

failed water quality sampling events in Morro Bay periodically triggered temporary closures for oyster harvesting as CDPH actively worked to allow the aquaculture operations to remain in place while simultaneously safeguarding public health (CDPH 2018). These short-term closures presented an ongoing challenge to aquaculture operations in Morro Bay and eventually contributed to a permanent reduction in its aquaculture lease areas from over 700 acres in 1988 to less than 300 in 1991. Even with this reduction in acreage, regular water quality and contaminant sampling and active management by CDPH has continued to be necessary.

The Central Coast Regional Water Quality Control Board, CDPH, Morro Bay National Estuary Program, Cal Poly State University and others have carried out extensive investigations of Morro Bay's water quality issues over the years (including studies, survey reports, comprehensive sampling efforts or evaluations in 1979, 1984, 1985, 1986, 1987, 1996, 1999, 2002, 2007, 2013 and 2018). Currently, shellfish cultivation is prohibited on over 200 of the 280 acres of remaining aquaculture lease areas in Morro Bay, and the remaining areas (approximately 73 acres) are carefully regulated by CDPH as "conditionally approved," as shown in [Exhibit 4](#).

Of the lease area held by Morro Bay Oyster Company, LLC (MBOC), approximately 12.6 acres are conditionally approved for cultivation and harvest. This designation has been used by CDPH in Morro Bay since 1979 and means that harvesting oysters there is prohibited seasonally or following rainfall and storm events (CDPH 2018). Consistent with this designation, MBOC is prohibited from harvesting for direct marketing from the conditionally approved portions of its lease area – M-614-01, Parcel 2 – during the months of November through January. During the months of February through October, closures are put into effect by CDPH based on rainfall levels.

In addition to the oyster cultivation operations that MBOC carries out in Morro Bay, a second company also grows shellfish there. This company, Grassy Bay Oyster Company, operates on two of its own lease areas, makes use of similar cultivation methods as those used by MBOC, and was recently issued a CDP by the Commission, authorizing both after-the-fact and proposed operations (CDP No. 9-18-0278).

MBOC's CDP application also includes after-the-fact and proposed elements. Specifically, MBOC is requesting after-the-fact authorization for ten years of installing and using shellfish cultivation structures without benefit of a permit, including the 40 floating longlines, 15 elevated longlines, 100 bottom bags, two nursery rafts and an approximately 2,600 square foot floating work platform that it currently uses. Additionally, MBOC is seeking authorization to expand its operations to include up to 140 additional floating or elevated longlines across approximately six acres of new cultivation beds, 200 additional bottom bags across an approximately 3,000 square foot cultivation bed, replacement of its 40 floating longlines with elevated longlines, and replacement of its 2,600 square foot floating work platform. MBOC's existing and proposed cultivation methods are more fully described in [Appendix B](#).

Shellfish Species

All of MBOC's existing operation is focused on planting, growing and harvesting the Pacific oyster (*Magallana gigas/Crassostrea gigas*). This species is considered to be native to Japan but is one of the most popular shellfish species for aquaculture in California and many other coastal

areas worldwide. Based on historic records, the Pacific oyster has been cultivated nearly continuously in Morro Bay since the 1930s. Although in a growing number of locations in southern California this species is known to be able to escape cultivation and establish wild populations, there is no record or evidence that this has occurred in Morro Bay or surrounding areas. If such records or evidence becomes available, MBOC could change its cultivation practices to exclusively use triploid Pacific oysters. Originally developed by aquaculture researchers to augment meat quality and growth rates, triploid oysters have an extra chromosome that also renders them nearly completely sterile and thus virtually incapable of establishing self-sustaining populations in the wild.

MBOC is also seeking to diversify its operation to include two additional species of oysters, the non-native Kumamoto oyster (*Crassostrea sikamea*) and the native Olympia oyster (*Ostrea lurida*). However, the lease issued to MBOC by the California Fish and Game Commission (State Water Bottom Lease No. M-614-01, Parcel 2) prohibits cultivation of these species and MBOC has not yet begun the process of requesting an amendment to its lease to eliminate that prohibition. If such a lease amendment is approved by the California Fish and Game Commission, MBOC could seek a corresponding amendment to its coastal development permit to include cultivation of these additional oyster species.

Floating Work Platform

Because the existing work platform has been in use for many years and some of its components are starting to degrade, MBOC proposes to fully remove it and replace it with a redesigned version supported by a series of new barges. Removal of the existing work platform would be accomplished by towing it to shore for deconstruction, removal from the bay and disposal.

Although MBOC has proposed in its coastal development permit application to replace the floating work platform with another similarly designed facility, its state water bottom lease only authorizes the lease area to be used for shellfish cultivation using specified methods. MBOC's lease does not allow for other operations – such as the installation and use of a floating work platform for oyster sorting, cleaning, packing, equipment storage and employee support facilities (restrooms, wash stations, break areas, etc.). As described further below, Commission staff reached out directly to the agencies responsible for the issuance and oversight of state water bottom leases for aquaculture – the California Fish and Game Commission and California Department of Fish and Wildlife – and confirmed that aquaculture leases are to be used exclusively for shellfish cultivation, and that MBOC is not authorized to maintain and use a floating work platform on its lease for other types of operations.

To resolve this issue, **Special Condition 10** would require MBOC, within 12 months, to remove its existing unauthorized floating work platform and all associated barges and moorings. **Special Condition 10** would also require MBOC to carry out an inspection or survey of the seafloor below the work platform shortly after its removal and to collect, remove and properly dispose of any aquaculture material or marine debris it encounters. If, subsequent to the removal of the floating work platform and clean-up of its mooring site, MBOC is able to obtain authorization from the California Fish and Game Commission to install and operate a floating work platform on its lease, MBOC may apply for an amendment to its coastal development permit to pursue such development.

After its floating work platform is removed from Morro Bay, the activities currently carried out on it by MBOC (shellfish sorting, cleaning, packing, employee support facilities, etc.) could be relocated to MBOC's onshore facilities or support vessels, as is common practice with similar shellfish aquaculture operations elsewhere in the state. Although the recently issued coastal development permit for the other shellfish farm in Morro Bay, Grassy Bar Oyster Company (CDP No. 9-18-0278), included a much smaller work platform used for a more limited range of activities, during its review of that application Commission staff was not aware of the limitations on the uses that could be carried out within and authorized by the Fish and Game Commission on aquaculture leases. Staff of the California Fish and Game Commission will be evaluating the Grassy Bar Oyster Company operation further and working directly with that company to resolve any lease compliance issues associated with its work platform.

Planting, Harvest and Maintenance Activities

MBOC's planting, harvest and maintenance activities would primarily be carried out on its intertidal lease area during low tides when the cultivation equipment is exposed and its personnel can walk among it. To move personnel and equipment between its cultivation areas and work barge, MBOC would use one or more of its flat bottom vessels (particularly during large plantings or harvests). Maintenance activities on the lease areas include inspecting and collecting cultivation bags for sorting approximately every two weeks. This activity is carried out using hand labor at low tides.

Vessel Use and Transit Route

MBOC's operations on its lease areas would be primarily reliant on the use of its 18 foot, 21 foot and 25 foot skiffs. Based on the number of oysters being grown and the season, these vessels would access MBOC's cultivation beds up to several times per week and would frequently move between the cultivation beds and work platform. Depending on the tidal height, vessels would be temporarily anchored adjacent to the work platform, cultivation bed, or at the edge of available deeper water channels. Upon removal of the work platform within 12 months, pursuant to Special Condition 10, MBOC would adjust its vessel routes to move directly between cultivation beds and MBOC's onshore facility or nearby docks and marinas.

Vessel transit would also frequently occur between the lease area and MBOC's onshore facility at 1287 Embarcadero and the adjacent boat slips it uses to store its vessels. Vessel trips also occur between the marina operated by California State Parks and the launch ramps at Tidelands Park Marina. On a typical week, MBOC estimates between 10 and 12 roundtrips for its vessels along this roughly 1.5 mile route. These trips would be used to transport personnel and equipment from shore to the work barge. Two of MBOC's vessels would also be used to support planting and harvesting operations at higher tides, and to transport loads of shellfish or equipment between the cultivation sites and work barge.

B. OTHER AGENCY APPROVALS

U.S. Army Corps of Engineers

Morro Bay Oyster Company, LLC (MBOC) does not currently have a permit or other required authorization from the U.S. Army Corps of Engineers (ACOE) for its existing operation or

proposed expansion. Over the past several months, MBOC has been working with the ACOE to resolve this situation and meet its permit requirements under the Clean Water Act and Rivers and Harbors Act of 1899. MBOC has provided ACOE staff with an application for a permit and ACOE staff is in the process of reviewing that application. Commission staff has coordinated with and provided regular updates to ACOE staff throughout its review of this CDP application.

National Marine Fisheries Service

Part of the ACOE permit review process involves consultation with the National Marine Fisheries Service (NMFS). This consultation includes an evaluation of potential issues associated with Essential Fish Habitat and Protected Species. Commission staff also reached out to and coordinated closely with NMFS staff during the review of this permit application regarding the project's potential to adversely affect eelgrass habitat and the application of appropriate protection measures. This coordination contributed to the eelgrass protection measures included in **Special Condition 7**.

Central Coast Regional Water Quality Control Board

Projects involving discharges of dredged or fill material to waters of the United States that require permits from the U.S. Army Corps of Engineers under Clean Water Act Section 404 are also required to obtain authorization from the Regional Water Quality Control Board (RWQCB) under Clean Water Act Section 401. MBOC is currently in communication with staff of the Central Coast RWQCB regarding its permitting process and requirements. During its review of this CDP application, Commission staff provided opportunities for input and updates to RWQCB staff.

California Fish and Game Commission

MBOC's operation is carried out within State Water Bottom Lease No. M-614-01, Parcel 2. This lease was issued for a period of 25-years by the California Fish and Game Commission and, unless renewed, will terminate on May 3, 2029. This lease includes the shellfish species and cultivation methods currently used by MBOC and requires MBOC to obtain and adhere to permits and authorizations from all other relevant agencies. During the course of its review of MBOC's permit application, Commission staff reached out to and solicited input from California Fish and Game Commission staff to confirm that MBOC's ongoing and proposed aquaculture activities are consistent with its lease. Feedback received by Commission staff indicates that the installation and use of MBOC's 2,600 square foot floating work platform is not currently authorized by the Fish and Game Commission and may potentially not be able to be authorized on a state aquaculture lease due to the intention for such leases to be used exclusively for shellfish cultivation. **Special Condition 10** would therefore require MBOC to carry out the proposed removal of its existing floating work platform within 12 months, and to seek an amendment to this coastal development permit prior to installing a new or replacement floating work platform if it is able to first receive authorization for such a facility from the California Fish and Game Commission.

California Department of Fish and Wildlife

MBOC's aquaculture operations are required to be registered annually with the California Department of Fish and Wildlife (CDFW) and to adhere to a variety of protocols related to introduced species and the importation of oyster seed. MBOC has a consistent compliance

record with these regulations and has a valid registration for 2019. In addition, CDFW is the primary state agency responsible for management and enforcement of California's network of marine protected areas (MPAs). MBOC's lease area and all of its proposed expansion areas are within one of these MPAs, the Morro Bay State Marine Recreational Management Area. Within this MPA, the "take" or removal of marine life is prohibited with several exceptions. Among these exceptions is take associated with the aquaculture of shellfish carried out pursuant to a valid State water bottom lease and permit. Commission staff reached out to and solicited input from CDFW Marine Region and Aquaculture and Bay Management Project staff during the course of this permit review to confirm that the proposed shellfish aquaculture operations would be carried out consistent with the relevant MPA regulations.

Tribal Outreach and Consultations

During the process of reviewing MBOC's CDP application for this project and developing this recommendation, Commission staff reached out to representatives from Native American Tribes understood to have current and/or historic connections to the project area. These Tribes include the Northern Chumash Tribal Council, the yak tityu tityu yak tilhini – Northern Chumash Tribe, and the Salinan Tribe of Monterey and San Luis Obispo Counties. Contact information for these Tribal Representatives was gathered from the Native American Heritage Commission's Native American Contact Lists.

Initial feedback on the CDP application received from representatives of the Northern Chumash Tribal Council (NCTC) indicated that its primary areas of interest and potential concern included protection of Morro Bay Estuary's environmentally healthy living balance, eelgrass and Sacred Viewshed. Specifically, NCTC was concerned about "structural above water View Impediments," "introducing a nonnative species into our Sacred Estuary," and consideration of "emergency plan for gas or oil spills, cleaning solvents, noise or exhaust pollutions, effect on endangered species, plans for cooperating with the recreational uses, motor rotors effect on Eel Grass, self-regulation plans, [and] long-term effects on the back bay." In response to this input, Commission staff provided additional information and background to NCTC about these issues and their consideration as part of the Commission staff's process of reviewing the CDP application and developing a recommendation. As that recommendation was developed, Commission staff additionally reached out to NCTC to provide an update and summary of the results of the staff's evaluation. At the time of publication of this staff report and recommendation, no additional questions or concerns had been brought to the attention of Commission staff by representatives of NCTC or the other two Tribes that were contacted.

Any concerns raised subsequent to the publication of this report will be brought to the attention of the Commission through the development of an addendum to this staff report and recommendation.

C. FILL OF OPEN COASTAL WATERS

Section 30233(a) of the Coastal Act states, in part:

The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative,

and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

- ...
(7) *Nature study, aquaculture, or similar resource dependent activities.*

The installation and maintenance of cultivation bags, floating longline anchoring posts, elevated longline support posts, and work platform moorings would involve the placement of up to 20,000 two by three foot plastic mesh cultivation bags or baskets, over 3,000 small diameter PVC posts, several hundred helical screw anchors, and three weighted mooring blocks within Morro Bay tidelands. These materials constitute “fill” as defined by the Coastal Act. Section 30108.2 of the Coastal Act states:

“Fill” means earth or any other substance or material, including pilings placed for the purpose of erecting structures thereon, placed in a submerged area.

Coastal Act Section 30233(a) permits fill in coastal waters if three tests are met: (1) the fill constitutes an allowable use under 30233(a); (2) there is no feasible less environmentally damaging alternative; and (3) feasible mitigation measures have been provided to minimize any adverse effects.

Allowable use

Morro Bay Oyster Company, LLC (MBOC) proposes to place – and seeks after-the-fact authorization for - fill in coastal waters for the purpose of cultivating oysters. As discussed above, MBOC’s proposed project is an aquaculture project, and as such qualifies as an “allowable use” under 30233(a)(7). The project is therefore consistent with the first test of Section 30233(a).

Alternatives

The Commission staff investigated project alternatives that would reduce or eliminate the need for fill. Due to the force of tides and currents within the proposed project areas, the presence of shellfish predators, as well as the design of the structures and gear associated with the cultivation methods and activities employed by MBOC, a system of anchoring and support posts, anchors, bottom bags and other cultivation gear is an essential element. For on-bottom cultivation, use of mesh bags allows the shellfish being grown to remain contained and consolidated during grow-out, so they may be fully recovered at harvest with minimal habitat disturbance (particularly in comparison to unconsolidated placement of oysters directly on the substrate, which can significantly alter the substrate and require mechanical or hydraulic dredging techniques to harvest). Therefore, eliminating fill is not a feasible alternative for this type of oyster culture operation.

The Commission considered several alternative anchoring and post systems to those proposed by MBOC for its elevated longlines and floating longlines, including different types of posts and stakes and different post spacing configurations. While a wider spacing of support posts would be possible, to maintain the oyster cultivation equipment above the substrate and within the target area of tidal influence would result in high levels of tension and weight on the horizontal line and would therefore require larger posts, more substantial support cables, and/or anchoring

systems on each end of the lines. These larger, more permanent structures would require more substantial installation methods, including the possible need for mechanized equipment (such as powered augers, water jets, or pile drivers). This would likely result in the installation of fewer larger structures rather than more numerous smaller structures, thereby not likely reducing the overall amount of fill required. Further, the larger structures would be more difficult to remove or adjust in the future and may require more intensive extraction methods, thus increasing the amount and severity of habitat disturbance that would occur during these activities.

Alternatives to the use of bottom bags were also considered, including the elimination of the bags and the use of support posts or racks to elevate a greater number of them above the mudflats. As noted above, elimination of the bags entirely would not reduce the total amount of proposed fill and would result in the placement of loose oysters and shell directly on the mudflats, increasing the loss and dispersal of shell, altering the physical makeup of the mudflats themselves, and requiring the use of harvest techniques that result in substantial disturbance and displacement of benthic habitat. As such, this alternative would not be less environmentally damaging than the proposed use of bottom bags.

Although MBOC's proposed operation would only include a relatively small number of bottom bags (300), Commission staff considered a project alternative that would have eliminated this cultivation method entirely in favor of the exclusive use of elevated or floating longlines. While the use of posts or racks to elevate more of the bottom bags off of the mudflats would reduce the amount of direct fill, the environmental benefits of such efforts are not clear. These types of elevated alternatives may facilitate access to the mudflats for foraging wildlife such as fish, bat rays, and shorebirds when compared to the use and placement of mesh bottom bags directly on the substrate, but even this is not certain. Some species of birds have been shown to largely avoid elevated structures, and the interaction of other species of birds and marine animals with them has yet to be carefully evaluated. As such, it cannot be stated with confidence that the use of elevated gear in place of on-bottom gear would significantly increase foraging activity or opportunities. Additionally, elevated structures may have shading effects and affect currents, hydrology, and sediment transport/deposition in ways that bottom bags do not. Other effects are likely to be similar between the two alternatives. For example, oyster feeding and the deposition of organic material onto the underlying substrate is likely to occur at similar rates between the two cultivation methods. While elevated gear in some locations may facilitate flushing, water movement, and dilution of organic materials, in other locations, the more substantial and robust gear in the water column associated with elevated gear may alter current speeds and directions in ways that would concentrate organic wastes.

Based on current scientific understanding, it appears that the use of bottom bags versus elevated gear at similar densities simply results in trading some effects for others with no clear overall advantages in impact potential or magnitude. The critical considerations appear to be with the density of cultivated oysters and installed equipment (lower densities have lower potential for adverse effects), as well as maintenance and operational practices. Assuming similar densities and practices, it does not appear to be less environmentally damaging to replace bottom culture gear with elevated culture gear.

The remainder of the proposed project includes a mix of floating culture (floating longlines), as well as off-bottom culture techniques (elevated longlines), using a support system with a minimal footprint that does not include the permanent placement or pile driving of anchors or supports. These project elements reduce the amount of fill compared to the alternative types and configurations of posts and stakes that the Commission considered. In addition, there do not appear to be other alternative cultivation methods that would be less environmentally damaging. The Commission therefore finds that the proposed project minimizes the amount of fill to the maximum extent feasible, and that the project is the least environmentally damaging feasible alternative and is therefore consistent with the second test of Section 30233(a).

Mitigation Measures

The final test of Coastal Act Section 30233(a) requires that feasible mitigation measures have been provided to minimize any adverse effects of the fill. As discussed in the Marine Resources section below, the placement of over four thousand individual PVC support posts and anchoring stakes on bay sediment is expected to result in loss of benthic habitat and mortality and disturbance to associated organisms. However, given the small total amount of this fill and its dispersion over a large number of very small individual sites (less than four square inches each and spread over 13 individual cultivation beds across over eight acres), as well as the abundance of benthic habitat in Morro Bay similar to that which would be filled, adverse impacts associated with the installation and presence of the proposed oyster cultivation support and anchoring systems would be minimal.

The proposed project would also include a more substantial amount of fill associated with the placement onto the substrate of the oyster bottom bags themselves – up to 300 six-square foot bags within a total area of roughly 3,000 square feet. These bottom bags are typically in place, lying on the intertidal mudflats, for 12 to 24 months at a time as the oysters within them grow to harvestable size. While the placement of these mesh bags on top of the substrate would not result in the loss or removal of this substrate from the bay, the presence of the oyster shell filled mesh bags and the biological processes of the living oysters themselves may have localized effects on the underlying and adjacent benthic habitat and influence the type and abundance of organisms that it supports. These effects are associated with physical smothering or displacement from the bags and shells, as well as organic enrichment due to the deposition of biological waste from oyster filtration and feeding. By affecting benthic ecology (species composition, richness, abundance and dominance) in these ways, this fill may also affect other larger species such as fish, rays, sharks and shorebirds that forage on intertidal mudflats. In addition to effects on foraging associated with changes in the type and abundance of species present within the habitat below and adjacent to the bottom bag cultivation areas, foraging would also be affected by the presence of the plastic mesh bags themselves which in some cases may block access to prey.

To help reduce the potential for adverse impacts associated with these ecological effects, the requirements in **Special Conditions 2 and 7** would limit the potential loss and dispersal of cultivation gear by requiring that all untethered bottom bags be appropriately weighted and placed within designated areas, and by preventing the placement and use of cultivation equipment within eelgrass habitat. **Special Condition 3** would require the development and implementation of a cultivation site access plan that includes mapped transit corridor to prevent

the loss and disturbance of eelgrass habitat due to prop-cutting or interactions with outboard motors. **Special Condition 6** prohibits wildlife disturbance during operations and vessel transit. Finally, **Special Condition 5** would create a variety of marine debris prevention and response protocols that would reduce the likelihood of debris loss and increase opportunities for its recovery.

The Commission finds that with the addition of **Special Conditions 2, 3, 5, 6, and 7**, feasible mitigation measures have been provided to minimize any adverse effects of fill, and, therefore, that the third and final test of Coastal Act Section 30233(a) has been met.

Conclusion

Because its three tests have been met, the Commission finds the proposed project, as conditioned, is consistent with Section 30233(a) of the Coastal Act.

D. MARINE RESOURCES

Section 30230 of the Coastal Act states:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231 of the Coastal Act states:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

The proposed project is primarily located on a roughly 12 acre area of intertidal and submerged mudflats within the “back bay” portion of the Morro Bay estuary near the outlet of Chorro Creek ([Exhibit 1](#)). As described by the Morro Bay National Estuary Program in its 2012 Comprehensive Conservation and Management Program:

The Morro Bay estuary is a 2,300 acre semi-enclosed body of water where freshwater flowing from the land mixes with the saltwater of the sea. The estuary environment encompasses the lower reaches of Chorro and Los Osos creeks, a wide range of wetlands, salt and freshwater marshes, intertidal mud flats, eelgrass beds, and other subtidal habitats. Morro Bay hosts one of the most significant and least disturbed wetland systems on the central and southern California coast.

In addition to this range of subtidal and intertidal marine and marsh habitats, Morro Bay also supports a wide variety of wildlife species. Huge flocks of resident and migratory seabirds and shorebirds rest and forage within the bay's waters, mudflats and marshes along with harbor seals, sea otters and sea lions. Two rare fish species, the tidewater goby and south-central California coast steelhead, can also be found within the bay's waters. The tidewater goby is federally listed as endangered and has been observed from near the mouth of Morro Bay to its central reaches, while the south-central coast steelhead is federally listed as threatened and is known from populations that spawn and rear in tributaries to Morro Bay and use the bay itself as migratory and rearing habitat.

Protective Designations

In recognition of the number, diversity and rarity of species and habitats that are found in Morro Bay and its overall ecological importance, the Morro Bay estuary has received several protective designations. Its waters and marshes are divided between two state marine protected areas and are included within the National Estuary Program.

Morro Bay National Estuary Program

The National Estuary Program (NEP) was established in 1987 by amendments to the Clean Water Act, with the intent to protect and restore estuaries of national significance. The program focuses not only on water quality but also on the integrity of the entire estuarine system, including its physical, biological, economic, and recreational values. The Morro Bay National Estuary Program is one of 28 NEPs working to safeguard and improve the health of some of the nation's most important coastal waters. Within California, Morro Bay joins San Francisco Bay and Santa Monica Bay in the National Estuary Program. Although the NEP is a non-regulatory program within the U.S. Environmental Protection Agency (EPA) and individual NEPs are eligible to receive some annual grant funding, national guidance and technical assistance from EPA, primary management of the country's NEPs is carried out by state and local agencies, universities and non-profits. In Morro Bay, a non-profit organization called the Morro Bay National Estuary Program (MBNEP) is the local management entity. The MBNEP and its ongoing research and restoration, education and outreach, and stakeholder and community engagement efforts and programs provide a significant asset for the protection and restoration of the bay's resources.

Marine Protected Areas

The upper reaches of the Morro Bay estuary and its extensive salt marshes are included within the Morro Bay State Marine Reserve. This designation provides the highest level of protection of any state marine protected area designation and prohibits the take of all marine life from within the reserve borders. The remainder of the bay – including the entirety of Morro Bay Oyster Company's operations – are included within the Morro Bay State Marine Managed Area. This designation also conveys protection for marine species and habitats but includes exemptions for several specified activities, including shellfish aquaculture carried out pursuant to a valid state water bottom lease and permit.

Benthic Habitat and Eelgrass

Benthic habitat at the overall project site (the roughly 12 acres within State Water Bottom Lease No. M-614-01, Parcel 2 that the California Department of Public Health has identified as conditionally approved for shellfish cultivation) is comprised almost entirely of subtidal and intertidal mudflats made up of fine sands and silts. Much of the area has a higher elevation and is exposed at low tide, but the area also has an east-to-west running deeper water channel near its south end in which MBOC's floating work platform is moored. Although often dominated by bare mud, the site's higher elevation mudflats also periodically support a variety of fast growing algae species, primarily the green sea lettuce (*Ulva spp.*) and red algae (*Gracilaria spp.*). MBOC is interested in hand harvesting these naturally occurring algae species and is currently seeking authorization from the California Department of Fish and Wildlife to pursue this activity. This activity would not result in placement of algae cultivation structures, planting or other cultivation activities.

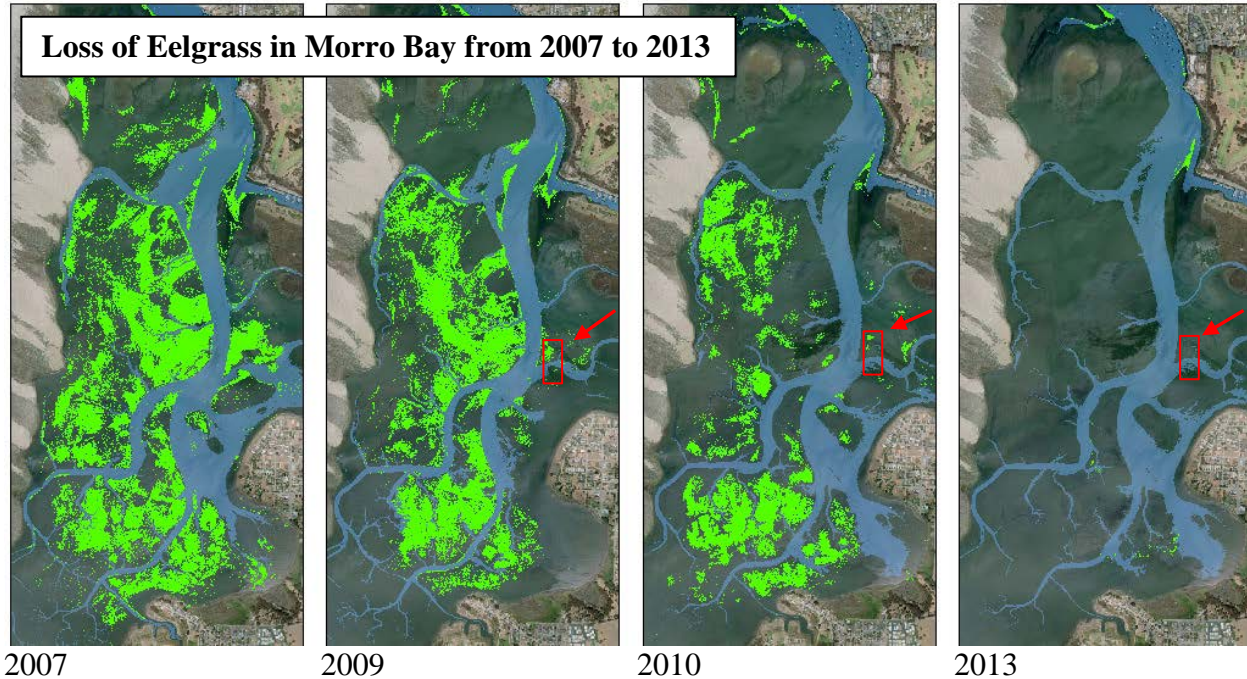
Historically, eelgrass was also abundant on and around many of the mudflats that MBOC proposes to use for shellfish cultivation. Eelgrass is known to form extensive beds and meadows in Morro Bay and these have traditionally been recognized as the largest and least impacted of any in central and southern California (MBNEP 2016). This ecologically valuable habitat has traditionally provided an essential role as wildlife refuge and nursery habitat for rare and commercially important fish and invertebrate species, forage for migratory birds such as black brant, and protection for water quality by stabilizing sediments and filtering and removing excess nutrients. Eelgrass is also considered to be a resource of cultural importance to the Native American Tribes of the Morro Bay area.

However, around the time MBOC's operations began in 2008, eelgrass habitat throughout Morro Bay began to sharply decline. From a near historic peak of roughly 344 acres in 2007, mapped eelgrass beds in Morro Bay had declined to cover less than 20 acres by 2013 (MBNEP 2014). This reduction of over 90% affected all parts of Morro Bay, but was most dramatic in the central and "back bay" portions of the estuary – those upper reaches located farthest from the bay's entrance to the open ocean (Walter, Rainville and O'Leary 2018). Although eelgrass is known to expand and contract from year to year, this level of loss had not before been recorded in Morro Bay¹. The cause of this loss has yet to be conclusively determined, but the scale and location of the loss outside of and far from shellfish cultivation areas across Morro Bay – as well as the very limited level of aquaculture occurring at the time - strongly indicates that it was not related to shellfish cultivation.

The figure below, adapted from the Morro Bay National Estuary Program's 2014 State of the Bay report, shows this decline graphically as intertidal areas that once supported extensive eelgrass meadows transition to open mudflats. In this figure, eelgrass beds are represented in green, deeper water subtidal channels are shown in blue and the approximate location of

¹ From 1960 to 1994 eelgrass acreage in Morro Bay was relatively stable, fluctuating between roughly 300 and 400 total acres. In late 1994, however, a large fire within the bay's watershed and heavy winter rains led to significant sediment erosion into the bay, smothering eelgrass beds and leading to a several years of declining acreage. By 1999, this declining trend reversed and by 2004, eelgrass was again approaching 300+ acres and pre-1994 levels.

MBOC's cultivation area is outlined in red and indicated with a red arrow (these arrows start in 2009, the year after MBOC's operations began):



For the most part, this collapse and disappearance of eelgrass beds throughout Morro Bay's central and back bay – including the areas in and around MBOC's aquaculture lease – has eliminated the potential for spatial competition, disturbance or other negative interactions between the aquaculture operation and eelgrass. However, as shown in the figure above, when MBOC began its operations in 2008, eelgrass was still abundant in the central bay and present within the north-west portion of its lease. According to personal communications with MBOC's owner, Neal Maloney, when he started placing bottom bags and other oyster cultivation equipment within MBOC's lease areas, he intentionally avoided areas in which eelgrass was present. A review of eelgrass mapping data collected by the Morro Bay National Estuary Program and historic aerial imagery corroborates this information and indicates that MBOC's operations were very limited in scale and located exclusively within a roughly two acre area in the southernmost portion of the project area (the cultivation bed currently being used for floating longlines, as shown in [Exhibit 2](#)). Small patches of eelgrass were present in a portion of this two acre area but could have easily been avoided due to the limited amount of cultivation equipment that MBOC was using at the time. A larger and more persistent eelgrass bed was present within the northwestern portion of the project area through 2010 (including the cultivation bed MBOC currently uses for elevated longlines), but MBOC was not using this area for aquaculture at that time (its elevated longlines were not installed until 2017). As the decline in Morro Bay's eelgrass persisted and accelerated into subsequent years – quickly resulting in its near complete disappearance from the central and back bay - MBOC's efforts to avoid eelgrass as it continued to develop and build up its operations became unnecessary. Eelgrass was no longer present in the project area and has remained absent for most of the past six years. Commission staff has no evidence suggesting that MBOC's operations since 2008 have resulted in or contributed to the loss of eelgrass within Morro Bay.

Despite its long absence, beginning in 2017 and continuing into the following two years, eelgrass beds and patches have begun to return to and expand within areas of historic eelgrass habitat that have been unoccupied for many years. Although its coverage and total acreage remain far from historic levels (including those from 2007 through 2010), this current expansion of eelgrass within Morro Bay may indicate the beginning of a recovery trend. Based on the mapped location of historic eelgrass habitat as well as the sites it currently occupies and has expanded into over the past three seasons, if this recovery trend continues, MBOC's cultivation areas may once again be located within and in close proximity to large areas of eelgrass. In fact, during a recent site visit on November 25, 2019, Commission staff observed both small patches and extensive and dense beds of eelgrass within and across many of the areas in which MBOC has proposed to expand its operations. As such, it is possible that MBOC's continued and expanded operations and uses of these areas may negatively affect eelgrass and other benthic habitats. However, it is still far from certain if this apparent expansion trend will continue, what its pace will be and what areas of historic eelgrass habitat may still be capable of supporting it. Additionally, the underlying cause of eelgrass decline and suppression over the past ten years has yet to be determined and may continue to persist.

Nevertheless, if historic eelgrass habitat in Morro Bay is still viable and capable of supporting eelgrass recovery – as appears to be the case based on Commission staff's recent site visit, the placement and use of aquaculture equipment within it may result in adverse impacts. Potential adverse impacts to benthic habitat and eelgrass from the proposed project include: (1) smothering of organisms and loss or disturbance of habitat due to the presence of bottom bags as well as hanging bags and floating bags that make contact with the underlying sediment at lower tides, and anchor and support posts on bay tidelands; (2) disturbance to sediments and eelgrass plants from longline post and anchor installation, removal activities, and ongoing operations (planting and harvest of Pacific oysters and equipment maintenance); and (3) shading from aquaculture gear and cultivation equipment (floating bags and hanging bags/baskets).

Smothering and Disturbance

The two elements of the proposed project that would primarily result in smothering and disturbance of benthic habitat are (1) the presence, placement and maintenance of the PVC anchoring stakes and support posts that would be used for the oyster cultivation equipment (floating longlines and elevated longlines/self-tipping lines); and (2) the presence, placement and maintenance of bottom bag cultivation gear. While this equipment would occupy benthic habitat on a more long-term basis and would therefore result in higher levels of smothering and disturbance, floating and hanging cultivation bags would also rest on bay sediments at lower tides and result in shorter-term smothering and disturbance effects.

PVC Posts and Anchors

Placement of the PVC post support and anchoring systems for the up to 180 proposed elevated longlines or floating longlines (a maximum of approximately 4,000 four inch diameter PVC posts) is expected to result in the long-term displacement and loss of roughly 350 square feet of benthic habitat known to support marine invertebrate communities and foraging habitat for shorebirds and marine wildlife. In addition, this activity would result in the short-term

disturbance of mudflat areas adjacent to each line, due to the foot traffic and trampling associated with the installation of the support and anchoring posts.

However, the lost and displaced habitat would be spread across roughly 4,000 sites – each with an area of approximately 12.6 square inches – and would therefore be insignificant. Additionally, in the context of the larger 12 acre project area (the conditionally approved portion of aquaculture lease no. M-614-01, parcel 2) and the 2,300 acre Morro Bay as a whole, the loss of roughly 350 square feet of mudflat habitat and short-term disturbance of adjacent areas due to foot traffic and trampling is not anticipated to adversely affect the biological productivity of the bay, or measurably reduce populations of the marine organisms that inhabit and rely on this habitat. Habitat mapping and aerial surveys of Morro Bay have shown that benthic habitat comprised of fine sand and silt sediment similar to the habitat present at the project site is extensive (covering hundreds of acres), and many of these areas support similar species and populations of marine life. Given the small size of the benthic footprint and associated disturbance areas relative to the abundance of similar benthic habitat in Morro Bay, as well as the dispersion of this footprint over several thousand very small individual sites, adverse impacts associated with the installation and presence of the system of PVC support and anchoring posts and stakes associated with the proposed oyster cultivation gear would be minimal.

Bottom Bags

Other elements of the cultivation gear MBOC proposes to use would also involve the placement of fill on benthic habitat. For example, the placement and use for oyster culture of the approximately 300 six square foot bottom bags MBOC is proposing to use would also result in the smothering and disturbance of benthic habitat. The total area proposed to be covered by these bags would be approximately 1,800 square feet, spread across a roughly 3,000 square foot area as 15 rows of 20 bags each. As discussed in a variety of studies, this use of mudflats may affect them in several ways, including by altering the chemical condition of the sediment and influencing the type, abundance, and diversity of species it supports. These effects result from sedimentation and organic enrichment caused by the oysters, as well as predator exclusion and current dampening from the presence of the aquaculture equipment on the surface of the mudflats. These effects would also be associated with the floating and elevated longlines but to a lesser degree because of the separation between the oysters and mudflat and increased water flow allowed by these cultivation methods.

Because the feeding activity of bivalve filter-feeders such as oysters results in the packaging of fine suspended material into larger feces that can rapidly settle to the seabed (especially under conditions with slow or poor water flushing and exchange) in areas of intensive shellfish cultivation, primary production and energy flow can be diverted from planktonic to benthic food webs. While the dynamics of bivalve feces deposition (settling velocity, disaggregation rate and resuspension) are poorly understood, enhanced sedimentation under areas of cultured shellfish is well documented (Castel et al. 1989; Mojica and Nelson 1993; Nugues et al. 1996; Spencer et al. 1996; Drake and Arias 1997; Spencer et al. 1997; Spencer et al. 1998; De Grave et al. 2001; Kaiser 2001; Crawford et al. 2003; Forrest and Creese 2006; Mitchell 2006; Bouchet and Sauriau 2008). As is the case for fin fish aquaculture, the accumulation of organic material beneath shellfish aquaculture facilities may result in the generation of an anaerobic environment that

promotes ammonification and sulfate reduction, increased sediment bacterial abundance, and changes in benthic community structure and biomass.

The magnitude and extent of these effects is strongly influenced by several factors, including stocking density (the number of oysters within the cultivation gear), current speed, coverage area (the total amount of contiguous area occupied by cultivation gear), coverage duration (length of time cultivation gear is in place before being moved) and fallowing frequency. In general, studies suggest that cultivation at low densities in areas with strong currents and with more separation between cultivation equipment, more frequent shifting of equipment and use of fallowing (rest periods between uses of an area) is likely to result in less substantial and more localized effects. In contrast, high density, long-term, extensive, fixed cultivation in more enclosed areas is likely to exacerbate environmental effects and lead to more severe disturbance to benthic habitat and communities. However, as a series of studies by Spencer et al. (1996, 1997, 1998) demonstrate, some benthic communities can be resilient to these types of disturbances and can return to reference conditions within months of an aquaculture harvest and removal of aquaculture equipment, even after significant changes have taken place.

The total area proposed to be used for oyster bottom cultivation by MBOC is quite limited (a total of 3,000 square feet), however, and several features of MBOC's proposed operation would also serve to limit the amount and extent of disturbance to benthic habitat that would result from it. These features include (1) the dispersion of its 300 bottom bags across 15 rows with corridors of open mudflats around and between them rather than in one large contiguous area; (2) the location of MBOC's bottom bag cultivation bed near the deeper water subtidal channel that runs through its lease and increases current speed and flushing rates in surrounding areas; (3) the modest stocking density of the bottom bags (roughly 150 oysters per bag); (4) the configuration of floating and elevated longlines and untethered bags in rows with gaps of at least five to ten feet between them; (5) the frequent (approximately every two weeks) flipping and shifting of bags (which includes relocating them, thus exposing previously covered areas of substrate); and (6) the weeks to months long fallowing of areas that occurs as production, harvest and planting volume fluctuates throughout the year and between years (for example, due to an unexpected oyster mortality event and loss of product several seasons ago, much of MBOC's cultivation area was left fallow until the following season).

In combination, these features of MBOC's operation would minimize the magnitude of any effects that the oyster cultivation gear and oysters may be having on the benthic habitat and its associated species. Although some adverse effects may occur, they would be limited as well as spatially and temporally dispersed. Therefore, the levels of disturbance to benthic habitat (changes to the community of organisms it supports and sediment chemistry) within the proposed area of MBOC's operation would not result in significant or long-lasting reductions to its biological productivity. Although specific testing and detailed analysis of the benthic habitat within MBOC's cultivation sites has not been carried out, available information from research carried out in other areas suggests that the effects to benthic habitat from MBOC's oyster cultivation operation would be - at most - modest, localized and not likely to persist once the area is left fallow or returned to a natural condition.

Eelgrass

MBOC's proposed use of bottom bags and elevated and floating longlines may also smother, disturb, shade or displace areas of more sensitive benthic habitat such as eelgrass beds. While much of MBOC's shellfish cultivation gear would be maintained in relatively fixed locations (for example, its elevated and floating longlines) that would be likely spatially restrict or limit the movement or expansion of eelgrass under and around it, MBOC also proposes to use roughly 300 untethered bottom bags. These bags would be placed in approximately 15 rows within a 3,000 square foot area, and because the number and specific location of these rows would change over time as a result of MBOC's production levels and operational practices, it would be possible for eelgrass to expand into this area during times of low use by MBOC. In addition, eelgrass is also currently growing in a variety of locations around the edges of sites MBOC currently uses or proposes to use for cultivation.

While it is unlikely that the proposed untethered bottom bag cultivation bed would support extensive eelgrass beds – particularly because MBOC began its operations during a time of relative eelgrass abundance in Morro Bay and intentionally selected the locations of its existing floating longline and bottom bag beds because of their lack of eelgrass – MBOC has nevertheless committed to avoiding any eelgrass that has or does establish within them. Specifically, in its permit application, MBOC has committed to remain at least 25 feet away from eelgrass when installing new cultivation gear. Because the size of the site MBOC has designated for untethered bottom bags (3,000 square feet) is nearly twice the size of the area that would be occupied by the up to 300 proposed bottom bags (1,800 square feet), MBOC has expressed confidence that it would be able to honor this commitment without significantly restricting or limiting its operations. MBOC's commitment to avoid eelgrass when installing new cultivation gear would also apply to its use of floating longlines and elevated longlines and its proposed installation of up to 180 new 210 foot elevated or floating longlines across six acres of new cultivation beds. This means that although MBOC has a goal of installing up to 180 new elevated or floating longlines, changes to the location and amount of eelgrass beds within the project area – and MBOC's efforts to avoid them - are likely to result in a reduction in the total number or length of lines MBOC ultimately installs.

Although the most recent eelgrass survey results from Morro Bay indicate that the proposed sites of MBOC's new cultivation beds (shown on [Exhibit 2](#)) do not currently support eelgrass, a review of historic aerial photographs and eelgrass survey results indicates that many of them supported eelgrass in 2007, 2009 and/or 2010. This was more than seven years before MBOC installed its existing elevated longline cultivation bed with 15 lines (which occurred in 2017), but the subsequent recovery of eelgrass in that cultivation bed may indicate that other areas of historic eelgrass habitat within the project area are also capable of or beginning to recover as well. In fact, during a visit to the project site on November 25, 2019, Commission staff observed numerous three to five foot diameter patches of eelgrass and extensive contiguous beds covering hundreds of square feet within several additional areas of historic eelgrass habitat that MBOC had been proposing to use for its expanded operations.²

² However, the presence of eelgrass within these areas and MBOC's commitment avoid placing new cultivation gear within 25 feet of eelgrass would mean that such areas would not be used for shellfish cultivation.

As part of its ongoing consultation with the U.S. Army Corps of Engineers (prompted by MBOC's efforts to seek federal authorization for its unpermitted existing operations and proposed expansion), the National Marine Fisheries Service is also currently evaluating which other sites within the project area may be particularly important for enabling and promoting the recovery of eelgrass in Morro Bay.

Recognizing the rarity and extremely imperiled status of eelgrass in Morro Bay at the current time and the location of MBOC's cultivation areas within an estuary of national significance and one of the state's marine protected areas, **Special Condition 7** would memorialize MBOC's commitment to avoiding eelgrass during the installation of new cultivation gear by prohibiting it from placing cultivation equipment, anchors, vessels or other gear, structures or equipment on or over eelgrass habitat, as defined by the National Marine Fisheries Service in its October 2014 California Eelgrass Management Policy. This definition specifies that eelgrass habitat includes both vegetated areas, as well as a 5 meter (16.4 foot) wide unvegetated area around them. MBOC's commitment to install all new cultivation gear at least 25 feet from eelgrass beds would be consistent with this requirement. In addition, **Special Condition 7** would also incorporate the pending results of the National Marine Fisheries Service's review of eelgrass habitat in the project area by also prohibiting the installation and use of aquaculture gear within all areas that it determines to be important for eelgrass recovery. Such areas may include mudflats in which eelgrass is not currently present but that have a strong history of supporting robust eelgrass beds and are likely to continue to have the physical characteristics needed for eelgrass to return (appropriate elevation range, substrate type, etc.). Further, **Special Condition 7** would also require MBOC to install and use its proposed elevated and floating longlines with the configuration and spacing described previously in this report and shown in [Exhibit 3](#), unless the National Marine Fisheries Service identifies a wider spacing or reduced density of equipment that would more effectively promote eelgrass recovery.

In order to help ensure that these protective measures are appropriately implemented, Special Condition 7 would also require MBOC to, prior to installing new cultivation equipment, provide the Executive Director with the results of an eelgrass survey showing that all areas of eelgrass habitat and National Marine Fisheries Service identified recovery areas would be avoided.

To additionally help minimize the effects of MBOC's oyster cultivation gear on benthic habitat and eelgrass, the Commission is also requiring in **Special Conditions 5 and 7** that MBOC remove all cultivation equipment and accumulations of oyster shell from the lease area upon expiration of this permit, and avoid and address the accidental loss and displacement of oyster shell and cultivation gear.

Benthic Disturbance from Operations

Movement of personnel and equipment to the proposed project site, as well as ongoing maintenance and use of the proposed aquaculture structures, also have the potential to result in disturbance of benthic habitats and eelgrass. This disturbance would be most likely to occur during the transit of project vessels and personnel to and from the cultivation sites, the staging of equipment and supplies for periodic repair and replacement of cultivation structures, and operations on the mudflats such as planting, harvest, and maintenance activities. These activities are proposed to be carried out during a range of high and low tides and would involve the

landing of one or more small project vessels on the mudflats near the cultivation areas, the loading or offloading of equipment and shellfish, and the movement of project personnel by foot among the bottom bags, longlines, or other aquaculture sites. Each row of untethered bottom bags and elevated or floating longlines would be separated from adjacent lines by between five and ten feet to allow access along its length. Mooring of project vessels, offloading of equipment, and movement of MBOC's employees among these access corridors on foot would result in the disturbance, crushing, and damage to benthic habitats and species. Assuming that the majority of planting, harvest, and maintenance activities would be focused within these corridors along each of the 180 proposed approximately 210- to 250-foot longline rows, roughly 4.5 acres of sediment would be adversely affected during the initial installation of the proposed cultivation structures, and periodically disturbed as a result of their ongoing maintenance and use. Additional areas would also be disturbed during the transit of project vessels to and from the lease, their mooring on tidelands, and the loading and offloading of equipment associated with the installation of the proposed elevated tumble culture lines.

To address the potential adverse impacts to marine biological resources and species of special biological significance, such as eelgrass, associated with this amount of disturbance to benthic habitats, MBOC has integrated several resource protection measures into its operations. For example, MBOC primarily makes use of cultivation equipment that floats and its personnel typically move between sites and carry out maintenance, planting and harvest activities at higher tides using skiffs to avoid the need to walk across and disturb the mudflat areas and to avoid repeated vessel landings, launchings and movement through sensitive habitat areas. In addition, MBOC typically uses consistent vessel access routes when coming and going from shore and between its cultivation areas. This use of consistent routes limits the amount of eelgrass habitat that MBOC's vessels pass through. Because the use of outboard motors through eelgrass habitat at some tidal heights can cause the eelgrass to be cut or uprooted, limiting vessel transit to a single area would protect eelgrass in other surrounding areas. During vessel transits, MBOC also maximizes its use of deeper water channels that do not support eelgrass.

To memorialize this aspect of MBOC's operations and further establish consistent vessel and personnel transit routes that avoid sensitive habitat areas such as eelgrass beds and marine mammal haul-outs, the Commission is requiring in **Special Condition 3** that MBOC develop and implement a Cultivation Site Access Plan that includes a map and protocols to minimize disturbance of areas of sensitive marine habitat. Additionally, to prevent benthic disturbance associated with the onsite storage/staging of materials on the lease area – and the potential loss or displacement of equipment into surrounding habitat areas due to current and tidal action - **Special Condition 5** would prohibit the staging and storage of equipment, tools, and materials on MBOC's cultivation sites (with the exception of materials securely stored on the work platform) and require that MBOC implement a variety of measures to avoid and address the accidental loss and displacement of cultivation gear and equipment. Such measures would include regular maintenance inspections during harvest to identify and correct worn or weathered gear at risk of breaking or escaping; clean-up events to recover materials that are accidentally lost; staff training to ensure best management practices are understood and used; and gear marking to help prevent loss and facilitate recovery. Prevention of gear loss and gear movement into sensitive habitat areas would be additionally required through the requirement in **Special Condition 2** that MBOC mark the perimeter of its bottom bag cultivation bed and only use

properly weighted bags, in order to help prevent movement of bottom bags into nearby eelgrass habitat where they could displace and smother it. Further, **Special Condition 7** also requires that MBOC avoid placement of gear, structures, or equipment on or above areas occupied with eelgrass.

Marine Debris

MBOC's proposed oyster aquaculture operation includes the placement and maintenance of several thousand individual pieces of plastic and PVC in Morro Bay. This material is associated with the hundreds of linear feet of nylon rope and cable that would be used for the floating and elevated longlines, the roughly 4,000 PVC posts that would be used to support the elevated longlines and anchor the floating longlines, and approximately 20,000 two-foot wide by three-foot long plastic mesh cultivation bags or two-foot long by one-foot wide plastic mesh cultivation baskets. As has been well documented in parts of Tomales Bay and Humboldt Bay near shellfish aquaculture operations, some of this material can disperse into the environment as debris – either due to inadequate maintenance and inspection operations or challenging oceanographic conditions (currents, tides, and wave action).

While these issues are less well known in Morro Bay and MBOC appears to have a strong record of careful maintenance and marine debris prevention, the similarities between MBOC's operation and cultivation equipment and those within other areas of California that are known to be more problematic suggests that a cautious, proactive approach would be appropriate here. The need for such an approach is further strengthened by the lack of consistent and available data on marine debris collection efforts and recovered materials in Morro Bay, and the significant amount of aquaculture debris found left behind on aquaculture lease areas when MBOC began operations. In addition, the use of common gear types, such as similarly designed bottom bags, and the historic lack of identifying marks or tags between the two existing shellfish aquaculture operations in Morro Bay, would make it difficult to determine in the future which operation is contributing the most and least to this issue. In other locations, cultivation equipment, cultivation bags and cultivation baskets in particular, are known to have been recovered substantial distances from cultivation areas, and examples are available from Morro Bay of aquaculture gear found smothering eelgrass habitat, buried in mudflats, and dispersed among the tidal salt marshes of Morro Bay State Park. The durability of the HDPE plastics used for much of the common cultivation equipment means that if it escapes, it can persist in the environment for many decades.

Even once it degrades, plastic in the ocean is increasingly understood to pose a threat to a wide range of marine organisms as it slowly breaks into smaller and smaller pieces over time. At each step in this process, plastic debris can be ingested by, entrap, or entangle marine wildlife from whales, dolphins, and seals down to sea turtles, seabirds, and fish.

To address the potential ongoing and future release and distribution of marine debris resulting from MBOC's oyster cultivation operations, the Commission is requiring in **Special Condition 5** that MBOC implement or continue a variety of best practices, including those focused on inspections following storm events; debris reduction trainings for field employees; quarterly cleanup events; gear marking; field storage of tools and construction materials; and comprehensive debris cleaning and removal activities carried out on each bed at the time of its

harvest. Although MBOC currently carries out a number of these practices voluntarily, memorializing these practices through operational requirements would help further ensure that they continue in the future. These requirements would reduce the long-term accumulation of debris within cultivation beds, prevent debris generation and loss, and promote recovery of materials lost due to storm action or other unavoidable causes. **Special Condition 5** would also help address the marine debris left behind in MBOC's lease area by prior operators by requiring MBOC, as part of its quarterly clean-up activities in Morro Bay, to specifically focus on the collection and removal of abandoned cultivation gear within its lease.

To further limit potential loss of one of the most commonly encountered types of large aquaculture debris – untethered cultivation bottom bags – **Special Condition 2** would require MBOC to demarcate in the field the boundaries of those sites in which untethered bottom bags would be used, and to only use untethered bottom bags that have been stocked with no less than two gallons or large oysters. This requirement would help prevent these bags from dispersing into surrounding areas and ensure that they are initially placed in the appropriate locations. Although the Commission has in past permits also required all bottom bags to be tethered to anchored longlines in order to prevent their movement and loss, MBOC has expressed concerns to Commission staff about the operational challenges that such a requirement would result in (primarily due to the time required to affix, maintain and detach bags from anchor lines), and has instead committed to continuing its practice of only placing untethered bottom bags in the bay if they are first found to meet a minimum weight threshold (measured as no less than two gallons of large oysters). In this way, MBOC would help ensure that all of its untethered bottom bags are heavy enough to remain in place during all but the most extreme conditions.³

An additional source of aquaculture related marine debris in Morro Bay and several other areas with long histories of shellfish cultivation has been associated with businesses that have ceased operations and left behind large quantities of equipment, cultivation structures, and gear within intertidal or subtidal lease areas. To address this issue and help ensure that funding is available to carry out clean-up of abandoned operations, the California Fish and Game Commission requires – as part of its leasing of state tidelands – that the lessees deposit funds into escrow accounts so that funding is available to be used in the event that an operation ceases prior to recovering and fully removing its equipment. However, the funds deposited into these accounts have rarely been withdrawn to fund clean-up activities and the deposited amounts have often been based on only rough approximations of clean-up, removal, and disposal costs that do not include an accurate or transparent accounting showing how they were estimated. As such, even if the funds in the escrow accounts were to be used, for many aquaculture leases they do not appear sufficient to cover actual clean-up costs. Staff of the California Fish and Game Commission and California Department of Fish and Game are currently working to address this issue, including by encouraging lessees to take steps to proactively develop and document more accurate clean-up cost estimates or simply to augment the funds in the escrow accounts for their leases. As agency staff continue to work on this issue, the clean-up fees currently contributed by MBOC will be evaluated. The availability of these funds - in combination with the requirement

³ Based on information from MBOC staff, the only time its untethered bottom bags were found to have been displaced was following a rapid series of extreme tides associated with the March 2011 tsunami. These tides also displaced more securely anchored fixed gear and tethered bottom bags as well.

in **Special Condition 1** that MBOC seek a permit amendment to remove its cultivation equipment from the bay prior to the expiration of its permit and cessation of its operations – would help ensure that MBOC’s existing and proposed cultivation equipment is ultimately removed from the bay and does not become marine debris. In other words, these measures would help prevent any subsequent holder of MBOC’s lease area from encountering the same type of debris nuisance that MBOC and the other operation in Morro Bay, Grassy Bar Oyster Company, inherited when they began operating.

The proposed removal of MBOC’s floating work platform would also introduce a potential source of marine debris. Specifically, demolition or deconstruction activities associated with separating the work platform into its component barge sections and/or removing machinery, structures and equipment from it may result in the creation and release of plastic, wood and metal debris. To help reduce this source of debris, **Special Condition 10** would require MBOC to only carry out the minimum amount of demolition and deconstruction activities necessary to tow the work platform to a boat ramp and safely remove it from Morro Bay. In addition, **Special Condition 10** would also require MBOC to carry out an underwater survey of the work platform site after it is removed in order to locate, retrieve, and properly dispose of any aquaculture debris or barge material that is accidentally released during removal or has accumulated as a result of work platform operations.

Wildlife Disturbance

The Morro Bay estuary has received state and federal recognition and protection as a critically important ecological resource. In addition to supporting a range of rare and sensitive habitat types, it is also home to an abundance of large and small wildlife from harbor seals, sea lions and sea otters to over 200 species of resident and migratory birds. MBOC’s proposed operation has the potential to adversely affect a number of these species through disturbance and interference with natural behavior such as foraging and resting.

Marine Mammals

In addition to providing opportunities for commercial shellfish cultivation, the intertidal mudflats of central Morro Bay are also used as haul-out and resting sites by the bay’s resident population of harbor seals. While no haul-out or resting sites are located in the project site or within the 150 foot minimum buffer distance recommended by the National Marine Fisheries Service, some aspects of MBOC’s operations would occur outside of its cultivation areas and may therefore come within closer proximity of known marine mammal haul-outs. For example, the movement of MBOC’s personnel and vessels to and from shore and between cultivation sites may bring them within or adjacent to marine mammal haul-out areas. In addition, both harbor seals and sea otters have been observed throughout the waters of Morro Bay and may be encountered there at any time.

To ensure these species and their critical use areas are appropriately protected, **Special Condition 6** and would prohibit MBOC and its personnel from chasing, flushing, or directly disturbing marine mammals during vessel transit, harvest, maintenance or inspection activities.

Shorebirds, Seabirds and Waterfowl

The mudflats and intertidal areas of Morro Bay – including those at and around MBOC’s cultivation areas – are widely regarded as critically important foraging habitat for a wide range of resident and migratory seabirds, shorebirds, and waterfowl such as black brant, least tern, dunlin, and several species of plover and sandpiper. In the past, MBOC has also used an elevated system of bird wire above its elevated longline cultivation bed to deter bird use and roosting. However, MBOC does not propose to continue using this system and immediately after issuance of this permit, would remove or shorten the elevated PVC posts used to support it. Discontinued use of this system on MBOC’s existing and proposed cultivation beds would help remove an impediment to the use of these areas for foraging by shorebird and seabird species.

In addition, **Special Conditions 3 and 6** would also require that during vessel transit, harvest, maintenance, inspection, and planting operations, MBOC avoid approaching, chasing, flushing, or directly disturbing shorebirds, waterfowl, or seabirds and that it establish protocols and training for its personnel in order to help ensure compliance with these measures.

Seawater Intakes

The removal of seawater through intake structures is known to result in the impingement and entrainment of marine life. The type and quantity of marine life that may be adversely affected in this way is related to the size and velocity of the intake structures. Larger, high-velocity structures can cause the impingement and entrainment of larger organisms that can include adult fish, while smaller low-velocity structures can typically only impinge and entrain smaller larval and juvenile organisms. While impingement (capture of fish and marine organisms against an intake screen due to suction) can often result in the injury or mortality of the affected organism, adverse effects of entrainment (capture of fish and marine organisms in the intake stream) vary based on the type of intake system (configuration of pipes, pressure changes, temperatures) and ultimate use of the entrained water.

As part of its proposed operations, MBOC would carry out a variety of activities that would require the use of seawater extracted from Morro Bay. These activities include (1) shellfish cleaning and sorting operations; and (2) operation of two floating upwelling systems (FLUPSYs)⁴. MBOC proposes to pump out seawater from Morro Bay for these activities.

Seawater use associated with operation of the FLUPSYs would be limited to the water drawn-in to upwelling tanks and troughs and immediately discharged back into the bay, and would therefore not include permanent removal, heating, or the pressure changes and mechanical stress that comes with movement through a long series of pipes. Because removal, heating, and mechanical stress are the primary causes of mortality for entrained organisms, the type of proposed water use associated with operation of the FLUPSYs would not be likely to result in entrainment impacts to juvenile fish and the larval and planktonic organisms within the water.

Seawater use associated with the shellfish cleaning, sorting and maintenance operations would include use of gasoline or electric powered intake equipment and thus more substantial mechanical stress, however, and would be likely to cause mortality to juvenile fish and a portion

⁴ See [Appendix B](#) for description of FLUPSYs.

of the larval and planktonic organisms in the water extracted from the bay for these uses. Among the juvenile fish known to be present within Morro Bay's waters are two species recognized with federal protection – the federally endangered tidewater goby (*Eucyclogobius newberryi*) and federally threatened south central California coast steelhead (*Oncorhynchus mykiss*).

Both the California Department of Fish and Wildlife (CDFW) and National Marine Fisheries Service (NMFS) have developed guidance and technical specifications for the use of intake structures located within water bodies in which juvenile salmonids such as steelhead are found. These guidelines are intended to protect these fish species by ensuring that intake screens are small enough to prevent their entrainment and intake velocities are low enough to not overwhelm their swimming abilities. Specifically, intake velocities are not to exceed 0.33 feet per second and mesh screening on intake structures is to be limited to 3/32 inch. The Commission has previously found these standards to reduce the potential impingement and entrainment of protected species of juvenile and adult, and has required their use on a variety of shellfish aquaculture operations that include seawater intake structures (for example, CDP No. E-11-029). **Special Condition 8** would establish these intake standards for the seawater intake systems that MBOC proposes to use for maintenance or shellfish cleaning, washing, or sorting operations. In addition, the requirement in **Special Condition 10** for MBOC to discontinue operating and remove its floating work platform within 12 months would also help address the adverse impacts to marine life associated with the platform's seawater intakes.

The installation of screening and adherence to the screening and intake velocity specifications in **Special Condition 8** would help to minimize the impacts associated with those intakes, as would the removal of the work platform and its associated intakes.

Removal of the platform would provide a greater level of protection for the threatened and endangered fish species that occupy Morro Bay as well as the other marine biological resources it supports. Given Morro Bay's inclusion in state designated marine protected areas and the national estuary program, **Special Condition 10** would provide the special protection required by the Coastal Act for such areas of special biological significance.

Invasive Biofouling Species

Shellfish farms and other artificial structures in marine environments provide three dimensional habitats for colonization by fouling organisms and associated biota (e.g., Costa-Pierce and Bridger 2002; McKindsey et al. 2006), and in many cases may provide a larger surface area of suitable hard substrate for attachment of fouling organisms than is available in the natural benthos (e.g., in soft-bottom areas). In addition, the fouling communities that develop on artificial structures can be quite different from those in adjacent rocky areas (Glasby 1999; Connell 2000). Artificial structures in central California, including piers, barges, docks and oil platforms, support a wide variety of invasive marine fouling species, including species known to present significant economic and ecological risk to marine areas along the west coast. Maintenance activities for in-water structures and vessels that involve periodic removal of fouling organisms without proper collection and disposal protocols may result in increased dispersal and propagation opportunities for these species. In addition, oyster cleaning, sorting and packing operations (which involve removing and mechanically processing fouled equipment and shellfish from the bay) also present a dispersal risk. Such opportunities for dispersion and

spread pose a particular risk with some algal species and colonial species (such as the invasive tunicates *Didemnum vexillum* and *Botrylloides violaceus*; limited amounts of which have been observed growing on MBOC cultivation equipment) that may break apart into many pieces when disturbed, each of which may be capable of surviving, growing, and reproducing on its own.

In order to minimize the risk of spreading and dispersing invasive species, MBOC would make use of catchment or containment trays around oyster cleaning and processing operations. Use of such trays would capture the largest fouling materials and prevent their release into the bay. In order to further guard against the spread and dispersion of non-native organisms into Morro Bay, the Commission is also adopting **Special Condition 9**, which prohibits MBOC from intentionally disposing of any equipment or waste, including living or dead shellfish, shells, or non-native fouling organisms, into the marine environment, and requires that all biological materials removed during cleaning operations be collected and disposed at an appropriate upland facility and that no direct discharge of wash water or non-native fouling materials occur during maintenance, cleaning, sorting or packing operations.

Conclusion

Although the Commission finds that the proposed project has the potential to adversely impact marine resources and the biological productivity of coastal waters, with implementation of **Special Conditions 1 through 11**, the project would be carried out in a manner in which marine resources are maintained, species of special biological significance are given special protection, the biological productivity of coastal waters is sustained, and healthy populations of all species of marine organisms will be maintained. In addition, the proposed project, as conditioned, would maintain the biological productivity of coastal waters appropriate to maintain optimum populations of marine organisms. The Commission therefore finds that the proposed project, as conditioned, is consistent with the marine resource sections (Sections 30230 and 30231) of the Coastal Act.

E. OIL SPILLS

Section 30232 of the Coastal Act states:

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

The proposed project includes the operation of up to three vessels that could potentially increase the chance of a vessel collision, equipment failure, breach or leak leading to a release of fuel oil into marine waters during project construction/installation and operational activities. In addition, until it is removed within 12 months, MBOC's proposed operational activities also include the use of a gasoline powered generator and intake pump on a floating work platform. Spills could occur during fueling of this equipment or the machinery could fail or leak and discharge oils into marine waters.

The first test of Coastal Act Section 30232 requires an applicant to "protect against the spillage of crude oil, gas, petroleum products, or hazardous substances..." In this case, MBOC has

incorporated into its operations a number of practices that reduce the risk and consequences of an oil spill. For example, MBOC only operates vessels during daylight hours, uses safe navigation and vessel handling practices, stows fuel and oil in sealed compartments, and maintains only the minimum quantity of hazardous materials on board its vessels and floating work platform (until that platform is removed from the bay pursuant to Special Condition 10).

Notwithstanding implementation of the above-described prevention measures, accidental spills can and do occur. The second test of Section 30232 requires that effective containment and cleanup facilities and procedures be provided for accidental spills that do occur. To meet this test the Commission typically requires an applicant to submit an oil spill contingency plan that demonstrates that the applicant has sufficient oil spill response equipment and trained personnel to contain and recover a reasonable worst case oil spill, and to restore the coastal and marine resources at risk from a potential oil spill.

Because neither of these requirements have been met, **Special Condition 11** would provide that MBOC submit, for Executive Director review and approval, a Hazardous Material Spill Prevention and Response Plan that includes identification of potential spill sources and quantity estimates of a project specific reasonable worst case spill; identification of prevention and response equipment and measures/procedures that will be taken to prevent potential spills and to protect marine and shoreline resources in the event of a spill; the provision of spill prevention and response equipment onboard project vessels at all times and on the work platform while it is still in place within the bay; and emergency response and notification procedures, including a list of contacts to call in the event of a spill. This Hazardous Material Spill Prevention and Response Plan would complement the practices described above that MBOC has already integrated into its operations and would take the form of a more typical stand-alone Plan that would be made available on each vessel deck for reference in the event of an incident. Such a plan would include the requisite spill notification number (the State Warning Center number 1-800-852-7550) in an easy to find location on the front page, along with the appropriate list of specific local contact names and numbers that will be called. Additionally, the plan required in **Special Condition 11** would also specify the total, worst-case volume of hazardous materials on the vessels and detail the type and quantity of response equipment that would be kept available on the vessel to address such a worst-case spill.

With implementation of the measures described above and in **Special Condition 11**, the Commission finds that MBOC would be undertaking appropriate measures to prevent a spill from occurring and effectively contain and respond to accidental spills that may occur. Therefore, the Commission finds the project consistent with the second test of Coastal Act Section 30232.

F. ALLEGED VIOLATION

As noted above in the Summary, violations of the Coastal Act exist on the subject property, including, but not limited to, installation and use of bottom bags, floating and elevated longlines, FLUPSYs, and a floating work platform. In response to notification by Commission permitting and enforcement staff about these Coastal Act violations, as well as its desire to carry out additional proposed development, MBOC submitted this CDP application. Approval of this application pursuant to the staff recommendation, issuance of the permit, and the applicant's

subsequent compliance with all terms and conditions of the permit would result in resolution of the above described violations going forward.

Although development has taken place prior to the submission of this Coastal Development Permit application, consideration of this application by the Commission has been based solely upon the Chapter 3 policies of the Coastal Act. Commission review and action on this permit does not constitute a waiver of any legal action with regard to the alleged violations, nor does it constitute an implied statement of the Commission's position regarding the legality of development, other than the development addressed herein, undertaken on the subject site without a coastal permit or permit amendment. In fact, approval of this permit is possible only because of the conditions included herein, and failure to comply with these conditions would also constitute a violation of this permit and of the Coastal Act. Accordingly, the applicant remains subject to enforcement action just as it was prior to this permit approval for engaging in unpermitted development, unless and until the conditions of approval included in this permit are satisfied.

Failure to comply with the terms and conditions of this permit may result in the institution of enforcement action under the provisions of Chapter 9 of the Coastal Act. Only as conditioned is the proposed development consistent with the Coastal Act.

G. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Section 13096 of the Commission's administrative regulations requires Commission approval of coastal development permit applications to be supported by a finding showing the application, as modified by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act ("CEQA"). Section 21080.5(d)(2)(A) of CEQA prohibits approval of a proposed development if there are feasible alternatives or feasible mitigation measures available that would substantially lessen any significant impacts that the activity may have on the environment. The project as conditioned herein incorporates measures necessary to avoid any significant environmental effects under the Coastal Act, and there are no less environmentally damaging feasible alternatives or additional, feasible mitigation measures available that would lessen the project's impacts. Therefore, the proposed project is consistent with CEQA.

Appendix A: Substantive File Documents

Coastal Development Permits and Application Materials:

Coastal Development Permit Application No. 9-19-0386 and associated file.

Adopted Findings for Coastal Development Permit Nos. E-11-029; E-12-012-A1; 9-14-0489; 9-17-0646; 9-18-0002-A1; 9-18-0278.

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Appendix B – Expanded Project Description

Shellfish Cultivation Methods

Although MBOC’s aquaculture lease include a total of roughly 12.6 acres of intertidal mudflats and subtidal areas that are conditionally approved by CDPH for cultivation, MBOC’s existing operation makes use of only about 2.2 of these acres. This area is divided between two separate cultivation sites and an approximately 2,600 square foot system of connected barges used as a work platform, as shown in [Exhibit 5](#). Within these sites, MBOC carries out three different kinds of shellfish growing activities that involve different types of gear and equipment. The methods include floating longlines, self-tipping longlines, and bottom bags.

Floating Longlines

MBOC’s use of floating longlines involves the use of 40 individual longlines, each of which is approximately 250 feet long and supports up to 100 six square foot plastic mesh oyster cultivation bags. The lines are anchored to the mudflat at either end using PVC posts and a small “crab float” buoy or Styrofoam block is attached to each cultivation bag to allow it to float on the water surface during mid and high tides. At low tides, the cultivation bags rest directly on the underlying mudflats.

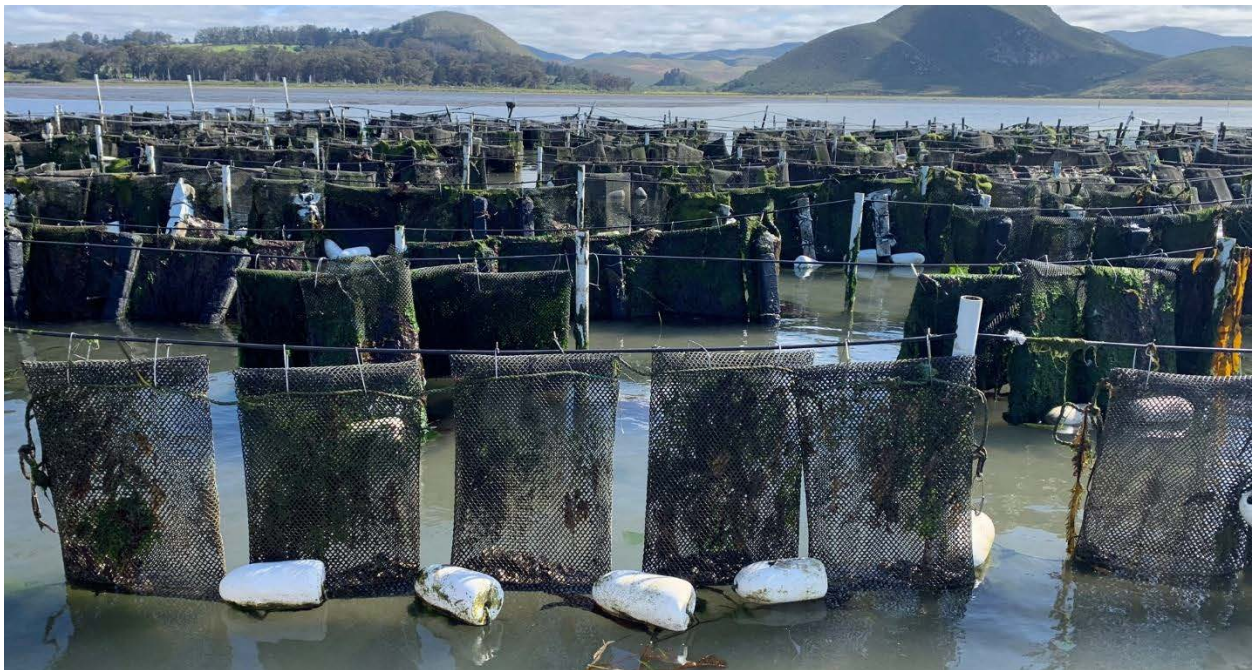
MBOC’s 40 existing floating longlines are arranged parallel to one another in two rows, with a space of approximately eight feet between lines and cover a total area of roughly 1.8 acres. The images below show MBOC’s floating longline cultivation bed from several hundred feet above and individual lines and attached cultivation bags from ground level.



Elevated/Self-Tipping Longlines

MBOC’s second cultivation method is an elevated longline system used for “self-tipping” or hanging cultivation bags. MBOC has 15 of these elevated longlines and as shown in the image below (overhead photograph of the first five and a half lines that MBOC installed), each one is made up of two approximately 100 foot lengths separated in the center by a ten foot access lane for a total length of roughly 210 feet. Each line supports up to 100 cultivation bags. The lines are anchored at either end with PVC posts or helical anchors and supported along their length with 21 additional PVC posts that hold the line and bags roughly four feet above the mudflats.

MBOC has also installed taller PVC posts at the ends and center of each line in order to support an overhead system of bird deterrent wire. However, this wire was not installed and MBOC no longer proposes to use it. Within its existing elevated longline cultivation bed, MBOC has proposed to remove or shorten the taller PVC posts to the height of the other posts (roughly four feet above the mudflat) within one month of receiving a CDP. Each cultivation bag used on the elevated longlines has a crab float affixed to it that allows the bag to float and move in the water column at higher tides. The elevated longlines are arranged in groups of four lines spaced roughly five feet apart, with wider spacing of ten feet between each group of four lines. In total, MBOC’s existing elevated longlines cover approximately 15,000 square feet, as shown in [Exhibit 2](#), and are arranged in a slightly northwest to southeast angle to minimize exposure to prevailing wind and currents.



Bottom Bags

Adjacent to its floating longline area, MBOC has a small area of higher elevation mudflats that is used for approximately 100 cultivation bags (arranged directly on the mudflat in five rows of twenty bags each). These untethered “bottom bags” are used for larger oysters and rest directly

on the mudflats. Each bag covers approximately six square feet, and the area used for the 100 bags covers approximately 1,100 square feet.

Installation, replacement and maintenance of the floating longlines, elevated longlines, and bottom bags described above would all be carried out by MBOC personnel using hand tools. Support from one of MBOC's three, 18-25 foot long flat bottom Carolina skiff vessels (powered with outboard motors) would also be provided periodically as needed.

Proposed Expansion and Modification of Cultivation Areas

In addition to requesting after-the-fact approval for the shellfish cultivation activities it has carried out for the past ten years without benefit of a coastal development permit, MBOC is also proposing to continue, expand and modify its operations. These changes would be carried out over the next several years and would include (1) the addition of up to 140 elevated longlines or floating longlines in eleven new cultivation beds across approximately six acres; (2) the conversion of some or all of MBOC's existing floating longline cultivation bed to an elevated longline cultivation bed through the replacement of up to 40 existing floating longlines with elevated longlines; and (3) the addition of up to 200 bottom bags.

Bottom Bags

MBOC's proposed addition of up to 200 untethered oyster cultivation bottom bags would slightly expand the existing area in the southeast portion of its lease currently used for 100 bottom bags, which together would cover a total of roughly 3,000 square feet of open intertidal mudflats.

New Cultivation Beds

MBOC's proposed addition of up to 140 new elevated (self-tipping) longlines or floating longlines would be spread across 11 cultivation beds. Eight of these beds would be configured with a maximum of 15 lines each using the same design, spacing, and configuration as MBOC's existing elevated longline cultivation bed. Specifically, each line would be a maximum of 210 feet long, would support up to 100 bags and be held four feet above the mudflat using 21 evenly spaced PVC posts. Floating longlines would be installed with the same length and spacing but would only be secured at the end of each line (so they can float with the tide) rather than elevated throughout. New lines of either type would be installed with lanes of at least five feet wide between each line and at least ten foot wide lanes between each group of four lines (and midway along each line). The eight beds would support up to 120 individual lines, and each bed would be separated from adjacent beds with at least 15 foot wide transit lanes to the north/south and at least a 30 foot wide transit lane to the east/west (as shown in [Exhibit 3](#)).

The remaining three smaller cultivation beds would be triangular shaped to fit within the corners of the conditionally approved portion of the lease not occupied with bottom bags (as shown in [Exhibit 2](#)) and would use half-length elevated or floating lines. MBOC would install up to 20 such lines across these three beds. These lines and beds would be installed with the same minimum spacing between lines and in transit lanes.

Although MBOC anticipates installing and using hanging cultivation bags on its elevated longlines, it has also applied to install and use plastic mesh cultivation baskets in place of the cultivation bags. The baskets would be installed with the same configuration (100 per line).

Conversion/Modification

In addition to the proposed installation of new cultivation beds, MBOC also proposes to convert its existing floating longline cultivation bed to elevated longlines. This would entail replacing up to 40 of the existing floating longlines in this bed with an equal number of elevated longlines, designed, installed, and configured as described above. This conversion would occur entirely or partially, based on future growing conditions and MBOC's success using the elevated longline cultivation method.

In total, MBOC's 140 new cultivation lines, 55 existing cultivation lines and new and existing bottom bags would involve the use of up to 20,000 individual oyster cultivation bags or baskets on approximately 8.2 acres of cultivation beds.

Installation

Proposed installation of the elevated longlines would be carried out by hand, and would involve the exclusive use of non-mechanized hand tools such as post drivers and augers to place helical earth anchors into the mud at either end of the 210 foot lines, as well as approximately 21 PVC posts at equally spaced intervals along its length. These posts would be three inches in diameter and extend approximately three feet into and above the mudflat. They would support a ¼ inch cable upon which the mesh cultivation bags would be affixed. The equipment would be brought to the site by hand at low tide or using one of MBOC's vessels at higher tide, and it would be temporarily kept in place until installed. MBOC anticipates carrying out the installation of the up to 140 proposed elevated longlines in multiple phases spread across several years during low-tide cycles when the mudflats are exposed and accessible on foot.

Planting, inspection and harvest of the cultivation bags along these lines would be carried out by MBOC personnel on foot at low tide or at high or mid-tide, using one of MBOC's flat bottom vessels.

Floating Work Platform

In addition to its proposed six acre expansion and continuing use of cultivation beds described above, MBOC also proposes to continue using and to redesign and replace, within two years, an approximately 2,600 square foot floating work platform/barge system currently moored within lease area M-614-01, Parcel 2. The existing work platform is made up of nine separate barges/rafts that range in size from 8' x 20' to 24' x 20' and have been affixed together with rope. Bird netting and three shade canopies have been installed on the barges to provide sun protection and prevent bird roosting. Floatation for the barges is provided by air filled polyethylene barrels and expanded polystyrene foam filled dock floats. The platform also has two small shed structures with solid wooden walls and corrugated roofs – one for the restroom area and one for secure equipment storage. These structures and the shade canopies extend approximately nine feet above the barge's decking.

Images of this platform is provided below and a schematic diagram of its components is included in **Exhibit 5**.



Unlike most shellfish aquaculture operations in California, those carried out by MBOC include use of an on-water floating work platform. Many activities related to oyster cultivation that would typically take place at an onshore site or work vessel – such as shellfish sorting, culling, cleaning, packing for sales, and equipment storage – are instead carried out within Morro Bay itself on MBOC’s floating work platform. MBOC also has an onshore work area that it uses for storage, equipment cleaning and repair activities and vessels that it uses to support oyster harvest, planting and transport, but it relies on its floating work platform for a range of other activities not directly related to oyster cultivation.

MBOC’s floating work platform is anchored in place in depths of roughly 10 to 25 feet with three weighted mooring blocks. Power on the facility is provided by a gasoline generator, water is provided through a seawater intake system and two gasoline powered pumps, and it is equipped with a restroom area and handwashing station. Additionally, the barge has an electric tube sorter/tumbling machine and two large tables used to wash and sort oysters by size.

Oysters are supplied to this equipment by affixing a longline (with attached cultivation bags) to an electric winch on a portion of the barge. The winch is then used to pull the longline up a ramp onto the work platform where the cultivation bags can be accessed by MBOC personnel. The cultivation bags are opened to remove the oysters, and they are placed directly into the tube sorter or sorting table for processing. During this processing, the oysters are washed in water extracted from the surrounding bay through an intake system and the wash water and associated debris is captured in catchment trays or discharged over the side of the work platform. Once the oysters are cleaned and sorted by size, those that require additional growout are placed back in cultivation bags and reattached to the longlines, and those that are mature are packaged for sale and transport to shore.

Packaging of oysters is carried out on the platform through the use of an automatic bagger machine powered by electricity and compressed air. Once packaged, the oysters are brought directly to shore or placed within a submerged wet storage enclosure on the work platform.

The barge is also used to store commonly used equipment such as bottom bags, PVC posts, tools, and storage containers and as a break area for MBOC personnel.

Floating Upwelling Systems (FLUPSYs)

FLUPSYs or nursery rafts are used to quickly grow shellfish seed to the size needed for outplanting on an aquaculture farm. These are in-water floating structures designed to upwell nutrient rich water through upwelling bins to provide a consistent source of nutrients to growing shellfish. The two FLUPSYs that MBOC proposes to continue operating are located outside of its aquaculture lease and held by mooring lines on the inner side of an existing dock structure managed by the City of Morro Bay near the Morro Bay T-Pier (as shown in the image below). The FLUPSYs are constructed of wood, and each would have eight submerged square mesh-bottom bins attached to a 12 foot long central fiberglass trough, which would be continually drained by an electric pump and allowed to naturally refill from surrounding bay waters. The trough and bins for each FLUPSY would be built into an approximately eight foot wide by 20 foot long raft, as shown in [Exhibit 5](#).

Within the FLUPSY bins, small oysters and clams (referred to as “seed”) would be placed after purchase from an offsite shellfish hatchery. This seed would be grown and sorted by size every several weeks using a sorting table and seawater filled tank on one of the FLUPSYs. Sorting would be done using a series of hand-held screens, and the largest oysters or clams would be brought to MBOC’s lease areas for planting and further grow-out.

