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BODEGA BAY, CALIFORNIA 94923-0247

31 January 2005

Catherine E. Kuhlman, Executive Officer
North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

Dear Ms. Kuhlman

This letter accompanies application forms for renewal of the NPDES discharge permit for the Bodega Marine Laboratory's seawater system outfall. The outfall discharges into the Bodega Marine Life Refuge ASBS, a situation prohibited by provisions of the Ocean Plan. Therefore we are requesting the assistance of the North Coast Regional Water Quality Control Board in requesting from the State Board an exception to this provision.

For this seawater system exception request, we will follow the format of requirements set forth in the letter to Peter G. Connors from Celeste Cantú dated October 18, 2004 (Appendix A). The survey of ASBS discharge sites completed during 2003 (Discharges Into State Water Quality Protection Areas, July 2003) also identified 6 discharge sites of stormwater runoff from man-made structures, and we will address those discharges and our management practices for stormwater runoff before we address the seawater discharge.

Stormwater Discharges

Since we received the survey results identifying stormwater discharges into the ASBS, we met with John Short of the RWQCB to determine best management practices and engineering modifications to eliminate detrimental effects on water quality in the ASBS. We have removed two discharge outlets, rerouting one of these to a rock-filled underground dry well, repaired a leak, and modified our management practices to minimize parking lot contaminants entering the freshwater wetland that drains into the ocean. With these changes we will have no dry-season discharges from any of these stormwater locations. Except for three very small, local areas where sheet flow is exposed to weathered concrete or wood, all wet weather stormwater will be processed through a vegetated wetland prior to release. We will address each of the stormwater discharge sites identified in the survey report, by SAMPLEID number (see map, Appendix B).

SAMPLEID BOD009

This discharge site is the wood and sand stairway, ending on a concrete step and retaining wall, that provides access to the sandy beach of Horseshoe Cove. It has been in place since the 1960s. Each step is a weathered redwood board holding back the sand-filled step. It gathers water only

from the immediate area of the steps, and its porous construction results in almost no surface flow down the steps. The redwood and concrete have been in place for many years and are unlikely to contribute to any deterioration of water quality.

SAMPLEID BOD010

This site is a natural seep in the coastal bluff. When the marine lab was constructed in the 1960s, a small concrete catch basin and grate were installed in the grassland on the bluff above the seep to gather natural drainage from the grassland and direct it to the seep underground, to reduce the risk of surface erosion. With the area now covered with vegetation, we have examined the basin and grate during the winter 2004-2005 rains and have concluded that they are no longer necessary. We will seal and fill the drain and remove the grate during summer 2005. There is no anthropogenic input to this seep.

SAMPLEID BOD011

This discharge site is the weathered concrete and wood pumphouse and stairs for the intake end of our seawater system. It does not drain any area beyond the surface of the concrete structure. It has freshwater surface flow only when raining. It has a minor flow of seawater (approx. 1.5 gallons per minute, gpm) that is overflow from monitoring instruments inside the pumphouse, measuring salinity and temperature of the intake seawater. This seawater has passed through the intake lines and pump to the instrument sensors and back by gravity flow to the intertidal rocks. It has not been treated or exposed to any pollutants.

A similar concrete structure of wood and weathered concrete is part of the seawater system outfall (SAMPLEID BOD008), and also drains only the immediate structure, with runoff only when raining.

SAMPLEID BOD013

This site is an inactive drain, originally a seawater discharge from some tanks in the Laboratory. The seawater was redirected to the main outfall during the 1980s, and this drain was sealed at its upper end. We have now plugged it also at its lower end, and have removed the pipe that was visible on the beach.

SAMPLEID BOD014

This area of vegetated gravel road and concrete boatramp provides access to Horseshoe Cove Beach for trailerable small boats and diving gear. It is used about 12 times per year on average. To minimize the potential for pollution from vehicles on the boatramp, we have these policies:

1. Vehicles may not use the boat ramp if they were leaking any fluids where they were parked last.

2. Vehicles and boats may not be rinsed or washed on the boatramp.

Our occasional inspections of the concrete boatramp have not found any indication of oil or grease, so this area is as clean as the other weathered concrete structures on the site.

There is also a small (80 square feet) air sampling laboratory near the boatramp. Signs are posted prohibiting any disposal or external use of soap or other contaminants. Currently there is plumbing for both freshwater and seawater to the location of this laboratory, but there are no taps in the laboratory, and these are not needed for the air sampling projects.

SAMPLEID BOD016

This discharge site is our only significant stormwater drain, a culvert pipe and concrete trough emptying onto the sands of Horseshoe Cove Beach. Water flowing through this system comes from a natural freshwater wetland approximately 220 feet from the beach. Rainwater falling on the buildings, road and parking lots runs by sheet flow to the surrounding vegetated grasslands. The native soil varies from sandy loam to loamy sand. During heavy rains, some of this water runs off the parking areas and driveway through vegetation that surrounds the parking areas and driveway, eventually entering the freshwater wetland. It then moves through the wetland to the downstream end where the culvert and trough carry it to the beach.

We have adopted these management practices to minimize the potential for pollution in the wetland:

1 We ask BML staff and students to make certain their cars do not have oil leaks.

Washing of private vehicles is prohibited at BML. State vehicles and boats may be rinsed only, without soap, in two designated areas.

3. No chemicals, including fertilizers, can be used in areas where they might wash from parking lots or Laboratory grounds into the wetland.

In addition to these rules governing runoff, we do not allow dogs or other pets on the Reserve surrounding the Laboratory, and we do not keep any mammals, either marine or terrestrial, on the premises for research.

SAMPLEID BOD017

This terra cotta pipe, installed when the Laboratory was built in the 1960s, drained a small service and parking area near the Laboratory. As we investigated this discharge we discovered that it also contained a trickle of seawater from a leaking seawater tank fitting. We repaired the tank leak so that seawater now only enters the main ocean outfall line, and we have re-engineered the stormwater drain from the service and parking area so that it is directed into a rock-filled underground dry well. These two changes have stopped all flows from this pipe to the ASBS, and we have sealed the old pipe at its lower end.

Seawater Discharge

Outline headings correspond to the requested information in the letter from Celeste Cantú.

1. The request letter

a. Information about the discharge

Organization:

Bodega Marine Laboratory
University of Califonia Davis
PO Box 247
Bodega Bay, CA 94923

Contact:
Dr. Dennis Thoney, Associate Director, 707-875-2005
Dr. Peter Connors, Reserve Manager, 707-875-2020
Ms. Kitty Brown, Laboratory Manager, 707-875-2006
FAX 707-875-2009

NPDES Permit Number: CA0024333

b. Ocean Plan Provisions

This exception is required by sections III.E.1 and III.H.2 of the Ocean Plan.

c. Rationale for the exception

The marine programs of the University of California at Bodega Marine Laboratory depend on the flowing seawater system to provide a laboratory habitat to maintain marine fishes, invertebrates and algae under natural conditions. These programs serve the public interest in several ways.

1 *Research:* BML is among the major marine research institutions in the country. Its scientists are investigating population dynamics of marine invertebrates and fishes, fisheries management, fish health, aquaculture, invertebrate diseases, introduced species effects, nearshore oceanography, physiology, developmental biology, genetics, endocrinology of marine invertebrates, ecological processes and community dynamics of invertebrates and algae, captive breeding and conservation biology of endangered species, and many other topics. These studies benefit agencies, industry and the general public by solving problems, providing management guidance, and expanding our understanding of nearshore marine systems. The University of California, the State of California, and various funding and regulatory agencies of the federal, state, and county governments have invested tens of millions of dollars over the years in facilities and programs to support this research. The National Science Foundation has twice provided major funding for improvements and upgrades to BML's flowing seawater system,

recognizing that this system provides a resource of national significance for marine scientists at UC and for scientists from other institutions who visit BML to conduct research. In 2003, 110 scientists used BML's seawater system.

2. *Teaching:* BML's seawater system is used in almost all our undergraduate classes in marine science (253 students in 2003) and is essential to most of the marine science graduate students conducting their thesis research at BML (66 graduate students in 2003). To train the next generation of marine scientists, BML must maintain its seawater system.

3. *Public education:* Although BML is not a public aquarium, approximately 12,000 public visitors (K-12 to adult) per year visit the Laboratory for guided tours to learn about the science conducted here. They observe local fishes and invertebrates in several displays and experimental animals in wet labs, all maintained as healthy organisms in the flowing seawater system. Educating the public to the problems that confront the State and the Nation in maintaining healthy marine ecosystems along our coast is of great importance.

4. *Monitoring the ocean:* BML's flowing seawater system is part of the Laboratory's coastal ocean observing node. Seawater is pumped from the intake in Horseshoe Cove to the intake pumphouse where automated systems measure salinity and temperature. We will install a fluorometer to measure chlorophyll in the ambient seawater within the next 5 months. These data are stored, summarized, and used to support research at BML as well as forming a node of a statewide monitoring network. The state and federal governments have been investing money in networks of ocean monitoring systems such as the BML system as a necessary step in gathering the data needed to guide management of the ocean and its fisheries.

d. Exception will not compromise protection:

The best evidence that this seawater system outfall will not compromise protection of the ocean waters for beneficial uses is the continued excellent health of the ocean ecosystem surrounding the outfall. The seawater system outfall has been in this location since the 1980s, and the communities of marine algae and invertebrates at the outfall location and elsewhere in the ASBS are diverse, robust, and healthy.

Marine ecologists representing at least 8 different universities and state agencies have continued to set up experiments and conduct studies in the vicinity of the outfall because they are convinced that the discharge is not affecting the communities or ecological processes that they wish to study. A large coast-wide monitoring project coordinated by marine ecologists from Oregon State University (PISCO, Partnership for Interdisciplinary Studies of Coastal Oceans http://www.piscoweb.org/what/index.html) selected the rocky intertidal site adjacent to the outfall as one of their monitoring sites because of the healthy, representative community at the site. Their data show that species richness in the low intertidal at Bodega is higher than at any other of the 10 locations sampled in California.

Two UCD ecologists (Dr. Jay Stachowicz, Dr. Matt Bracken) have established experimental and control plots very close to the outfall as part of an ecological study that covers a large part of the

rocky intertidal bench in the Bodega Marine Life Refuge ASBS. They selected sites near and far from the outfall, convinced that the outfall was unlikely to affect this ecosystem. Their subsequent detailed monitoring shows this to be the case. We include these monitoring results in the next section.

The population of harbor seals using a haulout adjacent to the outfall has grown steadily over the years of outfall use. Shorebird populations on the rocks have remained steady at the site since the 1970s. All these observations and data bolster the conclusion that granting an exception for this seawater discharge will not compromise protection of coastal waters.

e. Information for an environmental analysis

i. Existing environmental conditions

We have two data sets taken during 2004-05 that compare communities of marine algae and invertebrates at the outfall site with communities at sites more distant from the outfall. Both demonstrate that the discharge has not negatively affected the environment at the discharge site. The data sets are for different tidal levels, from the mid-intertidal bench to the low intertidal surge channel. The topography surrounding the outfall is not a gradual or continuous slope toward the subtidal zone. The outfall discharges water into the bottom of a narrow and deep surge channel that bisects the surrounding intertidal bench. During most tide and wave conditions, water from the outfall mixes with waves in the surge channel and flows out over the surrounding bench. The prevailing wave and current conditions carry the discharge water mainly to the southeast, toward the plots we are monitoring in the mid-intertidal.

We do not have monitoring data for the subtidal regions beyond the outfall, but we are confident they would show the same absence of outfall effects if we were able to work in that area. We think the intertidal sampling is more appropriate at our outfall site for these reasons: First and foremost, the subtidal environment near the outfall is an unsafe area for divers to attempt to collect data. The area was chosen for the outfall because of the high-energy mixing provided by the strong waves combined with the surge channel topography. Beyond the surge channel the topography continues as an irregular mix of granite boulders, columns and tables. Our campus Diving Safety Officer, Henry Fastenau, deems the area an unsafe location, dangerous for diving on almost every day of the year. To move farther away to find safe diving would take us too far away from the outfall for the data to be meaningful.

Second, because of the local topography at the site, a comparison of mid-intertidal habitats will be more scientifically meaningful because the habitat is repeated frequently throughout the Bodega Marine Life Refuge ASBS, and is easily accessible for detailed ecological sampling. To assess effects of the outfall discharge, we must be able to sample with suitable replication within a habitat type. The low surge channel habitat is less common on the Refuge, and different surge channels differ in important topographic factors such as depth, width, and orientation to the waves. Statistically and biologically significant comparisons are more difficult to obtain in surge channel habitat.

Accordingly, we have sampled a variety of community parameters, with ample replication, in the mid-intertidal zone of the rocky benches, and have sampled species richness in all zones down to the low intertidal zone of three surge channels.

a. *Mid-intertidal sampling* (data of Dr. Jay Stachowicz and Dr. Matt Bracken, July 2004): In a comparison of invertebrate and algal communities within one-meter diameter circular plots (8 plots near the outfall, mean distance of 20m from outfall; compared to 10 plots, mean distance of 41m from outfall), there were no significant differences in any of 12 species and community measures. For each measure, probability p-values are given in parentheses, with $p<0.05$ necessary for significance at the 95% level (see Appendix C, part II for sampling protocols).

Invertebrate richness (p=0.73)
Invertebrate diversity (p=0.07)* (diversity slightly higher near the outfall)
Total algal cover (p=0.29)
Pelvetiopsis cover (p=0.41)
Endocladia cover (p=0.31)
Mastocarpus cover (p=0.75)
Cladophora cover (p=0.99)
Bare space (p=0.49)
Mussel (*Mytilus*) cover (p=0.70)
Primary *Mytilus* cover (=mussels as a substrate for algae) (p=0.79)
Limpet (mostly *Lottia*) abundances (p=0.64)
Littorina snail abundance (p=0.07)* (*Littorina* slightly more common away from outfall)

b. *Surge channel sampling* (data of Dr. Christopher Harley and Ms. Jenna Shinen, January 2005): In a comparison of total species richness from high intertidal to near-subtidal on 10m sections of the walls of three surge channels (the outfall surge channel and two comparison channels A and B, 25m and 70m from the outfall surge channel), species richness was higher in the surge channel than in either of the other channels. Species richness was recorded as 37 in the surge channel, 32 in channel A and 29 in channel B (see Appendix C, part I for species lists and comparisons). Because meaningful replication is not possible in this comparison, and because the results may vary with season, we do not consider this result statistically significant, but it clearly suggests that the outfall has not had any negative effects on species richness.

c. *Photographic evidence*: We can supply photos of the healthy communities of marine algae and invertebrates at the site of the outfall to further indicate the absence of negative effects of the discharge. We include one such photo taken during December 2004 in the low subtidal of the surge channel at the underwater discharge point (Appendix D).

ii. Potential environmental impacts

a. *Volume and seasonal characteristics:* We monitor flow at two central points within the seawater system, after the water has passed through the clarifier but before it is distributed to end-user laboratories. We have attempted to measure flow also at the

outfall, but difficulties of measuring flow in partially full pipes caused us to remove the flow meter at that site. Discharge flow rate at the ocean outfall is approximately the same as the centrally measured flow rate, but it can differ from time to time if any of these three circumstances applies:

(1) Discharge rate will be less when other marine laboratories and public aquaria, because of the excellent water quality at our site, withdraw seawater from our system into tanker trucks for transport to their facilities. This difference is barely measurable, amounting to less than 10,000 gallons per month, or less than 0.1% of total flow.

(2) Discharge will be higher when raw (unfiltered) seawater is shunted around the clarifier directly to a laboratory. This occurs only part of the time, and may amount to anywhere from 0 to15% of total flow. If raw seawater is diverted in the future at a rate above 5% of total flow, we will install a separate flow meter to measure this diversion, and will include it in total flow.

(3) Discharge will be higher when the salmon research program is adding low salinity water to the discharge. This event may occur either when the program is transitioning fish through the smoltification process from fresh to saltwater, or when salmon are held in the Fish Pathology Laboratory for studies of diseases. Smoltification periods are infrequent (maximum of 21 days per year), during which fish are held in tanks with gradually increasing salinity. We mix water from our own well (not chlorinated, and slightly saline at 3ppt) with seawater in a semi-closed system, with makeup water at a maximum rate of 5 gallons per minute (gpm). Mixing proportions are set and controlled by the computer monitoring and control system to achieve the desired salinities. Total freshwater added to the seawater flow during these short periods varies up to a maximum of 1% of total flow.

When salmon are held in the Fish Pathology Laboratory in low salinity water, all effluent must pass through the chlorination-dechlorination system (described in next section and in Appendix F). These occurrences can require up to a maximum of 21 gpm of 3ppt water (almost fresh), contributing a maximum of 4% to our discharge. This flow could lower the discharge salinity by slightly more than 1ppt, within the normal range of salinities of the ambient ocean water in the ASBS (31 to 34ppt). The contribution of low salinity water only reached this maximum level of 21gpm during one 10-day period in 2004; at other times it has ranged between 0 and 16 gpm.

Flow data (see Appendix E) averaged 0.74 million gallons per day (mgd) over the past year. Our pumping system is capable of pumping up to 1.5 mgd, but we operate well below this limit. Our existing permit is for 3.0 mgd, but we will request renewal at a lower limit of 2.0 mgd, which still allows for upgrades to pumping equipment. The source is our dual-pipe intake line that draws water from within Horseshoe Cove adjacent to the Laboratory (SAMPLEID BOD012). Flow does not fluctuate dramatically with

season because most of our laboratory systems require fairly constant flow to maintain organisms, but an influx of visiting scientists and students during summer months usually contributes to an increase of about 20% during summer. There is no stormwater mingled with the seawater discharge.

b. *Chemical constituents:* We currently monitor chlorine residual in the outfall line continuously as part of our chlorination-dechlorination system for the seawater flowing through two pathology labs. Additional information about this system is included in Appendix F as part of the seawater system description. Because these two labs work on issues of fish health and invertebrate health, they sometimes hold diseased animals. The California Department of Fish and Game Pathogen Containment Facility at BML represents the only approved quarantine and holding facility for known or potentially diseased shellfish in California. Research includes species of importance to commercial and sport fisheries and also endangered species such as the white abalone. The Fish Health Laboratory focuses on species that include two state and federally-listed salmonid species, the winter-run Chinook and the Coho.

To preclude the escape of any disease microorganisms, all effluent from these two labs is treated with chlorine for 2 hours contact time, according to requirements set by the Dept. of Fish and Game. The system is computer-controlled, with chlorine concentration sensors and alarms at three points. Alarms activate backup systems when chlorine concentration falls outside desired parameters, and an automated service telephones Physical Plant staff at work or at home at all hours. Staff can make adjustments to the system from home via internet hookup. Chlorine concentration in the treatment system is controlled between 12 and 15 ppm currently, a range of values that is conservatively high to insure sterilization of the effluent from the pathology laboratories. We are evaluating whether these levels can safely be lowered for different pathogens to reduce the total amount of chlorine used.

After the two-hour retention and prior to discharge to the ocean, chlorinated seawater from the pathology laboratories is exposed to gaseous sulfur dioxide as a dechlorination process. Chlorine residual is then measured by sensor in the discharge as part of the continuous, computer-controlled monitoring system at BML. Chlorine has been reported as not detected on 99.4% of days over the past 5 years, with a detection limit of 0.1ppm as set by standard laboratory titration methods. This dechlorination system has been very reliable since we installed it 5 years ago, with very few readings above the limit. Most of these readings have occurred when the chlorine sensor needed cleaning or when BML staff were working on the system. We are planning to install another sensor as a backup to the final sensor near the discharge point.

The chlorination-dechlorination system does not apply to the full BML discharge. The two pathology labs have a maximum flow of 80 gpm combined, approximately15% of the total flow. Actual flow is usually much less than this limit. The remaining 85+% of the flow through BML does not pass through the chlorination system.

We are developing plans for one additional laboratory system that will require chlorine treatment and dechlorination prior to release of seawater. This new laboratory system will be dedicated to research with invasive marine species, and will be the only laboratory in California capable of safely addressing this important issue. Depending on the species involved, chlorine concentration may be higher than in the pathology laboratory treatment, but flow rates will be less. The total amount of chlorine used will probably range up to the amount currently used in the pathology laboratory treatment system. The new invasive species treatment system will be separate from and independent of the existing treatment system, with all effluent chlorinated and then dechlorinated prior to joining the main seawater discharge for the final chlorine sensor measurement.

We do not currently monitor any other chemicals. We ask the assistance of the RWQCB in determining what set of measurements in addition to chlorine are appropriate for this outfall. We note that most of the Table B constituents have no way of entering our seawater system lines if they were not present already in the intake seawater. We do not permit addition of chemicals into seawater in any part of the Laboratory. If a researcher requests use of a chemical in seawater, the request will only be approved if the research is done in a closed system and the seawater is later disposed of offsite. We do not use any chemicals for treatment of disease or parasites other than the chlorine system in the two pathology labs. Parasite treatment is accomplished with immersion of fishes in freshwater that is discharged into our septic system. If chemotherapeutics (e.g., antibiotics) are needed in the future, they will be used only in closed systems, with disposal of the seawater offsite.

c. *Physical constituents:* We monitor suspended solids, settleable solids, and pH in both intake and discharge lines (Appendix E). Suspended solids numbers vary seasonally, with high turbidity during winter storm months and lower turbidity during summer and fall. Settleable solids numbers are usually below detection limits. Values for both parameters in effluent water approximate the values in influent water in all months. Values for pH range from 7.8 to 8.2 and are similar in both influent and effluent seawater. We also monitor temperature and salinity, and will soon add chlorophyll concentration, in the intake water at the intake pumphouse.

d. *Indicator bacteria:* We do not monitor any bacterial concentrations. We do not have any marine mammals in our Laboratory and therefore no source of coliform bacteria. All human waste systems are on the separate septic system. We request the assistance of the RWQCB in determining what indicator bacteria measurements are relevant to our situation.

e. *Toxicity of the discharge:* We have not done any standard toxicity measurements of our discharge seawater. To a very real extent, our entire Laboratory is a toxicity study, with different research projects holding adult, juvenile, and embryonic fish, marine invertebrates and larvae. We have daily checks of all systems by our Aquatic Resources Group staff and periodic inspections by the UC Davis Animal Care and Use Committee. We are proud of our excellent record of maintenance of animals in our tanks without any

adverse effects from water quality other than occasional temporary problems associated with mechanical functions (clogged intakes, lines, and valves, or power failures). Many of our fishes and invertebrates remain in our system for a year or more before they are released back into the ocean. We currently have some fishes and invertebrates that have been in our tanks for 10 years without any ill effects.

iii. Management practices

The Laboratory seawater system is described in Appendix F. It is one of the most sophisticated, computer-controlled seawater systems at any University marine laboratory, with monitoring points throughout the system connecting sensors for temperature, salinity, flow rate, pressure, and chlorine concentration to a central computer system, monitored both within the Laboratory and at the homes of Physical Plant staff. Sensors are set with alarm levels for various parameters, and will automatically activate backup systems and contact staff at the lab or at home.

Physical Plant staff and Aquatic Resources staff run daily checks of the system and the animals held in seawater tanks. All setups of tanks and animals must be done by the staff of these two support groups. New research projects by visiting scientists are reviewed by the Laboratory Director for approval.

Projects involving exotic species or California species collected at other sites are given particularly close scrutiny to avoid introduction of non-native species, parasites, or diseases. Only one exotic species is currently held at BML, the Maine lobster, *Homarus americanus*. Dr. Ernest Chang has investigated the endocrinology of this species since the 1970s, in a laboratory setting that makes escape of animals very unlikely. We have never found any wild lobsters anywhere in the Bodega Marine Life Refuge ASBS. We ask Dr. James Moore of the Dept of Fish and Game, a resident researcher at BML, to review and advise us on any projects that propose holding exotic species at BML, and these projects require the approval of the Dept of Fish and Game. Dr. Moore also has monitored shellfish near the outfall for the presence of an exotic sabellid worm that has been found elsewhere in California, and he has not found it here.

Any projects working with diseases or parasites of fishes and marine invertebrates in our seawater system are confined to the two pathology wet labs. All seawater effluent from these two areas is treated with chlorine as described above. Accidental escape of disease organisms from these labs via research personnel is controlled by a disinfectant foot bath that all researchers must pass through before entering and leaving these labs.

We will add some backup and a check on the accuracy of the final chlorine readings by installing a second chlorine sensor at the outfall. We believe that most of the positive readings obtained since installing the new dechlorination system 5 years ago (11 positive readings in 5 years; see Historical compliance, section 3 and Appendix G) have been faulty sensor problems. A second sensor will give us a check on accuracy and a backup when a sensor needs cleaning. We also will install a continuous temperature sensor at the discharge. Both of these sensor additions will be installed by end of June 2005.

iv. Alternatives to the discharge

1. Abandon the BML flowing seawater system. The seawater system is the heart of the Bodega Marine Laboratory. Researchers and students must be able to bring marine organisms into laboratories for study, confident that they can provide the necessary environmental requirements for each species. The University of California, the State, the National Science Foundation and several other agencies have invested tens of millions of dollars in the Laboratory, and more than a million dollars in development of the seawater system because of the importance of the research and teaching programs at the site. Abandoning the seawater system would be a terrible waste. Because of the detriment to the University's programs of marine science research, teaching, public education and monitoring, this option is not favored.

2. Re-engineer the system to a closed system. A closed system would fail to meet the scientific needs of the University's programs. Scientists come to BML because they know they can hold animals in natural seawater. For some species, scientists need raw, unfiltered seawater to provide planktonic food sources even while the organisms are held in the Laboratory. A flowing system can provide this, but a closed system cannot. Closed systems have other problems that make them difficult to scale up to the size of the BML system, and all closed systems require some amount of new makeup water continually or periodically introduced into the system, with a continuing requirement for discharges. In cities these discharges can go to a public sewer system. At BML, there is no public system available, and saltwater cannot be discharged into our septic system. Because of these practical problems and the detriment to the University's programs of marine science research, teaching, and monitoring, this option is not favored.

3. Move the discharge point more than 1000 feet offshore, beyond the ASBS boundary. This would be a major undertaking, and would cause significant damage to the intertidal and subtidal habitats and communities through which the extended pipeline would pass. Large amounts of concrete would have to be poured on native habitats to anchor the extended pipeline through the high energy environment from the intertidal zone to the offshore location. Paying for this major construction project would require funding far in excess of the BML budget, and would divert UC funds from other beneficial programs. Because of the major negative impact on the habitats and biota of the ASBS, and the cost of implementation, this alternative is not favored.

4. Continue the discharge at the present location. This alternative provides the best support for the uses described above in marine science research, teaching, public education and ocean monitoring. The results of the ecological monitoring presented above indicate that there are no negative effects of the current discharge. Because this alternative supports all the positive impacts of the system and has no negative impacts on the habitats and biota of the ASBS, it is the preferred alternative.

2. **Completed standard NPDES application and associated forms** (attached).

3. **Historical compliance with NPDES permit conditions** (attached, Appendix G).

If there are questions about any of the information in this letter and application, please contact either of us, or Kitty Brown. We look forward to working closely with the Regional Board to provide all the information needed to request an Ocean Plan exception for our seawater discharge.

Sincerely,

Peter G. Connors, Reserve Manager

Dennis Thoney, Associate Director