

**CALIFORNIA COASTAL COMMISSION**

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**REVISED FINDINGS**

**Application No.:** E-01-008

**Project Applicant:** Monterey Abalone Company

**Project Location:** Municipal Wharf #2, Monterey Harbor, Monterey County

**Project Description:** Construct and operate an abalone grow-out facility to cultivate up to 500,000 red abalone in Monterey Harbor, including the installation of walkways and seawater pumping system under the wharf and placement of concrete moorings on the seafloor.

**Substantive File Documents:** Appendix B

**Prevailing Commissioners:** Dettloff, Allgood, Hart, Lee, McCoy, Potter, Reilly, Woolley, Wan

**SYNOPSIS**

The Monterey Abalone Company ("MAC") proposes to construct and operate a facility to cultivate up to 500,000 red abalone (*Haliotis rufescens*) from juveniles to maturity in two types of "culture units," barrels and cages, to be suspended in the water under Municipal Wharf #2 in Monterey Harbor. Monterey Harbor is located 110 miles south of San Francisco in Monterey Bay in Monterey County, adjacent to the Monterey Bay National Marine Sanctuary (Exhibit 1, "Project Location").

The MAC has been operating its facility since 1992 without benefit of a coastal development permit. In this application, the MAC proposes to authorize its existing operations (the culture of

approximately 170,000 abalone per year) and to expand its operation up to 500,000 abalone at full build out.

The MAC proposes to purchase small "seed" abalone (at about one year old, the seed abalone are 25-30 millimeters in shell length, 3-5 grams in weight) from hatcheries at various locations in California. The MAC will then grow the abalone out to market size (after two to three years of growth, approximately 85 millimeters in length, 110 grams in weight). The seed abalone will be stocked into culture units at a high density and monitored on a weekly basis. As the abalone grow, the number of abalone per culture unit will be reduced to maintain desired growth rates.

Beneath the deck of the wharf, the MAC proposes to construct six walkways and a platform among the concrete pilings that support the wharf. (Exhibit 2) The walkways will be used for suspending the culture units in the water, and the platform will be used for abalone cultivation activities such as cleaning of culture units. The MAC proposes to use two types of culture units, barrels and cages, both of which will be suspended in the water using a variety of mooring techniques and materials, including ropes, metal clips and plastic fasteners in a variety of configurations. The majority of the barrels and cages will be attached with rope to a primary taut rope that stretches between the facility's sub-wharf walkways and the cement moorings placed on the seafloor. Seawater, to wash down the abalone culture units, will be obtained through a 1.5" intake pipe located on the central platform.

Existing buildings on the wharf will be used as an office and a workshop; the workshop will be used for fabrication and maintenance of the culture units for rearing abalone, as well as for packing abalone for delivery to customers.

Table 1 summarizes project-related issues, potential resource impacts, and the conditions of approval to avoid, or reduce to a level of insignificance, adverse resource impacts.

On August 8, 2001, the Commission, by a vote of 9-0, approved the proposed project as conditioned.

The Commission staff recommends approval of the revised findings for application E-01-008.

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Table 1. Issue Summary: Potential Impacts and Proposed Conditions and Measures

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
<p><b>Marine Resources: Sabellid Polychaete Worm</b></p>	<p><b>Issue:</b> Possible introduction of the sabellid polychaete worm, an exotic species that deforms abalone shells and ultimately inhibits growth, which could have serious impacts on stocks of native marine gastropods if spread.</p> <p><b>Mitigation Measures:</b></p> <p><b>Special Condition 1</b> requires that the applicant obtain abalone seed stock only from the following sources: a facility that has been certified as a 'sabellid-free' facility by the California Department of Fish and Game ("CDFG"); <b>or</b> a facility that has had at least one spot inspection and has passed <b>all</b> spot and transfer inspections for the sabellid polychaete worm performed by the CDFG or a CDFG-designated inspector within the past 24 months. "Passing" an inspection is defined as complying with all CDFG inspection requirements and receiving a 100% negative determination for the presence of sabellid polychaete worm. Special Condition 1 further requires that the applicant fully adhere to the CDFG's transfer and inspection procedures for sabellid polychaete worm. Lastly, Special Condition 1 requires that if a sabellid infestation is detected at the facility, the applicant must immediately remove from marine waters the culture unit in which the infested animal was found and comply with all CDFG requirements for eradication and prevention of further infestation.</p> <p><b>Special Condition 3</b> prohibits disposal of any equipment or waste, including shells or kelp debris, into the marine environment. All debris from culture units must be disposed of on land.</p>
<p><b>Marine Resources: Withering Syndrome</b></p>	<p><b>Issue:</b> Spread of withering syndrome, a disease established in the wild south of San Francisco and subendemic in the Crescent City area.</p> <p><b>Mitigation Measure:</b></p> <p>CDFG has imposed a conditional ban on the transfer of infected seed stock to facilities in the area between San Francisco and Crescent City, and between facilities in the area north of Crescent City, contingent upon the results of a CDFG health exam showing no signs of Rickettsiales-Like Prokaryote ("rickettsia"), the suspected causative agent. Transfer is allowed if seed is inspected and meets CDFG's requirements.</p> <p><b>Special Condition 2</b> requires the applicant comply with all CDFG restrictions on the transfer of abalone and abalone seed, and with all CDFG withering syndrome inspection requirements prior to transfer of abalone or abalone seed. The applicant is also required to destroy any and all abalone that develops symptoms of withering syndrome.</p>
<p><b>Marine Resources: Water Quality</b></p>	<p><b>Issue:</b> Potential for depletion of dissolved oxygen in the water column.</p> <p><b>Mitigation Measures:</b></p> <p><b>Special Condition 3</b> prohibits disposal of any equipment or waste, including shells or kelp debris, into the marine environment. All debris from culture units must be disposed of on land.</p>

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
	<p><b>Special Condition 4</b> requires removal of all abalone, grow-out structures, moorings, materials, and equipment upon cessation of operations.</p>
<p><b>Marine Resources: Benthic Habitat</b></p>	<p><b>Issue:</b> Potential for impacts to benthic habitat and marine organisms.</p> <p><b>Mitigation Measures:</b></p> <p><b>Special Condition 3</b> prohibits disposal of any equipment or waste, including shells or kelp debris, into the marine environment. All debris from culture units must be disposed of on land.</p> <p><b>Special Condition 4</b> requires removal of all abalone, grow-out structures, moorings, materials, and equipment upon cessation of operations.</p> <p><b>Special Condition 5</b> prohibits the applicant from using non-native kelp or alternative abalone feed that contains antibiotics or hormones to feed the abalone cultured at its facility.</p> <p><b>Special Condition 6</b> prohibits the applicant from purchasing and culturing transgenic or genetically modified abalone seed stock.</p>
<p><b>Marine Resources: Kelp Harvesting</b></p>	<p><b>Issue:</b> The new demand for kelp to feed the abalone at the proposed facility could lead to adverse impacts on local kelp beds.</p> <p><b>Mitigation Measure:</b></p> <p>The CDFG and the Fish and Game Commission (F&amp;GC) recently updated kelp harvesting regulations in early 2001 to improve protection of kelp resources. The new regulations close a small portion of Bed 220 (the primary bed from which the proposed facility would harvest kelp); expand the area where bull kelp may be taken by hand harvest only, from Point Montera south to Santa Rosa Creek; restrict all harvesting of bull kelp within the Monterey Bay National Marine Sanctuary from March 1 through July 31 each year; establish new rules on how harvested kelp is to be weighed; specify how harvest quantities must be reported; create new kelp bed closures, particularly of kelp beds whose canopies are small and susceptible to impacts of overharvesting; and give the F&amp;GC the authority to control or restrict kelp harvesting on an emergency basis without formal revision of harvesting regulations. The new harvesting restrictions provide additional protection for local kelp beds.</p>
<p><b>Recreation: Kelp Harvesting</b></p>	<p><b>Issue:</b> Harvesting of the kelp canopy around Monterey Bay could affect recreational opportunities and other non-consumptive uses of kelp.</p> <p><b>Mitigation Measure:</b></p> <p>The CDFG and the Fish and Game Commission recently reviewed and updated kelp harvesting regulations in early 2001. The new regulations close a small portion of Bed 220 to harvesting to protect it for non-consumptive uses such as recreation and tourism.</p>

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Appendix A. Standard Conditions

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## 1.0 STAFF RECOMMENDATION

### Motion:

I move that the Commission adopt the revised findings in support of the Commission's action on August 8, 2001 conditionally approving Coastal Development Permit Application No. E-01-008.

### Staff Recommendation of Approval:

Staff recommends a YES vote on the motion. Passage of this motion will result in the adoption of revised findings as set forth in this staff report. Pursuant to PRC §30315.1, the motion requires a majority vote of the members from the prevailing side present at the August 8, 2001 hearing, with at least three of the prevailing members voting. Only those Commissioners on the prevailing side of the Commission's action are eligible to vote on the revised findings.

### Resolution:

The Commission hereby adopts the findings set forth below for Coastal Development Permit Application No. E-01-008 on the ground that the findings support the Commission's decision made on August 8, 2001 and accurately reflect the reasons for it.

## 2.0 STANDARD CONDITIONS      Appendix A

## 3.0 SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

### 1. Sabellid polychaete worm.

A. The applicant shall obtain abalone seed stock only from the following sources:

- i) a facility that has been certified as a 'sabellid-free' facility by the California Department of Fish and Game ("CDFG"); or
- ii) a facility that has had at least one spot inspection and has passed **all** spot and transfer inspections for the sabellid polychaete worm performed by the CDFG or a CDFG-designated inspector within the past 24 months. "Passing" an inspection is defined as complying with all CDFG inspection requirements and receiving a 100% negative determination for the presence of sabellid polychaete worm.

B. The applicant shall fully adhere to the CDFG's transfer and inspection procedures for sabellid polychaete worm.

- C. If a sabellid infestation is detected at the facility, the applicant shall immediately remove from marine waters the culture unit in which the infested animal was found and comply with all CDFG requirements for eradication and prevention of further infestation.
2. **Withering Syndrome.**
    - A. The applicant shall comply with all CDFG restrictions on the transfer of abalone and abalone seed, and with all CDFG withering syndrome inspection requirements prior to transfer of abalone or abalone seed.
    - B. The applicant shall immediately destroy any and all abalone that develops symptoms of withering syndrome.
  3. **Waste disposal.** The MAC shall not dispose of any equipment or waste, including shells or kelp debris, into the marine environment. All debris from culture units shall be disposed of on land.
  4. **Facility removal.** Upon cessation of operations, the MAC shall remove all abalone, grow-out structures, mooring devices, materials, and equipment within 90 days.
  5. **Restrictions on abalone feed type.** The MAC shall not use non-native kelp or alternative abalone feed that contains antibiotics or hormones to feed the abalone cultured at its facility.
  6. **Prohibition on purchase and culture of transgenic or genetically modified seed stock.** The MAC shall neither purchase nor culture transgenic or genetically modified abalone seed stock.

#### 4.0 FINDINGS AND DECLARATIONS

##### 4.1 Project Location

Monterey Harbor is located 110 miles south of San Francisco in Monterey Bay in Monterey County, adjacent to the Monterey Bay National Marine Sanctuary (Exhibit 1, "Project Location"). Monterey Harbor includes the Monterey Municipal Marina (a 413-slip, full service marina with a public launch ramp), Fisherman's Wharf (with restaurants, shops, dinghy docks and a guest dock), Municipal Wharf #2, Breakwater Cove Marina (a private 70-slip marina and fuel dock), Monterey Bay Boatworks, an open anchorage area, the Monterey Harbor breakwaters, and the Coast Guard wharf. The harbor also provides opportunities for commercial fishing and recreational activities such as fishing, sailing, kayaking, and whale-watching.

The proposed location of the Monterey Abalone Company ("MAC") facility is Municipal Wharf #2, owned by the City of Monterey, which was constructed in 1926 and is the easternmost structure in Monterey Harbor. Wharf #2 hosts five wholesale fish companies, the abalone facility that is the subject of this staff report, public restrooms, snack bar, restaurants, a boat

hoist, and the Monterey Peninsula Yacht Club. The MAC leases its space on and below the wharf from the City of Monterey. Commercial dive charters depart from the west side of Wharf #2. A 700-foot fishing promenade extends out from Wharf #2 and covers the protective sea wall on the east side of the marina. Anglers may fish from the east side of the wharf, but no fishing is allowed around the commercial facilities and in the marina for safety reasons.

#### 4.2 Project Description

The MAC proposes to construct and operate a facility to cultivate up to 500,000 red abalone (*Haliotis rufescens*) from juveniles to maturity in two types of "culture units," (barrels and cages) to be suspended in the water under Municipal Wharf #2, in Monterey Harbor. The MAC facility has been operating since 1992 without benefit of a coastal development permit, and therefore the proposed project application is not only for a permit for the existing facility size, but also for "full buildout" or the maximum facility size. Table 2 summarizes the proposed project's initial size and the size of the facility at full buildout.

**Table 2. Proposed project at initial size versus full buildout**

<b>CHARACTERISTIC</b>	<b>INITIAL PROJECT SIZE</b>	<b>FULL BUILDOUT (Cumulative total maximum)</b>
Number of walkways beneath wharf	6	16
Number of moorings placed on seafloor	130	190
Square footage of moorings placed on seafloor	436	636
Number of abalone cultured at the facility	170,000	500,000
Quantity of kelp harvested to feed abalone	5 tons/week maximum	10 tons/week maximum

The MAC proposes to purchase "seed" abalone (at about one year old, the seed abalone are 25-30 millimeters in shell length, 3-5 grams in weight) from hatcheries at various locations in California. The MAC will then grow the abalone out to market size (after two to three years of growth, approximately 85 millimeters, 110 grams). The seed abalone will be stocked into culture units at a high density and monitored on a weekly basis. As the abalone grow, the number of abalone per culture unit will be reduced to maintain desired growth rates. During the grow-out period, the abalone will be fed once a week, and the culture units will be cleaned once every two weeks. The cleaning of units entails hauling the culture unit out of the water using either a block and tackle, or a battery powered winch. The culture unit is placed on a walkway, and the outside is scrubbed with a brush to remove fouling organisms that might plug the mesh. The unit is opened, mesh windows are scrubbed from the inside, and any abalone that may have died are removed. Kelp adequate to feed the abalone for a week is then added to the culture unit, and the unit is returned to the water.

The culture units will be suspended in the water using a variety of mooring techniques and materials, including ropes, metal clips and plastic fasteners in several configurations. The



majority of the barrels and cages will be attached with rope to a primary taut rope that stretches between the facility's sub-wharf walkways and the cement moorings placed on the seafloor. The MAC proposes to place 130 concrete moorings (covering 436 square feet of seafloor) initially, and during expansion would install, at maximum, 60 additional moorings, for maximum total of 190 moorings (covering 636 square feet of seafloor total).

The MAC proposes to use an office and a workshop on the wharf; the office is to be used for administrative and sales activities, and the workshop will be used for fabrication and maintenance of the culture units for rearing abalone, as well as for packing abalone for delivery to customers. Beneath the deck of the wharf, the MAC proposes to construct six walkways and a platform among the concrete pilings that support the wharf, with a total of sixteen walkways at full buildout. The walkways will be used for suspending the culture units in the water, and the platform will be used for abalone cultivation activities such as cleaning of culture units. The walkway and platform designs have already been approved by the engineering department of the City of Monterey.

MAC also proposes to install a seawater pumping system to wash down the abalone culture units. Seawater will be obtained through a 1.5" intake pipe located on the central platform. Other components of the system include a pump and pressure tank.

The MAC proposes to harvest giant kelp (*Macrocystis pyrifera*) by hand in a 22-foot skiff four days per week in nearby kelp beds (usually in Bed #220 which is an open bed regulated by the Department of Fish and Game), for a typical harvest total of 5 tons of kelp per week, and a maximum of 10 tons of kelp per week at full build-out. The kelp will be transported directly to the MAC facility under the wharf and fed to the abalone. As an alternative to using native, locally harvested kelp as abalone feed, the MAC also proposes to use alternative and experimental abalone feeds, including raw vegetables, when kelp is not available.

This application does not include the construction of an abalone hatchery or nursery as a part of its proposed project description. If the MAC wishes to construct and operate an abalone hatchery or nursery, it must apply for an amendment to this coastal development permit.

#### **4.3 Other Agency Approvals**

##### **4.3.1 City of Monterey**

The State Lands Commission granted the tidelands in which the proposed project would occur to the City of Monterey, which approved the proposed project as landowner. The MAC has a lease from the City of Monterey to construct platforms and walkways underneath Municipal Wharf #2 and to operate its facility. The City of Monterey's Chief of Planning determined that the proposed project is categorically exempt from the California Environmental Quality Act review process. The City of Monterey Harbormaster has approved the proposed project.

### **4.3.2 California Department of Fish and Game**

The California Department of Fish and Game ("CDFG") requires permits for operation of aquaculture facilities and regulates the harvest of kelp through the licensing of kelp harvesters and the management of individual kelp beds. The MAC holds current year 2001 permits for aquaculture and for kelp harvesting from the CDFG. The CDFG recently promulgated new kelp harvesting regulations which restrict where the MAC may take kelp and which will protect the portion of Kelp Bed 220 near Monterey's Cannery Row.

### **4.3.3 Regional Water Quality Control Board – Central Coast Region**

The Regional Water Quality Control Board regulates discharges into ocean waters through the NPDES permit program. The Central Coast Regional Water Quality Control Board ("RWQCB") waived regulation of the proposed facility under the NPDES program in a May 2001 letter.

### **4.3.4 U.S. Coast Guard**

In a June 1997 letter, the U.S. Coast Guard determined that the proposed project poses no navigational hazards.

### **4.3.5 Monterey Bay National Marine Sanctuary, NOAA**

The Monterey Bay National Marine Sanctuary (MBNMS) was designated in accordance with the National Marine Sanctuaries Act. NOAA has been assigned responsibility for managing National Marine Sanctuaries and has developed regulations and permit requirements uniquely suited to protect the resources at each sanctuary. Regulations and permit requirements for the MBNMS are described in the United States Code of Federal Regulations, Title 15, Part 922. The Monterey Bay National Marine Sanctuary determined in a December 2000 letter that no permit for the grow-out facility would be required.

### **4.3.6 U.S. Army Corps of Engineers**

The Army Corps of Engineers requires permits for projects in harbors and open navigable coastal waters. Upon issuance of a coastal development permit, the Army Corps of Engineers intends to issue a Letter of Permission for the proposed project under the Rivers and Harbors Act.

## **4.4 Coastal Act Issues**

Coastal Act Section 30411(c) states in part:

*The Legislature finds and declares that salt water or brackish water aquaculture is a coastal-dependent use which should be encouraged to augment food supplies and to further the policies set forth in Chapter 4 (commencing with Section 825) of Division 1.*

Coastal Act Section 30222.5 states:

*Ocean front land that is suitable for coastal dependent aquaculture shall be protected for that use, and proposals for aquaculture facilities located on those sites shall be given priority, except over other coastal dependent developments or uses.*

Construction and operation of the proposed abalone grow-out facility will constitute aquaculture. Hence, the Commission finds that the proposed project is a coastal-dependent use that is given priority status in the Coastal Act pursuant to Coastal Act Section 30222.5.

#### **4.4.1 Marine Resources**

Coastal Act Section 30230 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.*

Coastal Act Section 30231 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.*

There are several potential impacts associated with cultivating abalone in the manner proposed: (1) introduction of an exotic parasite, the sabellid polychaete worm, into marine waters and native mollusks through infected abalone; (2) spread of "withering syndrome"; (3) impaired water quality; (4) impacts to benthic habitat; and (5) overharvesting of kelp to feed the abalone.

#### 4.4.1.1 The Sabellid Polychaete Worm<sup>1</sup>

##### **Discovery and Background**

Abalone culturists in California began to observe shell deformities and slow growth in their abalone in the late 1980s. The problem was soon attributed to a non-native sabellid polychaete worm from South Africa that was accidentally introduced to California when infested abalone were imported for commercial research.

The sabellid polychaete worm that parasitizes abalone and other mollusks does not feed on its host, but rather uses the hard shell as an attachment site. The worm itself is a suspension feeder, removing food from the surrounding waters. It damages its host by interfering with the natural growth of abalone shell. Thus, although infestations do not directly affect the quality of the abalone's meat, they can deform the shell to the point where the animal's growth slows or virtually ceases.

Because low infestations are not readily noticeable, the sabellid was spread rapidly through transfer of infested stock to virtually all abalone mariculture facilities in California by the mid 1990s. Various eradication methods have been tried, and eradication efforts have met with significant success, although complete eradication of the sabellid has proved elusive due to the hermaphroditic nature of the sabellid worm.

##### **Transmission mechanism**

The larval parasite reaches infestation stage when it is able to crawl. Larvae typically crawl to a new location on their hosts' shell or to a new host. The worm's larvae do not swim in the water column where they would be widely dispersed by currents; instead, they fall until they find a surface and crawl along the substrate until they find a suitable host. Transmission does not require direct contact between infested and uninfested animals. Furthermore, once the sabellid has been encased by shell, it no longer requires a living host for its development and reproduction, so that empty shells of animals that were infested before they died can act as a source of infestation. Thus, larvae can spread if they become dislodged from the host shell or from a substrate, and can be transported by kelp, equipment, wet hands, and infested shells.

##### **Environmental threat**

Spread of the sabellid is of particular concern for the following reasons:

- The sabellid is an introduced species. Biological control experiments using native California intertidal and subtidal fishes and invertebrates have not turned up any natural predators of adult sabellids.

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<sup>1</sup> Much of the factual information in this section about the sabellid is taken from the following sources:

"An Introduced Sabellid Polychaete Pest Infesting Cultured Abalones and its Potential Spread to other California Gastropods." Armand M. Kuris and Carolyn S. Culver. *Invertebrate Biology* 118(4): 391-403. American Microscopical Society, Inc., 1999.

"Identification and Management of the Exotic Sabellid Pest in California Cultured Abalone." (Carolynn S. Culver, Armand M. Kuris, and Benjamin Beede. A publication of the California Sea Grant College System. Publication No. T-041; ISBN 1-888691-05-0. (La Jolla, 1997).

- The biological and ecological characteristics of the sabellid suggest that it has a high potential for successful invasion in California, as demonstrated by its successful infestation of abalone facilities throughout California.
- Sabellid worm larvae accept a broad range of hosts and are capable of infesting several native species of mollusks in addition to abalone, particularly gastropods, creating a threat of spread from infested aquaculture facilities into wild populations and establishment in state waters. Rocky intertidal areas are particularly at risk. Research suggests that bivalves, such as mussels and oysters, are much less susceptible to infestation than snails.

The threat to natural populations is real as evidenced by the fact that the sabellid worm infested populations of native snails in the rocky intertidal zone within a small cove adjacent to the discharge pipe from an abalone aquaculture facility in Cayucos in central California. After the infestation was discovered in 1996, the aquaculture company, in cooperation with the CDFG and researchers at the University of California at Santa Barbara, began an eradication program based on the "epidemic threshold of transmission theory" which says that a certain density of hosts is required to maintain a rate of transmission sufficient for a parasite population to persist. Several million individuals of the main host species (a turban snail) were removed from the intertidal zone and destroyed. Subsequent field surveys at the site found no further evidence of the parasite, implying successful eradication of the sabellid infestation. The aquaculture facility that was the source of the discharge that caused the infestation in the wild also permanently significantly changed its husbandry and discharge practices in order to prevent discharges of infested materials. (*C. Culver, UCSB, personal communication June 4, 2001; Science Daily Magazine, August 18, 1999; F. Wendell, CDFG, personal communication, May 22, 2001*).

#### **Response by the California Department of Fish and Game**

In May 1996, the CDFG concluded that "every abalone aquaculture facility in the state is to be considered positive for presence of the [sabellid] worm unless, and until, inspections by the Department's Fish Health Laboratory ("FHL"), or other FHL approved inspectors determine otherwise."<sup>2</sup> To prevent the further introduction and spread of the sabellid worm, and to achieve its goal of complete sabellid eradication, the CDFG promulgated the following requirements:<sup>3</sup>

Outplanting of abalone into the wild. The Department requires in Fish and Game Code §6400 that any abalone to be planted into the wild must be inspected by the Department prior to planting. The Department only approves the outplanting of sabellid-free abalone from sabellid-free broodstock from a certified 'sabellid-free' facility.

Approved sabellid eradication and prevention plans. All registered abalone aquaculturists were required to submit a sabellid eradication plan to the Department by December 31, 1996. The Department reviews each plan and assesses the risk each facility may represent to California resources. Each facility is then be required to conform to an approved cleanup plan. New facilities must obtain an approved sabellid

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<sup>2</sup> Memo to all registered abalone aquaculturists from Jacqueline E. Schafer, CDFG, dated May 20, 1996.

<sup>3</sup> Memos to all registered abalone aquaculturists from Jacqueline E. Schafer, CDFG, dated May 20, 1996, and December 6, 1996.

prevention plan. The MAC submitted its sabellid polychaete worm prevention plan to CDFG in January 1997.<sup>4</sup>

Certification of facilities as "sabellid-free." On July 7, 1998, the director of the CDFG signed a policy containing procedures for the CDFG to certify facilities as sabellid-free (See Exhibit 3, "CDFG Sabellid Free Certification Policy"). Each operator must request initiation of CDFG's inspection program to certify a facility as sabellid-free. CDFG personnel then conducts three lethal inspections over a 24 month period. Each inspection entails inspection of each container (e.g., tank, cage, barrel) in the facility. The sampling protocol includes sufficient replication to allow CDFG to conclude that the stock is sabellid-free with 95% statistical confidence if no sabellids are observed in the sample. The MAC has not applied for sabellid-free certification due to the large number of samples required by CDFG for the testing and certification process. It is important to note that the purpose of the sabellid certification option is focused on providing certification for facilities that wish to raise abalone seed stock for outplanting in the wild for restoration, grow-out, or research purposes. The certification process also requires a very large proportion of a given facility's abalone stock to be destroyed through lethal inspection in order to satisfy the certification requirements, and is thus expensive and infeasible for smaller abalone facilities.

#### **Commission evaluation and mitigation of impacts**

If the animals used for cage culture at the proposed MAC facility came from facilities that contain the sabellid worm, there would be a small but significant chance of introducing infested animals to Monterey Harbor. Culver et al.<sup>5</sup> suspended infested abalone in cages above uninfested animals. All the individuals below the suspended cages became infested. The larva apparently fall into the water column either because of physical disturbance or as part of their natural behavior. In another experiment by Kuris and Culver (1999), uninfested abalone were placed in tanks with a plastic screen separating them from sabellid-infested abalone. Although infestation rates were much lower than when uninfested abalone were comingled with infested abalone without a barrier, the infestation rate was still significant. Research has found that the worms can also travel on shell and kelp debris.<sup>6</sup> After falling to the sea floor in the harbor, the sabellid larvae must then find a suitable host. The probability of this occurring is low. The harbor bottom is composed of sand and mud and gastropods occur in low density. A second avenue of dispersal is on kelp debris that gets washed out of the harbor. The information needed to estimate the probability of dispersal out of the harbor on kelp debris is not available. Finally, there is the possibility of culture units breaking loose in storms. This has occurred in the past and some of the abalone units were not recovered (*F. Wendell, CDFG, personal communication February 23, 1999*).

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<sup>4</sup> "Plan for the Eradication of the Sabellid Worm from the Facilities of the Monterey Abalone Company," Monterey Abalone Company.

<sup>5</sup> "Identification and Management of the Exotic Sabellid Pest in California Cultured Abalone." (Carolynn S. Culver, Armand M. Kuris, and Benjamin Beede. A publication of the California Sea Grant College System. Publication No. T-041; ISBN 1-888691-05-0. (La Jolla, 1997).

<sup>6</sup> "An Introduced Sabellid Polychaete Pest Infesting Cultured Abalones and its Potential Spread to other California Gastropods." Armand M. Kuris and Carolynn S. Culver. *Invertebrate Biology* 118(4): 391-403. American Microscopical Society, Inc., 1999.

The CDFG performed a Risk Assessment of the MAC facility in July 1997, immediately following a low level infestation at the MAC facility (all infested animals were sold prior to the assessment as sabellid infestation does not affect the abalone itself, only its shell). The 1997 assessment included a dive collection of various invertebrates from pilings beneath where infested animals had been held, and from another location distant from the MAC facility; all collected animals were found to be free of sabellids. The Risk Assessment recommended, however, that 1) kelp or other debris should not be discarded into the bay; 2) hands and equipment should be rinsed in fresh water between each cage to limit infestation; 3) populations should be kept separate; and 4) newly arrived abalone should be examined for possible infestation.<sup>7</sup> The CDFG made another dive collection of invertebrates near the MAC facility in 1998; no sabellid infestation was found, although divers did find three old abalone shells, two of which had light infestation. According to the CDFG, "the shells showed no sign of infestation at the shell margin and the shells could have been on the [ocean] bottom for a long time."<sup>8</sup> Another sabellid spot inspection took place in August 2000; no sabellid infestation was found.<sup>9</sup> The most recent spot inspection occurred on June 26, 2001; all animals tested negative for sabellids.<sup>10</sup>

In 1999, the Coastal Commission approved four abalone grow-out facilities to be operated in Pillar Point harbor. For those facilities, the Coastal Commission required that all abalone seed stock come from either (1) a facility that has been certified by the CDFG as "sabellid-free," or (2) a new facility that has applied for sabellid-free certification and that uses wild broodstock, each of which have been inspected by the CDFG and found to be free of sabellids prior to introduction to a facility. The stringency of this condition was based on concern at that time that the risk of sabellid transfer and infestation was high and required significant preventive measures to protect marine resources from infestation. However, since 1999, there have been several important developments that demonstrate significant progress in eradicating the sabellid worm as an infestation threat. These developments include:

- (1) significant changes adopted by the abalone aquaculture facilities in abalone husbandry and discharge practices that minimize the possibility of transmission of sabellid larvae;
- (2) the development of effective sabellid spot and transfer inspection procedures by the CDFG that have led to the eradication of the sabellid worm from the large majority of California abalone aquaculture facilities. Quarterly reports submitted by abalone facilities show 11 of the 16 abalone facilities in California to be sabellid-free, while CDFG spot inspections show 8 of the 16 abalone facilities in California to be sabellid-free (the facilities not determined to be sabellid-free are not necessarily infested; they either currently have no abalone stock, or spot inspections have not yet been conducted at those facilities)<sup>11</sup>;
- (3) the development of a Sabellid Free Certification Policy and process by the CDFG for abalone facilities that wish to sell and transfer abalone seed stock for potential outplanting and other purposes to be certified by CDFG as 'sabellid free'; and

<sup>7</sup> "Risk Assessment, Monterey Abalone, July 1, 1997," CDFG.

<sup>8</sup> Letter from Fred Wendell, CDFG, to Art Seavey, MAC, dated January 8, 1999.

<sup>9</sup> Letter from Thea Robbins, CDFG, to Art Seavey, MAC, dated March 27, 2001.

<sup>10</sup> Letter from Carolyn S. Friedman and Thea Robbins, CDFG, to Art Seavey, MAC, dated June 26, 2001.

<sup>11</sup> CDFG, "Status of Sabellid Clean-up Quarterly Reports and Spot Inspections as of July 1, 2001."

- (4) demonstration in the case of the Cayucos infestation that a sabellid infestation in the wild can be controlled and eradicated.

The CDFG aquaculture team has therefore made significant progress in developing and implementing procedures for preventing new infestations and for the sampling, reduction, and eradication of sabellid worms in existing abalone aquaculture facilities. Shore facilities are now successfully preventing transmission and infestation through significantly improved husbandry, cultural, and discharge practices. (*F. Wendell, CDFG, personal communication May 22, 2001*) Most importantly, the CDFG has developed a spot inspection program to inspect abalone facilities at least once a year that focuses on the most at risk abalone populations (usually older abalone), as well as an abalone transfer inspection program. For abalone transfer inspections, the small abalone used as "seed" are kept in isolated tanks and are inspected prior to transfer by the CDFG. For the spot and transfer inspections, sampling is performed on a sufficient number of individuals such that there is no more than a 5% probability of missing an infestation rate of 5% or greater. The CDFG also established procedures to certify an abalone-culturing facility as 'sabellid-free' which entail three spot inspections by CDFG personnel over a two-year period. To date, six facilities have applied to be certified as sabellid-free. No facility has become certified yet, although several facilities are very close to being certified in the near future. (*F. Wendell, CDFG, personal communication, May 22, 2001*).

Notwithstanding the significant progress made in eradicating the sabellid infestation from the majority of the state's abalone aquaculture facilities, the potential still exists for sabellid worms to be introduced to the MAC facility during seed stock transfers. The Commission is therefore requiring in **Special Condition 1** that the MAC only obtain abalone seed stock from the following sources: (i) a facility that has been certified as 'sabellid-free' by the CDFG, or (ii) a facility that has had at least one spot inspection and has passed all spot and transfer inspections for the sabellid polychaete worm performed by the CDFG or a CDFG-designated inspector within the past 24 months. "Passing" an inspection is defined as complying with all CDFG inspection requirements and receiving a 100% negative determination for the presence of sabellid polychaete worm. Special Condition 1 further requires the applicant to fully adhere to the CDFG's transfer and inspection procedures for sabellid polychaete worm. Lastly, Special Condition 1 requires that if a sabellid infestation is detected at the applicant's facility, the applicant must immediately remove from marine waters the culture unit in which the infested animal was found and comply with all CDFG requirements for eradication and prevention of further infestation. These requirements are necessary to ensure that operation of the MAC facility will maintain marine resources, protect the marine sanctuary, and maintain healthy populations of existing species of marine gastropods as required by Coastal Act Section 30230

To further reduce the possibility of sabellids being introduced to marine waters caused by project operations, **Special Condition 3** prohibits disposal of any equipment or waste, including shells or kelp debris, into the marine environment. All debris from culture units must be disposed of on land.

#### **Project consistency with Coastal Act policies**

The Commission finds that with the requirements of **Special Conditions 1 and 3**, the proposed project will be carried out so as to avoid to the greatest extent feasible the introduction of



sabellid worms into marine waters, and to ensure that the facility remains sabellid-free. The Commission therefore finds that the proposed project as conditioned can be carried out in a manner that will sustain and maintain the biological productivity and quality of coastal waters, and maintain healthy populations of all species of marine organisms as required by Coastal Act Sections 30230 and 30231.

#### 4.4.1.2 Withering Syndrome

##### Background

First discovered in the Channel Islands in 1986, withering syndrome ("WS") caused populations of black abalone from San Diego to Cayucos, San Luis Obispo County to decline by as much as 99 percent. The disease subsequently spread throughout southern California and has impacted several species of abalone, including the red abalone. WS has spread among wild abalone stocks in southern and central California, where the most plausible transmission method was through the water column. Withering syndrome is not harmful to humans, but can cause abalone to become lethargic and weak, lose weight, and eventually die of starvation. (F. Wendell, CDFG, *California Marine Currents, Vol. 1, No. 3*)

Recent research has concluded that the causative agent for withering syndrome is the bacteria Rickettsiales-Like Prokaryote ("RLP" or "rickettsia"), although the presence of rickettsia in an abalone does not necessarily mean that the abalone will develop WS symptoms. RLP is established from La Paz (cultured) to San Francisco (wild and uncultured), an area that is considered to be the endemic zone for WS. RLP was recently detected in two sites in northern California, Crescent City and Van Damme State Park, but without WS. Research has shown that elevated water temperature and the expression of WS in RLP-infected abalone are related. This might account for the appearance of WS following El Nino events. While elevated water temperature may be a "stress trigger" for WS in RLP-infected abalone, it may not be the only stresser. Colder water along the north coast may afford some protection against WS in spite of the presence of RLP, but this has yet to be confirmed. Further research is being performed to clarify what temperatures and environments stimulate the development of WS. A new method for RLP detection called Polymerase Chain Reaction has been developed; this is important because this method of RLP detection is non-lethal for abalone and the method may eventually be advanced enough that it could detect the presence of RLP in water samples.<sup>12</sup>

##### Recent identification and action by the CDFG

In 1998, the CDFG determined that withering syndrome was well-established in the wild south of the City of Carmel, and recognized that transfer of cultured abalone between aquaculture facilities was likely contributing to the spread of WS to wild abalone stocks beyond the disease's endemic range. As an immediate stop-gap measure, on August 26, 1998, the CDFG director

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<sup>12</sup> Friedman, C. S., K. B. Andree, T. T. Robbins, J. D. Shields, J. D. Moore, K. Beauchamp and R. P. Hedrick. 2000. "Candidatus *Xenohaliotis californiensis*," a newly described bacterial pathogen and etiological agent of withering syndrome found in abalone, *Haliotis* spp., along the west coast of North America. *Journal of Shellfish Research* 19:513., and Moore, J. D., T. T. Robbins and C. S. Friedman. 2000. Withering syndrome in farmed red abalone *Haliotis rufescens*: Thermal induction and association with a gastrointestinal Rickettsiales-like prokaryote. *Journal of Aquatic Animal Health* 12:26-34.

placed a conditional ban on transfer of seed stock to facilities north of Carmel and between facilities within the area north of Carmel. The condition allowed transfers of young abalone only (less than six months old) on the condition that a CDFG health exam did not find signs of rickettsia.

Despite this measure, however, both withering syndrome and rickettsia were detected in locations north of Carmel. In response, on March 22, 1999, the CDFG director adjusted the dividing line between endemic and clear areas northward to San Francisco (thus the conditional ban on seed stock transfer was based on San Francisco, not the City of Carmel). More recently, WS and rickettsia were detected north of San Francisco in Crescent City and near Van Damme State Park, where 10,000 abalone were outplanted for research purposes in 1995. In early 2000 a scientific panel was convened to assess the states of CDFG's efforts to control WS. On May 7, 2000, the CDFG issued a Withering Syndrome Action Plan that included the following elements: (1) monitoring at infected sites, exposed sites, and unexposed sites in order to determine background infection levels; (2) research on transmission of disease, and on water temperature's role as "stress trigger" for development of WS; and (3) another modification of the CDFG abalone transfer ban. The current CDFG policy, therefore, is a conditional ban on the transfer of infected seed stock to facilities within the area between San Francisco and Crescent City, and between facilities within the area north of Crescent City. (*F. Wendell, CDFG, personal communication, July 16, 2001; CDFG Withering Syndrome Action Plan, May 7, 2000*).

#### **Project consistency with Coastal Act policies**

Monterey Harbor is south of San Francisco, in an area within which the CDFG has now determined withering syndrome to be endemic. Any transfer of MAC stock to locations north of San Francisco, into areas clear of withering syndrome, would be subject to the conditional ban imposed by the CDFG (i.e., transfers would not be allowed unless an inspection does not find signs of rickettsia). However, the MAC does not ship abalone to other facilities for re-stocking; the MAC only purchases seed abalone for grow-out. The MAC purchases all of its seed abalone from abalone hatcheries in central and southern California.

The MAC has observed symptoms of WS in approximately 1% of the abalone under culture at its MAC facility. Laboratory tests have also confirmed the presence of WS bacteria in two samples of abalone from the MAC facility, although the MAC facility is located within the geographical range of endemic WS. The MAC's policy is to destroy any abalone with symptoms of WS, and its preventive measures include ensuring proper food quantities for the abalone, clean culture units that allow water to flow through easily, and proper stocking densities (taking into account abalone size).

In order to prevent further spreading of WS from the proposed MAC facility, the Commission imposes **Special Condition 2**, which requires the applicant to comply with all CDFG restrictions on the transfer of abalone and abalone seed, and with all CDFG withering syndrome inspection requirements prior to transfer of abalone or abalone seed. This condition further requires the applicant to destroy any and all abalone that develops the symptoms of WS.

The Commission therefore finds that with these measures in place, and as conditioned, the proposed project can be carried out in a manner that will sustain and maintain the biological

productivity and quality of coastal waters, and maintain healthy populations of all species of marine organisms as required by Coastal Act Sections 30230 and 30231.

#### 4.4.1.3 Water Quality

An aquaculture facility such as the one proposed by the MAC has the potential to reduce the dissolved oxygen ("DO") concentration in the water column in the vicinity of the facility.

##### **Species and uses potentially affected**

Monterey Harbor is a part of the Monterey Bay National Marine Sanctuary, and as such supports a large and diverse population of marine species, including rare and endangered species; marine invertebrate fauna including polychaete worms, crustaceans (e.g., crabs, shrimp), mollusks (e.g., snails, bivalves), anemones and seastars; and marine mammals. The area of seafloor directly beneath the proposed site for the abalone grow-out facility is sandy bottom and mud. Seastars, anemones and other organisms have colonized the concrete moorings and the pier pilings supporting the municipal wharf.

##### **Potential for depletion of dissolved oxygen in the water column**

The DO level in water is critical to the health of marine organisms, as deficient DO concentration could result in both lethal and sublethal effects. As a general rule, DO levels less than 5.0 mg/l are unacceptable to aquatic organisms.<sup>13</sup> The California Ocean Plan sets forth that DO concentration shall not at any time be depressed more than 10 percent from that which occurs naturally as the result of the discharge of oxygen-demanding waste materials (*Chapter II, Section D, No. 1; p. 4*). Although abalone can tolerate lower DO levels than fish, abalone also depend on good water quality and high DO levels.

At very high numbers, the respiration of the abalone could reduce DO levels in the water column. In addition, culture operations introduce the potential that abalone feed and fecal material could accumulate on the sea floor. High concentrations of particulate organic material may result in increases in decay organisms which consume available DO. Calm, poorly-mixed environments are especially susceptible to low DO levels, while areas that experience frequent tidal movement are more likely to maintain adequate DO levels. Increases in organic matter in bottom sediments could result in a local reduction in available DO from the surrounding environment below the level necessary to support local plant and animal species.

##### **Evaluation of potential impacts associated with potential depletion of dissolved oxygen in the water column**

Given the location of the MAC in open ocean waters, the proposed facility will not likely cause localized depletion of DO levels. The proposed facility site is relatively exposed and receives a significant amount of flushing from tidal currents and swells due to its location in a relatively open harbor environment. This flushing and exposure to ocean currents results in periodic scouring of the seafloor in the harbor area which removes organic and other material from the seafloor. Although the MAC will rely on currents and wave action to circulate seawater through the plastic screens on the culture units, it also proposes to clean culture units once every other

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<sup>13</sup> Stickney, Robert. *Principles of Aquaculture*. (John Wiley and Sons, 1994).

week. Material that will be removed during cleaning includes algae, invertebrates such as barnacles, sponges and tunicates, any uneaten kelp remaining in the barrels and cages, and any abalone feces that are not removed by natural flushing while the culture units are suspended in the water. The regular cleaning of the culture units is intended to minimize the potential for buildup of organic matter beneath the culture units on the seafloor.

The Central Coast Regional Water Quality Control Board ("CCRWQCB") determined that the proposed project "poses [an] insignificant threat to water quality"<sup>14</sup> and declined to require an NPDES permit for the abalone grow-out facility.<sup>15</sup> The CCRWQCB noted that "this aquaculture operation differs from other flow-thru operations because cages are suspended beneath a wharf in open water that is subject to tidal action...staff recently observed normal day-to-day cleaning operations and observed no impacts to receiving water quality." In addition, the CCRWQCB anticipated no significant water quality impacts with the expansion of the proposed facility to full build-out. The CCRWQCB also noted that "Abalone are very sensitive to changes in water quality, therefore the health of the organisms...would indicated the quality of the receiving water more accurately than any formalized receiving water monitoring program."<sup>16</sup> For the abalone aquaculture facilities proposed at Pillar Point harbor, the San Francisco Bay Regional Water Quality Control Board ("SFBRWQCB") required monitoring of DO concentrations. However, due to the open water location of the proposed MAC facility, the CCRWQCB determined that the MAC facility will not have an adverse impact on water quality and is not and will not deplete DO even at full build out. Further, the utility of conducting DO monitoring at the MAC facility area is low due to the presence of several seafood processing facilities on the same wharf as the proposed MAC facility. The seafood processing facilities intermittently discharge large quantities of discarded seafood parts directly beneath the wharf in an area immediately adjacent to the site of the proposed MAC facility. This discharge, which occurs at irregular intervals and is exempt from NPDES regulation, would significantly confuse the results of a DO sampling and monitoring program due to the quantity of discharge and the proximity of the discharge to the proposed MAC facility. It would be impossible to accurately attribute any potential decrease in local DO levels to a particular facility on the wharf or to a particular type of discharge.

To minimize the amount of organic matter introduced to the marine environment, the Commission is prohibiting in **Special Condition 3** prohibits disposal of any equipment or waste, including shells or kelp debris, into the marine environment. All debris from culture units must be disposed of on land. **Special Condition 4** further requires removal of all abalone, grow-out structures, mooring devices, materials, and equipment upon cessation of operations. The Commission therefore finds that the proposed project as conditioned will be carried out in a manner that sustains the biological productivity and quality of coastal waters, and maintain healthy populations of marine organisms as required by Coastal Act Sections 30230 and 30231.

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<sup>14</sup> Letter from Roger Briggs, Central Coast Regional Water Quality Control Board, to Monterey Abalone Company, February 27, 2001.

<sup>15</sup> Letter from Roger Briggs, Central Coast Regional Water Quality Control Board, to California Coastal Commission, May 22, 2001.

<sup>16</sup> Ibid.

#### 4.4.1.4 Benthic Habitat

An aquaculture facility such as the one proposed by the MAC has the potential to adversely impact benthic habitat and organisms, through accumulation of kelp debris and abalone feces, placement of concrete moorings on the seafloor, or the use of non-native kelp as abalone feed.

##### **Species and uses potentially affected**

Monterey Harbor is a part of the Monterey Bay National Marine Sanctuary, and as such supports a large and diverse population of marine species, including rare and endangered species; marine invertebrate fauna including polychaete worms, crustaceans (e.g., crabs, shrimp), mollusks (e.g., snails, bivalves), anemones and seastars; and marine mammals. The area of seafloor directly beneath the proposed facility site is sandy bottom and mud. Seastars, anemones and other organisms have colonized the concrete moorings and the pier pilings supporting the wharf.

##### **Potential benthic impacts due to accumulation of kelp and abalone feces**

The proposed facility could impact the benthic community via disturbance resulting from the potential build up on the seafloor of detritus, including kelp feed and fecal material. Substantial organic enrichment causes deleterious changes in the community of organisms that lives in sand or mud. Accumulation of organic material could cause a loss of most of the natural invertebrate community in the sediments. Furthermore, invertebrate community changes could lead to changes in the fish community (e.g., change the forage value of the seafloor to bottom-feeding fishes).

An estimation of the potential extent of benthic impacts is complicated by the presence of four fish processing facilities on the same wharf as the proposed grow-out facility. These facilities collectively dump as much as 5000 pounds of fish parts and bycatch into the harbor four times a month, for a maximum monthly discharge of 20,000 pounds of fish parts and bycatch. These facilities are located close to the proposed MAC facility site, at distances ranging from immediately adjacent to only 100 feet away. (*Paul Danger, City of Monterey, personal communication June 14, 2001*) The fish processing companies and their discharge are not regulated because they are exempt under federal regulations Title 40, Section 408 because they do not discharge more than 4,000 pounds of raw material per day. (*Matt Thompson, CCRWQCB, personal communication, June 11, 2001*) Thus, it would be impossible to trace the source of any organic matter accumulation in the vicinity of Monterey Harbor. In any case, the potential for organic matter to accumulate at the project site is unlikely at this location since the Monterey Harbor seafloor is continuously scoured by strong currents.

However, to minimize the introduction of materials into the marine environment, the Commission is prohibiting in **Special Condition 3** the disposal of any equipment or waste, including shells or kelp debris, into the marine environment. All debris from culture units must be disposed of on land.

##### **Potential benthic impacts due to placement of concrete moorings**

The proposed project would include the initial placement of 130 concrete moorings covering 436 square feet of seafloor, but at full build-out would install, at maximum, another 60 moorings, for a total of 210 concrete moorings covering 636 square feet of seafloor. Barrels are lighter and

tangle more easily than cages, and thus require attachment to moorings to prevent tangling and enable efficient functioning of the facility. However, the MAC has stated that after the initial 130-mooring installation, as expansion of the facility occurs, cages which do not require moorings will be used at a much higher ratio than barrels, in order to minimize the number of moorings. The mooring devices will not have a significant impact on the benthos because the proposed MAC facility would be located underneath a pre-existing wharf that already shades and impacts the benthic habitat in the water below. While the placement of the moorings will impact the immediate area of benthic communities found in the sand and mud of the seafloor, the impact area is small and will rapidly recolonize when the facility is no longer functioning and the moorings are removed.

In order to prevent the proposed facility's grow-out structures and associated equipment from becoming marine debris when the facility ceases to operate, the Commission is requiring the applicant in **Special Condition 4** to remove all abalone, grow-out structures, mooring devices, materials, and equipment within 90 days of cessation of operations.

**Potential impacts due to use of experimental feed or non-native kelp as abalone feed**

Use of non-native kelp or experimental feed as abalone feed could cause the introduction of exotic non-native species or harmful chemicals such as antibiotics or hormones to the marine environment. Feeds often contain additives such as hormones or antibiotics, and such additives could have negative impacts on marine organisms should they be introduced to the marine environment. Hormones can damage reproductive capabilities of marine organisms, and antibiotics can lead to development of antibiotic resistance. There are no hormones or antibiotics currently used as additives in any commercially formulated abalone feed, nor are there any that are approved by the Food and Drug Administration ("FDA").<sup>17</sup> However, the use of such additives in abalone feed may be approved by the FDA in the future.

Due to the potential for harm that could occur due to the introduction of non-native kelp, antibiotics or hormones to the marine environment, the Commission in **Special Condition 5** prohibits the applicant from using non-native kelp and alternative feed that contain antibiotics or hormones to feed the abalone cultured at its facility. The Commission acknowledges, however, that the FDA may eventually approve the use of certain antibiotics and hormones for use in abalone feed that do not harm marine organisms, and, in fact, are explicitly designed to prevent harm.<sup>18</sup> In this event, the applicant could seek an amendment to this permit to allow for the use of feeds that contain antibiotics or hormones so long as the applicant demonstrates that their use will not cause adverse impacts to marine resources.

**Potential impacts due to use of transgenic or genetically modified abalone**

The term "transgenic" refers to an organism that has had genes from another organism put into its genome through recombinant DNA techniques. The term "genetically modified" refers more broadly and generally to the deliberate manipulation or alteration of the genetic material of an organism through a variety of techniques, including the creation of transgenic organisms. The

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<sup>17</sup> The use of unapproved additives in animal feeds in the United States is illegal.

<sup>18</sup> For example, the CDFG is currently working to develop an antibiotic to protect abalone from harm from rickettsia, the causative agent for withering syndrome. (*Letter to the Coastal Commission from Dr. Paul Olin, University of California Sea Grant Extension, August 7, 2001.*)

culture of transgenic or genetically modified abalone could cause the introduction of genetically modified organisms to the marine environment. Research is currently underway to develop abalone hybrids and genetically modified abalone for various purposes, including the creation of larger and more disease-resistant abalone. However, one researcher notes that "not enough is currently known about gene expression events during reproduction, larval recruitment and settlement, growth, defense against disease and symbiotic interactions in marine invertebrates, to establish successful strategies for biotechnological interventions."<sup>19</sup> Given the comprised status of several species of native abalone, a precautionary approach to prevent the introduction of transgenic or genetically modified abalone into the marine environment and native abalone gene stocks is merited.

The Commission therefore imposes **Special Condition 6**, which prohibits the applicant from purchasing and culturing transgenic or genetically modified abalone seed stock.

#### **Consistency with Coastal Act policies**

The Commission finds that with the requirements of **Special Conditions 3, 4, 5 and 6**, the proposed project as conditioned will be carried out in a manner that maintains marine resources, sustains the biological productivity and quality of coastal waters, and maintains healthy populations of all species of marine organisms as required by Coastal Act Sections 30230 and 30231.

#### **4.4.1.5 Kelp Harvesting**

##### **Regulatory framework**

The Fish and Game Code (§6653 and §6750) provides the Fish and Game Commission ("F&GC") with the authority to establish regulations as may be necessary to ensure the proper harvesting of kelp and aquatic plants for commercial and sport purposes.<sup>20</sup> The CDFG is the lead agency responsible for managing both giant kelp (*Macrocystis pyrifera*) and bull kelp (*Nereocystis luetkeana*) pursuant to commercial and sport fishing regulations (14 CCR §30 and § 165). The F&GC recently finalized new amendments to these kelp harvesting regulations in accord with the California Environmental Quality Act.<sup>21</sup>

To manage commercial harvesting, the CDFG charts and numbers the state's kelp beds. Official beds are designated in Section 165.5(j) and (k) of Title 14, California Code of Regulations. Beds are actually geographic areas, not individual patches, and thus vary in length and contain

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<sup>19</sup> "Biotechnological Applications to Shellfish Aquaculture and Fisheries," by Gerardo Vasta, University of Massachusetts Dartmouth, North Dartmouth, MA, Northeastern Regional Aquaculture Center, in *Northeastern Aquaculture*, Vol. 7, No. 17.

<sup>20</sup> Under §6650, the F&GC may establish license and permit requirements; establish fees and royalties; require report of take; establish open and closed seasons; establish or change possession limits; establish and change area or territorial limits for harvesting; and prescribe the manner and the means of taking kelp and aquatic plants for commercial purposes. Under §6750, the F&GC may establish, extend, shorten or abolish open seasons and closed seasons; establish, change, or abolish bag limits, possession limits, and size limits; establish and change areas or territorial limits for taking; and prescribe the manner and means of taking kelp and aquatic plants for recreational purposes.

<sup>21</sup> "Giant and Bull Kelp Commercial and Sport Fishing Regulations." *Section 30 and 165, Title 14, California Code of Regulations*. California Department of Fish and Game. Final Environmental Document (March, 2001).

differing amounts of kelp canopy that change with time. Although one management objective is to “endeavor to maintain a sustainable harvest,”<sup>22</sup> the CDFG has no fixed standard for sustainable harvest because kelp production is so highly variable.

The CDFG uses aerial surveys to assess the kelp resources; the extent of giant kelp is determined by measuring the kelp bed’s surface canopy on the photographs. Under the new kelp harvesting regulations, aerial surveys will now take place twice a year, in winter and summer. Such biannual surveying is a significant improvement on the past frequency of surveying, which was only once every five years. (*R. Collins, CDFG, Personal Communication, May 30, 2001*) The F&GC then designates which kelp beds may be harvested, and places limitations on the method of harvest:

- Kelp beds are designated as either (a) available for lease and exclusive harvest by the lessee, (b) open beds available for harvest by any licensed kelp harvester, or (c) closed beds that cannot be harvested for environmental reasons.
- A kelp harvesting license from the CDFG is required to harvest kelp commercially from designated “open” beds. The license enables the licensee to harvest to the limit the regulations allow at designated open beds on a “first-come, first-served” basis. If a bed has been cut to the limit the regulations allow, the licensee is prohibited from harvesting and must go to another bed. Under the “open” designation, a bed’s canopy could be heavily or completely removed by harvest.
- Kelp plants (giant and bull) may be cut no deeper than four feet below the ocean surface. For giant kelp, this restriction protects the plants’ holdfasts, juvenile and reproductive blades, and young subsurface plants from being harvested before reaching maturity. Bull kelp is killed by this procedure.
- The F&GC may recommend temporary closure of a kelp bed for up to one year if it finds a bed has been significantly damaged (e.g., via storm, oil spill, or harvesting activities). Notice of the closure is sent to all licensed harvesters.

Kelp cannot be cut or harvested in marine life refuges, ecological reserves, national parks, or state underwater parks. Finally, the F&GC requires harvesters to keep harvest and landing records, which record, among other statistical information, the wet weight of harvest, date of landing, and bed of origin. Harvest records are submitted once per month.

#### **New project-related demand for kelp**

The MAC states that the initial facility size with 170,000 abalone requires harvesting 5 tons of kelp per week, and that the facility at full build-out with 500,000 abalone requires harvesting 10 tons of kelp per week, at maximum. The MAC proposes to harvest primarily from Kelp Bed 220 which is an open kelp bed regulated by CDFG, a small portion of which was recently closed to harvest.

The MAC is a founding member of the Monterey Kelp Cooperative (“MKC”), a private group of kelp harvesters which voluntarily restricts and self-regulates its total kelp harvest. MKC

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<sup>22</sup> Ibid., pp. 2-4.



members agree to a "Cooperative Kelp Plan" which specifies what total quantity of kelp that MKC members may harvest per week. The plan is revised every October and must be approved by MKC's Board of Governors. The three-person Board of Governors consists of one kelp harvester representative, one representative from the CDFG, and one representative from the Monterey Bay National Marine Sanctuary. MKC members other than the MAC include:

- Pacific Abalone Farms, represented by Gary Russell
- Grillo Enterprises, represented by Phyllis Grillo-Weinbrenner
- US Abalone, represented by David Ebert

Due to the partial closure of Bed 220, all MKC kelp harvesters, including the MAC, may harvest only from the portions of Bed 220 that are still open to harvesting, or from other nearby open kelp beds.

#### **Potential impacts to the kelp bed community**

In 1999, concern about the levels of kelp harvesting within the Ed Ricketts Underwater Park, which includes part of Bed 220, prompted the Monterey Bay National Marine Sanctuary, together with the Cities of Monterey and Pacific Grove, to fund a study on the effects of kelp harvesting in that area. The report<sup>23</sup> used aerial photographs dating from 1976 along with kelp harvest records to assess the impacts of a range of kelp harvesting intensities using statistical analysis. The study found no statistically significant difference between the control area and the harvested areas, but the sample size was small and statistical power was therefore low. Thus the study's results do not necessarily indicate that there was not a harvesting effect, only that such an effect was undetectable given the available data. The report recommended continued surveying and data-gathering in the area, more frequently than the once every five years that was the practice until recently. This recommendation will be implemented in the near future with biannual aerial surveying (once in winter, once in summer) that will significantly improve the quantity of data with which to assess overall effects of harvesting on kelp beds.

The volume of kelp needed to sustain aquaculture operations remains relatively constant throughout the year, but there are significant seasonal fluctuations in kelp abundance. During the winter kelp canopies are thinned by storms, so kelp must be taken from a few sheltered beds at levels similar to summer needs, which intensifies take from specific beds and may result in the removal of a significant portion of the total canopy. Hence, potential adverse impacts from kelp removal would be more likely to occur during winter. Kelp harvesting also potentially affects the entire kelp bed community beyond the kelp plants themselves, such as finfish populations that live in giant kelp forests (e.g., the young of some rockfish species recruit specifically to the upper kelp canopy); invertebrates that live on and among kelp; birds that forage in and adjacent to and rest in giant kelp beds; and sea otters, seals and sea lions that raft, rest, or forage in giant kelp forests.

CDFG recently finalized new kelp harvesting regulations that close a section of Bed 220 closest to Cannery Row in Monterey to harvesting by designating it as a "no take" area. Kelp harvesting

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<sup>23</sup> "The Effects of Small-Scale Kelp Harvesting on Giant Kelp Surface Canopy Dynamics in the Ed Ricketts Underwater Park Region: Final Report to the Monterey Bay National Marine Sanctuary and the Cities of Monterey and Pacific Grove." Michael D. Donnellan and Michael S. Foster, Coastal Solutions Group, 1999.

may still occur in the remaining areas of Bed 220 which are located to the west of Cannery Row and southward along most of the Monterey peninsula. The MAC will therefore harvest from the portions of Bed 220 that are still open to harvest, but is also likely to harvest from other open kelp beds in the area such as Bed 221, which starts immediately east of the MAC facility and Municipal Wharf #2. Particularly during winter, this displacement of kelp demand may shift impacts from kelp harvesting to other open kelp beds.

### **Recent changes in the kelp harvesting regulations**

In response to concerns about potential impacts from harvesting to bull kelp, the F&GC expanded the area where bull kelp may be taken by hand harvest only, from Point Montera south to Santa Rosa Creek. Hand harvesting encourages the harvesting of mature bull kelp plants that have released reproductive tissue into the local area. It also protects bull kelp from the large-scale harvest that could occur if mechanical harvesters were used in large patches of bull kelp. The new kelp harvesting regulations also restrict harvesting of bull kelp within the Monterey Bay National Marine Sanctuary from March 1 through July 31, a seasonal closure requested by the Sanctuary. Other significant changes include new rules on how harvested kelp is weighed; how harvest quantities must be reported; new kelp bed closures, particularly of kelp beds whose canopies are small and susceptible to overharvesting impacts; the closure of a portion of Bed 220 to harvesting; and a provision giving the F&GC authority to control or restrict kelp harvesting on an emergency basis without formal revision of harvesting regulations.<sup>24</sup>

### **Commission evaluation of impacts**

The MAC's proposed take of kelp is small relative to the quantities taken by other kelp harvesters in the state. (*R. Collins, CDFG, Personal Communication, May 30, 2001*) The total annual harvest of kelp canopy from Bed 220 by all users over the past decade has been less than 400 tons, but a rough estimate of the amount of drift kelp produced from Bed 220 is 200,000 tons per year; the current harvest is therefore less than 1% of the estimated drift kelp available from this bed.<sup>25</sup> However, the CDFG's recent decision to close the portion of Bed 220 closest to Monterey Harbor will lessen kelp harvesting impacts to that bed, particularly during the winter season. The MAC's voluntary participation in the Monterey Kelp Cooperative contributes to the reduction of cumulative impacts to local kelp resources. The proposed project will therefore not cause significant impacts to kelp resources.

### **Consistency with Coastal Act policies**

Section 30411(a) of the Coastal Act states:

*"The Department of Fish and Game and the Fish and Game Commission are the principal state agencies responsible for the establishment and control of wildlife and fishery management programs and the commission shall not establish or impose any controls with respect thereto that duplicate or exceed regulatory controls established by these agencies pursuant to specific statutory requirements or authorization."*

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<sup>24</sup> "Giant and Bull Kelp Commercial and Sport Fishing Regulations." *Section 30 and 165, Title 14, California Code of Regulations*. California Department of Fish and Game. Final Draft Environmental Document (March 2001), Chapter 2, "Project Description."

<sup>25</sup> *Ibid*, page 3-74.

For the purposes of Section 30411(a), the Fish and Game Commission's kelp harvesting regulation program is a "wildlife...management program." Section 30411(a) prohibits the Commission from "establish[ing] or impos[ing] any controls with respect to [any such program] that duplicate or exceed regulatory controls established by" the Fish and Game Commission. Therefore, the Coastal Commission lacks the regulatory authority to impose conditions to mitigate potential impacts on the affected kelp resource to a level of consistency with, or deny the project based on inconsistency with, applicable marine resource policies of the Coastal Act.

#### 4.4.1.6 Conclusion – Marine Resources

The Commission concludes for the reasons stated in sections 4.4.1.1 – 4.4.1.5 of this report, that the project as proposed and conditioned will be consistent with Coastal Act Sections 30230 and 30231.

#### 4.4.2 Placement of Fill in Coastal Waters

Coastal Act Section 30108.2 defines "fill" as "earth or any other substance or material, including pilings placed for purposes of erecting structures thereon, placed in a submerged area." The concrete moorings that will be placed on the harbor floor to secure the abalone grow-out facilities constitute fill, as defined in Coastal Act Section 30108.2.

Coastal Act Section 30233(a) 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:*

- (1) *New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
- (2) *Maintaining existing, or restoring previously dredged depths on existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
- (3) *In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.*
- (4) *In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of*

*structural pilings for public recreational piers that provide public access and recreational opportunities.*

- (5) *Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*
- (6) *Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*
- (7) *Restoration purposes.*
- (8) *Nature study, aquaculture, or similar resource dependent activities.*

Coastal Act Section 30233(a) permits fill in coastal waters if three tests are met. The first test requires that the project fit into one of the eight categories of uses permitted for open coastal water fill enumerated in Coastal Act Section 30233(a). The Commission finds that the proposed aquaculture facilities and operations are clearly allowed under use number (8), "nature study, aquaculture, or similar resource dependent activities."

The second test requires that there be no feasible less environmentally damaging alternative. The proposed abalone grow-out facility is premised on direct interface with marine waters. Monterey Harbor provides the necessary saline conditions to support marine culture of abalone, and the municipal wharf provides a protected area in which to secure the grow-out structures. The project is proposed to be located within the harbor and beneath a wharf where it will have the least impact. The concrete moorings placed on the seafloor are necessary to secure barrels and cages against tidal wave surges to prevent them from breaking free and to prevent tangling of lines. Barrels, which are small and light, require connections to seafloor concrete moorings in order to prevent tangling of culture unit lines that would impede the efficient functioning of the grow-out facility.

However, the MAC experimented with configurations of cages (which are larger and heavier than barrels) and found that cages function well without concrete moorings. When MAC expands and adds additional walkways, culture units, and abalone, its new culture units will be primarily cages, which will not require concrete moorings. However, a small number of barrels will always be needed as smaller culture units for various sizes of abalone that are very close to market size. Barrels are lighter and tangle more easily than cages, and thus require attachment to moorings to prevent tangling and enable efficient functioning of the facility. However, the MAC has worked with Commission staff to minimize the number of additional concrete moorings. The MAC has stated that after the initial 130-mooring installation, as expansion of the facility occurs, cages (which do not require moorings) rather than barrels will be used to the maximum extent feasible, so that the number of moorings in excess of the initial 130 moorings would only be 60, for a total of 190 moorings covering approximately 636 square feet of seafloor.

The third and final test requires that feasible mitigation measures be provided to minimize adverse environmental effects. The Commission finds that the conditions contained in this permit provide feasible measures to mitigate potential adverse effects on marine resources, as

discussed in Sections 4.4.1 through 4.4.1.5 of this report. Hence, the Commission concludes that the project as proposed and conditioned satisfies the three tests of Coastal Act Section 30233(a).

#### **4.4.3 Public Access and Recreation**

Coastal Act Section 30210 states:

*In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Coastal Act Section 30211 states:

*Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*

Coastal Act Section 30220 states:

*Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*

Coastal Act Section 30234 states:

*Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.*

Coastal Act Section 30234.5 states:

*The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.*

#### **Public Access**

The proposed facility will be located near the end of Municipal Wharf #2, underneath the surface of the wharf. Public access to the wharf is somewhat limited by the City of Monterey, the owner of the wharf. Although no fishing is allowed around the commercial facilities and in the marina for safety reasons, anglers may fish from the east side of the wharf. Abalone deliveries will be made by arrangement with other seafood wholesalers on the wharf, and the MAC estimates that

even at highest sales volume, only one vehicle trip per day will be generated by deliveries. The MAC has a permit for two vehicles to park on the wharf in front of the MAC workshop. The MAC will encourage its eight employees to bicycle or walk to work or park their vehicles at the foot of the wharf or nearby where there is public parking. The abalone facility will provide educational tours for groups, schools and visitors upon appointment.

### **Recreation at Monterey Harbor**

Monterey Harbor offers a wide variety of recreational activities including opportunities for commercial fishing and multiple recreational activities such as fishing, sailing, kayaking, and whale-watching. Municipal Wharf #2 hosts five wholesale fish companies, the abalone facility that is the subject of this staff report, public restrooms, a snack bar, restaurants, a boat hoist, and the Monterey Peninsula Yacht Club.

### **Commission evaluation of impacts**

The proposed aquaculture project will not interfere with the public's right of access to or along the shoreline because it will not include any construction of new development on land, restrict access to the project vicinity, or significantly impact the harbor's existing parking areas. Due to the proposed project's location beneath an existing wharf, and the very small amount of vehicle trips related to the proposed facility, the project would not significantly impact public access or recreation. The restrictions on public access and fishing at Municipal Wharf #2 were put in place by the City of Monterey for safety reasons prior to the MAC facility's proposed location on the wharf, so the proposed project would not alter or expand these existing restrictions.

### **Conclusion – Public Access and Recreation**

Hence, the Commission concludes that for the reasons stated above in this report, the project as proposed will be consistent with Coastal Act Sections 30210, 30211, 30220, 30234, and 30234.5.

#### **4.4.4 Scenic and Visual Qualities**

Coastal Act Section 30251 states in part:

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

Due to the MAC's proposed location beneath an existing municipal wharf in Monterey Harbor, there will be no significant impacts to the visual character of the harbor area. The proposed facility's office and workshop on the wharf would be located in existing buildings on the wharf, and would therefore not cause any alteration of the wharf's visual character. The Commission thus finds that the proposed project will be consistent with the existing visual character of the harbor as required by Coastal Act Section 30251.

#### 4.5 Alleged Violation

Development consisting of the construction of an abalone grow-out facility, including installation of walkways, platforms, a seawater pumping system and other structures, placement of concrete moorings on the seafloor, and operation of the facility since 1992, has taken place without benefit of a coastal development permit (see Table 2 for a summary of existing facility size in comparison to proposed full buildout size). Although development has taken place prior to submission of this permit application (Violation No. V-3-97-007), consideration of the application by the Commission has been based solely upon the policies of the Chapter 3 policies of the Coastal Act. Approval of the permit does not constitute a waiver of any legal action with regard to the alleged violation, nor does it constitute an admission as to the legality of any development undertaken on the subject site without a coastal permit.

#### 4.6 California Environmental Quality Act

The Commission's permit process has also been designated by the State Resources Agency as the functional equivalent of the California Environmental Quality Act ("CEQA") environmental impact review process. The California Public Resources Code § 21080.5(d)(2)(i) states:

*The rules and regulations adopted by the administering agency shall require that an activity will not be approved or adopted as proposed if there are feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment.*

Thus, CEQA requires the consideration of feasible alternatives and mitigation measures to lessen any environmental impacts of the project to a level of insignificance. The Commission incorporates into its finding of CEQA consistency its analysis in this staff report of the proposed project's potential impacts under Coastal Act policies. Although the abalone grow-out facility has some potential to result in adverse impacts to marine resources and marine water quality, the Executive Director finds no feasible less environmentally damaging alternatives or additional feasible mitigation measures other than those identified herein, that would substantially lessen any significant adverse impact which the activity may have on the environment. Therefore, the Commission finds that the project as fully conditioned is consistent with the mitigatory requirements of CEQA.



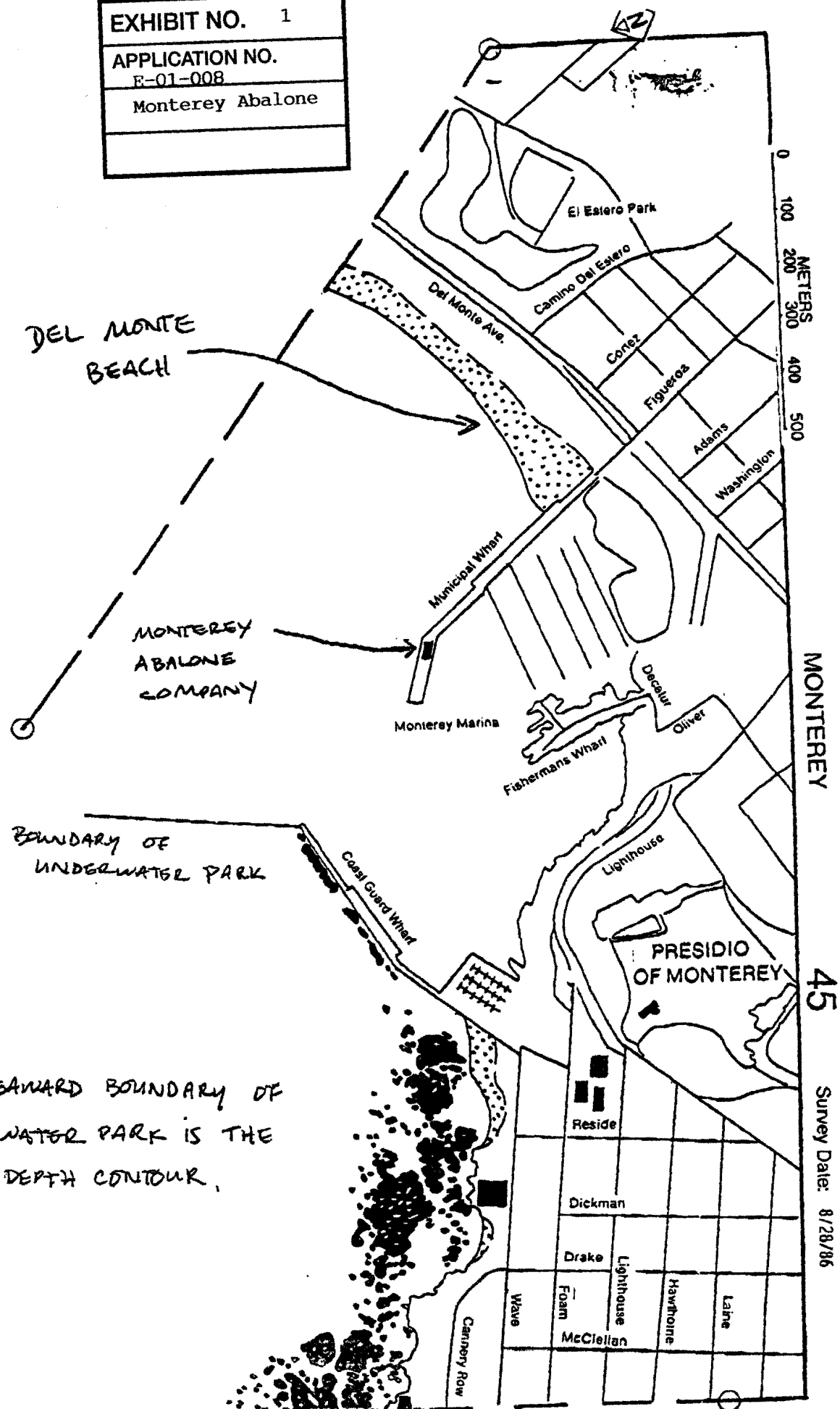


EXHIBIT NO. 1

APPLICATION NO.

E-01-008

Monterey Abalone



MONTEREY

45

Survey Date: 8/29/86

THE SEAWARD BOUNDARY OF THE UNDERWATER PARK IS THE 10 FATHOM DEPTH CONTOUR.

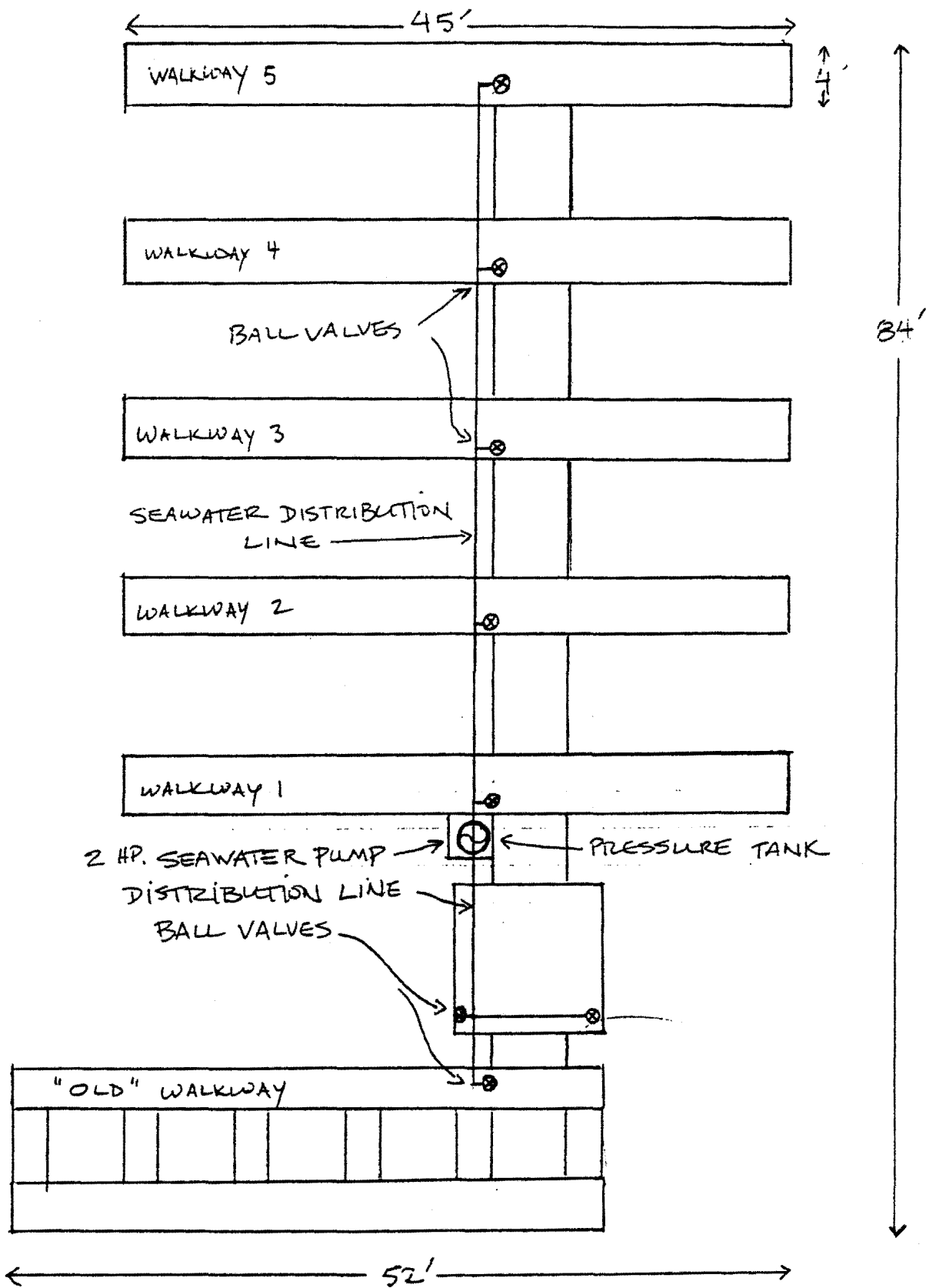


EXHIBIT NO.	2
APPLICATION NO.	E-01-008
Monterey Abalone	

# Certification Process of an Aquaculture Abalone Facility for Sabellid Worms and Stocking of Aquaculture Produced Abalone in Marine Waters

## Introduction

There has been an increased interest in the stocking of aquaculture-produced abalones in marine waters to enhance various abalone populations. This expressed interest in stocking of abalone has come at a time when most of the abalone aquaculture facilities are still infested with a parasitic sabellid worm. Department of Fish and Game (Department) staffs are interested in any type of abalone enhancement efforts, but the Department must protect the naturally occurring abalone populations from this parasitic sabellid worm.

A Department certification process policy for abalone aquaculture facilities is needed to protect naturally occurring abalone population, while allowing for enhancement efforts through the stocking of abalone produced at aquaculture facilities. The parasitic sabellid worm attaches to the shell of the abalone and causes the deformation and weakness in the shell. This deformation and shell weakness may cause increased mortality. In addition, other marine gastropods (snails) can be infected by the sabellid worm. The sabellid worm is not known to attach to the veliger larvae of an abalone. Therefore, there needs to be a policy that allows the stocking of both veliger (no shell) abalone larvae and abalone that have a shell.

## Proposed Policy

Aquaculture-produced abalones may be stocked in marine waters upon the certification of an aquaculture facility by a Department fish pathologist. There are two types of certifications. There is a veliger larvae certification and a sabellid free certification. A veliger larvae certification is issued if Department staffs conduct a complete inspection of an aquaculture facility and finds no sabellid worms present at the facility. This is a one time inspection and the veliger larvae certification is valid for a 12-month period. The sabellid free certification is issued if Department staffs conduct three inspections during a 24-month period (at 12 month intervals) and finds no sabellid worms present at the facility.

## Request for Certification

The owner of a currently licensed aquaculture facility (Fish and Game Code Section 15101) may request a certification inspection. This request will be in writing and sent to the Marine Resources Division aquaculture coordinator at:

EXHIBIT NO. 3
APPLICATION NO.
E-01-008
(Monterey Abalone)

Department of Fish and Game  
Mr. Rob Collins, Marine Aquaculture Coordinator  
1416 Ninth Street  
Sacramento, California 95814

The certification request will describe the physical location of the facility to be inspected and the locality of all abalone within the facility. A diagram of the water flow for all shore side facilities will be required also showing the flow of water from intake to discharge. The facilities' Abalone Clean-Up Plan filed with the Department will be used in the Certification process. A copy of the request for certification will be forwarded by Mr. Rob Collins to Mr. Bill Wingfield, Inland Fisheries Division (IFD), Field Station, Rancho Cordova.

If sabellid worms are detected during a certification inspection, then the owner of the aquaculture facility may request another certification inspection six months after an inspection detected any sabellid worms. This will allow time for the facility to clean up its facility, and for Department employees to conduct other needed inspections and required duties.

#### Fish Pathologist Responsibilities

A Department Fish Pathologist is responsible for the coordination of all certification inspections and the issuance of all veliger larvae or sabellid free certifications. Upon receiving a request for a certification inspection, the coordinating fish pathologist will arrange the time and place for the certification inspection. Department Marine Resources staff may help in the certification process as needed. The certification process may also be conducted by a fish pathologist certified by the Board of Certification of the Fish Health Section of the American Fisheries Society pursuant to their guidelines adopted effective January 1, 1982.

#### Inspection Fees

Aquaculturists will pay all costs incurred by the Department when conducting a certification inspection of a facility, when requested by the aquaculturist. The Department will assess a fee equal to the actual costs to the Department in salaries, travel expenses, and equipment use. This fee structure will be proportional to the time spent at a facility. Thus, a small facility will pay, in most cases, a smaller fee than a large facility.

#### Veliger Larvae Certification

This veliger larvae certification is issued if Department staffs conduct a complete inspection of an aquaculture facility and finds no sabellid worms present at the facility. This veliger larvae certification authorizes an aquaculture facility to sell or release veliger abalone larvae to any person who has a valid "Private Stocking Permit" (FG 749)

issued by the Department pursuant to Section 238.5, Title 14, CCR.

#### The Sabellid Free Certification

The sabellid free certification is issued if Department staffs conduct three inspections during a 24-month period (at 12 month intervals) and find no sabellid worms present at the facility. This sabellid free certification authorizes an aquaculture facility to sell or release veliger larvae or seed abalone to any person who has a valid "Private Stocking Permit" (FG 749) issued by the Department pursuant to Section 238.5, Title 14, CCR.

#### Stocking of Aquaculture Produced Abalone

No aquaculture-produced abalone may be stocked in any California marine waters unless a valid "Private Stocking Permit" (FG 749) has been issued. No "Private Stocking Permits" will be issued to stock abalone until at least one abalone aquaculture facility is certified with a veliger larvae certification. Inland Fisheries - Informational Leaflet No. 6 entitled "Regulations Governing Private Stocking of Aquatic Plants and Animals" explains stocking permit requirements.

All abalone progeny stocked must be planted within 100 miles from where the broodstock was collected by the aquaculturist. Department staff must verify the origin of the broodstock and the lineage of the progeny before a "Private Stocking Permit" is issued. This limitation of 100 miles will prevent the contamination of specific stock genes.

#### Summary

A certification process will allow the enhancement of California's abalone populations. This proposed policy should provide an additional incentive for abalone aquaculturists to rid their facility of the sabellid worm. A veliger larvae or sabellid free certification will be a desirable credential by aquaculturists, and should increase their ability to sell additional abalone for stocking purposes.

**APPENDIX A**  
**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 permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. 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 permittee to bind all future owners and possessors of the subject property to the terms and conditions.

**APPENDIX B**  
**SUBSTANTIVE FILE DOCUMENTS**

**Coastal Development Permit Application Materials**

Application for Coastal Development Permit E-01-008

**Agency Letters, Permits and Orders**

Letter from Grace Kato, State Lands Commission, to Kevin Colin, California Coastal Commission, November 27, 2000.

Letter from Stephen Scheiblaue, City of Monterey Harbormaster, to Marina Cazorla, California Coastal Commission, March 28, 2001.

Letter from M.L. Van Houten, U.S. Coast Guard, to Joseph Cavanaugh, Monterey Abalone, July 25, 1997.

Letter from Roger Briggs, Central Coast Regional Water Quality Control Board, to Marina Cazorla, California Coastal Commission, May 22, 2001, re NPDES Permit Determination.

Letter from Scott Kathey, Monterey Bay National Marine Sanctuary, to Joseph Cavanaugh, Monterey Abalone, December 20, 2000.

Department of Fish and Game 2001 Aquaculture Permit, November 11, 2000.

Department of Fish and Game 2001 Kelp Harvesting Permit, January 1, 2001.

Memos to all registered abalone aquaculturists from Jacqueline E. Schafer, California Department of Fish and Game, May 20, 1996; December 6, 1996.

Risk Assessment for Monterey Abalone, California Department of Fish and Game, July 1, 1999.

Letter from Fred Wendell, CDFG, to Art Seavey, Monterey Abalone Company, January 8, 1999.

Letter from Thea Robbins, CDFG, to Art Seavey, Monterey Abalone Company, March 27, 2001.

Letter from Carolyn S. Friedman and Thea Robbins, CDFG, to Art Seavey, Monterey Abalone Company, June 26, 2001.

Letter from Paul Olin, University of California Sea Grant Extension, to Marina Cazorla, California Coastal Commission, August 7, 2001.

**Environmental Documents and Reports**

California Department of Fish and Game Withering Syndrome Action Plan, May 7, 2000.

California Department of Fish and Game, "Certification Process of an Aquaculture Abalone Facility for Sabellid Worms and Stocking of Aquaculture Produced Abalone in Marine Waters," July 7, 1998

California Ocean Plan, 1997, State Water Resources Control Board.

Giant and Bull Kelp Commercial and Sport Fishing Regulations, Final Environmental Document, California Department of Fish and Game, March 2001.

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Friedman, C. S., K. B. Andree, T. T. Robbins, J. D. Shields, J. D. Moore, K. Beauchamp and R.P. Hedrick. 2000. "Candidatus *Xenohaliotis californiensis*," a newly described bacterial pathogen and etiological agent of withering syndrome found in abalone, *Haliotis* spp., along the west coast of North America. Journal of Shellfish Research 19:513.

Kuris, Armand M. and Culver, Carolynn S., "An Introduced Sabellid Polychaete Pest Infesting Cultured Abalones and its Potential Spread to other California Gastropods." Invertebrate Biology 118(4): 391-403. American Microscopical Society, Inc., 1999.

Moore, J. D., T. T. Robbins and C. S. Friedman. 2000. Withering syndrome in farmed red abalone *Haliotis rufescens*: Thermal induction and association with a gastrointestinal Rickettsiales-like prokaryote. Journal of Aquatic Animal Health 12:26-34.

Science Daily Magazine, August 18, 1999.

Stickney, Robert, Principles of Aquaculture, John Wiley and Sons, 1994.

Wendell, Fred, CDFG, California Marine Currents, Vol. 1, No. 3.



**Lease Documents**

City of Monterey Lease Expansion, Approved July 19, 1994.

**Other**

Collins, Robson. California Department of Fish and Game. Personal Communication. May 30, 2001.

Culver, Carolyn. Marine Science Institute, University of California at Santa Barbara. Personal Communication. June 4, 2001.

Danger, Paul. City of Monterey. Personal Communication. June 14, 2001.

Thompson, Matt. Central Coast Regional Water Quality Control Board. Personal Communication. June 11, 2001.

Wendell, Fred. California Department of Fish and Game. Personal Communication. February 23, 199; May 22, 2001.

