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State Water Resources Control Board

Division of Water Quality

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Arnold Schwarzenegger
Governor

DRAFT

NEGATIVE DECLARATION

Pursuant to Section 21080(c)
Public Resources Code

To:	Office of Planning & Research State Clearinghouse 1400 Tenth Street Sacramento, CA 95814	From:	State Water Resources Control Board Division of Water Quality P.O. Box 100 Sacramento, CA 95812-0100

Project Title: Exception to the California Ocean Plan for the University of California Scripps Institution of Oceanography Discharge into the San Diego Marine Life Refuge Area of Special Biological Significance

Applicant: University of California San Diego for the Scripps Institution of Oceanography
Office of Environmental Health and Safety. 0920
9500 Gilman Drive
La Jolla, CA 92093-0290

Project Description: University of California, San Diego Scripps Institution of Oceanography seeks an exception from the California Ocean Plan's prohibition on discharges into Areas of Special Biological Significance. The exception with conditions, if approved, would allow their continued waste seawater and co-mingled storm water discharge into the San Diego Marine Life Refuge ASBS.

Determination: The State Water Resources Control Board has determined that the above-proposed project will not have a significant effect on the environment for the reasons specified in the attached Initial Study.

Terms and Conditions:

1. The discharge must comply with all other applicable provisions, including water quality standards, of the Ocean Plan.

2. UCSD/SIO must take all reasonable and appropriate measures to minimize concentrations of chemical additives, including copper, and antibiotics, in the effluent. UCSD/SIO must consider appropriate alternatives, including alternative treatment techniques, pollutant minimization, source control, and process optimization, to reduce effluent concentrations of

copper, antibiotics, and other treatment additives. Formalin shall not be discharged to the ocean. Copper and other additives to the seawater from the Birch Aquarium must be minimized to meet the water quality objectives in Table B of the Ocean Plan.

3. Effluent and receiving water analysis for copper must employ the analytical method (Inductively Coupled Plasma/ Mass Spectrometry) with the lowest minimum detection limits.

4. A quarterly report of all chemical additives discharged via waste seawater must be submitted in the quarterly monitoring report to the Regional Board.

5. Flow measurements (using a flow metering device) for Outfall 001, and estimates for all other permitted outfalls, must be made and reported quarterly to the Regional Board.

6. By January 1, 2007 UCSD/SIO must eliminate all discharges of non-storm water urban runoff (i.e., any discharge of urban runoff to a storm drain that is not composed entirely of storm water), except those associated with emergency fire fighting.

7. UCSD/SIO must specifically address the prohibition of non-storm water urban runoff and the reduction of pollutants in storm water discharges draining to the ASBS in a revised Storm Water Management Plan/Program (SWMP). UCSD/SIO is required to submit their revised SWMP to the Regional Board within six months of permit issuance. The SWMP is subject to the approval of the Regional Board.

8. The revised SWMP must include a map of all entry points (known when the SWMP is prepared) for urban runoff entering the UCSD/SIO drainage system. The SWMP must also include a procedure for updating the map and plan when other entry points are discovered.

9. The revised SWMP must describe the measures by which non-storm water discharges will be eliminated, and interim measures that will be employed to reduce non-storm water flows until the ultimate measures are implemented.

10. The revised SWMP must also address storm water discharges, and how pollutants will be reduced in storm water runoff into the ASBS through the implementation of Best Management Practices (BMPs). The SWMP must describe the BMPs and include an implementation schedule. The implementation schedule must be designed to ensure an improvement in receiving water quality each year (over the permit cycle) due to either a reduction in storm water discharges (due to diversion) or reduction in pollutants (due to on-site treatment or other BMPs). The implementation schedule must be developed to ensure BMPs are implemented within one year of the permit issuance date.

11. Once every permit cycle, a quantitative survey of benthic marine life must be performed. The Regional Board, in consultation with the State Board Division of Water Quality, must

approve the survey design. The results of the survey must be completed and submitted to the Regional Board within six months before the end of the permit cycle.

12. Once during the upcoming permit cycle, a bioaccumulation study using sand crabs (*Emerita analoga*) and mussels (*Mytilus californianus*) must be conducted to determine the concentrations of metals near field and far field (up and down coast, and offshore) in the ASBS. The Regional Board, in consultation with the Division of Water Quality, must approve the study design. The results of the survey must be completed and submitted to the Regional Board at least six months prior to the end of the permit cycle (permit expiration). Based on the study results, the Regional Board, in consultation with the Division of Water Quality, may limit the bioaccumulation test organisms, required in subsequent permits, to only sand crabs or mussels.

13. The effluent from Outfall 001must be sampled and analyzed monthly for copper concentrations.

14. During the first year of the permit cycle two samples must be collected from Outfall 001 (once during dry weather and once during wet weather) and analyzed for all Ocean Plan Table B constituents. During the first year of the permit cycle two composite samples must also be collected (once during dry weather and once during wet weather) representing flows from Outfalls 002, 003, 004A, and 004B; these two composite samples must also be analyzed for all Ocean Plan Table B constituents. Based on these results the Regional Board will determine the frequency of sampling (at a minimum, annually) and the constituents to be tested during the remainder of the permit cycle, except that chronic toxicity must be tested at least annually.

15. Once annually during wet weather, the receiving water in the vicinity of the SIO pier must be sampled and analyzed for Ocean Plan Table B constituents. All Table B constituents must be analyzed during the first year. The Regional Board will determine the sample location(s). Based on the first year sample results the Regional Board will determine specific constituents to be tested during the remainder of the permit cycle, except that chronic toxicity must be tested annually.

16. If the results of receiving water monitoring indicate that wet weather discharges that include storm water are causing or contributing to exceedance(s) of applicable water quality objectives, UCSD/SIO is required to submit a report to the Regional Board within 30 days. Those constituents in storm water which are associated with exceedances of the receiving water objectives must be identified in that report. The report must describe BMPs that are currently being implemented, BMPs that are planned for in the SWMP, and additional BMPs that may be added to the SWMP. The report shall include a new or modified implementation schedule. The Regional Board may require modifications to the report. Within 30 days following approval of the report by the Regional Board, UCSD/SIO must revise its SWMP to incorporate any new or modified BMPs that have been and will be implemented, the

implementation schedule, and any additional monitoring required. As long as UCSD/SIO has complied with the procedures described above and is implementing the revised SWMP, then UCSD/SIO does not have to repeat the same procedure for continuing or recurring exceedances of the same constituent.

17. A study must be performed to determine the initial dilution and fate of the discharge during storms (larger waves and lower salinity discharge) and non-storm periods (smaller waves and higher salinity discharge). The study may be empirical (e.g., a dye study) and/or using a model.

18. In addition to the bacterial monitoring requirements in the Ocean Plan, coliform bacteria and total residual chlorine must be tested once monthly in the effluent from Outfall 003, draining the marine mammal holding facility, when in use.

19. UCSD/SIO must pursue and implement the results of a consultant's feasibility study for engineering controls to prevent exotic species from entering the ASBS, to the extent that such engineering controls are allowable under applicable laws, regulations, and permit conditions.

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Adopted by the State Water Resources Control Board on ________, 2004.

____
Debbie Irvin Date
Clerk to the Board

STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER QUALITY
P.O. BOX 100
SACRAMENTO, CA 95812-0100

INITIAL STUDY

I. Background

Project Title: Exception to the California Ocean Plan for the University of California Scripps Institution of Oceanography Discharge into the San Diego Marine Life Refuge Area of Special Biological Significance

Applicant: University of California San Diego for the Scripps Institution of Oceanography
Office of Environmental Health and Safety, 0920
9500 Gilman Drive
La Jolla, CA 92093-0920

Applicant's Contact Person: Larry Oberti (858) 534-1065

Introduction

On March 21, 1974, the State Water Resources Control Board (State Board), in Resolution No. 74-28, designated 31 Areas of Special Biological Significance (ASBS) (SWRCB 1974). Among those ASBS designated were the San Diego Marine Life Refuge ASBS and the San Diego – La Jolla Ecological Reserve ASBS. Since 1983 the California Ocean Plan (Ocean Plan) has prohibited waste discharges to ASBS (SWRCB 1983). Similar to previous versions of the Ocean Plan, the 2001 Ocean Plan (SWRCB 2001) states: "Waste shall not be discharged to areas designated as being of special biological significance. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas."

Assembly Bill 2800 (Chapter 385, Statutes of 2000), the Marine Managed Areas Improvement Act, added sections to the Public Resources Code (PRC) relevant to ASBS. Section 36700 (f) of the PRC now defines a state water quality protection area as "a nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Resources Control Board through its water quality control planning process." Section 36710 (f) of the PRC states: "In a state water quality protection area point source waste and thermal discharges shall be prohibited or limited by special conditions. Nonpoint source pollution shall be controlled to the extent practicable. No other use is restricted" The change in terminology from ASBS to State Water Quality Protection Area (SWQPA) went into effect on January 1, 2003 (without State Board action) pursuant to Section 36750 of the PRC.

The University of California San Diego Scripps Institution of Oceanography (UCSD/SIO) is located on the coast adjacent to the San Diego Marine Life Refuge ASBS. Scripps Institution of Oceanography was founded in the early twentieth century and has been discharging waste seawater into the ocean in the vicinity of its pier since 1910. The first Waste Discharge Requirements were issued by the San Diego Regional Water Quality Control Board (Regional Board) on September 30, 1969 (RWQCB 1969). The Regional Board issued Scripps its first National Pollutant Discharge Elimination System (NPDES) permit in Order No. 74-47, on Sept. 16, 1974, about 6 months after the Refuge was designated an ASBS. The Ocean Plan in effect at that time prohibited discharges into an ASBS that could alter natural water quality. Finding five of Regional Board Order 74-47 states: "On March 21, 1974 the State Water Resources Control Board designated the La Jolla Ecological Reserve as an Area of Special Biological Significance. This action by the State Board also prohibited any discharge to Areas of Special Biological Significance which could alter the natural water quality conditions. Staff is of the opinion that the discharge would not alter the natural water quality conditions" (RWQCB 1974). (The Regional Board incorrectly identified the discharge as entering the La Jolla – San Diego Ecological Reserve when instead it flows into the San Diego Marine Life Refuge.) The permit was re-issued in 1979, 1984, 1994 and 1999 (RWQCB 1979; 1984; 1994; 1999). This discharge has never been issued an exception by the State Board and, thus, does not comply with the California Ocean Plan.

Section III (I)(1) of the 2001 Ocean Plan states: "The State Board may, in compliance with the California Environmental Quality Act, subsequent to a public hearing, and with the concurrence of the Environmental Protection Agency, grant exceptions where the Board determines: a. The exception will not compromise protection of ocean* waters for beneficial uses, and, b. The public interest will be served."

Project Description

UCSD/SIO seeks an exception from the Ocean Plan's prohibition on discharges into ASBS. The exception with conditions, if approved, would allow their continued waste seawater and co-mingled storm water discharge into the San Diego Marine Life Refuge ASBS.

Environmental Setting

The San Diego Marine Life Refuge ASBS and the San Diego - La Jolla Ecological Reserve ASBS are contiguous ocean areas adjoining the La Jolla district of the City of San Diego. The combined area of these two contiguous ASBS is approximately 541 acres. The San Diego Marine Life Refuge ASBS is approximately 88 acres and has about 0.6 miles of coastline. The San Diego La Jolla Ecological Reserve ASBS is approximately 453 acres and has about 1.7 miles of coastline.

Habitats and Marine Biota

A 1980 survey of the intertidal and subtidal waters of the San Diego Marine Life Refuge ASBS reported the following habitats and communities (SWRCB 1980):

- A broad sandy shelf ranging from shore to a depth of 40 feet (12m). Sandy beach intertidal invertebrates include sand crabs (*Emerita analoga*) and amphipods (*Orchestoidea spp*.), and occassionally bloodworms (*Euzonus mucronata*) and bean clams (*Donax gouldii*). Subtidal invertebrates on the sandy shelf include burrowing anemones (*Harenactis attenuatta*), sea pansies (*Renilla kollikeri*), sea pens (*Stylatula elongata*), parchment tube worms (*Diopatra splendidissima*), opossum shrimp (*Acanthomysis costata*), tinted wentletrap snails (*Epitomium tinctum*), olive snails (*Olivella spp*.), sand stars (*Astropecten spp.*), brittle stars (*Amphiodia spp*.), and sand dollars (*Dendraster excentricus*).

- On the north end, a rocky intertidal reef system of mudstone ledges, boulders, and dike. The rocky intertidal zone flora include crustose and corraline red algae, surfgrass (*Phyllospadix*), green algae (particularly *Enteromorpha* and *Ulva*) and brown algae (particularly *Pelvetia, Scytosiphon, Pachydiction,* and *Sargassum*). Rocky intertidal invertebrates include sea anemones (*Anthopleura* spp.), colonial sand tube worms (*Phragmatopoma californica*), barnacles (*Chthamalus fissus, Balanus glandula,* and *Pollicipes polymerus*), limpets (*Lottia gigantea*, *Acmaea* (= *Lottia*) *spp.* and *Collisella* (= *Lottia*) *spp.),* littorine snails (*Littorina spp*.), black turban snails (*Tegula funebralis*), and mussels (*Mytilus californicus* and *M. edulis*).

- A concrete pier embedded in a sandy bottom to a water depth of 20 feet (7 m) is inhabited by a subset of the species found in the rocky intertidal community.

Immediately offshore of the San Diego Marine Life Refuge ASBS is the Scripps Branch of the La Jolla Submarine Canyon. Immediately south of the San Diego Marine Life Refuge ASBS is the San Diego La Jolla Ecological Reserve ASBS. A 1979 survey of the intertidal and subtidal waters of the San Diego La Jolla Ecological Reserve ASBS reported the following habitats and communities (SWRCB 1979):

- A broad sandy shelf in the northern part of the ASBS ranging from the shoreline down to depths of 100 feet (30 meters). The common sandy intertidal and subtidal invertebrate fauna is essentially the same as that found in the San Diego Marine Life Refuge ASBS described above.

- The relatively wide, peaty-clay banked head of the southern branch of the La Jolla Submarine Canyon. Invertebrates found in this habitat include sponges (including *Verongis thiona*), sea whips (*Lophogorgia* *chilensis*), sea pens (*Stylatula elongata*), parchment tube worms (*Diopatra splendidissima*), piddock clams (probably *Parapholas californica*), and stalked tunicates (*Styela spp*.)

- Relatively flat ledges of sandstone/shale, with seaweed beds dominated by surfgrass (*Phyllospadix sp.*), feathery boa kelp (*Egregia laevigata*), and giant kelp (*Macrocystis pyrifera*), and their respective communities, constitute the southern third of the ASBS and are indented by numerous sand channels.

- A complex reef system of mudstone boulders, with an absence of large attached seaweeds, that occupies the seaward margin of the rocky intertidal and subtidal areas off the La Jolla Caves area. The flora of the rocky intertidal zone is dominated by red algae (Rhodophyta), and other flora and fauna are similar to the rocky intertidal inhabitants of the San Diego Marine Life Refuge ASBS described above. The subtidal inhabitants of this reef system include red algae (*Corallina spp*., *Bossiella spp*., and *Gigartina sp*.), various sponges (including *Cliona celata* and *Haliclona permollis* among others), ostrich plume hydroids (*Aglaophenia struthinoides*), stony corals (*Astrangia lajollaensis*), sea fans (including *Muricea californica*), piddock clams (likely *Parapholas californica*), wavy turban snails (*Astraea undosa*), Kellet's whelks (*Kelletia kelleti*), encrusting ectoprocts (likely *Membranipora sp*., *Bugula sp*., *Schizoporella unicornis*, and *Eurystomella bilabiata*), knobby sea stars (*Pisaster giganteus*), red urchins (*Strongylocentrotus franciscanus*), sea cucumbers (*Stichopus parvimensis*), and tunicates (including *Styela clava*).

The northern portion of the La Jolla kelp bed, dominated by the giant kelp (*Macrocystis pyrifera*), is located in the vicinity of Goldfish Point inside of the San Diego La Jolla Ecological Reserve. The La Jolla kelp bed extends outside of the ASBS boundary south along the La Jolla peninsula and terminates on its southern extremity near False Point. The most recent information is that the La Jolla kelp bed is the second largest in Orange and San Diego Counties, with a canopy covering about 631 acres (Curtis 2003, unpublished data).

The two ASBS are habitat for the spiny lobster (*Panulirus interruptus*), an important seafood resource. Squid (*Loligo opalescens*), another important seafood resource, use these ASBS, especially the shallower portion of the submarine canyon, as a spawning habitat during the fall and winter. The grunion (*Leuresthes tenuis*) utilizes the sandy intertidal zone for spawning during the spring and summer. The lighting at Kellogg Park and at Scripps Pier has reduced the number of grunion that use those stretches of beach as a spawning site (SWRCB 1979).

The above habitats also support a wide variety of other fish species. Barracuda (*Sphyraena argentea*), bonito (*Sarda chiliensis*), mackarel (*Scomber japonicus*), and yellowtail (*Seriola dorsalis*) are common nearshore pelagic fish which are also important seafood resources. California halibut (*Paralichthys californicus*), an important seafood resource, inhabits the sandy bottom of these ASBS.

Other common fish inhabiting the sandy bottoms include speckled sanddabs (*Citharichthys stigmaeus*), bat rays (*Myliobatis californicus*), thornbacks (*Platyrhinoides triseriata*), shovelnose guitarfish (*Rhinobatis productus*), round stingray (*Urolophus halleri*), and angel shark (*Squatina californica*). Goldfish Point in the San Diego – La Jolla Ecological Reserve ASBS is named after the abundance of garibaldi (*Hypsipops rubicundus*) found in that area. In addition to garibaldi, blacksmith (*Chromis punctipinnis*), sheephead (*Pimelometopon pulchrum*), senorita (*Oxyjulis californica*), rock wrasse (*Halichoeres semicinctus*), kelp bass (*Paralabrax clat*hratus), sand bass (*Paralabrax nebulifer*), halfmoon (*Medialuna californiensis*), zebraperch (*Hermosilla azurea*), black surfperch (*Embiotoca jacksoni*), white surfperch (*Phanerodon furcatus*), walleye surfperch (*Hyperprosopon argenteum*), opaleye (*Girella nigricans*), black crested goby (*Coryphopterus nicholsii*), and topsmelt (*Atherinops affinis*) were found in densities greater than 0.10 individuals per square meter in seaweed beds or other rocky subtidal habitats. Wooly sculpin (*Clinocottus analis*) are common rocky intertidal inhabitants.

Sanderling (*Calidris alba*), western gull (*Larus occidentalis*), marbled godwit (*Limosa fedoa*), and surf scoter (*Melanetta perspiculata*) are birds that have been observed inhabiting these ASBS. Brown pelican (*Pelecanus occidentalis*) and Brandt's cormorants (*Phalocrocorax penicillatus*) are know to roost in the cliffs near La Jolla Caves at the southern end of the San Diego La Jolla Ecological Reserve. Brown Pelicans are an endangered species under both state and federal law. Gray whales (*Eschrichtius robustus*) are known to migrate relatively close to shore in the vicinity of these ASBS on their southerly migration. Gray whales were a federally endangered species at the time that the ASBS was originally designated, but were de-listed in 1994.

A complete listing of marine species inhabiting these ASBS may be found in the Reconnaissance Survey Reports for the San Diego Marine Life Refuge ASBS and San Diego – La Jolla Ecological Reserve ASBS (SWRCB 1979; 1980).

Marine Protected Areas and Prohibitions on the Take of Marine Life

The commercial or recreational take of invertebrates and marine plants in the San Diego Marine Life Refuge is prohibited. The San Diego Marine Life Refuge has exactly the same boundaries as the Scripps Coastal Reserve's marine waters, and the same prohibitions apply. In the San Diego-La Jolla Ecological Reserve the commercial or recreational take of all marine species is prohibited, with the exception of commercial bait fishing for squid (McArdle 1997).

Oceanographic Conditions and Marine Water Quality

The water transport in Southern California Bight in the general vicinity of La Jolla is influenced by the California Current and the Southern California Counter Current (SWRCB 1980). The California Current is generally located at the surface over the seaward slope, well outside of San Clemente Island and several hundred km offshore of the mainland; it flows toward the equator. Nearer to shore a large scale eddy effect takes place and surface water is transported poleward by the Southern California Counter Current. Upwelling also takes place in the Southern California Bight, in which nutrient rich bottom water rises to the surface. Even closer to shore, the current over the coastal shelf, in depths up to 60 meters, flows toward the equator. (Dailey, *et al.* 1993). The longshore current has a net southward flow and deposits sand into the heads of the La Jolla submarine canyon and thence down into the San Diego Trough (SWRCB 1980).

The sea state in the vicinity of La Jolla is usually calm and smooth, with wind waves of less than two feet. Swells normally arrive from the west to northwest, although winter storm swells come from a more southerly direction. Typical surf is one to two feet, but winter storms may produce waves of eight feet or more (SWRCB 1980).

Storms and accompanying precipitation are mostly concentrated in the winter months, but infrequently tropical squalls may result in significant precipitation during the summer months (SWRCB 1980). Based on records during the period 1961-1990 the annual rainfall for the La Jolla area is about 10–15 inches (National Weather Service 2004).

Between 1920 and 1978 water temperature at the Scripps Pier ranged from 8.3° C (46.4° F) and 14.5° C (58.0° F) (SWRCB 1980). According to more recent data inclusive of the period August 1916 to June 2001, surface water temperatures ranged from 10.1° C (50.2° F) to 25.8° C (78.4° F); the mean temperature during that period was 17.0° C (62.6° F) (calculated from raw data provided by Teresa Kacena (2003), SIO).

Between 1920 and 1978 the minimum salinity of surface water was 32.3 parts per thousand (ppt) and the maximum salinity at the surface was 34.7 ppt. Peak salinity occurs during the summer. The monthly means given for that period ranged from 33.3 to 33.9, and the mean annual salinity was 33.6 ppt . (SWRCB 1980). According to more recent data for the period 1993 to 1996, salinity ranged from 31.3 to 33.9 ppt, with a mean annual average of 33.4 ppt (calculated from raw data, SIO (2004)).

On June 17, 2003 UCSD collected three replicate composite samples from a location 0.25 mile west and up-current of the Scripps Pier. Each replicate was composited from samples collected from the surface, middle, and bottom portions of the water column. Samples one and two were analyzed once each with results of 1.93 and 1.94 µg/L total copper respectively. Sample three was analyzed twice with results of 2.14 and 2.31 µg/L total copper. Furthermore, another sample collected on the same date from the SIO seawater intake had a similar copper concentration of 1.61 µg/L (CRG Laboratories 2003). Based on these results ambient sea water in the vicinity of SIO has a copper concentration of approximately 2 µg/L. This is consistent with the 2.0 µg/L background copper concentration in the 2001 California Ocean Plan.

Water column visibility at La Jolla is generally very clear, with vertical visibility at times being as deep as 50 feet (15 meters). Visibilities of 20 to 30 feet (6 to 9 meters) are not uncommon in the vicinity of Dike Rock on the northern end of the San Diego Marine Life Refuge (SWRCB 1980). Visibility at times may be drastically reduced by the occurrence of red tides (blooms of phytoplankton), turbidity due to large waves, and storm runoff. Oil globules are known to be deposited on the beach at La Jolla. These oil globules may be a result of vessel discharges and/or natural oil seepage (SWRCB 1980). The shoreline in the San Diego Marine Life Refuge ASBS, as well as in the contiguous San Diego-La Jolla Ecological Reserve ASBS, exceeds water quality standards for bacterial indicators due to nonpoint and point sources (SWRCB 2003).

Land Use

The land use in La Jolla is primarily urban/suburban. Land use may be broken down as follows: 58% residential, 19% roads, 16% open space (including parks and a golf course), 5% schools (including the university), and 2 % commercial (City of San Diego 2002). The project is located within a small watershed within the larger district of La Jolla. In this small watershed, (approximately 2.3 square miles or 1481 acres) land use is dominated by the UCSD campus, open space including a golf course, and surrounding low density private residences (0-5 dwelling units per acre). There are 6,020 people living in this watershed, giving it a resident population density of 4 persons per acre (calculated using Census 2000 Block Level data, California Department of Forestry (2002)). During daylight hours the campus is a major employer, and at times traffic in the vicinity of the campus is heavy.

Existing Discharges

The Southern California Coastal Water Research Project (SCCWRP), under contract to the State Board, conducted a survey of all discharges into State Water Quality Protection Areas. SCCWRP's (2003) final report identified 92 discharges into the San Diego Marine Life Refuge ASBS, and a majority of these are from pipes and/or holes coming through seawalls, draining storm runoff from the campus, private residences, bluffs and landscaped areas. SCCWRP (2003) identified five outfalls that were characterized as point sources of wastewater, associated with the UCSD SIO, which is permitted to discharge one million gallons per day of waste seawater. These discharges are identified and regulated under Regional Board Order 99-83 (RWQCB 1999). Storm water discharges from the UCSD campus, including SIO, may in the future be regulated under a Phase II MS4 Permit.

SCCWRP (2003) also identified 195 drainages in the neighboring San Diego-La Jolla Ecological Reserve ASBS, including 184 discharges, 9 natural (but modified) outlets, and 2 potential sources that were not completely identified. The majority of discharges into this ASBS, adjacent to the San Diego Marine Life Refuge ASBS, were also from pipes and/or holes coming through seawalls, draining bluffs and landscape areas. Several large municipal storm drains are located here, the largest diameter drain located at the southern end of Kellogg Park at the foot of Avenida de la Playa. The southern coastline of this ASBS includes a tide pool area that receives discharges from pipes on the bluffs and gullies. The municipal storm water discharges in this ASBS are regulated under a Phase I MS4 Permit. A complete breakdown of drainages into these two ASBS combined is given in Table 1.

Table 1. Discharges into the San Diego Marine Life Refuge and the San Diego La Jolla Ecological Reserve ASBS

description	number	comments
Wastewater Point Source Outfalls	5	All from SIO seawater system, and includes co-mingled urban runoff
Large Storm Drains	20	Apparently maintained by municipalities
Small Storm Drains	245	Mostly draining individual properties
Nonpoint Sources	6	Paved or unpaved access routes, a pier, or erosion features associated with urban runoff
Gullies	9	Likely naturally occurring but also carry urban runoff
Potential Discharges	2	Only standpipe visible, unknown contents and discharge points
Total	287	

II. Environmental Impacts

The environmental factors checked below could be potentially affected by this project. See the checklist on the following pages for more details.

☐	Land Use and Planning	☐	Transportation/Circulation	☐	Public Services
☐	Population and Housing	☑	Biological Resources	☐	Utilities and Service Systems
☐	Geological Problems /Soils	☐	Energy and Mineral Resources	☐	Aesthetics
☑	Hydrology/Water Quality	☐	Hazards	☐	Cultural Resources
☐	Air Quality	☐	Noise	☐	Recreation
☐	Agriculture Resources	☐	Mandatory Findings of Significance		

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
1. GEOLOGY and SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☑
i) Rupture of a known earthquake fault, as delineated in the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines & Geology Special Publication 42.	☐	☐	☐	☑
ii) Strong seismic ground shaking?	☐	☐	☐	☑
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☑
iv) Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☑
d) Be located on expansive soils, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternate wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑
2. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☑
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☑
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☑
3. HYDROLOGY and WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☑
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (*e.g.*, the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑
c) Substantially alter the existing drainage pattern of the site, including through alteration of the course of a stream or river, or substantially increase the rate or volume of surface runoff in a manner that would:				
i) result in flooding on- or off-site	☐	☐	☐	☑
ii) create or contribute runoff water that would exceed the capacity of existing or planned stormwater discharge	☐	☐	☐	☑
iii) provide substantial additional sources of polluted runoff	☐	☐	☐	☑
iv) result in substantial erosion or siltation on-or off-site?	☐	☐	☐	☑
d) Otherwise substantially degrade water quality?	☐	☐	☐	☑
e) Place housing or other structures which would impede or re-direct flood flows within a 100-yr. flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
f) Expose people or structures to a significant risk of loss, injury, or death involving flooding:				
i) as a result of the failure of a dam or levee?	☐	☐	☐	☑
ii) from inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑
g) Would the change in the water volume and/or the pattern of seasonal flows in the affected watercourse result in:				
i) a significant cumulative reduction in the water supply downstream of the diversion?	☐	☐	☐	☑
ii) a significant reduction in water supply, either on an annual or seasonal basis, to senior water right holders downstream of the diversion?	☐	☐	☐	☑
iii) a significant reduction in the available aquatic habitat or riparian habitat for native species of plants and animals?	☐	☐	☐	☑
iv) a significant change in seasonal water temperatures due to changes in the patterns of water flow in the stream?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
v) a substantial increase or threat from invasive, non-native plants and wildlife	☐	☐	☐	☑
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☑

SIO was founded in the early twentieth century and has been discharging waste seawater into the ocean in the vicinity of its pier since around 1910. The first Waste Discharge Requirements were issued by the Regional Board on September 30, 1969 (Order 69-R24) (RWQCB 1969). In 1992 SIO opened its Stephen Birch Aquarium, replacing an older public aquarium. The waste seawater from the Stephen Birch Aquarium is discharged through SIO's Outfall 001.

<u>Copper and Other Treatment Additives</u>

The waste seawater from the Stephen Birch Aquarium at times has contained measurable concentrations of copper, derived from copper sulfate, which is used as a treatment for disease control.

A dilution factor of 2:1 is allowed in Regional Board Order 99-83 (RWQCB 1999). This dilution factor was originally determined using best professional judgement by state and regional board staff, but does not represent the results of an empirical study or the application of a valid computer model. Using the dilution factor of two, the effluent limits for copper according to the Ocean Plan would be 5 µg/L (6 month median), 32 µg/L (daily maximum), and 86 µg/L (instantaneous maximum).

The effluent copper limitations in Regional Board Orders 94-76 and 99-83 were instead a monthly average of 20µg/L, a daily maximum of 32µg/L, and an instantaneous maximum 86µg/L (RWQCB 1994; 1999). While the daily maximum and instantaneous maximum limits are soundly based in the Ocean Plan, the Ocean Plan does not specify a monthly average measurement. Using the monthly average of 20 µg/L does not insure compliance with the Ocean Plan's six month median limitation of 5µg/L copper.

During the period 1994-2003 measurements of copper in the effluent from SIO's outfall 001 ranged from a high of 31µg/L to below detection limits. Prior to March 2003 there were a large number of non-detects because the analytical method used during that time had a relatively high minimum detection limit (10 µg/L). A reasonable potential analysis was applied to the available data from 1994-2003. That analysis resulted in a mean copper concentration of 11.57µg/L (standard deviation 7.61) and a median copper concentration of 8.90 µg/L, which is over the 5.0 µg/L six month median limit (see Appendix A).

Copper is known to be toxic to marine life. Table 2 gives data derived from a comparison of critical life stage bioassays performed by several different laboratories (Saiz, 1995). The mean test results are within the range of the copper concentrations from SIO's outfall 001 during the period 1994 - 2003.

Table 2. Mean Critical Life Stage Bioassay Results reported as the No Effect Concentration (NOEC).

Test	mean NOEC µg/L	st. dev.
Giant kelp *Macrocystis pyrifera* gametophyte growth	16.7	3.4
Giant kelp *Macrocystis pyrifera* gametophyte fertilization	36.2	14.7
Sand dollar *Dendraster excentricus* fertilization	11.6	3.4
Purple Sea Urchin *Strongylocentrotus purpuratus* fertilization	9.1	4.0

The current permit is not consistent with the 2001 Ocean Plan requirements with regard to toxicity testing. The effluent toxicity limits in Regional Board Order No. 99-83, are for acute toxicity only, as follows: 1.5 TUa (monthly average) and 2.5 TUa (instantaneous maximum); these limits only apply to Outfall 001. The Ocean Plan requires chronic toxicity testing (using critical life stage bioassays on a minimum of three species) for discharges with dilution factors of less than 100:1. Using a dilution factor of 2:1 the Ocean Plan would require a daily maximum chronic toxicity effluent limit of 3 TUc.

According to information provided by the UCSD Environmental Health and Safety Office, the Stephen Birch Aquarium has used a variety of other additives, in addition to copper sulfate, which are also eventually discharged (see Table 3).

Table 3. Additives to Sea Water, SIO Stephen Birch Aquarium

Compound	**Maximum Amount Used Annually**	
Citric Acid	7,000	grams
Clove Oil	1	gram
Copper Sulfate	40,000	grams
Paragon I (antibiotic, includes dimethyl phosphonate, kanamycin sulfate, isoniazid, and nitrofurazone)	400	grams
Formalin (formaldehyde and methanol)	4,160	grams
Furazone Green (antibiotic)	4,000	grams
Gentamycin sulfate	No data provided by SIO	
Methylene Blue (antibiotic)	23	grams
Metronidazole (antibiotic)	100	grams
Paragon II (antibiotic, includes metronidazole, naladixic acid, and neomycin sulfate)	400	grams
Tetracycline (antibiotic)	980	grams
Sodium hypochlorite (household bleach)	200	gallons
Sodium thiosulfate	104	grams
Sulfa4 TMP (antibiotic)	500	grams
Tricane MS222	416	grams
Trichlorfon (organophosphate compound)	4,800	grams

In addition, baytril and erythromycin are fed or injected into fish, and it is possible that these compounds are excreted into the waste seawater.

As a result of the environmental review associated with this request for an exception from the Ocean Plan's ASBS discharge prohibition, several regulatory improvements will be implemented to better control and monitor the SIO discharges.

The previous permit's monthly average copper limit of 20 µg/L does not coincide with the Ocean Plan requirements and does not insure compliance with the Ocean Plan's receiving water objectives. As a result of the conditions in this exception, the permit effluent limits will now be soundly based in the Ocean Plan. Assuming a dilution factor of 2:1, the effluent limits would be: 5 µg/L (6 month median), 32 µg/L (daily maximum), and 86 µg/L (instantaneous maximum). SIO will also now be required to perform modeling and/or an empirical field study to determine the validity of that dilution factor. The results of that study will be useful in determining the immediate fate of copper and other pollutants in the receiving water. The results may also lead to the establishment of a more representative dilution factor and subsequently different effluent limits.

SIO performed bi-weekly sampling and analysis of copper concentrations in the effluent discharged from outfall 001 from May through early July 2003. The results of analysis by CRG Laboratories (2003), using a method detection limit of 0.005 µg/L, are shown in Table 4.

Using previous analytical methods (as was done for the data set from 1994 – 1998) these levels would have been non-detects. Instead, using an appropriate method (ICPMS, or Inductively Coupled Plasma/ Mass Spectrometry) and a lower detection limit (0.5 µg/L) we now have a clear idea of what the copper concentrations actually were for the period sampled.

The use of copper sulfate will be better managed to reduce the copper concentrations so as to meet the Ocean Plan required effluent limitations. SIO will be required to perform more frequent monthly measurements of effluent copper concentrations via the inductively coupled plasma mass spectrometry method specified in the Ocean Plan; this will result in fewer non-detects due to that method's minimum level of detection of 0.5 µg/L. This will allow for better management of the discharge by SIO and will allow the Regional Board to better track SIO's compliance with effluent limits. SIO will now be required to report the use of seawater additives on a quarterly basis. Furthermore, SIO is now committed to prohibiting formalin in its waste seawater effluent discharged to the ASBS. Instead, any waste seawater containing formalin will be discharged to the sewer. Ultimately this will result in less copper discharged and better protection for the beneficial uses.

Table 4. Analysis of Waste Sea Water Effluent, SIO Outfall 001

Sample date	Replicate 1 (µg/L)	Replicate 2 (µg/L)	Sample Mean (µg/L)
May 5, 2003	4.70	3.93	4.32
May 19, 2003	4.56		4.56
June 2, 2003	4.15	4.37	4.26
June 17, 2003	8.10		8.10
June 30, 2003	8.46	8.37	8.42
July 14, 2003	5.21	6.32	5.77
			mean 5.91
			median 5.17

The results in Table 4 indicate that frequent monitoring of effluent copper levels using a lower detection limit allows for better management and regulatory oversight with regard to meeting effluent limits. During the period tested the median value of 5.17 µg/L was very close to the six month median of 5.0 µg/L (see Appendix A). With better management of copper additives and elimination of dry weather urban runoff as required by the conditions in the exception it seems feasible that SIO will be able to meet the Ocean Plan effluent limits

Table 5. Typical concentrations, when additives are in use, in SIO's waste seawater effluent.

Constituent	µg/L
Baytril	0.00
Chlorine (free), neutralized with sodium thiosulfate	0.01
Citric Acid	1.78
Clove Oil	0.00
Copper	10.98
Erythromycin	0.00
Formalin	0.00
Furazone Green	0.50
Gentamycin sulfate	0.26
Methylene Blue	0.50
Metronidazole	1.49
Paragon I (metronidazole, neomycin sulfate, naladixic acid)	2.25
Paragon II (dimethyl phosphonate, nitrofurazone, isoniazid, neomycin and kanamycin sulfate)	1.46
Sulfa4 TMP	5.64
Tetracycline	1.84
Tricane MS222	5.46
Trichlorfon	7.04

Under the new permit the typical concentrations that will be present in the effluent, when the additives are used in relatively high concentrations, are shown in Table 5. A sea water sample spiked with a copper concentration of approximately 10.2 µg/L, and also containing the concentrations given in Table 5 for the other additives used by the Stephen Birch Aquarium, was subjected to critical life stage bioassays on three species; species tested were the sand dollar (*Dendraster excentricus*), giant kelp (*Macrocystis pyrifera*), and topsmelt (*Atherinops affinis*). The chronic toxicity NOEC was >100% for all three species and the sample was also found to have low acute toxicity (LC50 of >100, 88% survival in 100% effluent, TUa of 0.83) to topsmelt (AMEC 2003a). Using a dilution factor of 2:1, this translates to a TUc of < 1, well below the Ocean Plan's required daily maximum chronic toxicity effluent limit of 3 TUc. These results indicate that the proposed effluent is not toxic to the marine organisms tested. These three organisms are all native to southern California marine waters. While not identical, these organisms are generally considered representative of other marine organisms with regard to toxicity. Chronic toxicity testing, using the critical life stage bioassays for a minimum of three species, will now be required; this will allow the Regional Board to determine if future SIO discharges comply with the Ocean Plan's toxicity limits.

To protect aquatic life from the adverse effects of copper and other treatment additives, the State Board will condition approval of the exception on the following terms:

- *UCSD/SIO must take all reasonable and appropriate measures to minimize concentrations of chemical additives, including copper, and antibiotics, in the effluent. UCSD/SIO must consider appropriate alternatives, including alternative treatment techniques, pollutant minimization, source control, and process optimization, to reduce effluent concentrations of copper, antibiotics, and other treatment additives. Formalin shall not be discharged to the ocean. Copper and other additives to the seawater from the Birch Aquarium must be minimized to meet the water quality objectives in Table B of the Ocean Plan.*
- *Effluent and receiving water analysis for copper must employ the analytical method (Inductively Coupled Plasma/ Mass Spectrometry) with the lowest minimum detection limits.*
- *A quarterly report of all chemical additives discharged via waste seawater must be submitted in the quarterly monitoring report to the Regional Board.*
- *The effluent from Outfall 001must be sampled and analyzed monthly for copper concentrations.*
- *During the first year of the permit cycle two samples must be collected from Outfall 001 (once during dry weather and once during wet weather) and analyzed for all Ocean Plan Table B constituents. During the first year of the permit cycle two composite samples must also be collected (once during dry weather and once during wet weather) representing flows from Outfalls 002, 003, 004A, and 004B; these two composite samples must also be analyzed for all Ocean Plan Table B constituents. Based on these results the Regional Board will determine the frequency of sampling (at a minimum, annually) and the constituents to be tested during the remainder of the permit cycle, except that chronic toxicity must be tested at least annually.*
- *Once annually during wet weather, the receiving water in the vicinity of the SIO pier must be sampled and analyzed for Ocean Plan Table B constituents. All Table B constituents must be analyzed during the first year. The Regional Board will determine the sample location(s). Based on the first year sample results the Regional Board will determine specific constituents to be tested during the remainder of the permit cycle, except that chronic toxicity must be tested annually.*
- *A study must be performed to determine the initial dilution and fate of the discharge during storms (larger waves and lower salinity discharge) and non-storm periods (smaller waves and higher salinity discharge). The study may be empirical (e.g., a dye study) and/or using a model.*

<u>Bacteria</u>

SIO also periodically uses some of its facilities for maintaining marine mammals. This may result in some coliform bacteria in the waste seawater. Additionally, the shoreline in the San Diego Marine Life Refuge ASBS, as well as in the contiguous San Diego-La Jolla Ecological Reserve ASBS, exceeds water quality standards for bacterial indicators. Typically up to three pinnipeds (seals or sea lions) are held for periods of 12 to 16 weeks per year. It is possible that occasional discharges of water from the marine mammal holding facilities may contribute to the bacterial indicator waste load in the receiving water. Although SIO's discharge is not likely to be a major cause, monitoring must be performed to ensure that the discharge is not contributing to the exceedance.

The following terms and conditions will be required for the exception as they relate to bacteria:

- *In addition to the bacterial monitoring requirements in the Ocean Plan, coliform bacteria and total residual chlorine must be tested once monthly in the effluent from Outfall 003, draining the marine mammal holding facility, when in use.*

<u>Storm Water and Non-Storm Water Urban Runoff</u>

Storm water and non-storm water urban runoff have been and continue to be co-mingled with the waste seawater through SIO's outfalls. Urban storm water and non-storm urban runoff may contain constituents that are toxic to marine life. Storm water runoff collected by UCSD (prior to entering the storm drain system) during a small storm in May 2003 and analyzed by EnviroMatrix, Inc. (2003) contained copper concentrations from 0.022 to 0.360 mg/L (22 to 360 μg/L). Oil and grease in those same samples ranged from non-detect to 9 mg/L. Table 6 includes all of the storm water analytical results from the three samples collected on May 3, 2003.

Table 6. SIO Storm Water Effluent Analyses

Sample number	Cu (mg/L)	Specific Conductance (umho/cm)	Oil & Grease (mg/L)	pH	Total Suspended Solids (mg/L)
SW-1	0.022	182	9	6.73	ND* (< 20)
SW-2	0.360	299	ND* (< 5)	6.94	ND* (< 20)
SW-3	0.060	329	7	7.09	ND* (< 20)

*ND = Not detected, with detection limits in parentheses

UCSD has prepared and submitted a Storm Water Management Plan (SWMP), dated March 10, 2003, to the Regional Board that covers all of its campuses and properties, including those properties such as SIO that drain to the ASBS. The SWMP was developed to comply with EPA Phase II NPDES requirements promulgated under the Clean Water Act. The SWMP's purpose is to identify pollutant sources, develop BMPs, and provide measurable goals to reduce the discharge of identified pollutants. The SWMP includes a five year implementation schedule. Waste discharges into the ASBS are not specifically discussed. In a later July 21, 2003 submittal UCSD/SIO did provide specific BMPs (yard cleanup, spill prevention and control, and storm drain inspection/maintenance) to address "significant potential storm water pollutant sources" at SIO. However, a specific accelerated schedule for implementation of these measures was not provided at that time.

The shoreline in the San Diego Marine Life Refuge ASBS, as well as in the contiguous San Diego-La Jolla Ecological Reserve ASBS, exceeds water quality standards for bacterial indicators. Most of the storm drains, especially the larger municipal storm drains, are not associated with SIO. The City of San Diego's municipal storm drain discharges are regulated under a Phase I MS4 NPDES permit (for San Diego County and co-permittees) without the benefit of an exception from the State Board. It is likely that these storm drains are discharging more pollutants into these two ASBS, and having a much greater impact, than the SIO discharges. In 1979, solids deposited by urban runoff were noticeable on the beach sand in the vicinity of storm drains at the San Diego – La Jolla Ecological Reserve ASBS (SWRCB 1979). Muddy sediment was reported to be discharged from storm drains, and the large storm drain at the foot of Avenida de la Playa was described as producing a massive brown silty discharge. A paved roadway leading down Black's Canyon, about 500 yards north of the San Diego Marine Life Refuge, concentrates storm water runoff. Historically, closures of the waters within the ASBS have been associated with storm runoff and sewage spills (SWRCB 1980). Just north of Black's Canyon is Los Penasquitos Lagoon, the outflow from which also likely contributes to water quality degradation in the vicinity of SIO during storm runoff periods.

During this review it was determined that storm water is co-mingled with waste seawater from SIO. For those outfalls which discharge co-mingled storm water and waste seawater, SIO will be required to implement a Storm Water Management Plan with an accelerated schedule to prevent degradation of ASBS receiving waters during storm runoff periods, and to eliminate dry weather urban runoff from the waste seawater outfalls.

The following terms and conditions will be required for the exception as they relate to storm water and non-storm water urban runoff:

- *By January 1, 2007 UCSD/SIO must eliminate all discharges of non-storm water urban runoff (i.e., any discharge of urban runoff to a storm drain that is not composed entirely of storm water), except those associated with emergency fire fighting.*
- *UCSD/SIO must specifically address the prohibition of non-storm water urban runoff and the reduction of pollutants in storm water discharges draining to the ASBS in a revised Storm Water Management Plan/Program (SWMP). UCSD/SIO is required to submit their revised SWMP to the Regional Board within six months of permit issuance. The SWMP is subject to the approval of the Regional Board.*
- *The revised SWMP must include a map of all entry points (known when the SWMP is prepared) for urban runoff entering the UCSD/SIO drainage system. The SWMP must also include a procedure for updating the map and plan when other entry points are discovered.*
- *The revised SWMP must describe the measures by which non-storm water discharges will be eliminated, and interim measures that will be employed to reduce non-storm water flows until the ultimate measures are implemented.*
- *The revised SWMP must also address storm water discharges, and how pollutants will be reduced in storm water runoff into the ASBS through the implementation of Best Management Practices (BMPs). The SWMP*

must describe the BMPs and include an implementation schedule. The implementation schedule must be designed to ensure an improvement in receiving water quality each year (over the permit cycle) due to either a reduction in storm water discharges (due to diversion) or reduction in pollutants (due to on-site treatment or other BMPs). The implementation schedule must be developed to ensure BMPs are implemented within one year of the permit issuance date.

- *During the first year of the permit cycle two samples must be collected from Outfall 001 (once during dry weather and once during wet weather) and analyzed for all Ocean Plan Table B constituents. During the first year of the permit cycle two composite samples must also be collected (once during dry weather and once during wet weather) representing flows from Outfalls 002, 003, 004A, and 004B; these two composite samples must also be analyzed for all Ocean Plan Table B constituents. Based on these results the Regional Board will determine the frequency of sampling (at a minimum, annually) and the constituents to be tested during the remainder of the permit cycle, except that chronic toxicity must be tested at least annually.*
- *Once annually during wet weather, the receiving water in the vicinity of the SIO pier must be sampled and analyzed for Ocean Plan Table B constituents. All Table B constituents must be analyzed during the first year. The Regional Board will determine the sample location(s). Based on the first year sample results the Regional Board will determine specific constituents to be tested during the remainder of the permit cycle, except that chronic toxicity must be tested annually.*
- *If the results of receiving water monitoring indicate that wet weather discharges that include storm water are causing or contributing to exceedance(s) of applicable water quality objectives, UCSD/SIO is required to submit a report to the Regional Board within 30 days. Those constituents in storm water which are associated with exceedances of the receiving water objectives must be identified in that report. The report must describe BMPs that are currently being implemented, BMPs that are planned for in the SWMP, and additional BMPs that may be added to the SWMP. The report shall include a new or modified implementation schedule. The Regional Board may require modifications to the report. Within 30 days following approval of the report by the Regional Board, UCSD/SIO must revise its SWMP to incorporate any new or modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required. As long as UCSD/SIO has complied with the procedures described above and is implementing the revised SWMP, then UCSD/SIO does not have to repeat the same procedure for continuing or recurring exceedances of the same constituent.*
- *A study must be performed to determine the initial dilution and fate of the discharge during storms (larger waves and lower salinity discharge) and non-storm periods (smaller waves and higher salinity discharge). The study may be empirical (e.g., a dye study) and/or using a model.*

Biological Pollutants (Invasive Species)

Any marine organism not indigenous to the Southern California Bight that may possibly be introduced through the laboratory or aquarium discharges may be considered a biological pollutant. Currently available information (AMEC, 2003b) indicates that there are no invasive species that would be associated with a possible introduction from the Stephen Birch Aquarium and/or the other SIO discharges. Still, the potential for such introductions of potentially invasive species or pathogenic organisms does exist, and such accidental introductions could alter the marine community in an undesirable way.

Before being introduced into the research laboratory tanks at SIO, specimens are currently inspected for incidental invasive species. If a specimen is suspected of carrying or containing an invasive species, then it is quarantined. If this occurs the waste seawater from the quarantine tank is discharged to the sewer, thereby attempting to protect against biological contamination of the ASBS from the research laboratories.

The Stephen Birch Aquarium does hold and display species that are non- indigenous to the Southern California Bight. The sea water system allows for the re-circulation of seawater between the aquaria and the main reservoir. Seawater is pumped into the main reservoir from Scripps pier and allowed to mix with the re-circulated seawater. The excess (waste) seawater is discharged via a spillway out of the main reservoir which drains to the storm drain system and then to Outfall 001. Of special concern are warm water non-indigenous species that might escape. The only safeguards now in practice are:

- Specimens are quarantined and treated when observed to be infected with pathogens or parasites.
- The main seawater reservoir is used as a trap for adult specimens that might escape the aquaria.

- When observed, eggs collected from aquaria are placed into special incubator tanks fitted with filters to prevent the escape of eggs or larvae.
- The lower salinity in the storm drain and the colder temperatures in the receiving waters are relied on to prevent the introduction of warm water escapees.

The above procedures are not foolproof. One potential failure may be human error, such as in the case of an employee not observing a potentially invasive species due to its small size. Also, of more likely importance, is the reliance on the less saline water in the storm drain as a backup to human error. If such low salinity discharges are present year round then they constitute non-storm water urban runoff that instead of being encouraged should be eliminated, because the runoff is a waste entering the ASBS. Low salinity runoff should only be present during the infrequent storms and would therefore not be a valid protection against viable non-indigenous organisms from entering the ASBS. Finally, during El Niño periods the temperature in the ASBS may support the survival and possibly even reproduction of escaped warm water organisms. Therefore the expectation that cooler receiving waters would create a barrier to the success of a potentially invasive species introduction does not hold in all years.

UCSD/SIO recognizes the possibility for the introduction of a non-indigenous species under the current control regime, and has therefore contacted experts from other institutions (the Monterey Bay Aquarium and Sea World) to discuss biological control options. Based on these discussions and as a result of this request for an exception, UCSD has hired a consultant to perform an engineering feasibility study to determine additional controls, including consideration of chlorination/dechlorination, ultraviolet sterilization, and ozonation.

The following terms and conditions will be required for the exception as they relate to biological pollutants:

- *UCSD/SIO must pursue and implement the results of a consultant's feasibility study for engineering controls to prevent exotic species from entering the ASBS, to the extent that such engineering controls are allowable under applicable laws, regulations, and permit conditions.*

<u>General Conditions and Monitoring Requirements</u>

The conditions stipulated above, along with the following additional requirements, will allow SIO to continue its discharge under more stringent controls, resulting in lower copper concentrations and less pollution, including urban runoff, and will include the establishment of a more sensitive and informative monitoring program, thereby resulting in a net environmental benefit.

- *The discharge must comply with all other applicable provisions, including water quality standards, of the Ocean Plan.*
- *Flow measurements (using a flow metering device) for Outfall 001, and estimates for all other permitted outfalls, must be made and reported quarterly to the Regional Board.*
- *Once during the upcoming permit cycle, a bioaccumulation study using sand crabs (Emerita analoga) and mussels (Mytilus californianus) must be conducted to determine the concentrations of metals near field and far field (up and down coast, and offshore) in the ASBS. The Regional Board, in consultation with the Division of Water Quality, must approve the study design. The results of the survey must be completed and submitted to the Regional Board at least six months prior to the end of the permit cycle (permit expiration). Based on the study results, the Regional Board, in consultation with the Division of Water Quality, may limit the bioaccumulation test organisms, required in subsequent permits, to only sand crabs or mussels.*

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
4. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the DFG or USFWS?	☐	☐	☐	☑

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the DFG or USFWS?	☐	☐	☐	☑
c) Have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the federal Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, *etc.*) through direct removal, filling, hydrological interruption or other means?	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

In 2003, AMEC Earth and Environmental, Inc. performed a marine biological survey in the vicinity of the SIO discharge. Page 15 of the report stated "It should be noted that this survey could not and was not designed to determine any causal effect from the discharge, but to characterize the respective areas within a specific period of time…many species that occur in the sandy intertidal and subtidal habitats have high emigration and immigration rates, which contributes to the large amount of temporal and spatial patchiness." Keeping this qualification in mind, the following paragraphs discuss the comparison of the data in AMEC's (2003b) report with the 1979 and 1980 reports by the State Board (SWRCB 1979; 1980). (See appendices B through D for listings of species encountered)

Comparison of the Sandy Beach Community at SIO in Reports Dated 1980 and 2003

In September of 2003, AMEC found the sandy intertidal invertebrate community in the vicinity of the SIO discharges to be composed of bloodworms (*Euzonus mucronata*), sand crabs (*Emerita analoga*), beach hoppers (*Orchestoidea spp*.), bean clams (*Donax gouldi*), and pismo clams (*Tivela stultorum*). In October of 2003 the sandy subtidal invertebrate community in the vicinity of the SIO discharges was composed of burrowing anenomes (*Harenactis attenuata*), hydroids (*Obelia dichotoma*), sea pansies (*Renilla kollikeri*), parchment tube worms (*Diopatra splendidissima*), elbow crabs (*Heterocrypta occidentalis*), sheep crabs (*Loxorynchus grandis*), sea hares (*Aplysia californica*), basket snails (*Nassarius fossatus*), olive snails (*Olivella biplicata*), moon snails (*Polinices lewisii*), brittle stars (*Amphiodia occidentalis*), and sand stars (*Astropecten armatus*). Overall, AMEC identified 17 benthic invertebrate species in the sandy intertidal and subtidal habitats combined.

In 1980, 34 sandy bottom species were identified in the San Diego Marine Life Refuge ASBS. Thirteen of the 17 species identified by AMEC in 2003 were present in 1980; only *Heterocrypta occidentalis*, *Loxorynchus grandis, Polinices lewisii,* and *Aplysia californica* were not identified in 1980. In addition clam hydroids (*Clytia bakeri*), sea pens (*Stylatula elongata*), polychaete worms (*Nephtys californiensis* and *Owenia fusiformis*), spiny sand crabs (*Blepharipoda occidentalis*), mole crabs (*Lepidopa myops*), cancer crabs (*Cancer gracilis*), mysid shrimps (*Holmesimysis costata*, prev. *Acanthomysis costata*), swimming crabs (*Portunus xantusii*), tusk shells (*Dentalium spp.*), horn snails (*Cerithidea spp.*), eulimid gastropods (*Balcis spp*.), tinted wentletraps (*Epitonium tinctum*), nudibranchs (*Hermissenda crassicornis*) an unidentified Dorid nudibranch (family Dorididae), Recluz' moon snail (*Polinices recluzianus*), unidentified cockles (family Cardiidae), moss animals (*Diaperoecia californica*), sweet potato sea cucumber (*Molpadia arenicola*), white sea urchin (*Lytechinus anamesus*), sand dollar (*Dendraster excentricus*) were identified in the 1980 report but were not observed in 2003. It is possible that *Clytia bakeri* was present in 2003 but just not recorded, since it inhabits the shells of the bean clams which were every numerous during that survey. Kelp scallops (*Leptopecten monotimeris*), assorted species of ectoprocts, and a kelp crab (*Pugettia producta*) were identified in the 1980 report but are not usually associated with sandy bottom habitat (and therefore not included in the tally of 34 sandy bottom species); these may have been deposited from or remained attached to transient detached kelp fronds.

Between the 1980 and 2003 survey reports there was an apparent drop in species numbers. Of particular interest is the possible absence of the sand dollar *Dendraster excentricus* in 2003. This is a common and sometimes abundant inhabitant of the shallow sandy subtidal habitat in southern California, and was identified as being a dominant member of the community of the ASBS in the 1980 report, with densities measured of up to 0.08 individuals per square meter. Earlier, Fager (1968) found that *Dendraster excentricus* was present at densities greater than 10 per square meter in this area. Interestingly, *Dendraster excentricus* is known for its sensitivity to pollution, so much so that it is used as a bioassay test organism. The fact that *Dendraster excentricus* was not observed during the 2003 survey does not necessarily mean that they are not present; sand dollars are known to bury themselves in the sand and in that case would escape observation.

Caution should be exercised in interpreting this data, because differences in survey procedures could be one cause for the apparent wide disparity in the number of species observed (e.g., species may have been present but not observed during a survey due to the spacing or number of dive transects performed). A decrease in community species composition may also be due to many factors, including but not limited to pollution, harvesting pressure, other recreational pressures (e.g., physical disturbance), predation, natural cycles and changes in oceanographic conditions. As mentioned above the beaches at La Jolla may be heavily influenced by urban runoff from La Jolla, especially during the rainy season. Sandy beach habitats are also known for their spatial and temporal patchiness (Dailey *et al.* 1993). Wave action constantly disturbs sand at the shoreline. Longshore currents move sand along the coast. There is a seasonal movement of sand offshore during the winter and onshore during the summer. Populations of sandy beach inhabitants are therefore known to fluctuate widely seasonally and from one year to another (Sumich 1999). Therefore, differences in community composition over time may not be related to the SIO discharges.

Comparison of the Sandy Beach Community at SIO with a Beach near Kellogg Park

The AMEC 2003 survey also compared the sandy intertidal and subtidal habitat in the immediate vicinity of the SIO discharges with a similar habitat at the San Diego – La Jolla Ecological Reserve ASBS, near the north end of Kellogg Park. As mentioned above 17 species of invertebrates (5 intertidal and 12 subtidal) were identified in 2003 in the sandy intertidal/subtidal community in the vicinity of the SIO discharges. Three intertidal and seven subtidal species, for a total of 10 invertebrate species, were identified near Kellogg Park in the northern portion of the San Diego – La Jolla Ecological Reserve ASBS in 2003. A similar disparity in invertebrate species numbers occurred as reported in the 1979 and 1980 survey reports (SWRCB 1979; 1980). During that period 34 invertebrate species were identified in the shallow sandy subtidal habitat of the San Diego Marine Life Refuge ASBS while only 22 invertebrate species were identified in that habitat for the San Diego – La Jolla Ecological Reserve ASBS.

From this data we can generalize that in two separate surveys, the benthic community in the vicinity of the SIO discharges has been shown to have greater numbers of species than at beach in the San Diego – La Jolla Ecological Reserve. Both beaches are subject to the same recreational activities and natural environmental fluctuations. Even though the beach at SIO is subject to the impacts of the laboratory discharge it appears to support a more diverse community. Generally, greater species diversity is an indicator of a healthier and/or more stable community. However, caution should again be exercised, since the habitats of these two beaches are not identical. The beach at SIO is influenced not only by the laboratory discharges but also by the presence of the pier. The Kellogg Park beach in the San Diego – La Jolla Ecological Reserve is influenced directly by a municipal storm drain (servicing the area northeast of the intersection of Camino del Collado and El Paseo Grande) and has no analogous pier structure.

Pier Invertebrates and Algal Community

The Scripps Pier is an artificial reef-like habitat that is inhabited by marine algae and invertebrates that are also found on native rocky reef habitats in the vicinity. Because it is an artificial habitat it is not being considered here as a habitat or community to protect. However, because many of the invertebrates found on the pier may be sensitive to pollution, it is worth considering a brief review of the invertebrates observed on the pier in the 1980 and 2003 reports.

In 2003 AMEC identified 19 invertebrate species (or genera) inhabiting the pier. In the 1980 report 29 different species (or larger taxa) were observed. While there generally appears to be greater diversity in the 1980 survey, the two surveys differed in the level of taxonomic identification to the extent that direct comparisons are difficult. In the 1980 report, the algal community was dominated by the Chlorophytes (green algae) *Ulva* and *Enteropmorpha*, but there were representatives of the brown algae (Phaeophyta) and red algae (Rhodophyta) as well. In 2003 the algal community consisted only of the Phaeophytes and the Rhodophytes. This temporal difference in algae on piers or even natural rocky shores is known to occur naturally in response to grazing, competition, and physical disturbance. The dominant sessile members of the invertebrate community (sea anemones, mussels, and barnacles) are essentially the same in 2003 as those identified in the 1980 report. In the 1980 report the intertidal periwinkle (*Littorina spp.)* was found to be common on the pier but *Littorina* were not found in 2003. The purple sea urchin *Strongylocentrotus purpuratus*, which is known to be sensitive to pollution, was found on the pier in the 2003. Three species of commonly occurring tunicates were also found inhabiting the pier in 2003 while these were not identified in the 1980 report. Again, changes in community composition over time are not unusual in such environments, and do not indicate any gross impact from the laboratory/aquarium discharges.

<u>Fish Community</u>

Fish are motile and can swim out of an area in pursuit of prey or if water quality conditions temporarily degrade. Fish are therefore not as good an indicator of environmental perturbations as benthic invertebrates, at least at the local scale under consideration. Furthermore, fish are subject to harvesting pressures that may reduce their numbers locally. However, since the SIO waste seawater discharges are relatively constant, at least in terms of volume, it is still worth considering possible impacts to fish species diversity.

AMEC in 2003 observed seven fish species near the SIO discharges and pier. Three sandy bottom species were identified: California halibut (*Paralichthys californicus*), sand bass (*Paralabrax nebulifer*), and lizardfish (*Synodus lucioceps*). Three other species identified are common to shallow reefs, kelp forests, or piers; these were kelp bass (*Paralabrax clathratus*), halfmoon (*Medialuna californiensis*), and pile perch (*Damalichthys vacca*). Finally one pelagic species, sardine (*Sardinops sagax*), was observed as well. Only two species of fish were observed in the shallow sandy habitat of the San Diego – La Jolla Ecological Reserve ASBS near Kellogg Park; these were sanddabs (*Citharichthys stigmaeus)* and shovelnose guitarfish (*Rhinobatis productus*), both of which are common sandy bottom species. Even though the beach at SIO is subject to the impacts of the laboratory discharge it appears to support a more diverse fish community. However, given the species observed and their known habitat preferences, this is probably related more to the presence of the pier, and it's artificial reef effect, than to the relative impacts from discharges.

In the 1980 report for the San Diego Marine Life Refuge ASBS, six species of sandy bottom fish were recorded near SIO. These were sanddabs (*Citharichthys stigmaeus)*, thornbacks (*Platyrhinoides triseriata*), shovelnose guitarfish (*Rhinobatis productus*), angel shark (*Squatina californica*), round stingray (*Urolophus halleri*), and California halibut (*Paralichthys californicus*). In the 1979 report for the San Diego – La Jolla Ecological Reserve ASBS, only one species, *Citharichthys stigmaeus,* was reported for the shallow sandy bottom habitat. In both these reports it was mentioned that other species were observed, but were not recorded if they were of a "transient" nature. Therefore a comparison of the total number of fish species between the 1979/1980 and 2003 reports is not valid since all fish species were not recorded in the 1980 report. Only fish species normally inhabiting shallow sandy bottoms might be compared. It appears that during that earlier period the sandy bottom fish diversity was greater near SIO than further south in the San Diego – La Jolla Ecological Reserve ASBS. Also, the number of sandy bottom fish species in the vicinity of SIO was greater in the 1980 report than in 2003. However, the minimal amount of observations involved, and the complexity of natural and anthropogenic influences, does not allow a determination that there are any impacts on fish from the SIO discharges.

The 1980 report identified two species of fish as "unique components" to be protected in the ASBS. These were California halibut (*Paralichthys californicus*) and grunion (*Leresthes tenuis*). As mentioned above the California halibut was recorded as still inhabiting the ASBS in 2003. While not observed during dive surveys, AMEC verified that grunion still inhabited the ASBS, through a communication with Ms. Shelly Glenn of the Grunion Education Program. According to AMEC, surveys conducted from March through June 2003 by Ms. Glenn found that grunion were observed spawning in the area downcoast of the SIO discharges.

Based on this available information it does not appear that there is any obvious impact associated with the SIO laboratory discharges on the fish community.

<u>Conclusions Based on Biological Community Data</u>

The AMEC report concluded: "Given the results of the survey and taking into consideration the variability of the habitat, there appears to be no affect [sic] of the discharge on marine biological resources in the vicinity of the discharges" (AMEC 2003). This statement may have been too strong; however, it is true that the available data does not allow a determination that there are any impacts on marine life from the SIO discharges. Conversely, the available data also does not allow us to make an absolute statement that there are no water quality impacts from

SIO. We have no way of knowing what the pristine character of the marine biological community was prior to the urban development of La Jolla. The laboratory waste seawater discharges and urban runoff have been occurring over a long period of time, including the period for which biological data exists. Furthermore, the beach near Kellogg Park in the San Diego – La Jolla Ecological Reserve ASBS does not represent a true reference station because it is also not pristine, being under the influence of urban development, recreational use, and urban runoff.

While no gross impacts are obvious, it is very difficult (if not impossible) to make absolute statements about impacts based on the very minimal data available. This is especially true considering the complexity of natural variability, and the other anthropogenic discharges/impacts not attributable to UCSD/SIO. For this reason more monitoring should be performed, on a regular and more frequent basis, and using consistent and sensitive techniques, in order to better detect impacts if they occur. The following condition will be required for the exception:

- *Once every permit cycle, a quantitative survey of benthic marine life must be performed. The Regional Board, in consultation with the State Board Division of Water Quality, must approve the survey design. The results of the survey must be completed and submitted to the Regional Board within six months before the end of the permit cycle.*

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
5. AGRICULTURAL RESOURCES. In determining whether impacts to agricultural resources are significant environmental impacts, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping & Monitoring Program of the California Resources Agency, to non-agricultural uses?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☑
6. NOISE. Would the project result in:				
a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☑
b) Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☑
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing in or working in the project area to excessive noise levels?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project expose people residing in or working in the project area to excessive noise levels?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
7. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☑
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑
8. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State?	☐	☐	☐	☑
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☑
9. HAZARDS and HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☑
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☑
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?	☐	☐	☐	☑
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or to the environment?	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
10. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area either directly (*e.g.*, by proposing new homes and businesses) or indirectly (*e.g.*, through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
11. TRANSPORTATION / CIRCULATION. Would the project:				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (*i.e.*, result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☑
b) Substantially increase hazards due to a design feature (*e.g.*, sharp curves or dangerous intersections) or incompatible uses (*e.g.*, farm equipment)?	☐	☐	☐	☑
c) Result in inadequate emergency access?	☐	☐	☐	☑
d) Result in inadequate parking capacity?	☐	☐	☐	☑
e) Exceed, either individually or cumulatively, a level-of-service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☑
f) Conflict with adopted policies supporting alternative transportation (*e.g.*, bus turnouts, bicycle racks)?	☐	☐	☐	☑
g) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
12. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service rations, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	☐	☑
b) Police protection?	☐	☐	☐	☑
c) Schools?	☐	☐	☐	☑
d) Parks?	☐	☐	☐	☑
e) Other public facilities?	☐	☐	☐	☑
13. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☑
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts?	☐	☐	☐	☑
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☑
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☑
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☑
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑
14. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☑
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☐	☑
15. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	☐	☐	☑
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☑
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☑
16. RECREATION. Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☑

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
17. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☑
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☐	☑
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☑

Approval of a conditional exception will improve water quality and better protect beneficial uses. The discharge will be allowed to continue but must comply with the more stringent conditions discussed previously. If all of the terms and conditions described in the Initial Study are met (Appendix E), the SIO discharge will not compromise the protection of ocean waters of the ASBS for beneficial uses, and the public interest will be served. Granting the conditional exception, likewise, will not violate federal antidegradation requirements because water quality will not be lowered, but rather will be improved. Further, allowance of the exception will not violate the State Board's antidegradation policy (SWRCB 1968) since water quality conditions will improve; the discharge will not unreasonably affect present and anticipated beneficial uses; the discharge will not result in water quality lower than that prescribed in the Ocean Plan; and, the people of California benefit from the research and education provided by SIO while beneficial uses will still be protected.

DETERMINATION

On the basis of this initial evaluation, I find that approval of the conditional exception will not have a significant effect on the environment. A NEGATIVE DECLARATION will be prepared.

Prepared By:

Dominic Gregorio — 4/29/04 — Date
Environmental Scientist
Ocean Standards Unit

Reviewed by:

Frank Roddy — 4/29/04 — Date
Staff Environmental Scientist
Environmental Policy Support

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Appendix A

Reasonable Potential Calculator Outputs for UCSD/SIO Copper Discharges

Reasonable Potential Calculator uses the linear Regression on Order Statistics technique (ROS) for censored data (i.e., non detects) because it is robust, unbiased, and has a smaller variance than most other statistical techniques under the lognormal distribution. In addition, this technique will accept multiple detection limits or censoring levels (Helsel and Cohn 1988). The technique uses the uncensored fraction of the data in a probability plot to statistically reconstruct the censored values. A new data set (labeled X-new in the output file) is then created containing a combination of uncensored values and reconstructed or "fill in" values. Summary statistics are then estimated using the new data set.

Example 1: Reasonable Potential Calculator Output, using all available data, 1994-2003

RPcalc v1.8, Mar 18, 2004 07:56:37

```
Inputs:
  1. Data Notes              : USCD Cu 94-98 & 99-03 Outfall #1
  2. WQ Objective Conc., WQO : 3
  3. Background Conc., BSC   : 2
  4. Dilution Ratio, Dm      : 2
  5. RP Percentile           : 50
  6. RP Confidence Level     : 95

Unsorted Input Observations:
19, 24, 18, 31, 26, 27, 26, 17, 20, 10, <10, 16, <10, 18, <10, <10, <10, 20,
<10, <10, <10, <10, <10, 15, 14, 27, <10, 15.00, <10, <10, <10, 10.00, 10.00,
<10, <10, <10, <10, <10, <10, <10, 4.32, 4.56, 4.26, 8.10, 8.42, 5.77, 10.10,
16.00

Sorted Data Observations:
4.26, 4.32, 4.56, 5.77, 8.1, 8.42, <10, <10, <10, <10, <10, <10, <10, <10,
<10, <10, <10, <10, <10, <10, <10, <10, <10, <10, <10, <10, <10, 10, 10, 10,
10.1, 14, 15, 15, 16, 16, 17, 18, 18, 19, 20, 20, 24, 26, 26, 27, 27, 31
```

Data Summary:	N	%	Min	Max
Censored	21	43.750	10.000	10.000
Uncensored	27	56.250	4.260	31.000
Total	48			

```
Detection Limit Thresholds, 1 present:
  DLs are 10
```

Linear Regression on LogNormal Order Statistics (Helsel & Cohn 1988):

i	X-obs	X-new	Prob	NormZ
1	4.26	4.260	0.080	-1.403
2	4.32	4.320	0.161	-0.992
3	4.56	4.560	0.241	-0.703
4	5.77	5.770	0.321	-0.464
5	8.1	8.100	0.402	-0.249
6	8.42	8.420	0.482	-0.045
7	<10	2.375	0.026	-1.950
8	<10	2.965	0.051	-1.634
9	<10	3.427	0.077	-1.428
10	<10	3.832	0.102	-1.269
11	<10	4.204	0.128	-1.137
12	<10	4.556	0.153	-1.022
13	<10	4.897	0.179	-0.919
14	<10	5.230	0.205	-0.825
15	<10	5.559	0.230	-0.738

16	<10	5.887	0.256	-0.657
17	<10	6.217	0.281	-0.579
18	<10	6.549	0.307	-0.505
19	<10	6.886	0.332	-0.433
20	<10	7.230	0.358	-0.364
21	<10	7.582	0.384	-0.296
22	<10	7.943	0.409	-0.230
23	<10	8.316	0.435	-0.165
24	<10	8.702	0.460	-0.100
25	<10	9.104	0.486	-0.036
26	<10	9.522	0.511	0.028
27	<10	9.961	0.537	0.093
28	10	10.000	0.582	0.208
29	10	10.000	0.602	0.259
30	0	10.000	0.622	0.311
31	10.1	10.100	0.642	0.364
32	14	14.000	0.662	0.418
33	15	15.000	0.682	0.473
34	15	15.000	0.702	0.529
35	16	16.000	0.722	0.588
36	16	16.000	0.741	0.648
37	17	17.000	0.761	0.711
38	18	18.000	0.781	0.776
39	18	18.000	0.801	0.846
40	19	19.000	0.821	0.919
41	20	20.000	0.841	0.998
42	20	20.000	0.861	1.084
43	24	24.000	0.881	1.178
44	26	26.000	0.901	1.285
45	26	26.000	0.920	1.408
46	27	27.000	0.940	1.558
47	27	27.000	0.960	1.753
48	31	31.000	0.980	2.056

(NormZ) vs. (Nat. Log of Uncensored Observations)

Slope	Intercept	Correl r	N
0.702	2.234	0.976	27.000

Summary Statistics for X-new:

N	Mean	SDev	Min	Max	CV
48	11.572	7.607	2.375	31.000	0.657

Sample Percentiles for X-new:

P10	P25	Median	P75	P90	P95
4.167	5.612	8.903	16.750	26.000	27.000

Summary Statistics for Ln(X-new):

N	Mean	SDev	Min	Max	CV
48	2.239	0.663	0.865	3.434	0.296

Reasonable Potential Analysis:

Before Dilution, Upper One-sided Confidence Bound (UCB):
Upper 95% confidence bound for the 50th population percentile with N = 48
Normal Tolerance Factor, g' = 0.256 (Hahn & Meeker 1991, Table A12)

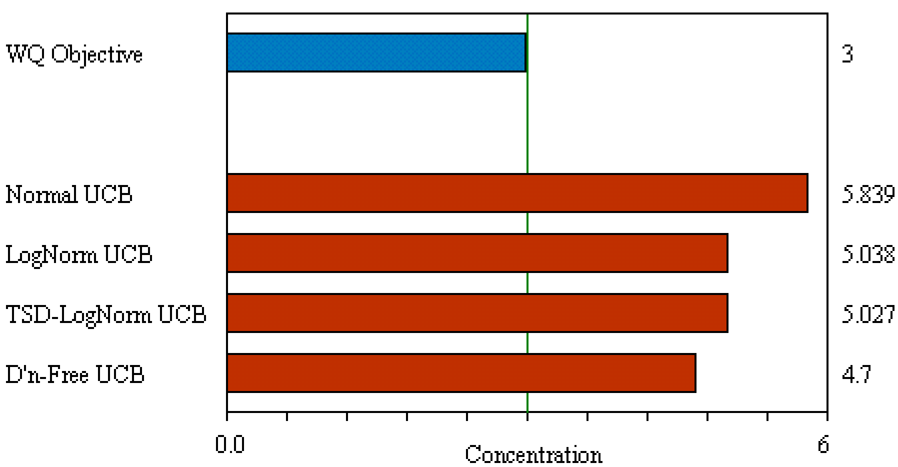
Distribution	UCB(before dilution)	Confidence Coeff.
Normal	**13.516 = Mean + SDev * g'**	**0.950**
LogNormal	11.115 = EXP(LnMean + LnSDev * g')	0.950
TSD-LogNorm	11.082 = X(48) * 0.357	0.950?
D'n-Free	10.100 = X(31)	0.970

After Dilution, Reasonable Potential Analysis:
UCB(after dilution) = [UCB(before dilution) + Dm * BSC] / (Dm + 1)

Distribution	UCB(after dilution)	RP for WQO=3?
Normal	5.839	Y
LogNormal	**5.038**	**Y**
TSD-LogNorm	5.027	Y
D'n-Free	4.700	Y

Comparison of WQ Objective with Calculated Upper 95% Confidence Bounds for the 50th Percentile (UCB).

N = 48 Observations, Dilution Ratio = 2



Notes: USCD Cu 94-98 & 99-03 Outfall #1

Example 2: Reasonable Potential Calculator Output, using data from May – July 2003 only

*** Reasonable Potential Calculator Output, RPcalc v1.8 ***
Mar 10, 2004 13:55:07

Inputs:

1. Data Notes : USCD Cu 2003 Outfall Means
2. WQ Objective Conc., WQO : 3
3. Background Conc., BSC : 2
4. Dilution Ratio, Dm : 2
5. RP Percentile : 50
6. RP Confidence Level : 95

Unsorted Input Observations:
4.32, 4.56, 4.26, 8.10, 8.42, 5.77

Sorted Data Observations:
4.26, 4.32, 4.56, 5.77, 8.1, 8.42

Data Summary:	N	%	Min	Max
Censored	0	0.000	10.000	10.000
Uncensored	6	100.000	4.260	8.420
Total	6			

Summary Statistics for X-new:

N	Mean	SDev	Min	Max	CV
6	5.905	1.907	4.260	8.420	0.323

Sample Percentiles for X-new:

P10	P25	Median	P75	P90	P95
2.982	4.305	5.165	8.180	8.420	8.420

Summary Statistics for Ln(X-new):

N	Mean	SDev	Min	Max	CV
6	1.734	0.312	1.449	2.131	0.180

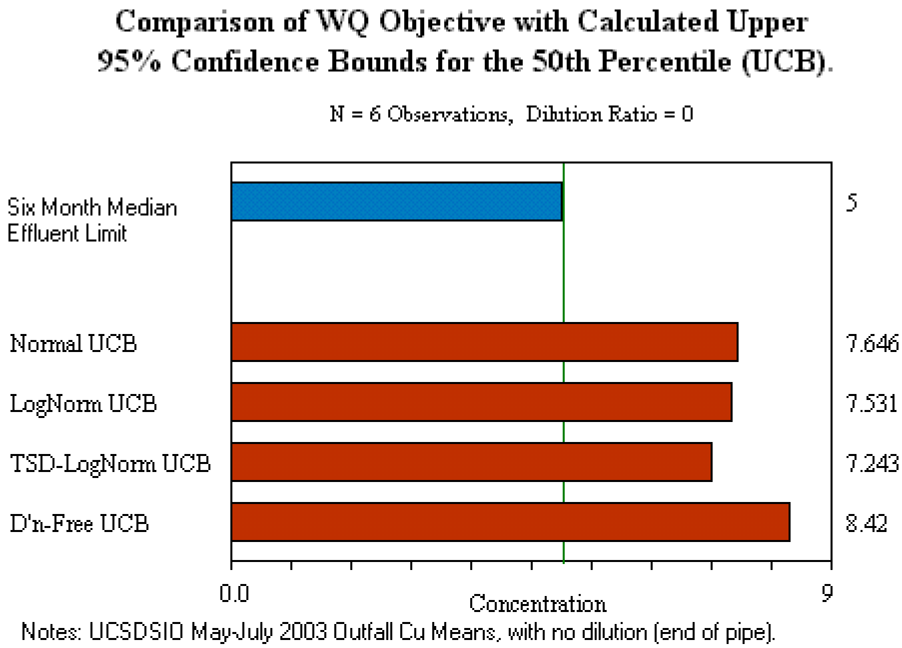
Reasonable Potential Analysis:

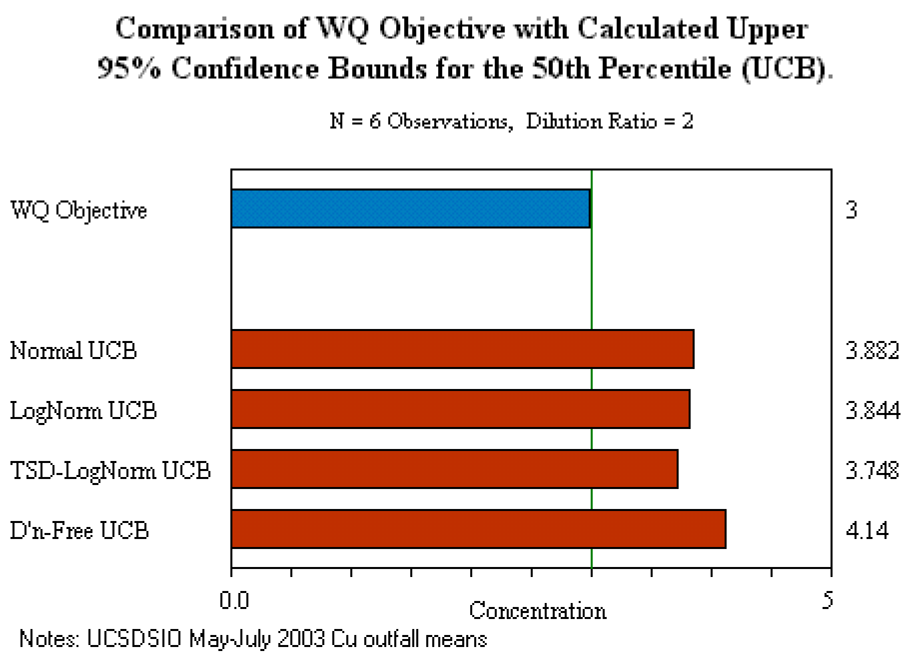
Before Dilution, Upper One-sided Confidence Bound (UCB):
Upper 95% confidence bound for the 50th population percentile with N = 6
Normal Tolerance Factor, g' = 0.913 (Hahn & Meeker 1991, Table A12)

Distribution	UCB(before dilution)	Confidence Coeff.
Normal	7.646 = Mean + SDev * g'	0.950
LogNormal	7.531 = EXP(LnMean + LnSDev * g')	0.950
TSD-LogNorm	7.243 = X(6) * 0.860	0.950?
D'n-Free	8.420 = X(6)	0.984

After Dilution, Reasonable Potential Analysis:
UCB(after dilution) = [UCB(before dilution) + Dm * BSC] / (Dm + 1)

Distribution	UCB(after dilution)	RP_for_WQO=3?
Normal	3.882	Y
LogNormal	3.844	Y
TSD-LogNorm	3.748	Y
D'n-Free	4.140	Y


Comparison of WQ Objective with Calculated Upper
95% Confidence Bounds for the 50th Percentile (UCB).
N = 6 Observations, Dilution Ratio = 0
Six Month Median
Effluent Limit
Normal UCB
LogNorm UCB
TSD-LogNorm UCB
D'n-Free UCB
5
7.646
7.531
7.243
8.42
0.0
9
Concentration
Notes: UCSDSIO May-July 2003 Outfall Cu Means, with no dilution (end of pipe).


Comparison of WQ Objective with Calculated Upper
95% Confidence Bounds for the 50th Percentile (UCB).
N = 6 Observations, Dilution Ratio = 2
WQ Objective
Normal UCB
LogNorm UCB
TSD-LogNorm UCB
D'n-Free UCB
3
3.882
3.844
3.748
4.14
0.0
5
Concentration
Notes: UCSDSIO May-July 2003 Cu outfall means

References:

Hahn, GJ and WQ Meeker. 1991. Statistical Intervals: A Guide for Practitioners. Wiley & Sons, NY. (See especially Sec. 4.4 Normal D'n UCB, Sec. 5.2.3 D'n-Free UCB.)

Helsel, DR and TA Cohn. 1988. Estimation of Descriptive Statistics for Multiply Censored Water Quality Data. Water Resources Research, Vol.24, No.12, pp. 1977-2004

USEPA. Technical Support Document of Water Quality-based Toxics Control, TSD. Sec. 3.3.2. EPA 505 2-90-001

Programmed by Steve Saiz, CalEPA, SWRCB, saizs@swrcb.ca.gov, January 20, 2004

Appendix B

Invertebrate Species Lists for the Shallow Sandy Bottom Communities of the San Diego Marine Refuge (SDMR) ASBS and the San Diego – La Jolla Ecological Reserve (SDLJER) ASBS

1979 (Kobayashi et al) SDLJER ASBS	1980 (Kobayashi et al) SDMR	2003 (AMEC) SDLJ ER	2003 (AMEC) SDMR
	burrowing anenomes (*Harenactis attenuata*)	burrowing anenomes (*Harenactis attenuata*)	burrowing anenomes (*Harenactis attenuata*)
	hydroids (*Obelia dichotoma*)		hydroids (*Obelia dichotoma*)
sea pansies (*Renilla kollikeri*)	sea pansies (*Renilla kollikeri*)	sea pansies (*Renilla kollikeri*)	sea pansies (*Renilla kollikeri*)
	clam hydroid (*Clytia bakeri*),		
sea pens (*Stylatula elongata*),	sea pens (*Stylatula elongata*),		
polychaete worms (*Nephtys californiensis*	polychaete worms (*Nephtys californiensis*		
	polychaete worms *Owenia fusiformis*),		
parchment tube worms (*Diopatra splendidissima*)	parchment tube worms (*Diopatra splendidissima*)	parchment tube worms (*Diopatra splendidissima*)	parchment tube worms (*Diopatra splendidissima*)
bloodworms (*Euzonus mucronata*)	bloodworms (*Euzonus mucronata*)	bloodworms (*Euzonus mucronata*)	bloodworms (*Euzonus mucronata*)
	bean clams (*Donax gouldi*)	bean clams (*Donax gouldi*)	bean clams (*Donax gouldi*)
pismo clams (*Tivela stultorum*)	pismo clams (*Tivela stultorum*)		pismo clams (*Tivela stultorum*)
unidentified cockles (family Cardiidae),	unidentified cockles (family Cardiidae),		
nudibranchs (*Hermissenda crassicornis*)	nudibranchs (*Hermissenda crassicornis*)		
unidentified Dorid nudibranch (family Dorididae),	unidentified Dorid nudibranch (family Dorididae),		
			sea hares (*Aplysia californica*)
	Recluz' moon snail (*Polinices recluzianus*),		
		moon snails (*Polinices lewisii*)	moon snails (*Polinices lewisii*)
tusk shell (*Dentalium spp.*),	tusk shell (*Dentalium spp.*),		
horn snail (*Cerithidea spp.*),	horn snail (*Cerithidea spp.*),	horn snail (*Cerithidea spp.*),	
	Eulimid gastropod (*Balcis spp.*),		
tinted wentletrap (*Epitonium tinctum*),	tinted wentletrap (*Epitonium tinctum*),		
basket snails (*Nassarius fossatus*)	basket snails (*Nassarius fossatus*)		basket snails (*Nassarius fossatus*)
olive snails (*Olivella biplicata*)	olive snails (*Olivella biplicata*)		olive snails (*Olivella biplicata*)
Pyramidellid gastropod (*Turbonilla sp.)*			
beach hoppers (*Orchestoidea spp*.)	beach hoppers (*Orchestoidea spp*.)	beach hoppers (*Orchestoidea spp*.)	beach hoppers (*Orchestoidea spp*.)
			elbow crabs (*Heterocrypta occidentalis*)
			sheep crabs (*Loxorynchus grandis*)
sand crabs (*Emerita analoga*)	sand crabs (*Emerita analoga*)		sand crabs (*Emerita analoga*)
spiny sand crab (*Blepharipoda occidentalis*	spiny sand crab (*Blepharipoda occidentalis*		
mole or white sand crab (*Lepidopa myops*	mole or white sand crab (*Lepidopa myops*		
	cancer crab (*Cancer gracilis*),		
	mysid shrimp (*Acanthomysis costata*),		
	swimming crab (*Portunus xantusii)*		
	moss animals (*Diaperoecia californica*)		
brittle stars (*Amphiodia occidentalis*)	brittle stars (*Amphiodia occidentalis*)	brittle stars (*Amphiodia occidentalis*)	brittle stars (*Amphiodia occidentalis*)
sand stars (*Astropecten armatus*)	sand stars (*Astropecten armatus*)	sand stars (*Astropecten armatus*)	sand stars (*Astropecten armatus*)
	sweet potato sea cucumber (*Molpadia arenicola*),		
sand dollar (*Dendraster excentricus*)	sand dollar (*Dendraster excentricus*)		
	white sea urchin (*Lytechinus anamesus*		
Total 22 species	Total 34 species	Total 10 species	Total 17 species

Appendix C

SIO Pier Invertebrate Community, 1980 and 2003 Reports

2003 Report (AMEC) Pier Observations	1980 Report (Kobayashi et al) Pier Observations
Sponge (*Haliclona sp*.)	Sponges (Porifera)
Sponge (*Leucetta losangelensis*)	
Sponge (*Leucilla nuttingi*)	
Aggregating anemone (*Anthopleura elegantissima*)	Aggregating anemone (*Anthopleura elegantissima*)
	Green anemone (*Anthopleura xanthogrammica*)
	Calcareous tube worm (*Spirorbis spp*.)
	Calcareous tube worm (*Eupomatus gracillis*)
	Colonial sandy-tubed worm (*Phragmatopoma californica*)
Barnacle (*Chthamalus spp.*)	Busckshot Barnacle (*Chthamalus spp.*)
Barnacle (*Balanus spp.)*	Pacific acorn barnacle (*Balanus glandula*)
	Red and white barnacle (*Balanus tintinn*abulum)
Gooseneck Barnacle (*Pollicipes polymerus*)	Gooseneck barnacle (*Pollicipes polymerus*)
	Gooseneck barnacle (*Mitella spp*.)
	Striped shore crab (*Pachygrapsus crassipes*)
	Porcelain crab *Petrolisthes spp.*
	Periwinkle or littorine snail (*Littorina spp*.)
	Chitons (*Nuttalina fluxa*)
	Chitons (*Mopalia spp*.)
	Limpets (previously *Acmaea spp.*, now *Lottia spp*.)
	Limpets (previously *Collisella spp*, now *Lottia spp*.)
	Owl limpet (*Lottia gigantea*)
	Black-turban snail (*Tegula funebralis*)
	Dogwinkle (previously *Thais*, now *Nucella emarginata*)
Sea slug (*Phidiana hiltoni*)	
Rock scallop (*Crassedoma giganteum*)	
Sea slug (*Hermissenda crassicornis*)	
Mussel (*Mytilus spp*.)[1]	California mussel (*Mytilus californianus*)
	Edible mussel (*Mytilus edulis*)[1]
Ochre star (*Pisaster ochraceus*)	Ochre star (*Pisaster ochraceus*)
	Knobby sea star (*Pisaster giganteus*)
	Bat star (*Patiria miniata*)
	Brittle stars (Ophiuroidea)
Purple sea urchin (*Strongylocentrotus purpratus*)	Purple sea urchin (*Strongylocentrotus purpratus*)
Bryozoan (*Bugula spp*.)	Bryozoa (Ectoprocta)
Bryozoan (Cellepo*raria brunnea*)	
Bryozoan (*Thalamoporella californica*)	
Tunicate (*Ciona intestinalis*)	
Tunicate (*Didemnum carnulentum*)	
Stalked tunicate (*Styela Clava*)	
Total 19 taxa observed	Total 29 taxa observed

1 Specimens originally identified as *Mytilus edulis* may include *M. galloprovincialis*, a similar species that was introduced from European waters into California approximately 100 years ago and is now widespread in the intertidal habitats of the Southern California Bight

Appendix D

Fish of the San Diego Marine Refuge (SDMR) ASBS near the SIO Pier and Discharges, and the shallow sandy habitats of the San Diego – La Jolla Ecological Reserve (SDLJER) ASBS

1980 report (Kobayashi et al) sandy bottom, SDMR	2003 report (AMEC), SDMR near SIO pier	1979 shallow sandy bottom SDLJER	2003 northern portion SDLJER near Kellogg Park
sanddabs (*Citharichthys stigmaeus)*		sanddabs (*Citharichthys stigmaeus)*	sanddabs (*Citharichthys stigmaeus)*
thornbacks (*Platyrhinoides triseriata*)			
shovelnose guitarfish (*Rhinobatis productus*)			shovelnose guitarfish (*Rhinobatis productus*)
angel shark (*Squatina californica*)			
round stingray (*Urolophus halleri*)			
California halibut (*Paralichthys californicus*)	California halibut (*Paralichthys californicus*)		
	Sand bass (*Paralabrax nebulifer*)		
	Kelp bass (*Paralabrax clathratus*)		
	Lizardfish (*Synodus lucioceps*)		
	Sardines (*Sardinops sagax*)		
	Halfmoon (*Medialuna californiensis*)		
	Pile perch (*Damalichthys vacca*)		
Total 6 species	Total 7 species	Total 1 species	Total 2 species

Appendix E

Terms and Conditions for the Scripps Institution of Oceanography California Ocean Plan Exception

1. The discharge must comply with all other applicable provisions, including water quality standards, of the Ocean Plan.

2. UCSD/SIO must take all reasonable and appropriate measures to minimize concentrations of chemical additives, including copper, and antibiotics, in the effluent. UCSD/SIO must consider appropriate alternatives, including alternative treatment techniques, pollutant minimization, source control, and process optimization, to reduce effluent concentrations of copper, antibiotics, and other treatment additives. Formalin shall not be discharged to the ocean. Copper and other additives to the seawater from the Birch Aquarium must be minimized to meet the water quality objectives in Table B of the Ocean Plan.

3. Effluent and receiving water analysis for copper must employ the analytical method (Inductively Coupled Plasma/ Mass Spectrometry) with the lowest minimum detection limits.

4. A quarterly report of all chemical additives discharged via waste seawater must be submitted in the quarterly monitoring report to the Regional Board.

5. Flow measurements (using a flow metering device) for Outfall 001, and estimates for all other permitted outfalls, must be made and reported quarterly to the Regional Board.

6. By January 1, 2007 UCSD/SIO must eliminate all discharges of non-storm water urban runoff (i.e., any discharge of urban runoff to a storm drain that is not composed entirely of storm water), except those associated with emergency fire fighting.

7. UCSD/SIO must specifically address the prohibition of non-storm water urban runoff and the reduction of pollutants in storm water discharges draining to the ASBS in a revised Storm Water Management Plan/Program (SWMP). UCSD/SIO is required to submit their revised SWMP to the Regional Board within six months of permit issuance. The SWMP is subject to the approval of the Regional Board.

8. The revised SWMP must include a map of all entry points (known when the SWMP is prepared) for urban runoff entering the UCSD/SIO drainage system. The SWMP must also include a procedure for updating the map and plan when other entry points are discovered.

9. The revised SWMP must describe the measures by which non-storm water discharges will be eliminated, and interim measures that will be employed to reduce non-storm water flows until the ultimate measures are implemented.

10. The revised SWMP must also address storm water discharges, and how pollutants will be reduced in storm water runoff into the ASBS through the implementation of Best Management Practices (BMPs). The SWMP must describe the BMPs and include an implementation schedule. The implementation schedule must be designed to ensure an improvement in receiving water quality each year (over the permit cycle) due to either a reduction in storm water discharges (due to diversion) or reduction in pollutants (due to on-site treatment or other BMPs). The implementation schedule must be developed to ensure BMPs are implemented within one year of the permit issuance date.

11. Once every permit cycle, a quantitative survey of benthic marine life must be performed. The Regional Board, in consultation with the State Board Division of Water Quality, must approve the survey design. The results of the survey must be completed and submitted to the Regional Board within six months before the end of the permit cycle.

12. Once during the upcoming permit cycle, a bioaccumulation study using sand crabs (*Emerita analoga*) and mussels (*Mytilus californianus*) must be conducted to determine the concentrations of metals near field and far field (up and down coast, and offshore) in the ASBS. The Regional Board, in consultation with the Division of

Water Quality, must approve the study design. The results of the survey must be completed and submitted to the Regional Board at least six months prior to the end of the permit cycle (permit expiration). Based on the study results, the Regional Board, in consultation with the Division of Water Quality, may limit the bioaccumulation test organisms, required in subsequent permits, to only sand crabs or mussels.

13. The effluent from Outfall 001must be sampled and analyzed monthly for copper concentrations.

14. During the first year of the permit cycle two samples must be collected from Outfall 001 (once during dry weather and once during wet weather) and analyzed for all Ocean Plan Table B constituents. During the first year of the permit cycle two composite samples must also be collected (once during dry weather and once during wet weather) representing flows from Outfalls 002, 003, 004A, and 004B; these two composite samples must also be analyzed for all Ocean Plan Table B constituents. Based on these results the Regional Board will determine the frequency of sampling (at a minimum, annually) and the constituents to be tested during the remainder of the permit cycle, except that chronic toxicity must be tested at least annually.

15. Once annually during wet weather, the receiving water in the vicinity of the SIO pier must be sampled and analyzed for Ocean Plan Table B constituents. All Table B constituents must be analyzed during the first year. The Regional Board will determine the sample location(s). Based on the first year sample results the Regional Board will determine specific constituents to be tested during the remainder of the permit cycle, except that chronic toxicity must be tested annually.

16. If the results of receiving water monitoring indicate that wet weather discharges that include storm water are causing or contributing to exceedance(s) of applicable water quality objectives, UCSD/SIO is required to submit a report to the Regional Board within 30 days. Those constituents in storm water which are associated with exceedances of the receiving water objectives must be identified in that report. The report must describe BMPs that are currently being implemented, BMPs that are planned for in the SWMP, and additional BMPs that may be added to the SWMP. The report shall include a new or modified implementation schedule. The Regional Board may require modifications to the report. Within 30 days following approval of the report by the Regional Board, UCSD/SIO must revise its SWMP to incorporate any new or modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required. As long as UCSD/SIO has complied with the procedures described above and is implementing the revised SWMP, then UCSD/SIO does not have to repeat the same procedure for continuing or recurring exceedances of the same constituent.

17. A study must be performed to determine the initial dilution and fate of the discharge during storms (larger waves and lower salinity discharge) and non-storm periods (smaller waves and higher salinity discharge). The study may be empirical (e.g., a dye study) and/or using a model.

18. In addition to the bacterial monitoring requirements in the Ocean Plan, coliform bacteria and total residual chlorine must be tested once monthly in the effluent from Outfall 003, draining the marine mammal holding facility, when in use.

19. UCSD/SIO must pursue and implement the results of a consultant's feasibility study for engineering controls to prevent exotic species from entering the ASBS, to the extent that such engineering controls are allowable under applicable laws, regulations, and permit conditions.