REVISED DRAFT

California Ocean Plan

1999-2002

TRIENNIAL REVIEW WORKPLAN

State Water Resources Control Board
Division of Water Quality
Ocean Standards Unit

June 30, 1999

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EXECUTIVE SUMMARY OF HIGHER PRIORITY ISSUES

Issue C.1.a: Applicability of the Ocean Plan to Water Quality Certification and Waste Discharge Requirements for Dredging Activity (August 1998 Staff Report Issue C.1.a).

Should the California Ocean Plan be amended to clarify that it is applicable to water quality certification activities and to the adoption of waste discharge requirements for dredging activities?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) contains the following statement:

> "This plan is not applicable to discharges to enclosed bays and estuaries or inland waters nor is it applicable to vessel wastes, or the control of dredging spoil." (emphasis added).

Issue Description: In the 1992 Triennial Review and Workplan, the staff concluded that the Ocean Plan should be amended to delete the provision which states that the Ocean Plan is not applicable to the discharge of waste from dredge or fill operations. It was proposed that the Ocean Plan be amended further to clarify that the Plan applies to the discharge of waste from dredging, and to the issuance of water quality certifications, waste discharge requirements and the waiver of waste discharge requirements for the disposal of dredge or fill material.

Summary of Public Comments:

- The commenters generally agreed that the Ocean Plan should be amended to make it applicable to the control of dredging spoil (material), in both inshore and offshore waters.

Staff Recommendation: *Higher Priority - Baseline Budget Effort*

- Review existing state and federal regulations and guidelines for the control of dredged material disposal.
- Define those parts of the Ocean Plan that can be listed as applicable to the control of dredged material, and determine if additional provisions are desirable to protect beneficial uses of state ocean waters.
- Prepare separate, non-regulatory guidance information that will explain the relationship between applicable federal regulations and state water quality standards, as represented by the amended Ocean Plan and basin plans, and explain how this information can be used advantageously in the review of 404 permit applications.

Staff/Budget Resources:

- Estimated Staff Effort: 0.2 PY per year over a 3-year period

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Issue C.1.b: Applicability of the Ocean Plan to Regional Mass Emission Regulation (August 1998 Staff Report Issue C.1.b).

Should the California Ocean Plan be expanded to regulate water quality on a mass emission basis?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) limits most pollutants in wastewater discharges based on their concentration in the discharge. Effluent limitations for pollutants in wastewater are determined based on Table B water quality objectives for individual discharges. However, there is no mass emission-based regulation of all sources of a pollutant entering large areas of the ocean environment.

Issue Description: Currently permits express discharges as mass emission limitations (multiplying the effluent concentration by the flow of the permitted discharge), yet little information is available on whether this approach is protecting beneficial uses on a regionwide basis. There is a potential need to augment existing concentration-based effluent limits with something more protective of coastal resources. This concern is especially relevant in areas of high-volume waste discharge.

Summary of Public Comments: This issue polarized commenters;

- The majority (Dischargers) said Mass Emissions Regulation (MER) is premature and should be a low priority for the SWRCB. They cited that MER is good in concept but "this approach is not ready for open coastal waters". Dischargers think that there must first be an adequate inventory of all sources of pollution, better characterization of these sources, and satisfactory models to trace fate and transport of major pollutants for each discharge to a region.
- Among those saying MER is a good approach, few suggestions were provided on how the SWRCB could establish, derive, or implement MER.
- The SWRCB should be methodical and systematic in its approach toward establishing MER; i.e., sediment quality criteria and/or site-specific objectives should be established first.
- The SWRCB should take a watershed approach toward addressing mass emissions.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Evaluate the concerns raised by the commenters, and work with RWQCB staff to assess the progress made thus far in implementing current permit-based MER limits. Explore options for regional and watershed approaches.

Staff/Budget Resources:

- Estimated Staff Effort: 0.2 PY per year over a three year period

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Issue C.1.c: Applicability of Ocean Plan Regulatory Controls to Prevent the Introduction of Non-Indigenous Marine Organisms, Including Those From Discharge of Ship Ballast Water (August 1998 Staff Report Issue E.1.a)

Should the California Ocean Plan be amended to regulate the discharge of ship ballast water which may contain non-indigenous marine plants and organisms because of the potential threat to designated beneficial uses?

Current Ocean Plan: To the extent that ballast water containing non-indigenous species is determined to be a "waste" that impairs designated beneficial uses, the California Ocean Plan (Ocean Plan) provides general requirements for the management of waste discharge to the ocean, including: "Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded."

Issue Description:

- The un-regulated discharge of ballast water and resulting introduction of non-indigenous aquatic species has resulted in significant economic costs and impairment of beneficial uses of the waters of the State.
- Existing federal and international programs relating to the exchange of ballast water have not been adequate to prevent profound environmental impacts to the waters of the State.

Summary of Public Comments:

- Ocean Plan should provide guidance for implementing a program to control introduction of non-indigenous species into coastal waters.
- Utilize existing State authorities to control the introduction of non-native species, including a ban on the discharge of contaminated ballast water and ballast sediments.
- Fund efforts to study and control the introduction of non-native species, including research into ballast water treatment methods and development of feasible ballast water handling and/or treatment facilities.
- Fund studies to characterize the magnitude and extent of non-indigenous species in coastal marine waters.

Staff Recommendation: *Higher Priority - Augmented Budget Effort*

- Collect and evaluate existing information regarding the magnitude and extent of non-indigenous species within coastal marine waters
- Fund field studies to identify and map the geographic location and extent of non-indigenous species in coastal marine waters, sample ballast water, and develop monitoring programs.
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Staff/Budget Resources:

- Estimated Staff Effort: Baseline- 0.4 PY in FY's 1999-2001 and 0.3PY in FY 2002.
- Estimated Contract Commitment: $50,000 per year augmented for FY 2000/2001 and FY 2001/2002

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Issue C.2.a: Revision of the List of Beneficial Uses in the Ocean Plan (August 1998 Staff Report Issue C.2.a)

Should the list of beneficial uses in the California Ocean Plan be changed to be consistent with the lists of beneficial uses in the Regional Water Quality Control Plans?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) lists fourteen beneficial uses of ocean water that shall be protected by its implementation. These uses are not defined within the Ocean Plan.

Issue Description: The list of beneficial uses in the Regional Water Quality Control Boards (RWQCBs) Basin Plans are not entirely consistent with each other, or with the 1997 Ocean Plan. The RWQCBs along the coast have used these lists to designate the level of protection which will be given to the beneficial uses in coastal waters. A question has arisen regarding the importance of these differences, and if the Ocean Plan and the individual Basin Plans should be amended to make the lists of beneficial uses consistent.

Summary of Public Comments:

- The SWRCB should adopt a standard list of beneficial uses as policy in the Ocean Plan, which the RWQCBs would include in the Basin Plans, but that the RWQCBs be allowed to adopt "sub-uses" to fit local situations.

- The "preservation and enhancement of National Marine Sanctuaries" be adopted as a beneficial use.

Staff Recommendation: *Higher Priority - Baseline Budget Effort*

- Examine the list of beneficial uses in the Ocean Plan and SWRCB Administrative Manual.
- Develop a tiered system of beneficial use categories and sub-categories which provides for broad uses in the Ocean Plan and, where appropriate, more-specific sub-categories adopted by either the SWRCB or the RWQCBs.

Staff/Budget Resources:

- Estimated Staff Effort: 0.2 PY per year over a three year period

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Issue C.3.a: Choice of Indicator Organism for Water-Contact Bacterial Standard and Increased Stringency of the Water-Contact Fecal Coliform Standard (August 1998 Staff Report Issue C.3.a).

Should enterococcus be added to the total and fecal coliform water-contact bacterial standards currently in the California Ocean Plan (Ocean Plan)? Should the fecal coliform standard be made more stringent?

Current Ocean Plan: The current Ocean Plan contains a total and fecal coliform water-contact standard, and a bacterial assessment and remedial action requirement that requires the measurement of enterococcus at all stations where total and fecal coliforms are sampled.

Issue Description: The focus of this issue will be to:

- Determine an appropriate microbiological indicator organism for use in the Ocean Plan;
- Determine if the existing fecal coliform standard for water-contact recreation should be amended from 200 organisms per 100 ml to 110 per 100 ml.

Summary of Comments:

- The State Water Resources Control Board (SWRCB) should not make a decision regarding indicator organism choices and standards until the DHS promulgates the AB 411 regulations, and that whatever decision the SWRCB makes should be consistent with this DHS regulation;
- the SWRCB should remove the total and fecal coliform water-contact bacterial standards from the Ocean Plan, and adopt enterococcus as the sole standard;
- The Ocean Plan should require monitoring for total and fecal coliform organisms only;
- The SWRCB should add an enterococcus standard to the total and fecal coliform water-contact bacterial standards contained in the Ocean Plan;
- The Ocean Plan should include all three bacterial indicator organisms;
- Although dischargers feel that their effluent plumes do not make it back to shore, it would be a false economy to eliminate the enterococcus monitoring requirement from National Pollutant Discharge Elimination System (NPDES) dischargers, since approximately 80% of the beach monitoring programs in the Southern California Bight are done by these dischargers. monitoring programs should include analyses for all three bacterial groups.
- All commenters were opposed to the suggestion that the fecal coliform standard be lowered to 110 MPN/100 ml.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Staff will propose several Ocean Plan amendments relating to bacterial standards, monitoring requirements, and research.

Staff/Budget Resources:

- Estimated Staff Effort: 0.33 PY per year over a three-year period

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Issue C.3.b: Review of the Water Quality Objectives for 2,3,7,8-TCDD and Related Compounds (Dioxins).

Should the water quality objective for Dioxin be reviewed to reflect new information received since the objective was adopted in 1990?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) water quality objective for TCDD equivalents is 3.9×10^{-9} micrograms/liter (0.0000000039 micrograms/liter.)

Issue Description: To ensure that the objective reflects current scientific information, State Water Resources Control Board (SWRCB) staff has been monitoring a major TCDD and TCDD equivalents assessment by the U.S. Environmental Protection Agency (U.S. EPA) and plans to recalculate the water quality objective based on the U.S. EPA review.

Summary of Public Comments:
- Endorse current staff approach of evaluating studies performed on dioxin-related compounds while awaiting the results of the US EPA's reassessment.
- There is insufficient evidence to revise the objective.
- A more stringent objective would cause increased costs in monitoring.
- Source determination and "realistic" control mechanisms should be part of the review.
- Conduct coastal surveys of edible California fish and shellfish to determine if there has been significant bioaccumulation of these compounds in edible fish tissue to be considered a possible human health risk.
- Need analytical test methods capable of screening samples at meaningful concentrations.
- Endorsed the World Health Organization's recommendation to decrease the toxicity factor for the eight-chlorine dioxin.

Staff Recommendation: *Higher Priority - Augmented Budget Effort*
- Re-evaluate the Ocean Plan water quality objective for dioxins based on results of the U.S.EPA review of these compounds.
- Consult with the Office of Environmental Health Hazard Assessment (OEHHA) regarding human health concerns, while independently emphasizing other aspects of interest to the SWRCB, including aquatic life impacts, fate in aquatic systems, and bioaccumulation in the marine environment.
- Staff would work with other interested parties to include dioxin monitoring in regional monitoring programs.

Staff/Budget Resources:
- Estimated Staff Effort: Baseline of 0.1 PY per year over a three year period, plus 0.5 PY per year augmented for FY 2000/2001 and FY 2001/2002
- Estimated Contract Commitment: $50,000 per year augmented for FY 2000/2001 and FY 2001/2002 ($50,000 for OEHHA and $50,000 for the Department of Fish and Game)

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Issue C.3.c: Biological Objectives (August 1998 Staff Report Issue C.3.c)

Should the narrative biological objective now in the California Ocean Plan be clarified with additional narrative and/or numerical language?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) contains the narrative biological objective "marine communities... shall not be degraded." The Ocean Plan defines degradation as a "significant difference" in various ecological measures of three major biotic groups: demersal fish, benthic invertebrates, and algae. There is no guidance provided on how to achieve this broad objective.

Issue Description: The development of biological objectives for marine waters is a relatively new area. Developing and refining such objectives will likely require a significant amount of cooperation among numerous parties to pool expertise and resources. In 1992, Ocean Unit staff recommended in-house consultation on statistical issues related to biological criteria. Little progress has been made on this issue due to a lack of resources (staff and funding). In 1998, EPA encouraged the SWRCB to place a high priority on completing the development of defensible biological objectives for the marine environment stating that this is a high priority for 1998-1999 Triennial Review.

Summary of Public Comments: There was widespread support for the concept of biological objectives among those commenting. However, the majority, (primarily dischargers) stated that while they support the concept, it should be a low priority (or deferred indefinitely) until there is enough information to support the use of numeric biological objectives. Specific comments include the following:

- There are problems interpreting specific numeric criteria used in the marine environment (i.e., they do not always clearly differentiate anthropogenic from natural events), and in applying them on a statewide basis (they were generally developed for specific habitats).
- There is a general lack of scientific work supporting the use of biological objectives measuring marine community health.
- The regulated community should participate in the development of biological objectives.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Continue to monitor and evaluate the development and application of biological objectives for marine waters in other states.
- Participate in cooperative efforts to research and develop biological objectives for the Pacific Coast.

Staff/Budget Resources:

- Estimated Staff Effort: 0.2 PY per year over a three year period
- Estimated Contract Commitment: Costs are included in contract estimates for Issue C.4.a (Regional Ambient Monitoring), approximately $50,000.

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Issue C.3.d: Water Quality Objectives To Address Specific Pollutants In Waste Discharges From Desalination Facilities (August 1998 Staff Report Issue C.3.d).

Should water quality objectives be developed for inclusion in the California Ocean Plan to address pollutants in desalination brine waste discharges?

Current Ocean Plan: Currently, there are no California Ocean Plan (Ocean Plan) Water Quality Objectives that specifically address pollutants in brine waste discharges from desalination plants.

Issue Description: There are several existing desalination plants along the California coast. The majority of these facilities are inoperative because the cost of desalination is generally higher than other sources of freshwater (e.g., ground water, surface water, etc.) (SCCWRP, 1994). This trend, however, may reverse as California's increasing population and the threat of drought squeezes the State's water supply. To help offset future water shortages, several facilities are either in the planning phase or are currently under construction in several locations in the State.

At present, there is not enough information available to determine if water quality objectives should be developed for pollutants specific to brine discharges. In the interim, it may be appropriate for Regional Water Quality Control Boards to issue waste discharge requirements containing site-specific effluent limitations based on the physical and toxicity characteristics of each individual brine discharge.

Summary of Public Comments:

- Several commenters agreed that there is no scientific basis to exempt brine waste discharges from Table B water quality objectives. Additional studies need to be conducted on the ecological impacts of brine waste discharges on the receiving water (Pacific Ocean) before any regulatory actions are taken.

Staff Recommendation: *Higher Priority - Augmented Budget Effort*

- Continue to review studies examining the environmental impacts of desalination wastes on receiving waters as they become available.

- Hire a contractor to conduct studies evaluating what environmental impacts desalination waste discharges may have on receiving waters. The results may be used in the development of water quality objectives specific to desalination discharges.

Staff/Budget Resources:

- Estimated Staff Effort: 0.8 PY (over a three-year period).
- Estimated Contract Commitment: $50,000 per year augmented for FY 2000/2001 and FY 2001/2002

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Issue C.3.e: Establish a Fecal Coliform Standard for Shellfish Harvesting Areas and for Shellfish Tissue (August 1998 Staff Report Issue C.3.e).

Should the shellfish harvesting standards in the California Ocean Plan be modified to include a fecal coliform value for harvesting waters, and a standard for shellfish tissue?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) currently contains a total coliform standard of 70 organisms per 100 ml for waters of all areas where shellfish may be harvested for human consumption. There is no standard for shellfish tissue currently in the Ocean Plan.

Issue Description:

- The Department of Health Services (DHS) has suggested adding a fecal coliform standard of 14 organisms per 100 ml to the Ocean Plan, making the Ocean Plan shellfish standards consistent with the National Shellfish Sanitation Program (NSSP) guidelines for commercial shellfish growing areas. commercial shellfish growing areas;
- A shellfish tissue standard should be added to the Ocean Plan.

Summary of Public Comments:

- The SWRCB should adopt the a fecal coliform standard of 14 MPN/100 ml for waters where shellfish are grown for human consumption;
- The SWRCB should take into account the results of any studies conducted pursuant to the Shellfish Protection Act, as well as the possible effect that the AB 411 regulations might have on shellfish growing waters before amending this water quality standard;
- The SWRCB should continue efforts to find new indicator species that can be used to differentiate human versus animal fecal pollution so that effective control measures can be developed;
- Since the issue of shellfish protection is being handled on a site-specific basis under the Shellfish Protection Act, any modifications to the Ocean Plan should wait until ongoing studies are completed;
- No comments were received concerning the addition of a tissue standard.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Provide financial and technical support for studies at commercial shellfish growing areas.
- Work with others to study/measure fecal coliform within recreational shellfish harvest areas.
- Monitor ongoing research on indicator organisms, including DNA fingerprinting.
- Work with Regional Boards to adopt site-specific standards for shellfish harvest areas.

Staff/Budget Resources:

- Estimated Staff Effort: 0.5 PY per year over a three-year period
- Estimated Contract Commitment: Baseline funding of $140,124 for FY 1999/2000, $100,000 for FY 2000/2001, and $100,000 for FY 2001-2002.

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Issue C.3.f: Sediment Quality Objectives.

Should numeric sediment quality objectives be developed for marine waters?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) currently contains *narrative* sediment quality objectives in Chapter II.

Issue Description:

- Much of the toxic material in wastewater is attached to particles that settle and become part of the sediment. Recent surveys of the Southern California Bight revealed that nearly 90 percent of the area had evidence of anthropogenic sediment pollution.
- *Numeric* sediment quality objectives would define unacceptable toxicant levels in sediments for the protection of marine benthic organisms or human health.
- The U.S. Environmental Protection Agency (U.S. EPA) has actively pursued the development of guidelines for establishing sediment quality criteria guidelines. Moreover, the U.S. EPA has recently announced their Contaminated Sediment Management Strategy (U.S. EPA 1998) which describes a policy framework to reduce ecological and human health risks posed by sediment contamination.

Summary of Public Comments:

- Continue efforts to develop numeric sediment quality objectives.
- Sediment quality objectives are not appropriate due to the lack of definitive research.
- Sediment quality objectives cannot be developed without unnecessary public expenditures and are inappropriate for reliably regulating sediment impacts.
- Objectives should be developed on a site-specific or regional basis.
- Defer development of sediment objectives until the U.S.EPA Sediment Management Strategy proves successful or until SWRCB evaluates existing efforts.
- Establish a working group of agency and scientific experts to address this issue.
- Establish sediment quality evaluation procedures based on "sediment-associated constituent impacts" rather than on sediment concentrations.
- Sediment quality objectives would provide the basis for regulating dredging and the disposal of contaminated sediments.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Establish a working group of Agency and scientific experts to assess the current state of sediment quality objective development.
- The ultimate goal of the working group would be to develop a SWRCB sediment management policy that could be referenced in the Ocean Plan.

Staff/Budget Resources:

- Estimated Staff Effort: 0.33 PY per year over a three-year period

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Issue C.3.g: Incorporation of Site-Specific Water Quality Objectives Into the Ocean Plan

Should the California Ocean Plan incorporate procedures for establishing site-specific water quality objectives in addition to current statewide water quality objectives?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) contains no provisions to develop site-specific objectives. Ocean Plan allows the Regional Water Quality Control Boards (RWQCBs) to establish more restrictive objectives and effluent limitations to protect beneficial uses. RWQCBs can set less restrictive permit limits under specified conditions.

Issue Description:

- In the October 1992 Triennial Review and Workplan, staff concluded that a method for developing site-specific objectives appropriately belonged in the Ocean Plan

Summary of Public Comments:

- Incorporate provisions and procedures for deriving site-specific water quality objectives into the Ocean Plan.
- The Site-Specific Objectives Task Force's preferred alternative would require a RWQCB to develop site-specific objectives if a written request, supported by preliminary funds, is made to the RWQCB and if either of the following two conditions exists:
  - an existing or potential statewide objective or beneficial use is not achieved
  - a holder of waste discharge requirements does not meet an existing or potential effluent limit and cannot achieve the limit through pollution prevention measures.
- Site-specific objectives for ocean waters assumes that ocean dynamics will be constant and fails to account for large scale ocean events such as the El Niño phenomenon.

Staff Comment:

- It is inappropriate to remove RWQCB discretion regarding the development of site-specific objectives.
- Staff no longer believes that it would be appropriate to include site-specific objectives in the Plan itself

Staff Recommendation: *Higher Priority - Baseline Effort*

- If procedures for development of site-specific water quality objectives are adopted into the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, then determine if such provisions should be added to the California Ocean Plan.

Staff/Budget Resources:

- Estimated Staff Effort: 0.1 PY per year over a three-year period

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Issue C.3.h: Review Chemical Water Quality Objectives for Aquatic Life and Human Health

Should water quality objectives be recalculated to reflect new scientific information or methodology?

Current Ocean Plan: Table B of the 1997 California Ocean Plan contains numeric water quality objectives for the protection of marine aquatic life and human health.

Issue Description:
- The development of water quality objectives is an ongoing process Eight pollutants of concern have U.S. EPA criteria that are not regulated by the Ocean Plan.
- Water quality objectives for human health are based on seafood consumption of 23 g/day.
- Chemical Objectives Task Force recommended a probabilistic approach.

Summary of Public Comments:
- New water quality objectives should be added to the Ocean Plan once U.S.EPA has established criteria levels; not enough "real world" data to establish new objectives.
- SWRCB should first determine if a need exists for the new objectives
- SWRCB should validate all new scientific information used to develop new objectives.
- All the objectives for the protection of marine aquatic life should be reevaluated.
- There is no basis for including a water quality objective for asbestos in the Ocean Plan.
- The existing 23 g/day seafood consumption rate is too low
- Pollutant *bioaccumulation* effects should be incorporated into the methodology.
- The currently used cancer risk level of 10^{-6} is too low when compared to risk levels used by other agencies (including Cal-EPA).
- support a probabilistic approach to calculating water quality objectives.

Staff Comments:
- U.S.EPA is revising its methodology for establishing water quality criteria for the protection of human health.

Staff Recommendation: *Higher Priority - Baseline Effort*
- Examine the feasibility of establishing water quality objectives for non-priority pollutants.
- Revise objectives for human health in Table B using the new U.S.EPA methodology.
- Evaluate the new methodology using a probabilistic approach.
- Contract assistance to revise objectives for the protection of marine aquatic life.

Staff/Budget Resources:
- Estimated Staff Effort: 0.7 PY per year over a three-year period
- Estimated Contract Commitment: Baseline funding of $35,000 for FY 1999/2000, $8,000 for FY 2000/2001, and $7,000 for FY 2001/2002

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Issue C.4.a: Regional Ambient Water Quality Monitoring and the Ocean Plan (August 1998 Staff Report Issue C.4.a).

Should the California Ocean Plan contain regional ambient water quality provisions?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) contains provisions to regulate individual point source pollution discharges. There are no provisions in the Ocean Plan for monitoring collective pollution inputs to a marine region.

Issue Description: This issue was discussed as a high priority issue in the 1992 Triennial Review and Workplan. At that time, staff recommended taking an ecosystem-wide approach to monitor water quality, by coordinating among Regional Water Quality Control Boards (RWQCBs), and particularly, by working with the Santa Monica Bay Restoration Project. At this time, staff are interested in promoting integrated, non-regulatory approaches to regional monitoring that encourage cooperation, efficient use of monitoring resources, and that provide the State with needed marine ambient monitoring data to assess the status of water and marine resource health.

Legislation and Executive mandates have recently required the SWRCB to place greater emphasis on coastal water quality and monitoring [Governor Wilson's 1997 Executive Order W-162-97, AB 1581 (Keeley), and AB 1429 (Shelley)].

Summary of Public Comments: Commenters were polarized on this issue.

- Add regional monitoring provisions to the California Ocean Plan. The majority of commenters supported this due to the need for information concerning region-wide assessments of water quality and marine resources.
- Link coastal monitoring and watershed monitoring by incorporating "integrated coastal management approaches" with information needs.
- Make recommendations for regional monitoring in the OP that are consistent with the Coastal Monitoring Strategy required in both AB1581 (Keeley) and implement the tasks remaining from AB1429 (Shelley) regarding monitoring for coastal watersheds.
- The discharger community supports regional monitoring but the SWRCB should not try to create provisions for it in a regulatory document like the OP; do not add regional monitoring provisions to the Ocean Plan.
- Adding such provisions to the Ocean Plan would reduce the flexibility now enjoyed by regionally based and organized efforts like SCCWRP and SFEI, that are currently widely accepted, designed, and conducted.
- Regional monitoring agreements arranged by the RWQCB's that add permit flexibility and supplemental monitoring are sufficient; the Ocean Plan is not updated frequently enough to reflect current needs for information

Staff Recommendations *Higher Priority - Augmented Budget Effort Alternative 3.b*

- Continue to design and fund existing cooperative, regional monitoring efforts (SCCWRP, SFEI, Central Coast RWQCB) to monitor trace metals, bacterial contamination, storm water run-off, and bioaccumulation in fish tissues off the California coast.

- Beginning in FY 2000-2001, establish a permanent marine monitoring trends and analysis program within the SWRCB's Division of Water Quality to:
    - Evaluate the results of marine monitoring studies conducted across multiple coastal regions for statewide assessments of water quality, sediment, and marine resource health;
    - Report on the status of coastal beneficial uses based on monitoring results, and make recommendations to improve SWRCB water quality objectives and policies.

Staff/Budget Resources:

- Estimated Staff Effort: Baseline of 0.6 PY per year over a three year period, plus 2 PY augmented annually beginning in FY 2000-2001
- Estimated Contract Commitment: Baseline of $130,000 for FY 1999-2000 and $100,000 annually for succeeding years, plus $400,000 augmented annually beginning in FY 2000-2001.

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Issue C.4.b: Review of Standardized Monitoring and Reporting Requirements (August 1998 Staff Report Issue C.4.b).

Should modifications be made to Appendix II of the California Ocean Plan to provide additional guidance to the RWQCBs and discharger community regarding monitoring and reporting requirements?

Current Ocean Plan: Appendix II of the California Ocean Plan (Ocean Plan) includes standard monitoring procedures to provide direction to the Regional Water Quality Control Boards (RWQCBs) in developing monitoring programs to accompany discharge permits.

Issue Description: Monitoring and reporting requirements have been left to the discretion of each RWQCB. Several commenters during the 1992 Triennial Review noted that there should be greater statewide standardization of monitoring requirements. The procedures in Appendix II of the Ocean Plan need to be updated and reviewed to include the most current methods of sampling and analysis.

Summary of Public Comments:

- Several dischargers expressed that the Ocean Plan is not the place to specify monitoring requirements, saying that "standardizing methods and techniques have been a natural outgrowth of regional monitoring", and those parties conducting regional monitoring should be the ones to advocate standardized methods.
- Methods should not be standardized in the Ocean Plan, as it is too infrequently updated.
- Most all of the commenters indicated support of standardized reporting through a database like the proposed System for Water Information Management (SWIM).
- Any proposed reporting requirements should be flexible, frequently updated, consistent statewide, user-friendly, built with adequate QA/QC, and made useful through enforcement. Most dischargers indicated that they wanted to continue working on standardizing reporting techniques and needs through the SWIM process and current negotiations with SWRCB staff, and not by amendments to the Ocean Plan.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Focus discussions on generating specific recommendations to improve Appendix II;
- Derive potential amendment(s) to Appendix II linking compliance monitoring requirements with supplemental monitoring needs of the RWQCBs, SWRCB, and regulated community--create flexibility for regional monitoring and coastal watershed monitoring; and
- Actively track the development of the SWIM database and determine if implementation of SWIM will require amendments to the Ocean Plan.

Staff/Budget Resources:

- Estimated Staff Effort: 0.2 PY per year over a three year period

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Issue C.4.c: Statistical Interpretation of Chronic Toxicity Data Testing (August 1998 Staff Report Issue C.4.c).

Should the point estimate method be used instead of hypothesis testing for statistical analysis of chronic toxicity test data?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) utilizes different statistical approaches for interpreting acute and chronic toxicity test data. For chronic toxicity tests, hypothesis testing is used (i.e., NOEC) and for acute toxicity tests the point estimate (LC50) approach is followed.

Issue Description: Table B of the 1997 Ocean Plan lists water quality objectives for protection of aquatic life. This list includes an objective for chronic toxicity used "to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological responses". The Ocean Plan requires chronic toxicity to be measured by exposing aquatic organisms to varying concentrations of effluent according to specific test protocols as listed in Appendix II of the Ocean Plan. Chronic toxicity is measured in toxic units chronic (Tu_c), defined as 100/No Observable Effect Concentration (NOEC). NOEC is a statistical endpoint used in hypothesis testing.

With the recent addition of acute and chronic toxicity test methods to Table A of 40 CFR 136, all toxicity test methods used in the NPDES permits now fall under the purview of U. S. Environmental Protection Agency (U.S. EPA).

Summary of Public Comments:

- All of the commenters recommended that point estimation methods and the confidence intervals that can be derived from the regression models used to calculate point estimate effects be used for compliance monitoring. They also stated the hypothesis statistical approach and the associated NOEC are too dependent upon dilutions; as a result, statistical significance may not necessarily denote biological significance in toxicity testing.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Work with U.S.EPA staff reviewing the current statistical approaches utilized in analyzing toxicity test data. The knowledge gained as a result of this cooperative effort could then be used to provide guidance to Regional Water Quality Control Boards on which statistical method to require in NPDES permits for ocean discharges.

Staff/Budget Resources:

- Estimated Staff Effort: 0.1 PY per year over a three year period

Staff Contact For This Issue:

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Issue C.4.d: Implementation of Toxicity Reduction Evaluations (TREs) (August 1998 Staff Report Issue C.4.e).

Should chronic marine TIE methods be developed for toxicity test methods listed in the California Ocean Plan?

Current Ocean Plan: If a discharge consistently exceeds an effluent limitation based on a toxicity objective in Table B, a Toxicity Reduction Evaluation (TRE) is required. The TRE shall include all reasonable steps to identify the source of toxicity. Once the source(s) of toxicity is identified, the discharger shall take all reasonable steps necessary to reduce toxicity to the required level.

Issue Description: A TRE is a site-specific study conducted in four stages to: 1) identify the sources of toxicity in the effluent, 2) isolate these sources, 3) evaluate the possible mitigatory responses to control the toxicity, and 4) confirm toxicity has been removed from the effluent. A TIE is the identification phase of a TRE in which a series of chemical analytical procedures, combined with the toxicity test procedures, are used to identify the specific chemicals causing the toxicity in the effluent.

The issue of which criteria are to be used in triggering a TRE is being investigated by members of Southern California Toxicity Assessment Group's (SCTAG) methods and policy committees. SCTAG is comprised of representatives from the waste discharger community, consultant laboratories, and government, including SWRCB staff. As for TIE method development, six of the seven tier 1 critical life stage test methods currently listed in the Ocean Plan (Appendix II) now have TIE methods (U.S. EPA, 1996).

Summary of Public Comments:

- Two commenters recommended dropping this issue as part of the Triennial Review because most ocean dischargers have not experienced problems with exceeding toxicity limits and relatively few full blown TREs are in fact necessary. In addition, the level of effort required to develop more TIE methods is unnecessary.
- One commenter strongly supported efforts made in the development of TIE methods for chronic marine toxicity tests. This same commenter urged the SWRCB to provide more guidance to RWQCBs on (1) what procedures to follow in the event of a chronic toxicity violation, and (2) how many violations necessitate conducting a TRE/TIE.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Defer the determination of a TRE trigger to the Regional Water Quality Control Boards.
- Complete TIE method development (six of the seven tier 1 critical life stage test methods currently listed in the Ocean Plan (Appendix II) now have TIE methods).

Staff/Budget Resources:

- Estimated Staff Effort: 0.1 PY per year over a three-year period

Staff Contact For This Issue:

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Issue C.4.e: Acute Toxicity Test Methods (August 1998 Staff Report Issue C.4.f).

Should the SWRCB use existing acute toxicity test methods approved by U.S. EPA, or develop new test methods?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) requires that compliance with the acute toxicity limitation (TUa) in Table A shall be determined "using an established protocol, e.g., American Society for Testing Materials, U. S. Environmental Protection Agency (U.S. EPA), American Public Health Association, or State Board."

Issue Description: The Ocean Plan requires that "compliance with the acute toxicity limitation (TUa) shall be determined using an established protocol, e.g., American Society for Testing Materials (ASTM), EPA (i.e. U.S. EPA), American Public Health Association, or State Board"(i.e. SWRCB). With the addition of acute toxicity test methods to U.S. EPA's 40 CFR 136 in 1994, permitted dischargers are now required to use only U.S. EPA approved acute toxicity test methods.

The issue of acute test methods was raised because some newer acute tests are more sensitive than older tests and because some protocols are more rigorously defined than others. For example, the Fourth Edition U.S. EPA acute toxicity methods manual (U.S. EPA, 1993) recommends that younger test organisms be used than those recommended in the Third Edition (U.S. EPA, 1985). In practical terms, this meant that an effluent may "pass" a test based on the third edition manual but "fail" if a more recent test is used.

Summary of Public Comments:

- All of the commenters stated the importance of this issue is dependent upon the outcome of Issue 1 (Replacement of the Acute Toxicity Effluent Limitation in Table A with an Acute Toxicity Water Quality Objective) which is proposed for amendment to the California Ocean Plan. If a mixing zone is not adopted for acute toxicity then this issue should become a high priority. Several commenters also stated the current technology based limitation used in combination with the newer, more sensitive acute toxicity test methods is needlessly overprotective.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Staff will evaluate the need to develop new acute toxicity test methods to supplement the current list of U.S.EPA approved test protocols in 40 CFR 136. The outcome of Issue 1 (Replacement of the Acute Toxicity Effluent Limitation in Table A with an Acute Toxicity Water Quality Objective) proposed for amendment to the 1997 California Ocean Plan will be a consideration in the evaluation.

Staff/Budget Resources:

- Estimated Staff Effort: 0.8 PY (over a three year period).

Staff Contact For This Issue:

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Issue C.4.f: Regulatory Control of Storm Water Discharge (August 1998 Staff Report Issue C.1.c).

Should the California Ocean Plan be amended to assist storm water dischargers and regulators in achieving the standards contained in the Plan?

Current Ocean Plan: Since 1978, the California Ocean Plan (Ocean Plan) states that it is "...applicable, in its entirety, to point source discharges to the ocean", which includes storm water discharges. The State Water Resources Control Board (SWRCB) has determined that implementation of Ocean Plan water quality standards must be met, but integrated with the federal concept of storm water regulation which emphasizes "best management practices" rather than compliance with numeric effluent limitations.

Issue Description: The focus of this issue will be to:

- Determine whether existing storm water control programs are adequate to ensure compliance with Ocean Plan standards;
- Recommend appropriate amendments to the Ocean Plan which will assist storm water dischargers and regulators in achieving the standards.

Summary of Public Comments:

- Ocean Plan should provide guidance for implementing storm water programs.
- Watershed management approach should be applied to coastal waters.
- More information needed to characterize and monitor storm water discharges.
- Schedule of compliance needed for meeting Ocean Plan water quality objectives.
- Review appropriateness of existing Ocean Plan water quality objectives to storm water discharges.
- Conduct economic analysis of cost to comply with Ocean Plan standards.
- Storm water discharge is a trans-border (U.S. / Mexico) issue.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Collect and evaluate existing information to determine effectiveness of existing (and proposed MS4 Phase II) storm water control programs in meeting Ocean Plan standards.
- Augment existing information with field work by the six coastal RWQCB's to ensure that all point sources of storm water discharging to coastal waters are identified, characterized and mapped in a timely manner.
- Develop guidance for a phased implementation program for appropriate Ocean Plan objectives.

Staff/Budget Resources:

- Estimated Staff Effort: 0.3 PY per year over a three-year period
- Baseline Budget Commitment: Baseline funding of $90,000 per year for FY 2000/2001 and FY 2001/2002

Staff Contact For This Issue:

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Issue C.4.g: Regulatory Control of Nonpoint Source Discharge

Should the California Ocean Plan include a specific implementation program for the control of nonpoint sources of pollution?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) applies to nonpoint source waste discharges "*wherein compliance with water quality objectives shall, in all cases, be determined by direct measurements in the receiving waters*".

Issue Description: The focus of this issue will be to:

- Determine whether existing nonpoint source (NPS) control programs (utilizing whatever implementation strategies are deemed appropriate) are adequate to ensure compliance with Ocean Plan standards
- Recommend appropriate amendments to the Ocean Plan which will assist nonpoint source dischargers and regulators in achieving the standards.

Summary of Public Comments:

- Evaluate effectiveness of existing SWRCB NPS program in meeting Ocean Plan water quality standards. Develop Tier 1-3 "trigger" criteria.
- Ocean Plan should provide guidance for implementing NPS programs.
- Watershed management approach should be applied to coastal waters.
- More information is needed to characterize & monitor NPS discharges.
- Schedule of compliance needed for meeting Ocean Plan water quality objectives.
- Review appropriateness of existing Ocean Plan water quality objectives to non-point source discharges.
- Storm water discharge is a trans-border (U.S. / Mexico) issue.

Staff Recommendation: *Higher Priority - Augmented Budget Effort*:

- Monitor progress of current SWRCB NPS management program, and local / regional efforts for meeting Ocean Plan water quality standards.
- Formulate conclusions and recommendations for each of the comments raised during both the 1992 and 1998-1999 Triennial Reviews. Develop Ocean Plan amendments to provide guidance for implementing NPS control programs
- Define and map the geographic location and extent of NPS discharges directly to coastal and ocean waters within the jurisdiction of the Ocean Plan.

Staff/Budget Resources:

- Estimated Staff Effort: 0.3 PY per year over a three-year period
- Estimated Contract Commitment: $100,000 augmented one year only for FY 2000/2001

Staff Contact For This Issue:

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Issue C.4.h: Review Monitoring Requirements for Bacterial Standards in Appendix II (August 1998 Staff Report Issue E.4.a)

Should the Bacterial Standards section of Appendix II, Standard Monitoring Procedures be clarified and the references updated?

Current Ocean Plan: Appendix II of the California Ocean Plan (Ocean Plan) contains information on the range of sample dilutions to be used for bacterial analysis. It also references which analytical methods are to be used.

Issue Description: Staff has received comments from dischargers and environmental groups that this section is worded unclearly and needs to be re-written.

Summary of Public Comments:

- Appendix II of the Ocean Plan should be modified to add a compliance reporting standard for coliform testing at or above the 95% confidence limit;
- the low detection limit for indicator bacteria should be raised to <20 from the <2 currently in the Ocean Plan. In terms of risk to the swimming public, there is no difference between 20 and 2 organisms to offset the additional cost for analyses using the multiple tube fermentation technique;
- if enterococci monitoring remains in the Ocean Plan, EPA Method 1600 should be added to Appendix II as an acceptable method for detection and enumeration of enterococci. This is a 24 hour method.
- There is increasing interest in chromogenic substrate tests for total coliform and *Escherichia coli*. However, these tests are not currently approved by U.S. EPA for use in marine waters. Many agencies directly responsible for public health may have prematurely incorporated or substituted these unapproved test methods. There is minimum or no documentation of comparability of the chromogenic tests with approved methods (in specific water types and in wet vs. dry season samples). The chromogenic substrate tests are designed to measure *E. coli*, and this value is then substituted for fecal coliform. And, there is no accreditation or oversight process of these new methods.

Staff Recommendation: *Higher Priority - Baseline Effort*

Staff/Budget Resources:

- Estimated Staff Effort: 0.8 PY over a three-year period

Staff Contact For This Issue:

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Issue C.4.i: On-going Review of the Ocean Plan's Critical Life Stage Tests (August 1998 Staff Report Issue E.4.b)

Should there be an on-going review of the critical life stage test list in the California Ocean Plan?

Current Ocean Plan: In 1997, the State Water Resources Control Board (SWRCB) adopted an updated list of critical life stage tests. Toxicity tests on the list are used to monitor compliance with the water quality objective for chronic toxicity.

Issue Description: The Toxic Unit chronic (TUc) listed in Table B of the California Ocean Plan (Ocean Plan) is used to monitor compliance of permitted ocean waste discharges for chronic toxicity. Marine critical life stage toxicity tests is the tool used to measure the chronic toxicity of the discharges and to determine whether compliance is met.

In 1994, the PRC recommended to SWRCB staff a revised list of critical life stage protocols acceptable for use in measuring compliance (Bay et al., 1994) of waste discharges into the ocean. This list was the culmination of four additional years of test method refinement and development since the use of specific toxicity tests was first included in the 1990 Ocean Plan.

As the field of aquatic toxicology continues to evolve, the tests used to measure the toxicity of waste discharges continue to improve. As a result, ongoing review of currently listed and newly proposed critical life stage test methods are essential in keeping pace with improvements in the field.

Summary of Comments:

- All of the commenters recommend that resources be made available to continue reviewing the Ocean Plan list and to propose necessary revisions to keep pace with the evolving field of aquatic toxicology and critical life stage test method development.

Staff Recommendation: *Higher Priority - Baseline Effort*
Staff will work with the Protocol Review Committee and contract with researchers from U.C. Santa Cruz to continue evaluating and updating the current Ocean Plan list of critical life stage test methods. The contractor would also provide technical expertise to laboratories performing the marine toxicity tests and conduct workshops for State and Regional Board staff on WET test procedures.

Budget Resources:

- Estimated Staff Effort: 0.8 PY over a three-year period
- Estimated Contract Commitment: Baseline funding of $70,000 per year over a three year period

Staff Contact For This Issue:
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Issue C.5.a: Clarification of Terminology in Ocean Plan (August 1998 Staff Report Issue E.5.a)

Should any existing definitions be changed, new definitions added, or other changes made to clarify the meaning of the California Ocean Plan?

Current Ocean Plan: Many terms used in the 1997 California Ocean Plan (Ocean Plan) are clarified in Appendix I. Several terms require a technical definition which may include a mathematical formula or an example.

Issue Description: A number of technical terms in the California Ocean Plan are not defined. Although they may be understood by persons involved in the management or regulation of waste discharges, other persons affected by the Ocean Plan provisions may find the terms confusing. Some people reading or implementing the Ocean Plan may not be aware of the special meaning of these terms. Some terms are perceived to be confusing because they are not precise.

Summary of Comments: The commenters supported the proposed issue and all recommended clarification of the definitions for ocean waters and enclosed bays. Each commenter suggested preparation of a more complete list of examples for the definitions of "ocean waters" and "enclosed bays" and stated that, ideally, a map of the ocean waters boundary would be very helpful.

Staff Recommendation: *Higher Priority - Baseline Effort*

- Select "enclosed bays" for use as additional examples in the definition and coordinate with staff working on developing a new "Bays and Estuaries Plan" and the "Thermal Plan" so that a common definition could serve all plans.
- Prepare a proposal for amending Section 13391.5(a) CWC and any water quality control plans in which the definition appears.
- Investigate the possibility of (a) using electronic mapping equipment to identify all "enclosed bays" along the California coast and (b) making the results available to the public.

Staff/Budget Resources:

- Estimated Staff Effort: 0.1 PY per year over a three year period.

Staff Contact For This Issue:

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A. INTRODUCTION

1. California Ocean Plan

The California Ocean Plan (Ocean Plan) is the State's water quality control plan for ocean waters. It lists "beneficial uses" of California's ocean waters which need to be protected; establishes "water quality objectives" necessary to achieve protection for those beneficial uses; and sets forth a program of implementation (including waste discharge limitations, monitoring, and enforcement) to ensure that water quality objectives are met.

The State Water Resources Control Board (SWRCB) adopted the Ocean Plan in 1972, and has since revised the Plan five times, most recently in March 1997. Copies of the 1997 Ocean Plan can be obtained on the Internet at www.swrcb.ca.gov (click on "Plans/Policies"), or by contacting the Ocean Standards Unit at (916) 657-1114.

2. Ocean Plan Triennial Review Process

Federal law [Section 303(c)(1) of the Clean Water Act] and State law [Section 13170.2(b) of the California Water Code] require that ocean water quality standards be reviewed at least once every three years. The purpose of the triennial review of the Ocean Plan is to guarantee continued adequacy of water quality standards.

The triennial review process, as implemented by the SWRCB, consists of an initial public hearing to identify the most important issues to be addressed; followed by staff evaluation of highest priority options for Ocean Plan amendments and preparation of a workplan; a public workshop and meeting on the workplan; and SWRCB action to resolve identified issues, through amendments to the Ocean Plan, if needed.

The August 1998 *Staff Report: Issues for Review* initiated the 1998-1999 California Ocean Plan Triennial Review process, and provided background on issues proposed for review by SWRCB staff at this time. Based upon input received during the public review period, including hearings conducted in Sacramento, Irvine and Monterey, this *1999-2002 Triennial Review Workplan: Staff Recommendations* (Workplan) has been prepared for SWRCB approval to define the scope of the current review of the Ocean Plan. Staff has recommended a priority option for each issue, and a budget identifying the resources necessary to complete the review and analysis for that option. To give detailed attention to each issue concurrently would far outstrip available resources. Resolution of many issues may require the help of other agencies, such as municipal discharge authorities and the U.S. Environmental Protection Agency (U.S. EPA).

The higher priority issues approved for review will be addressed over the next three-year period following SWRCB approval of the Workplan. As issues are resolved, the Ocean Plan will be amended annually (if necessary) using a process analogous to the process used to amend Regional Water Quality Control Plans (Basin Plans).

3. Issues Proposed For Analysis in 1999-2002 Triennial Review Workplan

This Workplan is arranged topically, with references to appropriate sections of the Ocean Plan. The issues discussed in Section C of this Workplan are those which SWRCB staff have identified to date as candidates for analysis in the current 1998-1999 Triennial Review. A brief summary is offered describing the rationale for selection of each issue. Final selection of issues to be reviewed, and assignment of priorities, will be made by the SWRCB at a board meeting on July 15, 1999, following a public workshop on June 30, 1999.

4. Explanation of Issue Summaries

In all, 35 issues were addressed during the 1998-1999 Triennial Review. During the public review process held in September and October 1998, staff of the SWRCB received 78 pages of testimony and 170 pages of written comments on issues presented in the August 1998 *Staff Report: Issues for Review*. Staff also provided comment on 15 of the issues, particularly on those for which a wide range of opinion was expressed. Related higher-priority issues are combined into broader single issues where possible.

Each of the issue summaries presented in Section C of this Workplan contain the following sections:

Issue Description: A brief description of the issue.

List of Commenters: A list of the people (and their affiliation) that commented on the issue.

Comment Summary: A brief summary of the commenters testimony and comments.

Alternative(s) for Staff Action: Staff listed up to three different alternatives for possible analysis of the issue. For many of the less complex issues, only one option is suggested. For each alternative, the estimated staff effort and estimated contract commitment is presented. The estimated effort covers the entire three-year period of the Triennial Review.

a. ***Minimum Effort*** -- The minimum time necessary to superficially evaluate the issue based upon readily available information.

b. ***Baseline Effort*** -- The effort necessary to perform the issue analysis with existing Ocean Standards Unit personnel. The amount given would fall within the current available staff allocated to this project. This alternative provides for a much more detailed analysis of issues than the minimum effort.

c. ***Augmented Budget Effort*** -- This would provide for more detailed investigations into areas that staff believes require more effort than can be performed in-house, such as 1)statistical analysis of procedures for determining compliance at or below the level of

chemical detectability, 2) development of toxicity protocols for discharges requiring toxicity reduction evaluations, 3) expertise in evaluating chronic and acute toxicity protocols and 4) bacterial monitoring for California conditions.

Staff Recommendation: A suggestion is made for which alternative staff action should be performed.

Recommended Priority: Staff have grouped each of the issues into one of four priority categories: higher, medium, lower, or issues to be eliminated from further study at this time. Staff arrived at each priority by evaluating (1) whether resolution of the issue would solve a significant water pollution problem, (2) ease of implementation, (3) relevance to the Ocean Plan, and (4) staff perception of public concern.

5. Issues Considered in 1992 Workplan

In October 1992, the State Water Resources Control Board (SWRCB) adopted Resolution 92-88, directing staff to review a series of high priority issues identified in the 1992 Triennial Review and Workplan (see Page A-6). Staff was further authorized to make recommendations to the SWRCB for any necessary changes to the California Ocean Plan (Ocean Plan). The SWRCB further resolved that the Ocean Plan may be amended annually or as each major issue analysis is completed.

To begin the 1992 Triennial Review, the SWRCB held a Public Hearing to solicit input on potential Ocean Plan issues. Thirty-five issues were presented by the public at the hearing and in written comments. The testimony and comments were summarized, and the SWRCB adopted a workplan that identified twenty-four high priority issues to be addressed over the following three years. It was recognized that the level of resources necessary to address all twenty-four high priority issues concurrently far outstripped what was available so the workplan laid out a phased approach to examining the issues.

The resources available for examining the issues identified in the 1992 Workplan were budgeted as 5 staff members and $200,000 in annual contract funds. Fiscal constraints led to a reduction in resources to 3 staff members and no contract funds until a budget restoration occurred in July 1997. These subsequent constraints reduced the SWRCB's ability to examine these issues and thus slowed the rate of review.

Several high priority issues were of a continuous nature; thus, the two issues resulting in 1997 amendments to the Ocean Plan, revision of the chronic toxicity list of test protocols and clarification of terminology, continued as high priority issues. Other high priority issues were found to consist of more than one substantive item, and the initial listing of 24 high priority issues was expanded to 31. Of these 31 issues, 4 were resolved in 1997, 6 have been proposed for resolution by the staff in the October 1998 Draft Functional Equivalent Document for Amendment of the California Ocean Plan, and 2 are recommended for elimination in this

Workplan. The remaining 19 issues are described in this workplan and recommended for on-going review.

There were 10 lower priority issues identified in the 1992 Triennial Review and Workplan. Public comment received during the current 1998-1999 Triennial Review led staff to recommend that 4 be carried over into this workplan and that 6 be eliminated from further consideration. The following tables "Resolution of Issues" on pages A-8 and A-9 describe the actual and proposed disposition of the 41 issues accepted for review in 1992.

6. 1992 Workplan Issues Adopted as 1997 Amendments to Ocean Plan

   a. Chronic Toxicity Testing: refine and develop new test methods based on indigenous marine species (1992 Issues A.2.a and A.2.b).

   The 1990 Ocean Plan contained seven critical life stage protocols to evaluate the effect of municipal and industrial waste discharges on the marine environment. Based on recommendations of a 10-member external advisory group known as the Protocol Review Committee, the Ocean Plan was revised to delete one protocol, update four protocols, and adopt three new protocols.

   b. Clarification of terminology (1992 Issue A.4.b).

   Minor changes in terminology were approved to make the Ocean Plan easier to understand and implement.

   c. No modification of beneficial uses for mariculture (1992 Issue A.4.a).

   Based on comments received during the Triennial Review process, it was decided that "mariculture" is a more appropriate description of a marine water beneficial use than is "aquaculture". Use of the term "aquaculture" includes mariculture, but does not adequately explain the distinction between freshwater and ocean water - a distinction that may be important in future discussions regarding the shellfish harvesting beneficial use.

7. 1992 Workplan Issues Proposed for 1998/99 Amendments to Ocean Plan

   a. Acute Toxicity Requirements in the Ocean Plan (1992 Issue A.2.f).

   Staff proposes to replace the current technology-based Acute Toxicity Effluent Limitations with an acute water quality objective.

   b. Review water quality objectives in Table "B" (1992 Issue A.1.b).

   Staff proposes to change the objectives for 12 compounds, using Cal/EPA-recommended cancer potency factors and a California-specific fish consumption rate in their recalculations.

c. Compliance determination for chemical water quality objectives (the "PQL" issue) (1992 Issue A.1.g).

Staff proposes to revise the Compliance Determination section of the Ocean Plan using the Minimum Level concept, and to adopt statewide Minimum Levels to be included as an appendix to the Ocean Plan.

d. Review and revision of Ocean Plan format and organization (1992 Issue A.4.c).

Staff proposes to change the format of the Ocean Plan to a form similar to that used for the other statewide water quality control plans.

e. Development of special protection for National Marine Sanctuaries and marine laboratories (1992 Issue A.1.h).

Staff proposes to amend the Ocean Plan to include definitions and procedures for the designation and implementation of Outstanding National Resource Waters and for Outstanding State Resource Waters.

f. Administrative cleanup (1992 Issue 4.b).

Staff proposes various minor administrative changes to the Ocean Plan that would update references to laws and regulations, and explain the relationship of the Plan to other statewide plans and policies

California Ocean Plan
1992 Triennial Review and Workplan
(As Adopted October 22, 1992)

A. HIGHER PRIORITY ISSUES

1. Water quality objectives and regulatory implementation.

    a. Applicability of the Ocean Plan to water quality certification and waste discharge requirements for dredging activity.
    b. Review of water quality objectives in Table B.
    c. Review of the water quality objectives for 2,3,7,8-TCDD (Dioxin) and related compounds.
    d. Biological objectives.
    e. Mass emission regulation.
    f. Regional monitoring and standardized monitoring and reporting procedures.
    g. Compliance determination for chemical objectives.
    h. National Marine Sanctuaries and marine laboratories.
    i. Storm water discharge control.
    j. Application of Ocean Plan water quality objectives to potential adverse effects of waste discharges associated with the desalination of ocean waters.

2. Toxicity objectives and regulatory implementation.

    a. Chronic toxicity testing: use of non-native species.
    b. Chronic toxicity testing: review of test protocol list.
    c. Statistical interpretation of chronic toxicity data.
    d. Chronic toxicity testing: standardized reporting requirements.
    e. Implementation of toxicity reduction evaluations (TREs).
    f. Acute toxicity: (1) test methods, and (2) acute toxicity requirements in Table A.

3. Bacterial standards.

    a. Choice of indicator organisms for water contact bacterial standard and increased stringency of the water contact fecal coliform standard.
    b. Establish a fecal coliform standard for shellfish harvesting areas and for shellfish tissues.

4. Format and terminology.

    a. Mariculture.
    b. Clarification of terminology.
    c. Format and organization of the Plan.

5. Sediment quality objectives.
6. Suspended solids regulation.
7. Nonpoint source control.

B. LOWER PRIORITY ISSUES

8. Clarification of natural light requirements.
9. Establishing the desalination of marine water for fresh water production as a designated beneficial use.
10. Extension of the boundary for water-contact zone.
11. Restriction on application of dilution factors in nearshore waters.
12. Ambient toxicity monitoring.
13. Application of bacterial standard to non-contact recreational areas.
14. Re-examine Table C background concentrations.
15. Areas of Special Biological Significance.
16. Incorporation of site-specific water quality objectives in the Plan.
17. Adoption of an effluent limitation for BOD.

C. ISSUE INAPPROPRIATE FOR CONSIDERATION

18. Guidelines for Regional Board permit limits that are more stringent than those derived from Ocean Plan methods

RESOLUTION OF ISSUES

A. HIGHER PRIORITY ISSUES	1992 Issues Resolved: 1997 Ocean Plan Amendments	1999 Proposed Amendments	1999 Triennial Review (Proposed Resolution)	Total 1992 Issues Resolved		1992 Issues Carried Over: 1999 Triennial Review Higher Priority	1999 Triennial Review Medium Priority	1999 Triennial Review Lower Priority	Total 1992 Issues Carried Over		1999 Triennial Review Workplan Issue No.
1. Water Quality Objectives & Regulatory Implementation											
a. Dredging Activity						X			X		C.1.a
b. Table B Water Quality Objectives											
(EPA Requested Review)		X		X							
On-going Review						X			X		C.3.h
c. Review of Dioxin Water Quality Objectives						X			X		C.3.b
d. Biological Objectives						X			X		C.3.c
e. Mass Emission Regulation						X			X		C.1.b
f. Monitoring											
Regional Monitoring						X			X		C.4.a
Standardized Reporting Procedures						X			X		C.4.b
g. Compliance Determination for Water Quality Objectives		X		X							
h. National Marine Sanctuaries & Marine Labs		X		X							
i. Stormwater Implementation						X			X		C.4.f
j. Water Quality Objectives for Desalination Brines						X			X		C.3.d
2. Toxicity Water Quality Objectives & Regulatory Implementation											
a. Chronic Toxicity Testing: Non-native Species	X			X							
b. Chronic Toxicity Testing: Test Protocol List											
Update Protocols	X			X							
On-going Review						X			X		C.4.i
c. Chronic Toxicity: Statistical Interpretation						X			X		C.4.c
d. Chronic Toxicity: Standardized Reporting								X	X		E.4.a
e. TRE Implementation						X			X		C.4.d
f. Acute Toxicity											
Test Methods						X			X		C.4.e
Table A Requirements		X		X							
3. Bacterial Standards											
a. Choice of Indicator Organisms						X			X		C.3.a
b. Fecal Coliform Standard for Shellfish Harvesting Waters						X			X		C.3.e
4. Format & Terminology											
a. Mariculture	X			X							
b. Clarification of Terminology											
1997 Ocean Plan Amendments	X			X							
1999 Proposed Ocean Plan Amendments		X		X							
On-going Review						X			X		C.5.a
c. Format & Organization of Ocean Plan		X		X							
5. Sediment Quality Objectives						X			X		C.3.f
6. Suspended Solids Regulation											
Suspended Solids			X	X							
Chlorination By-products			X	X							
7. Nonpoint Source Control						X			X		C.4.g
SUB-TOTAL HIGHER PRIORITY ISSUES	4	6	2	12		18		1	19		

RESOLUTION OF ISSUES

B. LOWER PRIORITY ISSUES	1992 Issues Resolved: 1997 Ocean Plan Amendments	1999 Proposed Amendments	1999 Triennial Review (Proposed resolution)	Total 1992 Issues Resolved		1992 Issues Carried Over: 1999 Triennial Review Higher Priority	1999 Triennial Review Medium Priority	1999 Triennial Review Lower Priority	1999 Triennial Review (Issue to be Eliminated)		1999 Triennial Review Workplan Issue Number
8. Natural Light									X		F.3.a
9. Desalination as Designated Beneficial Use									X		F.2.a
10. Extension of Water Contact Zone								X			E.3.a
11. Dilution Factors in Near-shore Waters									X		F.3.d
12. Ambient Toxicity Monitoring								X			E.4.b
13. Bacterial Stds. for Non-contact Rec. Use									X		F.3.b
14. Table C Background Seawater Conc.							X				D.3.a
15. Areas of Special Biological Significance									X		F.2.b
16. Site-specific Water Quality Objectives						X					C.3.g
17. Effluent Limitation for BOD									X		F.3.c
SUB-TOTAL LOWER PRIORITY ISSUES						1	1	2	6		

SUMMARY - 1992 TRIENNIAL REVIEW											
Higher Priority Issues											
Issues Resolved	4	6	2	12							
Issues Carried Over						18		1			
SUB-TOTAL - Higher Priority Issues	4	6	2	12		18		1			

RESOLUTION OF ISSUES

Lower Priority Issues											
Issues Resolved											
Issues Carried Over						1	1	2	6		
SUB-TOTAL - Lower Priority Issues						1	1	2	6		
TOTAL ALL ISSUES	**4**	**6**	**2**	**12**		**19**	**1**	**3**	**6**		

B. WORKPLAN OVERVIEW AND SCHEDULE

1. Workplan Schedule

The 1998-1999 Triennial Review of the California Ocean Plan (Ocean Plan) consists of three major phases:

a. Identification Phase (August 1998 to July 1999)

- Identification of issues raised by the public, other agencies, and staff of the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCB).
- Summary of comments received on issues.
- Discussion of options to examine and evaluate these issues.
- Recommendations of higher priority issues to be examined.
- Preparation of a draft Workplan for SWRCB review.
- SWRCB workshop on Workplan and staff recommendations - June 30, 1999.
- Workplan approval by the SWRCB - July 15, 1999.

b. Analysis Phase (August 1999 to June 2001)

- Staff investigation of issues, development of proposed Ocean Plan amendments and documentation.
- Public distribution of draft Ocean Plan amendments and documentation for review.
- SWRCB hearing on Ocean Plan issues.

c. Adoption Phase (July 2001 to June 2002)

- Staff response to comments, revision of proposed Ocean Plan amendments.
- Public distribution of final proposed Ocean Plan amendments.
- SWRCB workshop and meeting to adopt Ocean Plan amendments.

For issues which can or need to be placed on a more rapid schedule, individual amendments to the Ocean Plan may be proposed to the SWRCB at any time during the period between July 1999 and June 2002.

2. Workplan Budget Resource Commitments

As noted on the following table “Resource Commitments for Higher Priority Issues” on page B-6, twenty-two issues have been selected for higher priority review and analysis during the 1998-1999 Triennial Review. Medium or lower priority issues will not be considered during the 1998-1999 Triennial Review process.

The estimated resource commitment presented in the following table indicates a full effort by staff of the Ocean Standards Unit to finish review of higher priority issues during the 1998-1999 Triennial Review. The estimates will accommodate minor diversions of staff time to other assignments, recognizing that these diversions will occur. For example, Ocean Standards Unit staff must also be familiar with, and respond to, requests related to "lower priority" issues. If there are additional significant diversions, however, resolution of the higher priority issues may not be accomplished within the indicated schedule. The time necessary to resolve some higher priority issues, including those which require the assistance of external contractors, may also extend beyond June 2002.

3. Summary of Commenters

The following table "Summary of Commenters" on page B-8 provides a listing of all individuals and organizations which submitted comments on the August 1998 *Staff Report: Issues for Review*. For a detailed summary of the specific comments submitted on each particular topic, see the appropriate issue paper contained in Section C of this Workplan.

4. Procedure For Adoption Of Ocean Plan Amendments

As noted in Section 1, the 1998-1999 Triennial Review of the Ocean Plan will be implemented in three phases. The following procedures will be utilized in adopting amendments to the Ocean Plan, including compliance with the requirements of the California Environmental Quality Act (CEQA). These procedures will be modified as necessary to ensure that the SWRCB fulfills its statutorily mandated requirements. The staff analysis and public comment (Phase II report) on the analysis will form the basis for the adoption of any revised Ocean Plan standards. This review will be conducted pursuant to 40 CFR 131.20 and California Water Code Section 13170.2(b).

Compliance With Requirements Of CEQA

The SWRCB must comply with the requirements of the California Environmental Quality Act (CEQA) when adopting a regulatory program. CEQA provides that a state agency regulatory program is exempt from the requirements for preparing Environmental Impact Reports (EIRs), Negative Declarations and Initial Studies if certified by the Secretary of Resources.

The process the SWRCB is using to adopt the Ocean Plan has been certified by the Resources Agency as "functionally equivalent" to the CEQA process requirements (14 Cal. Admin. Code Section 15251(g)).

The following procedures are in accordance with SWRCB regulations (23 Cal. Admin. Code Section 3775 et seq) for environmental documents prepared for water quality control plans such as amendments to the Ocean Plan.

a. Documents to Prepare.

(1). Environmental Checklist Form
(2). A report summarizing the amendments to the Ocean Plan with the Staff Report prepared during Phase II. The report will include a discussion of reasonable alternatives to the proposed amendments, evaluation of potential environmental impacts, and mitigation measures to minimize any significant environmental impacts of the proposed amendments.
(3). The amended Ocean Plan.
(4). Notice of Filing.
(5). Notice of Public Hearing.
(6). Notice of Decision.

b. Functional Equivalent and Public Hearing Process.

(1). Environmental Checklist Form.

(a) Prepare an Environmental Checklist Form for the proposed Ocean Plan amendments.

(2). Pre-Hearing Package (Notice of Filing, Hearing Notice, draft Ocean Plan, and summary report)

(a) Send a copy of the pre-hearing package to the agencies and persons listed below. The Notice of Filing, Hearing Notice, draft Ocean Plan and summary report (pre-hearing package) will be circulated at least 45 days (preferably 90 days, with comments due 15 days before action) prior to SWRCB action on the proposed amendments(s)

(b) The following agencies and persons will be sent a copy of the pre-hearing package:

- Those who normally receive notices of Ocean Plan review and exceptions or who staff believes would be interested in the proposed amendment(s).
- Those who have commented on the Ocean Plan review in Phases I and II.
- Those Federal, State and local agencies who have jurisdiction by law or expertise with respect to the subject(s) of the proposed Ocean Plan amendment(s). The transmittal letter to these agencies should indicate that the Ocean Plan is being submitted for consultation under provisions of CEQA

(c) The general public will be notified by the following procedure:

- The Notice of Filing and Hearing Notice will be published for one time (or three times if a discharge prohibition is proposed) in newspapers of general circulation in the major metropolitan areas (e.g., San Diego, Orange County, Los Angeles, Santa Barbara, San Luis Obispo, San Jose, San Francisco, and Eureka).

(3). Responses to Comments.

(a) Staff will prepare written responses to the comments concerning significant environmental points raised during the evaluation process, if such comments are received within 15 days before the date the SWRCB intends to take action on the amended Ocean Plan proposal. Copies of the written responses shall be available at the SWRCB meeting for any person to review. If appropriate, the Environmental Checklist Form and analysis of environmental effects may be revised based on a review of comments received.

(b) If the SWRCB receives written comments on the proposed amendment(s) less than 15 days before the date the SWRCB intends to take action on the proposed amendments, the staff will, to the extent feasible, prepare written responses to the significant environmental points raised in these comments. For the late comments for which the staff is not able to prepare written responses before the SWRCB meeting, and for the oral comments on the draft Ocean Plan which are made at the SWRCB meeting, the staff shall orally respond to the significant environmental points raised and the substance of such responses shall be recorded in the minutes of the SWRCB meeting.

(c) Following the conclusion of the comments and the responses thereto, the SWRCB may take action on the proposed amendments to the Ocean Plan. The comments received, and the responses, shall be included in the record of the SWRCB action on the Ocean Plan review and revision

(4). Staff Summary Report of Amendments to the Ocean Plan.

(a) Before the draft Ocean Plan can be adopted by the SWRCB, staff shall prepare a summary report outlining any significant environmental impacts described in the Environmental Checklist Form and shall provide mitigation measures to lessen the impact(s) (if needed). The summary report will also include the staff analysis prepared during Phase II. Conclusions must be made as to what, if any, potential significant adverse impacts, feasible alternatives and feasible mitigation measures exist.

(b) If completion of the Environmental Checklist Form has led to the conclusion that the proposed amendments may have significant effect on the environment, the SWRCB shall not approve the proposed amendments if there are feasible mitigation measures available which would substantially lessen the potential significant adverse impacts.

(5). Notice of Decision.

(a) Following the SWRCB approval and adoption of the amended Ocean Plan

(6). Environmental Protection Agency Approval.

(a) After SWRCB adoption, the amended Ocean Plan will be sent to EPA for approval.

RESOURCE COMMITMENTS FOR HIGHER PRIORITY ISSUES

	FISCAL YEAR 99 / 00				FISCAL YEAR 00 / 01				FISCAL YEAR 01 / 02				TOTALS			
HIGHER PRIORITY	**PY's**		**CONTRACTS**		**PY's**		**CONTRACTS**		**PY's**		**CONTRACTS**		**PY's**		**CONTRACTS**	
ISSUES	**Baseline**	**Augment**	**Baseline**	**Augment**	**Baseline**	**Augment**	**Baseline**	**Augment**	**Baseline**	**Augment**	**Baseline**	**Augment**	**Baseline**	**Augment**	**Baseline**	**Augment**
Applicability of the Plan																
C1a-Dredging Activity	0.2				0.2				0.2				**0.6**			
C1b-Mass Emissions	0.2				0.2				0.2				**0.6**			
C1c-Ballast Discharge	0.4				0.4			50,000	0.3			50,000	**1.1**			100,000
Beneficial Uses																
C2a-Beneficial Uses	0.2				0.2				0.2				**0.6**			
Water Quality Objectives																
C3a-Indicator Organisms	0.4				0.3				0.3				**1**			
C3b-Dioxins	0.1				0.1	0.5		50,000	0.1	0.5		50,000	**0.3**	1		100,000
C3c-Biological Objectives	0.2				0.2				0.2				**0.6**			
C3d-Desalination Discharge	0.1				0.4			50,000	0.3			50,000	**0.8**			100,000
C3e-Shellfish Harvesting	0.5		140,124		0.5		100,000		0.5		100,000		**1.5**		340,124	
C3f-Sediment Quality	0.3				0.4				0.3				**1**			
C3g-Site-specific Objectives	0.1				0.1				0.1				**0.3**			
C3h-Chemical Objectives	0.7		35,000		0.7		8,000		0.7		7,000		**2.1**		50,000	
Implementation of the Plan																
C4a-Ambient Monitoring	0.6		130,000		0.6	2	100,000	400,000	0.6	2	100,000	400,000	**1.8**	4	330,000	800,000
C4b-Standardized Monitoring	0.2				0.2				0.2				**0.6**			
C4c-Statistical Interpretation	0.1				0.1				0.1				**0.3**			
C4d-TRE's	0.1				0.1				0.1				**0.3**			
C4e-Acute Toxicity	0.5				0.1				0.2				**0.8**			
C4f-Storm Water	0.3				0.3		90,000		0.3		90,000		**0.9**		180,000	
C4g-Nonpoint Sources	0.3				0.3			100,000	0.3				**0.9**			100,000
C4h-Bacterial Monitoring	0.2				0.2				0.4				**0.8**			
C4i-Critical Life Stage Tests	0.2		70,000		0.3		70,000		0.3		70,000		**0.8**		210,000	
Format & Organization																
C5a-Clarification	0.1				0.1				0.1				**0.3**			
ISSUE SUB-TOTALS	**6**	**0**	**375,124**	**0**	**6**	**2.5**	**368,000**	**650,000**	**6**	**2.5**	**367,000**	**550,000**	**18**	**5**	**1,110,124**	**1,200,000**
Expenses																
Travel			10,000				12,000				13,000				35,000	
Temporary Help			15,000				20,000				20,000				55,000	
WORKPLAN TOTALS	**6**	**0**	**400,124**	**0**	**6**	**2.5**	**400,000**	**650,000**	**6**	**2.5**	**400,000**	**550,000**	**18**	**5**	**1,200,124**	**1,200,000**

SUMMARY OF COMMENTERS

COMMENTERS	ISSUES	Dredging Activity	Mass Emissions	Ballast Discharge	Beneficial Uses	Indicator Organism	Dioxins	Biological Objectives	Desalination Discharge	Shellfish Harvesting	Sediment Quality	Site-specific Objective	Chemical Objectives	Ambient Monitoring	Standardized Monitoring	Statistical Interpretation	TRE's	Acute Toxicity	Storm Water	Nonpoint Sources	Bacterial Monitoring	Critical Life Stage Tests	Valley Ag. Discharge	Clarification	Table C Seawater Conc.	Water Contact Zone	Standardized Reporting	Toxicity Monitoring	Toxicity Mixing Zone	Suspended Solids	Desalination (Use)	ASBS's	Natural Light	Non-contact Rec. Stndrd.	BOD	Dilution Factors
(Issue # From May 99 Workplan)		C1a	C1b	C1c	C2a	C3a	C3b	C3c	C3d	C3e	C3f	C3g	C3h	C4a	C4b	C4c	C4d	C4e	C4f	C4g	C4h	C4i	C4j	C5a	D3a	E3a	E4a	E4b	E4c	F1a	F2a	F2b	F3a	F3b	F3c	F3d
(Issue # From Aug 98 Staff Report)		C1a	C1b	E1a	C2a	C3a	C3b	C3c	C3d	C3e	C3f	D3f	E3a	C4a	C4b	C4c	C4e	C4f	C1c	C4g	E4a	E4b	n/a	E5a	D3e	D3b	C4d	D4a	n/a	C1d	D2a	D2b	D3a	D3d	D3g	D3c
Aliso Water Mgmt Assn						X									X											X										
Calif Aquaculture Assn										X																										
Center for Marine Con / NRDC		X	X	X	X	X			X		X		X	X	X				X	X			X	X		X						X				
Cal Dept of Fish & Game		X		X	X			X			X		X	X	X				X	X																
City of Los Angeles						X		X			X		X		X	X	X	X		X		X				X	X									
City of San Diego			X	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X		X			X	X	X			X		X		X	X	
County of Orange (CSD)			X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X			X	X		X			X	X	X	X	X	
County of Orange																			X	X																
County of LA (CSD)		X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X		X	X	X	X	
County of LA (Env Hlth)						X															X															
County of SD (Env Hlth)						X																														
County of Ventura																			X																	
Friends of the Sea Otter		X		X	X				X		X			X	X				X	X			X									X				
Heal the Bay		X	X			X				X	X			X			X		X	X										X						
G. Fred Lee			X			X		X			X			X					X	X								X		X						
Fred Krieger																			X																	
Monterey Bay NMS		X		X	X	X			X		X			X	X				X	X						X										
Monterey Region WPCA							X	X	X																											
RWQCB1 (North Coast)																			X														X			
RWQCB3 (Central Coast)		X																																		
RWQCB4 (Los Angeles)		X	X			X		X			X		X						X																	
Save Our Shores		X	X	X	X	X			X		X		X	X	X				X	X			X	X		X						X				
SFEI				X																																
Sierra Club (San Diego)			X	X		X	X	X	X	X	X	X	X	X					X	X						X								X		
Surfrider Foundation						X															X															
Tri-TAC/CASA/SCAP			X	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X		X			X	X	X			X		X		X	X	
U.S. EPA (Region IX)			X	X		X	X	X	X	X	X		X	X	X				X	X	X					X			X	X						
West States Petrol Assn							X	X			X		X																								
Public Hearing 9/01/98				X																																
Public Hearing 9/09/98			X			X				X		X				X	X	X	X	X		X				X										
Public Hearing 10/09/98		X	X	X	X						X			X						X																
Staff Comments		X		X	X		X	X				X	X	X					X	X			X	X		X			X			X				
TOTAL		11	13	14	11	18	9	13	8	9	17	7	13	15	12	5	7	6	18	18	5	6	4	4	4	13	4	3	2	6	1	8	3	5	4	0

C. HIGH-PRIORITY ISSUES

Issue C.1.a: Applicability of the Ocean Plan to Water Quality Certification and Waste Discharge Requirements for Dredging Activity (August 1998 Staff Report Issue C.1.a).

Should the California Ocean Plan be amended to clarify that it is applicable to water quality certification activities and to the adoption of waste discharge requirements for dredging activities?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) contains the following statement:

> "This plan is not applicable to discharges to bays and estuaries or inland waters nor is it applicable to vessel wastes, or the control of dredging spoil." (emphasis added).

Issue Description: In the 1992 Triennial Review and Workplan, the staff concluded that the Ocean Plan should be amended to delete the provision which states that the Ocean Plan is not applicable to the discharge of waste from dredge or fill operations. It was proposed that the Ocean Plan be amended further to clarify that the Plan applies to the discharge of waste from dredging, and to the issuance of water quality certifications, waste discharge requirements and the waiver of waste discharge requirements for the disposal of dredge or fill material.

List of Commenters: Adam White, Central Coast Regional Water Quality Control Board 3; Linda Sheehan and Ann Notthoff, Center for Marine Conservation; Jim Curland, Friends of the Sea Otter; William J. Douros, Monterey Bay National Marine Sanctuary; Vicki Nichols, Save Our Shores; Donald L. Lollock, Department of Fish and Game; Catherine Tyrrell, Los Angeles Regional Water Quality Control Board 4.

Summary of Comments: The commenters generally agreed that the Ocean Plan should be amended to make it applicable to the control of dredging spoil (material), in both inshore and offshore waters. Concern was expressed that the disposal of toxic dredged materials can adversely affect aquatic life in the sea-surface microlayer, in the water column, and on the ocean bottom. The disposal of dredged materials can destroy the habitat for various forms of aquatic life on the ocean floor. Materials in the dredged sediment can bioaccumulate in aquatic life and, aside from the effects on the aquatic life itself, can result in health advisories which limit human consumption of the resource. The lack of regulations or guidance from the SWRCB leads to inconsistent actions by the various Regional Boards when reviewing proposed dredging and dredge disposal activities.

Staff Comment: This issue continues to receive strong support. All eight of the comments recommended that the Ocean Plan be amended to clarify that it is applicable to the disposal of dredged material, and several recommended a high priority for this issue. As a further example of the support for this issue, it should be noted that, following circulation of the current Staff Report in August 1998, the staff circulated a Draft Functional Equivalent Document (FED) for amendment of the California Ocean Plan in October 1998 based on the previous Triennial Review. Issue 6 Administrative Changes in the California Ocean Plan described staff consideration of amending the Ocean Plan to state that it was applicable to

vessel wastes and the control of dredged material. The staff concluded that, since the SWRCB did not have a program for the control of vessel wastes, it would not propose amendment of the Ocean Plan to make it applicable to vessel wastes. In addition, since the SWRCB is not able to adopt a standard test for sediment toxicity or a method for determining sediment suitability for unconfined disposal, the staff did not propose to amend the Ocean Plan to make it applicable to the control of dredged material at this time. The comments on FED Issue 6 generally recommended that the SWRCB make the Ocean Plan applicable to the control of dredged material but, if it could not be done in the proposed FED amendments, that it be included in the Triennial Report Work Plan.

The current issue is restricted to consideration of controlling the disposal of dredged material in Ocean waters. It does not include control of the actual dredging activities or disposal of dredged material in other than ocean waters as defined in the Ocean Plan.

Although the Ocean Plan is not applicable to the control of dredged material, the SWRCB and the RWQCBs take part in a coordinated program required by federal regulations. The U.S. EPA and U.S. Army Corps of Engineers (U.S. ACOE) share federal authority for disposal of dredged materials. The U.S. ACOE issues permits for the discharge of dredged or fill material into the navigable waters at specified disposal sites pursuant to Section 404 of the CWA (33 USC 1344). Thus, such permits are termed "404 permits". U.S. ACOE must review the selection of disposal sites and the approval of 404 permits in compliance with guidelines established by the U.S. EPA (see 40 CFR PART 220). In addition, Section 401 CWA (33 USC 1341) requires the applicant for a federal permit, for any activity which will result in a discharge of waste, to provide the permitting agency with a "certification" from the state water pollution control agency. If the SWRCB certifies that the activity will comply with State water quality standards, the permit will be issued.

Applications for U.S. ACOE Section 404 permits are sent to the appropriate RWQCB. Upon receipt of a complete application, the RWQCB may:

1. ***Waive Certification*** - Waiver of certification means that the project as proposed does not violate the State's water quality standards. Waiver of certification can be accomplished by either:

    a) The RWQCB can waive the State's certification authority if it fails or refuses to act on an application for certification in a "reasonable time"(normally 60 days).
    b) The RWQCB may waive the State's right to regulate the planned activity by using its State authorities (i.e. waste discharge requirements).

2. ***Issue Certification*** - Issuance of certification is a finding that, as conditioned, the project will not violate State water quality standards. The conditions of certification become part of the federal permit.

3. ***Deny Certification*** - Denial of certification is a determination that, as conditioned, the State cannot make a finding that the project will not violate State water quality standards. Such a determination does not preclude the applicant from correcting the problem and resubmitting the application.

The RWQCBs do not currently have authority to issue certification. Instead the RWQCB staff makes a certification recommendation to the Executive Director of the SWRCB, who then takes the certification action. Currently, there is a proposed revision to the State's regulations which would delegate this authority to the RWQCBs. If certification is denied the federal permit is not valid. Like certification, a denial can only be issued at the SWRCB level of authority.

4. ***Issue Waste Discharge Requirements*** - A RWQCB may issue waste discharge requirements, either in-lieu of, or in addition to certification. By taking this action the RWQCB will regulate the discharge through its State Porter-Cologne Water Quality Control Act Authority.

Regulations of the U.S. ACOE relating to the discharge of dredged or fill material are contained in 33 CFR PARTS 335, 336, 337 and 338. These regulations include provisions relating to the 404 permit process and intergovernmental coordination. Regulations of the U.S. EPA relating to ocean dumping are found in 40 CFR PARTS 220, 221, 222, 223, 224, 225, 227 and 228. 40 CFR PART 227, Subpart G explains the use of "Limiting permissible concentrations" of constituents in the liquid phase of dredged material which are dependent on applicable marine water quality criteria and toxicity tests. 40 CFR PART 228 lists approved sites for the disposal of dredged material. Some of the sites in ocean waters are outside of state waters.

U.S. EPA and U.S. ACOE have developed guidelines for the evaluation of dredged material proposed for discharge into waters of the United States (1, 2, 3). During review of a proposal for a significant dredging activity, either U.S. EPA or U.S. ACOE may require that samples of the material to be dredged be subjected to analyses described in the guidelines. The RWQCB reviewing the application may consider the results of these analyses and other available information, or may request the development of additional information to determine if the activity would lead to a violation of state water quality standards. 40 CFR 227.1(d) states, "After consideration of the provisions of sections 227.28 and 227.29, no permit will be issued when the dumping would result in a violation of applicable water quality standards.".

Alternative(s) for Staff Action:

1. ***No Effort***

2. ***Baseline Effort***

Review existing state and federal regulations and guidelines for the control of dredged material disposal. Define those parts of the Ocean Plan that can be listed as applicable to the control of dredged material, and determine if additional provisions are desirable to protect beneficial uses of state ocean waters. Coordinate with SWRCB staff, the RWQCBs and appropriate local, state and federal agencies to understand existing procedures for the review of applications for discharge of dredged material to ocean waters, and any existing problems that could be resolved by amendments to the Ocean Plan or policy adoption by the SWRCB. Prepare draft amendments to the Ocean Plan to clarify that it is applicable to the control of dredged material, and to provide policy guidance for implementation. Prepare separate, non-

regulatory guidance information that will explain the relationship between applicable federal regulations and state water quality standards, as represented by the amended Ocean Plan and basin plans, and explain how this information can be used advantageously in the review of 404 permit applications. Prepare necessary materials for SWRCB action, including necessary public hearings and preparation of environmental and administrative documents, and submittal for U.S. EPA approval.

Estimated Staff Effort: 0.2 PY per year over a 3-year period

Staff Recommendation: Alternative 2 - Baseline Budget Effort

Recommended Priority: Higher Priority

References:

U.S. EPA and U.S. ACOE 1991 *Evaluation of Dredged Material Proposed For Ocean Disposal. Testing Manual.* February 1991. EPA-503/8-91/001

U.S. EPA and U.S.ACOE 1995 *QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations. Chemical Evaluations*. April 1995. EPA 823-B-95-001.

U.S. EPA and U.S. ACOE 1998 *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.-Testing Manual.* February 1998. EPA 823-B-98-004.

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Issue C.1.b: Applicability of the Ocean Plan to Regional Mass Emission Regulation (August 1998 Staff Report Issue C.1.b).

Should the California Ocean Plan be expanded to regulate water quality on a mass emission basis?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) limits most pollutants in wastewater discharges based on their concentration in the discharge. Effluent limitations for pollutants in wastewater discharges are determined based on Table B water quality objectives multiplied by a dilution credit based on the characteristics of individual outfalls. However, there is no mass emission-based consideration of all sources of a pollutant in the ocean environment.

Issue Description: While individual discharge permits express discharges as mass emission limitations, multiplying the effluent concentration by the flow of the permitted discharge, little information is available to determine whether this permitting approach is protecting beneficial uses on a regionwide basis.

The need to augment concentration-based effluent limits with mass emission regulation (MER), especially in areas of high-volume waste discharge, has long been recognized by the State Water Resources Control Board (SWRCB). As stated in the 1992 Triennial Review and Workplan, the U.S. Environmental Protection Agency (U.S. EPA), in 1990, requested the SWRCB to address this issue in its next Triennial Review and the issue remains a high priority issue. Comments received during the last Triennial Review include support for mass-emission regulation, and concerns for the need to clarify the relative contributions of currently regulated discharges, historical discharges, and urban run-off.

List of Commenters: Robert W. Horvath (County Sanitation Districts of Los Angeles County, Sept. 9, 1998); Terry Oda (U.S. EPA, Region IX); Edward Kimura (Sierra Club, San Diego Chapter); G. Fred Lee, and Anne Jones-Lee, (G. Fred Lee & Associates); Linda M. Sheehan (Center for Marine Conservation) and Ann Notthoff (Natural Resources Defense Council); Robert W. Horvath 10/16/98, (County Sanitation Districts of Los Angeles County); Robert P. Ghirelli (Orange County Sanitation District); Alan C. Langworthy (The City of San Diego); Vicki Nichols (Save Our Shores); Margaret H. Nellor (Tri-TAC, SCAP, CASA); Mark Gold (Heal the Bay); Catherine Tyrrell, (LA RWQCB).

Summary of Comments: On the concept of augmenting concentration-based effluent limits with mass emission regulation (MER), the comments received were generally polarized, with the majority saying the idea is premature and should be a low priority for the SWRCB, and the rest saying the approach is good. Few suggestions were provided on how the SWRCB could establish, derive, or implement MER. More than half of stakeholders stressed the need for the SWRCB to be methodical and systematic in its approach toward establishing MER; for example, that sediment quality criteria and/or site-specific objectives should be established first. Two stakeholders suggested that the SWRCB take a watershed approach toward addressing mass emissions. One commenter said MER, is “technically infeasible”. Other commenters, for the most part dischargers, cited that MER is good in concept but “this approach is not ready for open coastal waters”. Before the MER approach can be

implemented, there must first be an adequate inventory of all sources of pollution, better characterization of these sources, and satisfactory models to trace fate and transport of major pollutants for each discharge to a region.

Alternative(s) for Staff Action:

1. ***Minimum Effort***
Staff would delay addressing Mass Emission Regulation until progress has been made in related issues, such as Sediment Quality, Site-Specific Objectives, Nonpoint Source Control, Stormwater Discharge Control, and Regional Monitoring. These elements are required to assess relative contributions of pollutants entering the coastal environment from multiple point and non-point sources.

Estimated Staff Effort: 0.1 PY (over a three year period)

2. ***Baseline Effort***
Staff will evaluate the concerns raised by the commenters, and would work with RWQCB staff to assess the progress made on a regional basis in implementing MER limits.

Estimated Staff Effort: 0.2 PY per year over a three year period

3. ***Augmented Budget Effort***
In addition to the baseline effort, staff would contract for the assessment of the relative contributions of specific pollutants statewide, from point and non-point sources, as well as propose options for various approaches to implement MER. Estimated contract requirements are based on the cost to complete similar work for the Southern California Bight.

Estimated Staff Effort: 1.0 PY (over a three year period)
Estimated Contract Effort: $150,000 (over a 2-year period)

Staff Recommendation: Alternative 2 - Baseline Effort

Recommended Priority: Higher Priority

References:

Southern California Coastal Water Research Project. 1996. *Southern California Coastal Water Research Project - Annual Report 1996*, pp. 44-55.

Staff Contact For This Issue:

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Issue C.1.c: Applicability of Ocean Plan Regulatory Controls to Prevent the Introduction of Non-Indigenous Marine Organisms, Including Those From Discharge of Ship Ballast Water (August 1998 Staff Report Issue E.1.a)

Should the California Ocean Plan be amended to regulate the discharge of ship ballast water which may contain non-indigenous marine plants and organisms because of the potential threat to designated beneficial uses?

Current Ocean Plan: The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB) are responsible for the control of water pollution within the waters of the State. Vessel wastes, other than sanitary wastes, may be regulated by the SWRCB if such action does not conflict with other State or federal laws or regulations. To the extent that ballast water containing non-indigenous species is determined to be a "waste" that impairs designated beneficial uses, the California Ocean Plan (Ocean Plan) provides general requirements for the management of waste discharge to the ocean, including:

> "Waste management systems that discharge to the ocean must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community." (emphasis added)

In addition, the Ocean Plan includes the following narrative water quality objective that applies to the discharge of non-indigenous species into coastal marine waters:

> "Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded."

Issue Description: According to *"California's Ocean Resources: An Agenda for the Future"* (Ocean Agenda) released by the California Resources Agency in March 1997, the un-regulated discharge of ballast water and resulting introduction of non-indigenous aquatic species has resulted in significant economic costs and impairment of beneficial uses of the waters of the State. Existing federal and international programs relating to the exchange of ballast water have not been adequate to prevent profound environmental impacts to the waters of the State.

Because of the potential threat to designated beneficial uses, there is significant interest by the SWRCB and RWQCBs to use their regulatory authority to control the introduction of non-indigenous species resulting from the discharge of ballast water. The San Francisco RWQCB recently determined that the introduction of non-indigenous ("exotic") species resulting from the discharge of ballast water has impaired several beneficial uses in San Francisco Bay. This action places the Bay as a high priority on the 1998 Clean Water Act (CWA) Section 303(d) list of impaired water bodies, and sets in motion a process to prepare a specific implementation program to restore water quality by eliminating the source of the problem. This is a new issue that staff proposes to investigate during the 1998 -1999 Triennial Review process. Most of the available research and information on this subject pertains to waters within the jurisdiction of the RWQCB Basin Plans or the now-rescinded Enclosed Bays and Estuaries Plan (i.e. San Francisco Bay, sloughs and inlets, and the major port facilities along

the coast). As a result, the magnitude and areal extent of this potential problem within coastal ocean waters covered by the Ocean Plan is not known at this time. Staff will gather appropriate information to determine the impact of this problem within coastal marine waters covered by the Ocean Plan.

List of Commenters: Donald L. Lollock & Marian Ashe, California Dept. of Fish & Game (OSPR); Linda M. Sheehan, Center for Marine Conservation / Ann Notthoff, Natural Resources Defense Council; Alan C. Langworthy, City of San Diego (Metropolitan Wastewater Dept); Robert P. Ghirelli, Orange County Sanitation District; Jim Curland, Friends of the Sea Otter; William J. Douros, Monterey Bay National Marine Sanctuary (U.S. Dept of Commerce - NOAA); Vicki Nichols, Save Our Shores; Andrew N. Cohen, San Francisco Estuary Institute; Edward Kimura, Sierra Club (San Diego Chapter); Margaret H. Nellor, Tri-TAC/SCAP/CASA; Terry Oda, U.S. Environmental Protection Agency (Region IX).

Summary of Comments: Extensive comments were submitted on this issue during the 1998-1999 Triennial Review. Comments have been summarized and grouped into the following categories for ease of review.

Ocean Plan should provide guidance for implementing a program to control introduction of non-indigenous species into coastal waters: Several commenters requested that the State develop regulatory controls designed to protect native species (and other beneficial uses) from invasive non-indigenous species. It was also suggested that the Ocean Plan should be amended to contain guidance and requirements with respect to disposal of vessel wastes - particularly ballast water.

Comments from the Monterey Bay National Marine Sanctuary (Sanctuary) recommended that the SWRCB undertake a broad evaluation of appropriate means to address the introduction of non-indigenous species. The rich and complex ecosystem in the Sanctuary could be seriously disrupted by an influx of introduced species, particularly in nearshore coastal habitats and the estuarine waters of Elkhorn Slough and Pescadero Marsh. Compared to San Francisco Bay, the Sanctuary is not yet in crisis condition regarding non-indigenous species. However, for the Central Coast, the Sanctuary does not want to wait until so many species have invaded that Monterey Bay or Elkhorn Slough would qualify for listing on the CWA Section 303(d) list of impaired water bodies.. The 1998-1999 Triennial Review presents an excellent opportunity to take steps to *prevent* additional introductions. Invasion by non-indigenous species is one issue where *prevention* is key--once species become established in a region they can rarely be eradicated.

Examples of non-indigenous species in coastal marine waters: One commenter noted that while most invasions of non-indigenous marine organisms have occurred in bays and estuaries, some are known to exist in open coastal waters within the jurisdiction of the Ocean Plan. As an example, the commenter indicated that a species of New Zealand sea slug was collected in San Francisco Bay in 1992. Within a few years it had spread to bays and to open coastal areas from Bodega to San Diego.

Another non-indigenous species, a South African worm that is a shell parasite of abalone and can infest a wide variety of marine snails, has been released (and, according to the commenter, continues to be released) into California coastal waters by the abalone aquaculture industry. The commenter indicated that the worm has become at least temporarily established in ocean waters at one site, where it infests native snails.

These examples suggest that the open coastal waters of California are not invulnerable to invasions by non-indigenous species; and that such invasions could result in substantial detrimental effects on native biodiversity, on the commercial and sport harvest of marine organisms, and on aquaculture (to name a few of the beneficial uses protected by Ocean Plan water quality standards).

Means of introducing non-indigenous species into coastal marine waters: Commenters suggested that mechanisms other than the discharge of ships' ballast water may also be effective at successfully inoculating non-indigenous species into the open coastal environment. With the development over the last few decades of new mechanisms for the worldwide transport of non-indigenous species (such as the international migration of semi-submersible exploratory drilling platforms, the rapid growth of aquaculture, transport via packing materials, aquaria, medical / research projects, and the expansion of international trade and shipping), coastal and near-shore waters may be receiving a growing number and expanding diversity of non-indigenous organisms from an ever-widening range of source areas.

Another commenter suggested that while controlling ballast water discharge is only part of the solution to the problem of depredations by non-indigenous species and potential damage to beneficial uses, it could be a significant step.

State has legal authority regarding introduction of non-indigenous species into coastal marine waters: Several commenters suggested that both existing State law and the Ocean Plan contain provisions that can be used to regulate the discharge of ballast water into State waters. The State Dept of Fish & Game (DFG) commented that as “trustee agency” for California's fish and wildlife resources, their interest regarding the ballast water issue is based, in large part, upon the real concern that the introduction of non-indigenous aquatic nuisance species (as well as viruses and bacteria harmful to native species), is occurring throughout the State. Ballast water and associated sediments have been identified as being a primary mechanism for the transport of many of these nuisance species, viruses, and bacteria.

The DFG's position on ballast water discharge is guided and supported by regulations found in Article 3, Sections 6430 through 6439 of the California Fish and Game Code. **Aquatic Nuisance Species Prevention and Control Act**. The *Legislative Findings and Declarations* contained in Section 6430 state:

> "The Legislature finds and hereby declares that... the people of the state have a primary interest in the regulation of the dumping of ballast water originating in foreign ports in any river, estuary, bay, or coastal area of this state.

The DFG suggests that further justification for a prohibition of vessel ballast water discharges in coastal waters can be found in the following Ocean Plan language, which is also contained in many of the RWQCB Basin Plans:

> "Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded."

Another commenter pointed out that California Water Code Section 13170.2(b) states that the Ocean Plan standards must not allow:

> "...degradation to indigenous marine species or pos[e] a threat to human health";

Suggested content of a statewide implementation program to control the introduction of non-indigenous species: Commenters suggested that the SWRCB and the Ocean Plan could play an important role in the interagency effort needed to address this critical issue. One commenter recommended that the State take the following actions for coordinating California, West Coast and federal efforts aimed at controlling the introduction of non-indigenous species:

1. Support swift implementation of a strong federal program to control the introduction of non-native species through ballast water;

2. Investigate and coordinate with efforts in other West Coast ports and harbors;

3. Consider legislation that bans the discharge of contaminated ballast water and ballast sediments;

4. Work to coordinate, strengthen and fully utilize existing state authorities that may be used to control the introduction of non-native species; and

5. Fund state efforts to study and control the introduction of non-native species

The commenter suggested that the recommendations described above should be implemented as soon as possible in order to avoid further damage to the state's already fragile aquatic ecosystems. Swift implementation will require adequate funding from the Legislature for, among other things:

1. Development by the RWQCBs of an acceptable level or "Total Maximum Daily Load" (TMDL) for non-indigenous species;

2. Incorporation of ballast water control provisions into the Ocean Plan;

3. Development of an inter-agency plan to maximize use of existing laws for controlling non-indigenous species;

4. Implementation of the plan's recommendations; and

5. Research into ballast water treatment methods and development of feasible ballast water handling and/or treatment facilities.

Monitoring and reporting programs needed: The DFG recommended that a monitoring and reporting program be developed which would include requirements for submitting a ballast water discharge control form to the DFG for review. The form would be filled out by the appropriate vessel operator, and would require such information as when the ballast water was put into the vessel, whether or not the ballast water was exchanged prior to entering port, the location of the ship when it exchanged the ballast water, etc.

Commenters also suggested that biological monitoring will be necessary to assess the effectiveness of control measures. This is especially important since invasive species can cause disruption to native species that are not easily identifiable through current marine monitoring programs.

More information and research are needed to characterize the magnitude and extent of non-indigenous species in coastal marine waters: Although the San Francisco bay and estuary have been studied extensively, several commenters noted the relative scarcity of information regarding the magnitude and extent of non-indigenous species in coastal marine waters. Information on the organisms carried in ballast water arriving at California ports needs to be obtained, analyzed and monitored in order to provide a more complete understanding of the nature and intensity of their impact on coastal ecosystems, as well as provide baseline data against which to measure the effectiveness of future control efforts.

A commenter suggested that a series of "rapid assessment surveys" be conducted throughout the State to identify and assess the extent of non-indigenous species along the coast. These surveys can also provide information on the distribution of native and non-indigenous organisms with respect to environmental variables, the seasonal and yearly changes in distribution, and provide baseline data against which to measure the rate of future invasions. Resources are also needed to enter the collected information into a database, do some analysis, and prepare reports containing trends, conclusions and recommendations for action.

Federal timeline for regulating ballast water discharge is behind schedule: Many commenters described federal actions mandated under the *1996 National Invasive Species Act* which require the United States Coast Guard (USCG) to establish voluntary national guidelines for ballast water exchange. The guidelines are to direct vessels entering waters of the United States to exchange ballast water beyond the U.S. "exclusive economic zone" (where the exchange poses no threat of infestation or spread of non-indigenous species) or to use other environmentally sound ballast water management methods. If at any point the Secretary for Commerce determines that compliance with the guidelines is inadequate, the Secretary is required to promulgate regulations with mandatory requirements.

Commenters pointed out that the USCG is already many months behind the schedule mandated by Congress for adoption of the voluntary national guidelines. Given that the initial task of adopting voluntary guidelines is probably the easiest of the tasks in the schedule (which include determining the criteria for assessing adequate compliance and effectiveness, conducting the assessment, and adopting mandatory regulations will all be considerably more

difficult and controversial), it seems likely that the USCG will fall yet further behind. Commenters suggested that waiting for the federal government to deal with this problem may turn out to be a rather long wait, and it is now time for the State to establish its own program.

Staff Comments: Existing federal and international programs relating to the exchange of ballast water have not been adequate to prevent profound environmental impacts to the waters of the State resulting from the introduction of non-indigenous species. Although not the only source, the discharge of ballast water is a significant cause of the problem as evidenced by documented changes to the ecosystem of the San Francisco bay and estuary.

Regulation of ballast water discharge has historically been the responsibility of the federal government. However, the State (through the DFG and the RWQCBs) has recently entered the field by using existing laws to protect fish and wildlife, and water quality. Staff has concluded that there is not sufficient information to determine (on a statewide basis) whether existing beneficial uses are being adequately protected. Additional efforts are necessary to identify the magnitude and areal extent of this problem in coastal marine waters, including those under the jurisdiction of the Ocean Plan. As recommended in the June 1998 Joint Report to the Governor from the Secretary for Environmental Protection and Secretary for Resources "*An Analysis of Federal Responsibilities Related to Ocean Resource Management in California*":

> "SWRCB and DFG should continue to work with USCG to ensure that proposed voluntary federal ballast water monitoring and reporting regulations prevent any further impairment of the beneficial uses of California's waters and, if it is determined that the regulations are not adequate, California should move rapidly at both the State and federal level to prohibit the discharge of ballast waters within its jurisdiction according to the provisions of the federal Clean Water Act.
>
> "Due to the international scope of ballast water exchange and introduction of nonindigenous species, the State should seek federal funding for research into the magnitude of the problem and economic impact of potential solutions in order to lay the groundwork for a more stringent locally-based program."

The extent to which local ports and the shipping industry institute proactive programs to prevent and/or mitigate further impairment of beneficial uses of coastal marine waters will help define the degree to which the State needs to enter the field of regulating ballast water discharge. Another consideration might be adding language to the Ocean Plan prohibiting the discharge to State waters (including enclosed bays and estuaries) of ballast water containing non-indigenous species.

Alternative(s) for Staff Action:

1. ***Minimum Effort***
Monitor progress of current efforts by the USCG, DFG, RWQCB 2 (San Francisco), CALFED Agency Team and others to control the introduction of non-indigenous species in coastal and ocean waters within the jurisdiction of the Ocean Plan. Evaluate the appropriate role of the SWRCB to ensure coordinated efforts to address this statewide issue.

Estimated Staff Effort: 0.1 PY per year over a three-year period

2. ***Baseline Effort***
In addition to the Minimum Effort, the current Ocean Standards Unit staff allocation for this issue will permit a more detailed investigation (including formulation of conclusions and recommendations) for each of the comments and suggestions raised during the 1998-1999 Triennial Review. In addition, staff will collect and evaluate existing information from the RWQCBs, shipping industry, port operators, researchers, and other interested parties regarding the magnitude and extent of non-indigenous species within coastal marine waters, including those under the jurisdiction of the Ocean Plan. Appropriate amendments to the Ocean Plan will be developed with the assistance of stakeholders to see that ballast discharge regulations are implemented in a timely manner.

Estimated Staff Effort: 0.4 PY for FY's 1999-2001, and 0.3 PY in FY 2002.

3. ***Augmented Budget Effort***
In addition to the Baseline Effort, augmented budget resources are necessary through cost-sharing arrangements to identify and map the geographic location and extent of non-indigenous species in coastal marine waters, including those under the jurisdiction of the Ocean Plan. Such an effort is a necessary first step in understanding the degree to which non-indigenous species are affecting beneficial uses and the coastal ecosystem. Resources are necessary to augment existing information with field work by qualified contractors, researchers, and the six coastal RWQCB's to ensure that ballast water samples are taken, rapid assessment surveys are conducted throughout the State (including analysis of data, mapping, and dissemination of information), and biological monitoring programs are developed. All efforts will be coordinated with appropriate representatives of the USCG, DFG, and the RWQCB's.

Estimated Staff Effort: (See Baseline Effort)

Estimated Contract Commitment: $50,000 per year augmented for FY 2000/2001 and FY 2001/2002

Staff Recommendation: Alternative 3 - Augmented Budget Effort

Recommended Priority: Higher Priority

References:

Cohen, A. N. San Francisco Estuary Institute, Richmond, CA. October 1988. *Ships' Ballast Water and the Introduction of Exotic Organisms into the San Francisco Estuary: Current Status of the Problem and Options for Management.*

National Sea Grant College Program / Connecticut Sea Grant Project R/ES-6. April 1995. *The Role of Shipping in the Introduction to the Coastal Waters of the United States (other than the Great Lakes) and an Analysis of Control Options*".

U.S. Coast Guard, Marine Safety Office - San Francisco Bay, Alameda, CA. 1996. *Ballast Water Survey, July 1996.*

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Issue C.2.a: Revision of the List of Beneficial Uses in the Ocean Plan (August 1998 Staff Report Issue C.2.a)

Should the list of beneficial uses in the California Ocean Plan be changed to be consistent with the lists of beneficial uses in the Regional Water Quality Control Plans?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) lists fourteen beneficial uses of ocean water that shall be protected by its implementation. These uses are not defined within the Ocean Plan.

Issue Description: The individual Regional Water Quality Control Boards (RWQCBs) have Basin Water Quality Control Plans (Basin Plans) which list and define the beneficial uses to be protected. The lists of beneficial uses in the Basin Plans are not entirely consistent with each other, or with the 1997 Ocean Plan (see Table 1 included with this Issue). The RWQCBs along the coast have used these lists to designate the level of protection which will be given to the beneficial uses in coastal waters. A question has arisen regarding the importance of these differences, and if the Ocean Plan and the individual Basin Plans should be amended to make the lists of beneficial uses consistent.

List of Commenters: Linda M. Sheehan and Ann Notthoff, Center For Marine Conservation; William J. Douros, Monterey Bay National Marine Sanctuary; Robert W. Horvath, County Sanitation Districts of Los Angeles County; Robert P. Ghirelli, Orange County Sanitation District; Alan C. Langworthy, City of San Diego; Vicki Nichols, Save Our Shores; Jim Curland, Friends of the Sea Otter; Margaret H. Nellor, Tri-TAC; Donald L. Lollock, Department of Fish and Game.

Summary of Comments: A majority of the comments recommended that the Ocean Plan be amended to be consistent with the Basin Plans. These comments reflected the way the question was asked. However, commenters also expressed a feeling that the RWQCBs should have the best knowledge of the waters and their uses and, therefore, it may be appropriate for them to establish the beneficial uses. Other comments recommended that the SWRCB adopt standard uses as policy in the Ocean Plan, which the RWQCBs would include in the Basin Plans, but that the RWQCBs be allowed to adopt "sub-uses" to fit local situations. The comments did not recommend a priority for work plan purposes.

Several of the comments recommended that "preservation and enhancement of National Marine Sanctuaries" be adopted as a beneficial use.

Staff Comment: The federal Clean Water Act (CWA) (33 U.S.C. 1251 *et seq.*) requires each state to adopt water quality standards. The federal Environmental Protection Agency (U.S. EPA) has adopted regulations to implement provisions of the CWA. These regulations require each state to adopt water quality standards which include 1) use designations consistent with the CWA, 2) water quality criteria sufficient to protect the designated uses, and 3) an antidegradation policy consistent with 40 CFR 131.12. The regulations provide that states may adopt sub-categories of a use (40 CFR 131.10(c) and, under certain conditions, seasonal uses (40 CFR 131.10(f)).

The CWA provides national goals for the quality of the navigable waters of the United States (Sec. 101(a)). The meaning of these CWA provisions has been stated in 40 CFR 131.2 as, ""Serve the purposes of the Act" (as defined in sections 101(a)(2) and 303(c) of the ACT) means that water quality standards should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water and take into consideration their use and value for public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, and agricultural, industrial, and other purposes including navigation. ..."

The California Water Code (CWC) provides that the SWRCB shall formulate and adopt state policy for water quality control (Section 13140). The legislature has designated the SWRCB as the state water pollution control agency for all purposes stated in the CWA, and authorized it to exercise any powers delegated to the states by the CWA (Section 13160). Section 13170 CWC provides that the SWRCB may adopt water quality control plans in accordance with the provisions of Sections 13240 to 13244, inclusive, insofar as they are applicable, for waters for which water quality standards are required by the Federal Water Pollution Control Act. Such plans, when adopted, supersede any regional water quality control plans for the same waters to the extent of any conflict.

From the above, it is clear that the SWRCB has the primary responsibility to develop state water quality plans which comply with state and federal laws, and that such plans are state policy which supersede regional water quality control plans to the extent of any conflict. Therefore, it is necessary for the SWRCB to ensure that the beneficial uses in the Ocean Plan are consistent with the provisions of state and federal law, and that internal conflicts between the state and regional water quality control plans are avoided. It is in this context that possible inconsistencies between the Ocean Plan and the regional water quality control plans are being examined.

In the review of this issue, it became apparent that the establishment of a "tiered" system of beneficial uses would be valuable for the watershed management process which has been initiated at the RWQCB level. A tiered system would consist of generalized use categories in the water quality standards at the state policy level, the Ocean Plan, with sub-categories of those uses in specific situations recognized in the Basin Plans. The water quality management plans for watersheds tributary to the ocean must be developed to protect beneficial uses both in surface inland waters and in ocean waters within the "zone of influence" of the tributary streams and runoff. The use of sub-categories of ocean beneficial uses may be appropriate within these zones of influence.

Consideration of adopting "preservation and enhancement of National Marine Sanctuaries" as a beneficial use is included in Issue 5 of the "Draft Functional Equivalent Document; Amendment of the Water Quality Control Plan for Ocean Waters of California" which was circulated for public review in October 1998, and need not be considered for this Workplan.

Alternatives for Staff Action:

1. ***No Effort***

2. ***Baseline Effort***
Examine the list of beneficial uses in the Ocean Plan and SWRCB Administrative Manual. Determine if the beneficial uses for ocean waters in each RWQCB Basin Plan are either (a) consistent with the uses in the Ocean Plan, or (b) represent a logical sub-category of a use in the Ocean Plan. For Basin Plan uses which are not consistent or do not represent a logical sub-category of an Ocean Plan use, work with the RWQCBs to develop a tiered system of beneficial use categories and sub-categories which provides for broad uses in the Ocean Plan and, where necessary, sub-categories adopted (including appropriate Basin Plan amendments) by either the SWRCB or the RWQCBs.

Estimated Staff Effort: 0.2 PY per year over a three year period

Staff Recommendation: Alternative 2 - Baseline Budget Effort.

Recommended Priority: Higher Priority

References:

U.S. EPA. 1997. 40 CFR 131.10

U.S. EPA. 1993. *Water Quality Standards Handbook, Second Edition*. EPA-823-B-93-002, Sept. 1993.

U.S. EPA. 1998. *Advance notice of proposed rulemaking (ANPRM) seeking comments from interested parties on possible revisions to the Water Quality Standards Regulation at 40 CFR Part 131*. Federal Register for July 7, 1998 (Volume 63, Number 129, pages 36741-36806). Page 36779.

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TABLE 1. CONSISTENCY BETWEEN BENEFICIAL USES IN OCEAN PLAN AND BASIN PLANS

BASIN PLAN BENEFICIAL USES APPLICABLE TO OCEAN WATERS	COMPARABLE OCEAN PLAN BENEFICIAL USES	OCEAN PLAN USE CONSISTENT WITH BASIN PLAN USE?	NOTES REGARDING CONSISTENCY
Municipal and Domestic Supply		No	Use not in Ocean Plan. Basin Plan use provides protection for desalination intake.
Industrial Process Supply	Industrial water supply	Not entirely	Ocean Plan use includes Basin Plan use.
Industrial Service Supply	Industrial water supply	Not entirely	Ocean Plan use includes Basin Plan use.
Navigation	Navigation	Yes	
Water Contact Recreation	Water contact and non-contact recreation, including aesthetic enjoyment.	Not entirely	Ocean Plan use includes Basin Plan use. Basin Plan definition includes possible ingestion of water.
Non-contact Water Recreation	Water contact and non-contact recreation, including aesthetic enjoyment.	Not entirely	Ocean Plan use includes Basin Plan use. Basin Plan definition excludes possible ingestion of water.
Commercial and Sport Fishing	Commercial and sport fishing.	Yes	
Aquaculture	Mariculture.	Yes	Basin Plan definition includes Mariculture for marine waters.
Marine habitat	Marine habitat.	Yes	
Preservation of Biological Habitats	Preservation and enhancement of Areas of Special Biological Significance (ASBS).	Not entirely	Ocean Plan use is specific for ASBS. Basin Plan definition is broader but includes ASBS.
Rare, Threatened, or Endangered Species	Rare and Endangered Species.	Not entirely	Basin Plans include “threatened” species.
Migration of Aquatic Organisms	Fish migration.	Not entirely	Ocean Plan use is limited to fish migration. Basin Plan use includes all aquatic organisms.
Spawning, Reproduction, and/or Early Development	Fish spawning and shellfish* harvesting.	Not entirely	Ocean Plan use does not include “early development”. Includes shellfish* harvesting which is a separate use in Basin Plans.
Shellfish Harvesting	Fish spawning and shellfish* harvesting.	Yes	Ocean Plan use includes shellfish harvesting.

Issue C.3.a: Choice of Indicator Organism for Water-Contact Bacterial Standard and Increased Stringency of the Water-Contact Fecal Coliform Standard (August 1998 Staff Report Issue C.3.a).

Should enterococcus be added to the total and fecal coliform water-contact bacterial standards currently in the California Ocean Plan (Ocean Plan)? Should the fecal coliform standard be made more stringent?

Current Ocean Plan: The current Ocean Plan contains a total and fecal coliform water-contact standard, and a bacterial assessment and remedial action requirement that requires the measurement of enterococcus at all stations where total and fecal coliforms are sampled.

Issue Description: The first part of this issue deals with the choice of an indicator organism. In 1986, U.S. EPA recommended that states adopt an enterococcus standard for marine waters, based on epidemiological studies conducted in east coast waters. These studies supported enterococcus as a superior indicator of adverse human health effects as compared to total and fecal coliform bacteria. Like the coliform bacteria, enterococcus bacteria are a group of bacteria that are normally found in the gastrointestinal tract of warm-blooded animals.

The adequacy of total and fecal coliform bacteria as indicators of human disease-causing organisms has been questioned for a number of years. Indicator organisms are used as surrogates for disease-causing organisms, with the assumption that high levels of the indicators imply the presence of fecal contamination. However, bacterial indicator organisms may not be reliable predictors of non-bacterial pathogens, such as enteric viruses or protozoans. State Water Resources Control Board (SWRCB) staff had concerns that the correlations developed in the U.S. EPA studies would not be applicable to the cooler California waters.

To resolve the issue of which bacterial group would be a better indicator organism, the Ocean Plan was amended in 1990 to require dischargers to measure enterococcus density at all stations where total and fecal coliform monitoring are required. Also, if a shore station consistently exceeded a coliform objective or exceeded a geometric mean enterococcus density of 24 organisms per 100 ml for a 30-day period or 12 organisms per 100 ml for a six-month period, the Regional Board was to require the appropriate discharger to conduct sanitary surveys. The intent of the 1990 Amendment was twofold: the first goal was to determine what levels of enterococci could be expected in California marine waters; and the second goal was to develop a database with all three indicators measured concurrently. In the majority of cases, bacterial exceedances at shore stations followed rainfall, making it unlikely that POTW discharges were the major cause of the high bacterial counts. In part because of this, Regional Board staff did not require POTWs to conduct sanitary surveys. The ongoing enterococcus monitoring has resulted in controversy because dischargers have been required to bear the expense of monitoring for this additional indicator organism.

An independent technical group, the Microbiological Advisory Committee (MAC) was formed in 1992 to advise State Board staff on how to investigate this issue. As a starting point, the MAC recommended a statistical analysis of two data sets, which included concurrent measurement of all three indicators. A contract was initiated with the University of California, Berkeley in 1993, which stipulated the following:

1. At each monitoring station, for each month and for each individual indicator organism, the number of times the measured level exceeded the allowable value contained in the Ocean Plan was determined; and
2. For each monitoring station, the density of indicator organisms was compared against each other and to physical parameters measured at the same time (water temperature, salinity, dissolved oxygen, etc.).

The contract also required that recent epidemiological studies be reviewed, summarized and related (if possible) to the discharger data analyses. Based on review of both discharger monitoring data and results of recent epidemiological studies, UC Berkeley was: (1) to make recommendations for possible revision of the Ocean Plan water contact bacterial standards and (2) to identify areas in which additional research is necessary.

Because there was interest in the environmental fate of indicator organisms based on monitoring data taken over a time course of several years and under diverse environmental conditions, data from the City of San Diego and the City and County of San Francisco were analyzed. The study concluded that:

1. When fecal contamination is present, all three indicators respond similarly;
2. During less polluted periods, this relationship breaks down and the three indicator organisms vary independently; and
3. From a risk management perspective, the measurement of enterococcus levels seems to add little to the information provided by total and fecal coliform data.

The authors suggested that the Ocean Plan revert to the pre-1990 bacterial monitoring requirements calling for total and fecal coliform only (Spear et al., 1998).

The Santa Monica Bay epidemiological study provides staff with critical information to be used in amending the Ocean Plan bacterial standard. This study was designed to investigate the following questions:

1. What are the relative risks of specific adverse health outcomes in subjects bathing at 0, 1-50, and 51-100 yards from a storm drain compared to subjects bathing at other locations at the same beach? and
2. Are risks of specific outcomes (e.g. highly credible gastrointestinal illness; ear, eye and sinus infections; upper respiratory infections; skin rashes and lesions) among subjects associated with levels of the bacterial or viral indicators?

The study concluded that distance from the storm drain, particularly swimming in front of the storm drains studied, is associated with an increased risk for a broad range of adverse health effects. A number of bacterial indicators, particularly the total to fecal coliform ratio with total coliform are above 1,000 organisms/100ml, and enterococcus at levels above 104 organisms/100ml, are associated with increased risk of adverse health effects.

Some of the criticism of this study focused on the finding that the total to fecal coliform proved to be a good indicator to adverse health effects. Critics stated that this was a site-specific finding only, and that the relationship would only hold true for samples taken directly in front of the

drains. SWRCB staff also asked for additional re-analysis in order to investigate if there were days when the ratio indicated adverse health effects but enterococcus did not (and conversely, when enterococcus indicated an adverse health effect, but the ratio did not). To address some of these questions, SWRCB staff asked the principal investigator three additional questions:

1. Determine if the total to fecal ratio is an informative indicator of risk only in front of the storm drain;
2. Determine if there are days that enterococcus is a better predictor of adverse health risk than the total to fecal ratio; and
3. Determine if the total to fecal ratio and the enterococcus densities move independently or do they correlate.

The answer to these questions are as follows:

1. The total to fecal coliform ratio (when restricted to days when the total coliforms exceeded 1,000 or 5,000) is still a useful predictor of risk even beyond the area in front of the drain;
2. The answer to this question is variable, depending on what cutpoint is used. Basically, there were days within the study when the total to fecal ratio predicted an adverse health problem, but enterococcus levels did not. The converse was also true; and
3. Enterococcus was associated with increased risk of at least one health outcome (diarrhea with blood) independent of the total to fecal ratio. Even though this is a rare adverse health effect, it is one of the more severe effects looked for in the study.

Also influencing this issue is Assembly Bill 411 (AB 411) which was chaptered in October 1997, requiring the Department of Health Services (DHS), in consultation with local health officers and the public, to establish minimum standards for the sanitation of public beaches. This legislation requires: 1) testing of waters adjacent to all public beaches for total coliform, fecal coliform, and enterococci bacteria; 2) standards to be set for total coliform, fecal coliform, and enterococci; 3) establishment of sampling protocols; and 4) weekly bacterial testing between April 1 and October 31 for any beach visited annually by more than 50,000 people which also has a storm drain outlet that flows in the summer. DHS has developed draft regulations implementing this Bill; as of May 14, 1999 these regulations have not been adopted. Although this Bill and the resulting regulation pertain to county health agencies and not to the publicly-owned treatment works (POTW) dischargers covered under the Ocean Plan, there is a common link. The Ocean Plan's bacterial water contact standards and DHS' regulation implementing AB 411 are intended to protect the health of persons engaged in water contact recreational activities.

The second part of this issue, raised by Department of Health Services (DHS), deals with amending the fecal coliform standard for water-contact recreation from 200 organisms per 100 ml to 110 per 100 ml.

List of Commenters: Charles W. Carry and Robert W. Horvath, County Sanitation Districts of Los Angeles County; David A. Caretto, Aliso Water Management Agency and South East Regional Reclamation Authority; Terry Oda, United States Environmental Protection Agency; Edward Kimura, Sierra Club, San Diego Chapter; Eve J. Kliszewski, Ph.D, Surfrider Foundation; G. Fred Lee, Ph.D., DEE, G. Fred Lee & Associates; Linda M. Sheehan, Center for Marine Conservation; Ann Notthoff, Natural Resources Defense Council; William J. Douros, United

States Department of Commerce National Oceanic and Atmospheric Administration; Jack Petralia, Los Angeles Environmental Health; Judith A. Wilson, City of Los Angeles; Robert W. Horvath, County Sanitation Districts of Los Angeles County; Robert P. Ghirelli, Orange County Sanitation Districts; Chris Gonaver, County of San Diego Department of Environmental Health; Alan C. Langworthy, City of San Diego; Vicki Nichols, Save Our Shores; Margaret H. Nellor, Tri-TAC, SCAP, CASA; Catherine Tyrrell, Los Angeles Regional Water Quality Control Board; and Mark Gold, D. Env., Heal the Bay.

Summary of Comments: The consensus was that the State Water Resources Control Board (SWRCB) should make a choice as to which indicator organism(s) should be included in the Ocean Plan for bathing water protection, and that this issue should be a high priority. Most of the commenters felt that the SWRCB should not make a decision regarding indicator organism choices and standards until the DHS promulgates the AB 411 regulations, and that whatever decision the SWRCB makes should be consistent with this DHS regulation.

One commenter felt that we should remove the total and fecal coliform water-contact bacterial standards from the Ocean Plan, and adopt enterococcus as the sole standard.
Staff Comment: Results from the Santa Monica Bay Epidemiological Study suggest that total coliform to fecal coliform ratio is a very useful indicator of swimming risks. The ratio provides insight on the degree of contamination, as well as the age and proximity of the contamination at the sampling point.

Four commenters recommended that the Ocean Plan require monitoring for total and fecal coliform organisms only. After years of monitoring for total and fecal coliform, these groups strongly believe that enterococcus has never been helpful in terms of evaluating a problematic situation. Also, since most monitoring agencies test for total and fecal coliform, there is also a regional perspective for these indicator organisms. The Santa Monica Bay epidemiology study found the total coliform to fecal coliform ratio to be one of the better indicators for predicting health risks associated with swimming in ocean waters contaminated by urban runoff, and that enterococcus data add no further information. The total to fecal coliform ratio is also indicative of sewage contamination and is used to monitor sewage spills. Sampling and testing for enterococcus is cost prohibitive; it requires twice the testing media and almost twice the technician time of the other tests. A 48-hour waiting period is not conducive to making public health decisions regarding recreational water quality.
Staff Comment: The U.S. EPA has recently revised their enterococci method. The new method uses a single medium, and gives results in 24 hours. Publicly owned treatment works (POTW) dischargers have commented that, while one of the components of the new media is expensive, this is offset by a reduction in analyst time.

One discharger stated that, after collecting total and fecal coliform and enterococcus data for a number of years, they have found that their monitoring stations virtually never show significant contamination except from storm water runoff. They also believe that the Ocean Plan is an inappropriate device to mandate a data gathering effort, and that only a focused effort (such as an epidemiological study) can lead to a conclusion of which indicator is the best suited for ocean water-contact recreation standards.

Six commenters recommended that the SWRCB add an enterococcus standard to the total and fecal coliform water-contact bacterial standards contained in the Ocean Plan. One concern is that wastewater from Tijuana contains pathogens, and that fecal coliform is an inadequate indicator of pathogens. The SWRCB should make an effort to find superior alternate indicator organisms. ***Staff Comment:*** Staff of the SWRCB is actively following research aimed toward finding a human-specific indicator organism. The SWRCB also provides funding for pertinent research, such as the Santa Monica Bay Epidemiological Study.

Another commenter stated that, in spite of the fact that dischargers feel that their effluent plumes do not make it back to shore, it would be a false economy to eliminate the enterococcus monitoring requirement. Approximately 80% of the beach monitoring programs in the Southern California Bight are done by National Pollutant Discharge Elimination System (NPDES) dischargers. POTW monitoring programs are providing the public with critical information on beach water quality, and have become far more than effluent plume tracking efforts. They have become essential to the public right to know effort for water quality at California beaches. Further, the Santa Monica Bay epidemiology study demonstrated that enterococci densities greater than 104 MPN/100 ml were associated with incidences of diarrhea with blood. This association was completely independent from the total coliform to fecal coliform ratios. The risk of diarrhea with blood is approximately one in 175. At the public hearing held in Irvine, some dischargers used the results of the Spear et al. study as rationale to eliminate the Ocean Plan's enterococcus monitoring requirements. This commenter is concerned that the correlations used in determining the dependence of enterococcus densities on fecal and total coliform densities were misinterpreted. Also, the study was designed to focus on monitoring locations near POTW discharges. The results of this study should not be extrapolated to include analyses of beaches impacted by either dry or wet weather runoff. The SWRCB is asking the wrong question about indicator standards; we should be focusing on what standards would be most protective of public health. An enterococcus standard of 104 MPN/100 ml would be a health based standard.

U.S. EPA recommended that resolving the indicator organism question should be the highest priority for the 1998-1999 Triennial Review, and strongly encouraged the SWRCB to adopt enterococcus as its primary bacterial water quality object for contact recreational areas.

Several commenters stated that the Water code Section 13170.2(b) requires that the Ocean Plan standards must not "pos[e] a threat to human health". Because enterococcus has been associated with human health effects not necessarily identified by total and fecal coliform, excluding enterococcus from the Ocean Plan would constitute a threat to human health.

One commenter stated that the recent studies "strongly suggest that there is a possibility that there is no single indicator organism for a water-contact bacterial standard, or that the choice of an appropriate indicator organism may be site-specific"... and that the SWRCB should not relax bacterial water quality numerical limits or reduce the selection of indicator organisms until such time as there is a clear consensus of scientific opinion regarding the most appropriate indicator organism for marine water-contact areas. Another commenter wrote that all three indicator organism groups have an appropriate place in assessing health risks to bathers in ocean water-contact areas. Consequently, monitoring programs should include analyses for all three bacterial groups.

One commenter further added that the wording in the Ocean Plan regarding water-contact bacterial standards monitoring necessitates five sampling surveys each month. This caused logistical problems. To simplify sampling operations with little or no compromise on information, the Ocean Plan should be changed to require sampling on a weekly basis, "...and not more than 20 percent of the samples at any sampling station, in any 5 consecutive week period, may exceed ...". For weekly programs, this would result in 52 data values each year at each sampling site, eight less than if 60 surveys (five per month) were performed. This would still provide excellent information on trends of indicator bacteria and adherence to water quality objectives, while better utilizing monitoring resources.

Several comments pertained to the DHS's 1992 suggestion that the fecal coliform standard be lowered to 110 MPN/100 ml. All commenters were opposed to this suggestion. One person wrote that, based on the Santa Monica Bay epidemiological study, fecal coliform bacterial levels alone did not correlate with illness. As a result, the fecal coliform standard should not be lowered. Another commenter stated that this issue should be deferred until a decision is made on which is the best indicator for bacterial contamination.

A suggestion was made that an epidemiological study and risk-analysis be done for the Monterey Bay region, patterned after the Santa Monica Bay study. This would better characterize the region and assist in the determination of an appropriate state-wide bacterial standard.

One commenter asked two questions: 1) will the SWRCB ever provide guidance on a sanitary survey methodology; and 2) will the SWRCB ever require the completion of a sanitary survey?

Alternatives for Staff Action:

1. ***Minimum Effort***
Revert to the pre-1990 Ocean Plan bacterial monitoring requirements. Keep the same values for the total and fecal coliform as currently contained in the Ocean Plan, but delete the enterococcus monitoring requirement.

Estimated Staff Effort: 0.1 PY (over a three-year period).

2. ***Baseline Effort***
Ocean Standards staff will suggest that the Ocean Plan be modified as follows:

a. Delete Chapter II, section B (Bacterial Assessment and Remedial Action Requirements) from the Ocean Plan;
b. Add a total to fecal coliform ratio standard to the Ocean Plan;
c. Add an enterococcus standard to the Ocean Plan;
d. Require only total and fecal coliform monitoring at nearshore and offshore stations;
e. Make shoreline monitoring requirements consistent with proposed Section 7958 of Title 17 of the California Code of Regulations when and if finalized;
f. Evaluate ongoing research on alternate indicator organisms, direct monitoring of enteric viruses, and fecal source identification methods.

Since all comments opposed the suggestion that the fecal coliform standard be lowered to 110 MPN/100 ml, this issue will be dropped.

Estimated Staff Effort: 0.33 PY per year over a three-year period

Staff Recommendation: Alternative 2 - Baseline Effort

Recommended Priority: Higher Priority

References:

Haile et al., 1996. *An Epidimiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay.*

Spear, R. C., H. Xu, S. Selvin, R. C. Cooper. 1996. *An Analysis of Marine Bacterial Indicator Monitoring Data.* Environmental Engineering and Health Sciences Laboratory, University of California, Berkeley.

U.S. EPA. 1986. *Ambient Water Quality Criteria for Bacteria*.

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Issue C.3.b: Review of the Water Quality Objectives for 2,3,7,8-TCDD and Related Compounds (Dioxins) (August 1998 Staff Report Issue C.3.b).

Should the water quality objective for Dioxin be reviewed to reflect new information received since the objective was adopted in 1990?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) water quality objective for TCDD equivalents is 3.9 x 10 to the minus nine micrograms/liter (0.0000000039 micrograms/liter.) TCDD equivalents are defined as the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-TCDFs) multiplied by their respective toxicity factors. The toxicity factors are provided in a table on page 21 of the Ocean Plan.

Issue Description: The water quality objective for TCDD equivalents was adopted by the SWRCB with the 1990 amendments to the Ocean Plan. In adopting the amendments, the SWRCB specifically instructed staff to review the TCDD equivalents objective as soon as possible within the next Triennial Review period to ensure that the objective reflects the most current scientific information. State Water Resources Control Board (SWRCB) staff has been monitoring a major assessment by the U.S. Environmental Protection Agency (U.S. EPA) of estimated risk from exposure to TCDD and TCDD equivalents and has proposed basing the SWRCB reassessment of the water quality objective on U.S. EPA's review.

List of Commenters: Terry Oda (US Environmental Protection Agency), Robert W. Horvath (Sanitation Districts of Los Angeles County), Robert S. Jacques (Monterey Regional Water Pollution Control Agency), Robert P. Ghirelli (Orange County Sanitation District), Alan C. Langworthy (City of San Diego), Edward Kimura (Sierra Club, San Diego Chapter), Margaret H. Nellor (Tri-TAC, California Association of Sanitation Agencies-CASA, and Southern California Alliance of Publicly Owned Treatment Works-SCAP), Jeff Sickenger (Western States Petroleum Association)

Summary of Comments: One commenter specifically endorsed the use of the dioxin toxicity equivalents approach as opposed to setting an objective only for TCDD. Six commenters endorsed the current staff approach of monitoring and evaluating studies being performed on dioxin and related compounds while awaiting the results of the US EPA's reassessment before attempting to reevaluate the TCDD-equivalents water quality objective. Currently, there is insufficient evidence to revise the objective. A more stringent objective would cause increased costs in monitoring. Source determination and the availability of "realistic" control mechanisms should be part of the review.

It was recommended that the SWRCB conduct coastal surveys of edible California fish and shellfish to determine if there has been significant bioaccumulation of these compounds in edible fish tissue to be considered a possible human health risk. If such bioaccumulation has not occurred, then revision of the objective should be given relatively low priority.

If results from coastal monitoring indicate that appreciable concentrations of these compounds have accumulated, then analytical test methods capable of screening samples at meaningful concentrations are needed. Commenters noted that there is a problem of dealing with

nondetectable amounts of these compounds where the discrepancy between levels of detection and health significance is great. The risk assessment assumptions currently used express non-detectable concentrations as fractional values of the detection level, typically zero, 0.5, or 1.0 times the method detection limit. This approach is inappropriate when such large discrepancies exist.

In addition to supporting on-going review to possibly modify the objective, one commenter endorsed the World Health Organization's recommendation to decrease the toxicity factor for the eight-chlorine dioxin. The same commenter stated that the US EPA should reevaluate its position since "virtually all other industrialized nations believe that the environmental impact of dioxins/furans is significantly less than EPA has suggested" and, therefore, EPA "should evaluate its findings in the context of the collective opinion of the global scientific community."

A commenter noted that dioxins had been detected in discharge from the South Bay International Wastewater Treatment Plant south of San Diego, CA. Since the surrounding watershed includes both the cities of San Diego and Tijuana, Mexico, international cooperation will be necessary. It was recommended that the SWRCB review recent scientific findings and work with the U.S. State Department on this issue.

Staff Comments: Staff believes that it would be a useful effort to monitor representative samples of edible tissue from resident fish to determine if detectable concentrations of 2,3,7,8-TCDD and related compounds are present. To maximize the value of such a study, this monitoring preferably would be performed in conjunction with existing regional monitoring programs being conducted in California. However, staff also recognizes that there is a very limited number of laboratories equipped to perform these analyses at the very low levels of detection necessary to determine if these compounds are present at concentrations of potential health significance. A credible survey would be expensive. Thus, a joint effort by the SWRCB and other interested parties would have the most potential to accomplish this monitoring.

Alternative(s) for Staff Action:

1. ***Baseline Effort***
Re-evaluate the Ocean Plan water quality objective for dioxins based on results of the U.S. EPA review of these compounds.

Estimated Staff Effort: 0.1 PY per year over a three-year period

2. ***Augmented Budget Effort***
In addition to the minimum effort, staff would consult with the Office of Environmental Health Hazard Assessment (OEHHA) regarding human health concerns, while independently placing special emphasis on other aspects of this issue that are of particular interest to the SWRCB, including aquatic life impacts, fate in aquatic systems, and bioaccumulation in the marine environment. Staff would work with other interested parties to include dioxin monitoring in regional monitoring programs.

Estimated Staff Effort: Baseline of 0.1 PY per year over a three year period, plus 0.5 PY per year augmented for FY 2000/2001 and FY 2001/2002

Estimated Contract Commitment: $50,000 per year augmented for FY 2000/2001 and FY 2001/2002 ($50,000 for OEHHA and $50,000 for the Department of Fish and Game)

3. ***Maximum Effort***
In addition to the Baseline Effort, the SWRCB would conduct a joint study with other interested parties to determine the distribution and concentration of dioxins in fish collected from enclosed bays and estuaries and in near-coastal waters.

Estimated Staff Effort: 0.5 PY per year over a three-year period

Estimated Contract Commitment: $200,000 ($100,000 to provide matching funds for the monitoring study in addition to $100,000 identified in the Augmented Budget Effort.)

Staff Recommendation: Alternative 2 - Augmented Budget Effort

Recommended Priority: Higher Priority

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Issue C.3.c: Biological Objectives (August 1998 Staff Report Issue C.3.c)

Should the narrative biological objective now in the California Ocean Plan be clarified with additional narrative and/or numerical language?

Current Ocean Plan: Section E. in the California Ocean Plan (Ocean Plan), *Biological Characteristics*, contains the narrative biological objective "marine communities... shall not be degraded." The Ocean Plan defines degradation as a significant difference in various ecological measures of three major biotic groups: demersal fish, benthic invertebrates, and algae. Degradation is to be determined by comparison of the waste field with reference site(s), for changes in the structure and/or function of marine communities.

Issue Description: This was a high priority issue in the 1992 Ocean Plan Triennial Review and Workplan. Comments received ranged from the inappropriateness of biological objectives and criticisms of specific indices used, to requests for more research to support their use. In 1992, Ocean Unit staff recommended in-house consultation on statistical issues with regard to the interpretation of biological criteria. In 1998, EPA encouraged the SWRCB to place a high priority on completing the development of defensible biological objectives for the marine environment stating that "the development of biologically-based use classification and assessment systems" is one of EPA's national Water Quality Standards Program Priorities for 1998-1999 Triennial Reviews."

List of Commenters: Terry Oda (United States Environmental Protection Agency, Region. IX); Edward Kimura (Sierra Club, San Diego Chapter); Robert S. Jaques (Monterey Regional Water Pollution Control Agency); G. Fred Lee, and Anne Jones-Lee, (G. Fred Lee & Associates); Judith A. Wilson (City of Los Angeles, Bureau of Sanitation); Robert W. Horvath (County Sanitation Districts of Los Angeles County); Robert P. Ghirelli, D.Env. (Orange County Sanitation District); Alan C. Langworthy (City of San Diego); Jeff Sickenger (Western States Petroleum Association); Margaret H. Nellor (Tri-TAC, SCAP, CASA); Donald L. Lollock (CA Department of Fish and Game); Catherine Tyrrell, (LA RWQCB).

Summary of Comments: Most of those commenting stated support for the concept of biological objectives. However, the majority, comprised primarily of dischargers, stated that while they support the concept, it should be a low priority (or deferred indefinitely) until there is enough information to support the use of numeric biological objectives.

Those opposing the adoption of specific numeric criteria cited problems with the interpretation of certain indices used in the marine environment (for example, these indicators may not clearly differentiate anthropogenic from natural events), and questioned their application on a statewide basis--because indices were generally developed for specific habitats. Numerous commenters stressed the general lack of scientific studies supporting the use of indices measuring community health. Several commenters suggested that Ocean Unit staff wait to consider this issue until after certain studies and EPA efforts mentioned in the discussion are completed. Two commenters said that because the regulated community conducts extensive compliance monitoring, both currently and historically, it should participate in the development of biological objectives. One commenter recommended that

the definition of degradation be changed from "statistical degradation" to "ecological degradation".

One commenter supported the development of well-defined biological objectives that would replace the current water quality based permit limits derived from chemical specific objectives. However, chemical-specific objectives would still be necessary for the protection of human health and for the estimation of whole effluent toxicity.

Staff Comments: Staff concedes that there is a lack of information on the "proven" use of biological objectives in Pacific Coast marine waters. Like all new initiatives, such new approaches will require a significant amount of time, expertise, and resources during early developmental stages. Staff believes that the participation of all parties likely to be affected, as well as experts in marine ecology, is critical for the development of meaningful biological objectives. Opportunities exist to advance our understanding by supporting research and by encouraging the development, implementation, and refinement of biological objectives.

Alternative(s) for Staff Action:

1. ***Minimum Effort***
Continue to monitor and evaluate the development and application of biological objectives for marine waters in other states, as resources allow.

Estimated Staff Effort: 0.1 PY (over a three year period)

2. ***Baseline Effort***
In addition to the minimum effort listed above, SWRCB staff would participate in the development of biological objectives for the Pacific Coast by participating in all research and development. Funding would be provided, as a state match, to advance research on promising biological indices or other measures that estimate the health of California's marine communities.

Estimated Staff Effort: 0.2 PY per year over a three year period
Estimated Contract Commitment: Costs are included in contract estimates for Issue C.4.a (Regional Ambient Monitoring), approximately $50,000

3. ***Augmented Budget Effort***
In addition to the work listed above, SWRCB staff would contract with California Sea Grant to conduct a workshop on the development and application of biological objectives in California marine waters for all stakeholders invested in marine water quality. Funding would be available for specific research proposals arising from workshop discussions.

Estimated Staff Effort: 2.0 PY (over a three year period)
Estimated Contract Commitment: $700,000.

Staff Recommendation: Alternate 2 - Baseline Effort

Recommended Priority: Higher Priority.

Staff recommends that this issue retain its high priority status, while spending a minimum of resources to accomplish it.

References:

Southern California Coastal Water Research Project. 1998. *Southern California Bight 1994 Pilot Project: I. Executive Summary, Vol. I.* p. 2.

Southern California Coastal Water Research Project. 1998. *Southern California Bight 1994 Pilot Project (SCBPP), Vol. IV, Benthic Infauna.*

U.S. EPA. 1991. *Policy on the Use of Biological Assessment and Criteria in the Water Quality Program.*

U.S. EPA. 1997. *Estuarine and Coastal Marine Waters Bioassessment and Biocriteria Technical Guidance, DRAFT.*

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Issue C.3.d: Water Quality Objectives To Address Specific Pollutants In Waste Discharges From Desalination Facilities (August 1998 Staff Report Issue C.3.d).

Should water quality objectives be developed for inclusion in the California Ocean Plan to address pollutants in desalination brine waste discharges?

Current Ocean Plan: Currently, there are no California Ocean Plan (Ocean Plan) Water Quality Objectives that specifically address pollutants in brine waste discharges from desalination plants.

Issue Description: There are several existing desalination plants along the California coast. The majority of these facilities are inoperative because the cost of desalination is generally higher than other sources of freshwater (e.g., ground water, surface water, etc.) (SCCWRP, 1994). This trend, however, may reverse as California's increasing population and the threat of drought squeezes the State's water supply. To help offset future water shortages, several facilities are either in the planning phase or are currently under construction in several locations in the State.

The brine waste produced by desalination facilities is often sent to Publicly Owned Treatment Works (POTWs) where it is pretreated prior to mixing with the freshwater effluent. The pretreatment process removes chemicals used in the water treatment process at the desalination facility. These chemicals may include chlorine, softening agents, and pH modifiers. The resultant combined effluent flow (from the desalination facility and the POTW) discharged into the ocean has a lower salinity and toxicity than untreated brine waste as a result of pretreatment and mixing.

Untreated brine waste discharged into the ocean "behaves" differently than either POTW freshwater effluent or the brine waste-freshwater mixture. The "brine waste" plume is more dense than the receiving ocean water due to a much higher salinity and it tends to settle on the ocean bottom. As a result, a brine waste plume can have an adverse effect on the bottom-dwelling marine organisms due to the combined effects of high salinity and toxic chemicals. The toxic chemicals may be removed by treatment prior to discharge, but the high salinity alone may be toxic to some life-forms before it is diluted.

A recent study (1992-1993) conducted by the Southern California Coastal Water Research Project (SCCWRP) investigated the toxic effects of waste brine and waste brine-sewage mixtures on marine life (SCCWRP, 1994). The organisms studied were the giant kelp (*Macrocystis pyrifera*), the amphipod *(Rhepoxynius abronius)*, and the purple sea urchin (*Strongylocentrotus purpuratus).* The endpoints examined were percent germination and germ tube growth for the giant kelp test, survival for the amphipod test, and percent normal development for the purple sea urchin. The study results indicated elevated salinity significantly affected sea urchin development. Percent normal development was reduced substantially at a salinity concentration of 36.5 parts per thousand (ppth), only slightly higher than the seawater control salinity (33.5 ppth). Though the slightly elevated salinity did not affect kelp spore germination or tube length or amphipod survival, other studies have found desalination plant brine is toxic to kelp spores (a study conducted by ABC Labs in 1992 on Santa Barbara's reverse osmosis desalination plant brine) (SCCWRP, 1994).

Findings of recent toxicity studies indicate more research is needed to predict the movement of a negatively buoyant brine waste plume in the ocean environment and to determine ecological impacts of discharges on the benthos. Staff will continue to monitor studies on the ecological effects of desalination brines discharged to marine waters.

At present, there is not enough information available to determine if water quality objectives should be developed for pollutants specific to brine discharges. In the interim, it may be appropriate for Regional Water Quality Control Boards to issue waste discharge requirements containing site-specific effluent limitations based on the physical and toxicity characteristics of each individual brine discharge.

List of Commenters: William J. Douros, Monterey Bay National Marine Sanctuary; Robert S. Jaques, Monterey Regional Water Pollution Control Agency; Vicki Nichols, Save Our Shores; Linda M. Sheehan, Center for Marine Conservation; Ann Notthoff, Natural Resources Defense Council; Edward Kimura, Sierra Club, San Diego Chapter; Terry Oda, U.S.EPA, Region 9; Robert P. Ghirelli, Orange County Sanitation District; Jim Curland, Friends of the Sea Otter.

Summary of Comments: Several commenters agreed that there is no scientific basis to exempt brine waste discharges from Table B water quality objectives. Additional studies need to be conducted on the ecological impacts of brine waste discharges on the receiving water (Pacific Ocean) before any regulatory actions are taken.

One commenter recommended that desalination waste be exempt from the NPDES permitting process if it is found the discharge has a minimal environmental impact on the ocean.

Alternative(s) for Staff Action:

1. ***Baseline Effort***
Staff will continue to review studies examining the environmental impacts of desalination wastes on receiving waters as they become available. Staff may defer to Regional Water Quality Control Boards in situations where water quality objectives are needed to address pollutants in desalination brine discharges.

Estimated Staff Effort: 0.8 PY (over a three-year period).

2. ***Augmented Budget Effort***
In addition to the minimum effort, staff will hire a contractor to conduct studies evaluating what environmental impacts desalination waste discharges may have on receiving waters. The results may be used in the development of water quality objectives specific to pollutants in desalination discharges.

Estimated Staff Effort: (See Baseline Effort)
Estimated Contract Commitment: $50,000 per year augmented for FY 2000/2001 and FY 2001/2002

Staff Recommendation: Alternative 2 - Augmented Budget Effort

Recommended Priority: Higher Priority

References:

California Coastal Commission. 1993. *Seawater Desalination in California*, p.1-5. Prepared by Energy and Ocean Resources and Technical Services Division, October 1993.

Southern California Coastal Water Research Project. 1994. *Toxic Effects of Elevated Salinity and Desalination Waste Brine,* in Southern California Coastal Water Research Project, Annual Report 1992-93, p. 149-153.

Staff Contact For This Issue:

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Issue C.3.e: Establish a Fecal Coliform Standard for Shellfish Harvesting Areas and for Shellfish Tissue (August 1998 Staff Report Issue C.3.e).

Should the shellfish harvesting standards in the California Ocean Plan be modified to include a fecal coliform value for harvesting waters, and a standard for shellfish tissue?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) currently contains a total coliform standard of 70 organisms per 100 ml for waters of all areas where shellfish may be harvested for human consumption. There is no standard for shellfish tissue currently in the Ocean Plan.

Issue Description: The Department of Health Services (DHS) has suggested adding a fecal coliform standard of 14 organisms per 100 ml. The addition of a fecal coliform requirement to the existing shellfish harvesting standard would make the Ocean Plan consistent with the National Shellfish Sanitation Program (NSSP) guidelines for commercial shellfish growing areas. During the 1992 Triennial Review, commenters suggested that a shellfish tissue standard also be added to the Ocean Plan.

There are six commercial shellfish growing areas in California. The objective of the NSSP is to prevent human illness associated with the consumption of fresh and fresh/frozen molluscan shellfish by developing sanitary controls over all phases of the growing, harvesting, shucking, packing, and distribution of shellfish. The NSSP developed a manual containing the minimum criteria and guidelines for the safe growing and harvesting of shellfish; commercial shellfish harvesting waters are required to meet one of the following:

1. The total coliform median or geometric mean MPN of the water does not exceed 70 per 100 ml water and no more than 10 percent of the samples exceed an MPN of 230 per 100 ml for a 5-tube decimal dilution test; or
2. The fecal coliform median or geometric mean MPN of the water does not exceed 14 per 100 ml and not more than 10 percent of the samples exceed an MPN of 43 per 100 ml for a 5-tube decimal dilution test.

Currently, there is no shellfish tissue standard for commercial use.

The adequacy of current coliform standards for shellfish harvesting waters has been questioned, particularly with respect to viral pathogens. Indicator organisms are used as surrogates for disease-causing organisms, with the assumption that high levels of indicators imply the presence of fecal contamination. However, bacterial indicator organisms may or may not be reliable predictors of viral or protozoan pathogens.

In California, interest in shellfish harvesting waters has received increased attention since the passage of the Shellfish Protection Act of 1993. This Act acknowledges shellfish harvesting as a beneficial use of the State's waters and notes that pollution from point and nonpoint sources is currently threatening many of the State's commercial shellfish growing areas. Whenever a commercial shellfish growing area is identified as threatened under the terms of the Act, the appropriate Regional Board is required to form a technical advisory committee (TAC) to investigate the problem and suggest remedial action. Bacterial contamination of

shellfish growing waters most often occurs during the winter months, when the rain runoff carries fecal material from the watersheds into the waterbodies.

Current efforts to identify and remediate fecal contamination to shellfish growing waters are directed toward commercial operations. Four of the six coastal commercial shellfish harvesting areas have been identified as threatened (as defined by the Shellfish Protection Act) and the following technical advisory committees have subsequently been formed:

Humboldt Bay TAC (North Coast Regional Board) - Currently there are two commercial growers operating three leases in Humboldt Bay. The TAC has reviewed available data, and has identified several potential sources of fecal contamination to the Bay: dairy and beef cattle operations, horse operations, septic systems, and timber operations. A study was designed and presented for approval at a December 1998 TAC meeting. This study will begin during the winter of 1999-2000. During the current winter (1998-1999) DHS, in conjunction with the shellfish growers, will conduct a pilot study to refine sampling locations.

Morro Bay TAC (Central Coast Regional Board) - There is one commercial grower operating two leases in Morro Bay. The TAC, working in conjunction with the National Estuary Program, has a two phase plan to identify pollution sources to the Bay. The first phase requires compiling existing information and implementing studies necessary to fill identified data gaps, provide baseline data on pollutant loadings, and develop estimates of spatial and temporal variability. The second phase of technical activity is to develop a long term environmental monitoring program that will identify current and emerging problems, assess effectiveness of actions and programs implemented under the plan, and provide essential information to direct and refocus the management plan as needed over time. Phase one, which began in 1996, is a cooperative effort involving the State and Regional Board, DHS, Morro Bay National Estuary Program, and interested citizens. A study protocol, designed to monitor the Bay and its watersheds during winter storms, was presented to the TAC during a December 1998 meeting. Sampling began during January 1999, and will continue into the winter of 2000.

Aqua Hedionda TAC (San Diego Regional Board) - One commercial shellfish operation is located in this lagoon. Because the growing waters are classified as restricted, all shellfish from this operation must be depurated before they can be sold. The Agua Hedionda TAC has conducted several small-scale studies to identify fecal coliform pollution sources in the shellfish growing waters. Results of these studies have suggested that birds roosting on the mussel growing platforms are a pollution source of concern. The TAC is now focusing on ways to prevent the birds from roosting on the growing platforms. Once those mitigation measures are in place, the TAC will re-evaluate the water quality of the lagoon.

Tomales Bay TAC (San Francisco Regional Board) - There are eight shellfish growers currently operating a total of 14 leases in Tomales Bay. The TAC determined that a study should be performed to determine the various point and non-point sources of fecal contamination that are impacting shellfish growing areas. In addition, samples from selected sites were analyzed for indicator organisms that show potential for being more human-specific than coliform bacteria.

A pilot monitoring study was conducted during the winter of 1994-1995. The goals of the pilot study were to:

1. Evaluate enterococcus, Clostridium perfringens and Bacteroides species as potential indicators;
2. Test sample volume, collection, sample transport logistics, and laboratory analysis in preparation for the full-scale study; and
3. Finalize site selection of watershed sampling stations.

Using the results of the pilot study, the study protocol was finalized for the full-scale study. C. perfringens analysis was not included in the full-scale study. C. perfringens forms endospores, which are very resistant to adverse environmental conditions. Endospores can remain dormant many years, but can be triggered to convert back into a vegetative cell when placed in appropriate environmental conditions. Because of this condition, it is not possible to determine if a samples positive for C. perfringens are the result of a recent fecal contamination or is from past contamination.

The full-scale study was conducted during the winter of 1995-1996. Samples were collected at 40 locations throughout the watersheds and in the bay. All samples were analyzed for four standard indicators of microbiological water quality: total and fecal coliform, enterococcus, and *Escherichia coli*. One of the problems with trying to identify fecal pollution sources is that there is currently no routine method to distinguish between human and animal feces. Part of this study was designed to sample downstream from a known pollution source and to analyze these samples for a variety of indicator organisms. The hope was that one or more of the indicator organisms would prove to be more specific for each type of pollution source. At these selected sites, samples were analyzed for the four standard indicators, as well as for coliphage and for the anaerobic bacterium *Bacteriodes vulgatus*.

Results of this study support the conclusions of earlier surveys, concluding that the agricultural lands along the eastern shoreline and at the southern extent of the bay contribute significant fecal pollution immediately following significant rainfall. The primary land use in these subwatersheds consists of dairies and cattle grazing land. Degradation of bay water quality coincided with the pulses of fecal contamination from the watershed after rainfall. However, localized sources of fecal contamination such as failing on-site sewage disposal systems cannot be discounted, as they pose a greater risk during the winter when soils are saturated (Tomales Bay Shellfish Technical Advisory Committee Final Report, 1998).

Ongoing Methods Research - Much work has been done to find an indicator organism that would be more predictive of adverse human health effects. As mentioned above, there are short-comings in using the traditional bacterial indicator organisms. The National Marine Fisheries Service National Indicator Study (NIS) sponsored methods research and standards development efforts specifically for protection of shellfish growing waters. Research was varied, and included work on alternate bacterial indicators, phages, human enteric viruses, and immunological techniques. Unfortunately, the NIS is no longer being funded. A great deal of work is currently being done on deoxyribonucleic acid (DNA) fingerprinting techniques as a way to identify sources of fecal material.

Related Legislation - In October 1997, the Health and Safety Code was amended to require DHS, as a pilot project, to conduct sanitary surveys for areas containing naturally occurring populations of shellfish that are harvested for human consumption. These areas are limited to Pismo Beach, Morro Bay, Humboldt Bay, Tomales Bay, San Francisco Bay, Mission Bay, Little River Beach, Carpinteria State Beach, Padrero Lane Beach, Ventura Silver Strand, Holiday Beach, Palos Verdes Peninsula, Huntington Beach, Oceanside State Beach, Aqua Hedionda Lagoon, Batiquitos Lagoon, South San Diego Bay and the mouth of the Ventura River. The surveys are to assess water quality and shellfish quality, and determine areas that are unfit for recreational shellfish harvesting based on NSSP standards. The pilot program is only required during years when the Legislatures provides sufficient funding, and is to remain in effect until January 1, 2004. To date, the program has not been funded.

List of Commenters: Jeffrey Young, California Aquaculture Association; Terry Oda, U.S. Environmental Protection Agency; Edward Kimura, Sierra Club, San Diego Chapter; Charles W. Carry and Robert W. Horvath, County Sanitation Districts of Los Angeles County; Robert P. Ghirelli, D. Env., Orange County Sanitation District; Alan C. Langworthy, The City of San Diego; Margaret H. Nellor, Tri-TAC, SCAP, CASA; Mark Gold, D. Env., Heal the Bay.

Summary of Comments: Two commenters agreed that SWRCB should adopt the a fecal coliform standard of 14 MPN/100 ml for waters where shellfish are grown for human consumption. This action would make the Ocean Plan consistent with the DHS regulations. The total coliform standard alone can provide misleading information on the safety of shellfish-growing waters.

U.S. EPA recommended that this issue be assigned a medium priority. The document *Quality Criteria for Water* (U.S. EPA, 1986) recommends the adoption of fecal coliform as an indicator of water quality in shellfish harvesting areas. However, the SWRCB should take into account the results of any studies conducted pursuant to the Shellfish Protection Act, as well as the possible effect that the AB 411 regulations might have on shellfish growing waters before amending this water quality standard.

Another commenter writes that the question of including a fecal coliform standard for shellfish harvesting waters is clouded by the issue concerning the validity of using coliform as an indicator organism. Studies conducted by Dr. Dixon of California State University at Hayward using *Bacteroides vulgatus* are promising, as *B. vulgatus* appears to be unique to humans. The SWRCB should continue efforts to find new indicator species that can be used to differentiate human versus animal fecal pollution so that effective control measures can be developed.

Staff Comment: During the Tomales Bay Study, 35 water samples (23 creek samples and 10 bay samples) were analyzed for *B. vulgatus* and *B. fragilis*. All samples were negative for these anaerobic microorganisms. Because the study design did not include a positive control for a human source, the authors of the report determined that these results were inconclusive. However, the DHS is still working with Dr. Dixon to refine analytical methods.

Four commenters stated that this should be a lower priority issue. Since the issue of shellfish protection is being handled on a site-specific basis under the Shellfish Protection Act, any modifications to the Ocean Plan should wait until ongoing studies are completed. Revised standards should include wording that states that bacterial standards apply to a one-month monitoring period.

No comments were received concerning the addition of a tissue standard.

Alternatives for Staff Action:

1. ***Baseline Effort***
Monitor the progress of the studies at the individual commercial shellfish growing areas. Encourage coastal Regional Boards that have commercial and recreational shellfish harvesting as beneficial uses to adopt site-specific standards, as allowed by the current Ocean Plan. Establish a fecal coliform standard of 14 organisms per 100 ml for shellfish harvesting waters. Work with Regional Boards to identify areas of recreational shellfish harvesting that will be regulated by this standard. Determine how this standard will impact publicly owned treatment works monitoring programs. Monitor DHS's pilot program progress. Provide financial and technical support for the studies at the individual commercial shellfish growing areas. In conjunction with DHS and the Department of Fish and Game, design and conduct a study to measure fecal coliform within selected recreational shellfish harvesting areas. Monitor ongoing research on improved water quality indicator organisms, especially the improving technology of using DNA fingerprinting to identify sources of fecal contamination. Encourage coastal Regional Boards that have commercial and recreational shellfish harvesting as beneficial uses to adopt site-specific standards, as allowed by the current Ocean Plan, especially in the areas listed in the Health and Safety Code. Monitor DHS's pilot program progress.

Estimated Staff Effort: 0.5 PY per year over a three-year period

Estimated Contract Commitment: Baseline funding of $140,124 ($100,000 from PCA# 341-01 and $40,124 from PCA# 115-01) for FY 1999-2000; $100,000 from PCA# 341-01 for FY 2000-2001; and $100,000 from PCA# 341-01 for FY 2001-2002.

Staff Recommendation: Alternative 1 - Baseline Budget Effort

Recommended Priority: Higher Priority

References:

National Oceanic and Atmospheric Administration, 1990. *The National Collaborative Shellfish Pollution Indicator Study*

Tomales Bay Shellfish Technical Advisory Committee Final Report: *Investigation of Pollution Sources Impacting Shellfish Growing Areas in Tomales Bay*. 1998.

United States Department of Health & Human Services, 1988. *National Shellfish Sanitation Program Manual of Operations. Part I - Sanitation of Shellfish Growing Areas.*

U.S. EPA. 1986. *Ambient Water Quality Criteria for Bacteria*.

U.S. EPA. 1986. *Quality Criteria for Water*. EPA 440/5-86-001.

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Issue C.3.f: Sediment Quality Objectives (August 1998 Staff Report Issue C.3.f).

Should numeric sediment quality objectives be developed for marine waters?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) currently contains narrative sediment quality objectives in Chapter II:

- *The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded;*
- *The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions;*
- *The concentration of substances set forth in Chapter IV, Table B, in marine sediments shall not be increased to levels which would degrade indigenous biota;*
- *The concentration of organic materials in marine sediments shall not be increased to levels which would degrade marine life.*

Issue Description: Establishing numeric sediment quality objectives was ranked as "higher priority" by the State Water Resources Control Board (SWRCB) in 1987. In 1989, Section 13390 et seq. was added to the California Water Code which created the Bay Protection and Toxic Cleanup Program. These Water Code Sections require the SWRCB to adopt a workplan for the development of sediment quality objectives for enclosed bays and estuaries. In 1991, the SWRCB established a conceptual approach to develop sediment quality objectives for enclosed bays and estuaries. The annual fees collected to support the Bay Protection and Toxic Cleanup Program, however, were less than originally anticipated and are no longer collected (as of January 1, 1998). As a consequence, progress in establishing sediment quality objectives for enclosed bays has been delayed indefinitely. The 1992 Triennial Review and Workplan recommended that sediment quality objectives for marine waters be derived from sediment quality objectives developed for enclosed bays.

Much of the toxic material in wastewater is attached to particles that settle and become part of the sediment. Many organisms filter or ingest sediments, accumulate toxicants, and often transfer them to other animals higher in the food web. Also, sediments can release toxicants back into the water by physical or biochemical processes long after the discharge of these toxicants has stopped. Physical disturbances of the benthic sediments (from dredging or heavy storms) may increase the release of toxicants. Recent surveys of the Southern California Bight revealed that nearly 90 percent of the area had evidence of anthropogenic sediment pollution (Schiff and Gossett 1998).

Numeric sediment quality objectives would define unacceptable toxicant levels in sediments for the protection of marine benthic organisms or human health.

The U.S. Environmental Protection Agency (U.S. EPA) has actively pursued the development of guidelines for establishing sediment quality criteria guidelines. Sediment quality criteria for protection of benthic organisms have been proposed for five priority pollutants: acenapthene, dieldrin, endrin, fluoranthene, and phenanthrene. Moreover, the U.S. EPA has recently announced their Contaminated Sediment Management Strategy (U.S. EPA 1998)

which describes a policy framework to reduce ecological and human health risks posed by sediment contamination.

List of Commenters: Terry Oda, Chief , CWA Standards & Permits Office, U.S. EPA; Edward Kimura, Water Subcommittee, San Diego Sierra Club; G. Fred Lee, Anne Jones-Lee; Linda Sheehan, Center For Marine Conservation / Ann Notthoff; NRDC; Jim Curland, Friends of the Sea Otter; Vicky Nichols, Executive Director, Save Our Shores; William Douros, Monterey Bay National Marine Sanctuary; Judith A. Wilson, Director, Bureau of Sanitation, City of Los Angeles; Robert W. Horvath, Assistant Department Head, Technical Services, Los Angeles County Sanitation District; Robert P. Ghirelli, Director of Technical Services, Orange County Sanitation District; Alan Langworthy, Deputy Metropolitan Wastewater Department Director, City of San Diego; Western States Petroleum Association; Tri-TAC, SCAP, & CASA; Mark Gold, Executive Director, Heal the Bay; Donald L. Lollock, Chief, Scientific Division, Office of Spill Prevention and Response, California Department of Fish and Game; Katherine Tyrrell, Director, Coastal Waters Program, Los Angeles RWQCB.

Summary of Comments: Of the 14 written comments received regarding this issue, two commenters felt this issue should be a high priority and four commenters felt this issue should be a low priority.

Many commenters recommended that the SWRCB continue efforts to develop numeric sediment quality objectives. Other commenters felt that the development of sediment quality objectives was not appropriate at this time due to the lack of definitive research in this area. One commenter felt that sediment quality objectives cannot be developed without unnecessary public expenditures and are inappropriate for reliably regulating sediment impacts.

Some commenters recommended that sediment quality objectives should be developed on a site-specific or regional basis. Some commenters suggested that the SWRCB defer the development of numeric sediment objectives until the USEPA Sediment Management Strategy proves successful or until SWRCB evaluates existing efforts throughout the country. One commenter recommended the SWRCB establish a working group of agency and scientific experts to address this issue. Another commenter recommended establishing sediment quality evaluation procedures based on "sediment-associated constituent impacts" rather than on sediment concentrations. Some commenters felt that having sediment quality objectives would provide the basis for regulating dredging and the disposal of contaminated sediments.

Alternative(s) for Staff Action:

1. Minimum Effort
Make no changes to the existing Ocean Plan narrative sediment objectives. This alternative would rely on the existing narrative sediment objectives to protect marine benthic biota.

2. *Baseline Effort*
Establish a working group of Agency and scientific experts to assess the current state of sediment quality objective development. The ultimate goal of the working group would be to

develop a SWRCB sediment management policy that could be referenced in the Ocean Plan. This group would be charged with assessing previous SWRCB efforts and other research efforts to determine (1) if numeric sediment quality objectives can or should be developed and (2) to examine alternative approaches to assess contaminated sediment effects on marine biota, e.g., sediment toxicity tests.

Estimated Staff Effort: 0.33 PY per year over a three-year period

Staff Recommendation: Alternative 2 - Baseline Effort

Recommended Priority: Higher Priority

References:

Schiff, C. K and R. W. Gossett. 1998. *Southern California Bight 1994 Pilot Project: Part III. Sediment Chemistry*. Southern California Coastal Water Research Project, January 1998.

U. S. EPA. 1998. *Contaminated Sediment Management Strategy*. Office of Water. Office of Science and Technology. Document number EPA 823-R-98-001. Executive Summary can be found in the Federal Register Vol 63(No. 87):25037-25040, 5/6/98.

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Issue C.3.g: Incorporation of Site-Specific Water Quality Objectives Into the Ocean Plan (August 1998 Staff Report Issue D.3.f).

Should the California Ocean Plan incorporate procedures for establishing site-specific water quality objectives in addition to current statewide water quality objectives?

Current Ocean Plan: There are no provisions in the California Ocean Plan (Ocean Plan) describing procedures to develop site-specific objectives. Instead, the Ocean Plan provides that the Regional Water Quality Control Boards (RWQCBs), when issuing waste discharge permits, can establish more restrictive water quality objectives and effluent limitations than those in the Ocean Plan as necessary to protect beneficial uses. Additionally, RWQCBs can set less restrictive provisions in a permit provided that an applicant can meet specified conditions.

Issue Description: One commenter during the 1992 Ocean Plan Triennial Review public hearing recommended that site-specific objectives be incorporated into the Ocean Plan. The commenter observed that, since many of the current water quality objectives for the protection of marine life are below Primary Drinking Water Standards, the "comparatively small dilution factors allowed to dischargers may result in discharge permit violations".

When the October 1992 Triennial Review and Workplan was prepared and adopted by the State Water Resources Control Board (SWRCB), staff concluded that a method for developing site-specific objectives appropriately belonged in the Ocean Plan and that to be consistent with the Inland Surface Waters Plan (ISWP) and the Enclosed Bays and Estuaries Plans (EBEP), site-specific objectives should be incorporated into the Ocean Plan. Staff recommended that an analysis of procedures for establishing site-specific objectives contained in other statewide Plans should be performed "if resources were available after completing review of higher priority issues."

List of Commenters: Charles W. Carry and Robert W. Horvath, Sanitation Districts of Los Angeles County; Robert P. Ghirelli, Orange County Sanitation District; Alan C. Langworthy, City of San Diego; Edward Kimura, Sierra Club, San Diego Chapter; Margaret H. Nellor, (Tri-Tac, California Association of Sanitation Agencies-CASA, and Southern California Alliance of Pubicly Owned Treatment Works-SCAP)

Summary of Comments: Four of the five commenters on this issue represent publicly owned sewage treatment agencies. All four recommended that the SWRCB incorporate provisions and procedures for deriving site-specific water quality objectives into the Ocean Plan. Two commenters referenced alternatives developed by the Site-Specific Objectives Task Force, a group convened by the SWRCB in 1995 for development of the Inland Surface Waters and Enclosed Bays and Estuaries Plans. The commenters noted that the Task Force recommendations are equally applicable to the Ocean Plan. The Task Force's preferred alternative would require a RWQCB to initiate development of site-specific objectives if a written request, supported by a preliminary commitment to fund the study, were made to the RWQCB and if either of the following two conditions existed:

1. An existing or potential statewide objective or beneficial use is not achieved in the receiving waters, or
2. A holder of waste discharge requirements, including an NPDES permittee, does not or may not in the future meet an existing or potential effluent limit based on the statewide objective and cannot be assured of achieving the effluent limit through reasonably achievable pollution prevention measures.

The fifth commenter noted that adoption of site-specific objectives for ocean waters assumes that ocean dynamics will be constant and fails to account for large scale ocean events such as the El Nino phenomenon. Under changing ocean conditions, there is the potential for transport of higher levels of pollutants from areas granted site-specific objectives to other regions. Thus, incorporation of site-specific objectives into the Ocean Plan raises a serious concern when less restrictive conditions are allowed.

Staff Comment: In reviewing the Site-Specific Objectives Task Force alternative favored by the two commenters, SWRCB staff in the September 1997 Draft Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California and Functional Equivalent Document provided the following observation:

> "Because the RWQCB has the authority and responsibility to address standards actions as necessary to protect beneficial uses, it is inappropriate to remove RWQCB discretion regarding the development of site-specific objectives. Furthermore, this option may limit RWQCB flexibility to address noncompliance situations in other more innovative or appropriate means."

Staff also believes that, while there may be justification for amending the Ocean Plan to contain provisions for development of site-specific objectives, staff no longer believes that it would be appropriate to include site-specific objectives in the Plan itself.

Alternative(s) for Staff Action:

1. ***No Effort***

2. ***Baseline Effort***
Track the progress of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California. If procedures for development of site-specific water quality objectives are adopted into the Policy, then determine if such provisions should be added to the California Ocean Plan.

Estimated Staff Effort: 0.1 PY per year over a three-year period

Staff Recommendation: Alternative 2 - Baseline Effort

Recommended Priority: Higher Priority

References:

California State Water Resources Control Board. September 11, 1997. *Draft Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California and Functional Equivalent Document*., pp V-124 to V-135.

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Issue C.3.h: Review Chemical Water Quality Objectives for Aquatic Life and Human Health (August 1998 Staff Report Issue E.3.a)

Should water quality objectives be recalculated to reflect new scientific information or methodology?

Current Ocean Plan: Table B of the 1997 California Ocean Plan (Ocean Plan) contains numeric water quality objectives for the protection of marine aquatic life and for the protection of human health. These water quality objectives apply to all discharges within the jurisdiction of the Ocean Plan. Permit effluent limitations are derived using Table B objectives, background seawater concentrations, and the minimum initial dilution of the waste discharge.

Issue Description: The California Water Code (Section 13170.2) requires the State Water Resources Control Board (SWRCB) to establish the California Ocean Plan and to ensure that standards in the Ocean Plan are adequate to protect marine species and human health. At the national level, the Clean Water Act [(CWA), Section 303(c)(2)(B)] requires states to adopt numeric *criteria* for toxic pollutants which could impair designated uses and for which U. S. Environmental Protection Agency (U.S. EPA) has developed criteria guidance under Section 304(a). CWA Section 304(a) requires the U.S. EPA to develop and publish criteria for water quality accurately reflecting the latest scientific knowledge. In California, water quality *objectives* are equivalent to CWA Section 303 criteria.

The development of water quality objectives is an ongoing process. New scientific data describing the effects of pollutants on aquatic life and human health are constantly being developed. Thus, water quality objectives should periodically be revised to reflect new scientific information.

There are at least eight pollutants of concern having U.S. EPA water quality criteria (in the National Toxics Rule) that are not regulated by the Ocean Plan. SWRCB staff should examine the toxicological hazards associated with these eight pollutants to see if they should be added to Table B.

Some pollutants are regulated using "chemical groupings" in the Ocean Plan (e.g., dichlorobenzenes) while U.S. EPA regulates by specific compounds (e.g., 1,2-dichlorobenzene, 1,3-dichlorobenzene). Staff should decide whether pollutants regulated using groupings would be more efficiently regulated as individual compounds.

Water quality objectives for the protection of human health are based on a seafood consumption estimate of 23 g/day. The Cal/EPA, Office of Environmental Health Hazards Assessment is currently re-examining California seafood consumption estimates. If the recommended California seafood consumption estimate changes significantly then water quality objectives would have to be re-calculated.

Numeric water quality objectives are presently calculated using the U.S. EPA *deterministic* methodology (i.e., the "inputs" are single-value point estimates and the output is a single-value point estimate of the proposed water quality objective). A newer approach to

calculating water quality objectives addresses the fact that there are considerable uncertainties in assessing risks associated with exposure to pollutants. This *probabilistic* approach attempts to characterize the variability associated with the "inputs" used in the U.S. EPA methodology: reference dose, cancer potency factors, fish consumption, human body weight, and bioconcentration factor. A probability distribution is defined for each variable used in the U.S. EPA methodology. Single-value inputs are then randomly chosen from the probability distribution. When this process is repeated many times a frequency distribution of proposed water quality objectives is obtained. This approach to calculating water quality objectives was recommended to the SWRCB by the Chemical Specific Objectives Task Force.

List of Commenters: Terry Oda, Chief , CWA Standards & Permits Office, U.S. EPA; Edward Kimura, Water Subcommittee, San Diego Sierra Club; Linda Sheehan, Center For Marine Conservation / Ann Notthoff; NRDC; Judith A. Wilson, Director, Bureau of Sanitation, City of Los Angeles; Robert W. Horvath, Assistant Department Head, Technical Services, Los Angeles County Sanitation District; Robert P. Ghirelli, Director of Technical Services, Orange County Sanitation District; Chris Gonaver, Chief, Community Services & Planning Division, Department of Environmental Health, San Diego County; Alan Langworthy, Deputy Metropolitan Wastewater Department Director, City of San Diego; Western States Petroleum Association; Vicky Nichols, Executive Director, Save Our Shores; Tri-TAC, SCAP, & CASA; Donald L. Lollock, Chief, Scientific Division, Office of Spill Prevention and Response, California Department of Fish and Game; Katherine Tyrrell, Director, Coastal Waters Program, Los Angeles RWQCB.

Summary of Comments: Of the 13 written comments received regarding this issue, three commenters felt this issue should be a high priority and five commenters felt that this issue should be a low priority. One commenter did not believe that there is enough "real world" information to establish new objectives.

Five commenters agreed that new water quality objectives should be added to the Ocean Plan when USEPA has established criteria levels. Others disagreed with this notion stating that the SWRCB should first determine if a need exists for the new objectives and that the USEPA criteria may not be relevant to conditions in California marine waters. One commenter recommended that the SWRCB validate all new scientific information used to develop new objectives.

Some commenters suggested that Table B should contain objectives for all pollutants of concern; others made recommendations to add objectives for certain compounds including diazinon and chlorpyriphos, endocrine disrupters, and MTBE, toluene, ethylbenzene, xylene, and napthalene. Of these, toluene and ethylbenzene are already in Table B. Two commenters supported regulating individual pollutants (as in the National Toxics Rule) rather than groups of closely related pollutants (as in the existing Table B list).

Two commenters recommended that Table B should contain objectives to protect *all* beneficial uses rather than only two (protection of aquatic life and human health from contaminated seafood consumption).

One commenter recommended that all the objectives for the protection of marine aquatic life be reevaluated using the latest scientific information.

Another commenter felt that there is no basis for including a water quality objective for asbestos in the Ocean Plan because sources for this pollutant are entirely natural.

Some commenters recommended that Table B objectives for the protection of human health should be recalculated after OEHHA revises the California seafood consumption rate or after new seafood consumption rate data becomes available. Two commenters believed that the existing 23 g/day seafood consumption rate is too low and that the consumption rate used should protect the most vulnerable citizens who consume large amount of locally caught seafood.

Objectives for the protection of human health currently in Table B were established using the chemical specific *bioconcentration* factors. Three commenters recommended that pollutant *bioaccumulation* effects be incorporated into the methodology used to calculate objectives.

One commenter felt that the currently used cancer risk level of 10^{-6} is too low when compared to risk levels used by other agencies (including Cal-EPA).

Two commenters supported a probabilistic approach to calculating water quality objectives; one commenter felt this should be given a low priority.

Staff Comments: Six amendments to the Ocean Plan are now being proposed in the 1998 Draft Functional Equivalent Document. One of these amendments involves the modification of objectives in Table B using new risk assessment data while adhering to the 1980 USEPA methodology. However, the USEPA is currently in the process of revising its methodology for establishing water quality criteria for the protection of human health (USEPA 1998). These revisions will reflect advances in science and policy and develop consistency between risk assessments performed in support of the Clean Water Act and the Safe Drinking Water Act. A major change in the USEPA methodology will be the use of bioaccumulation factors rather than the bioconcentration factors now used.

Water quality objectives in Table B are divided into two sections: objectives for the protection of marine aquatic life and objectives for the protection of human health. This division is due to the different methods used to calculate these objectives. Once established, however, water quality objectives may be associated with protecting any of the beneficial uses listed in Chapter I of the Ocean Plan. For example, an objective for the protection of marine aquatic life could be used to protect the following beneficial uses: aesthetic enjoyment, mariculture, rare and endangered species, marine habitat, fish migration, and fish spawning.

Alternative(s) for Staff Action:

1. ***Minimum Effort***
Examine the feasibility of establishing water quality objectives for non-priority pollutants. The Clean Water Act addresses the need to establish criteria for “toxic pollutants. ” Any

pollutant not included in the list of toxic pollutants may not have clearly established procedures for developing criteria.

Estimated Staff Effort: 0.3 PY (over a three-year period).

2. *Baseline Effort*

In addition to the Minimum Effort, evaluate the ongoing changes in the USEPA methodology for criteria to protect human health. Revise objectives for the protection of human health in Table B using the new methodology (if appropriate) and using the most recent risk assessment data. In addition, evaluate the new methodology using a probabilistic approach. Revised water quality objectives will require an attainability analysis in order to assess economic impacts. The procedures used to determine discharger compliance with water quality objectives are expected to be revised for the 1998 FED during FY 1999-2000.

In addition to the Baseline Staff Effort, contract assistance is necessary to revise objectives for the protection of marine aquatic life. This would require a thorough literature search of scientific studies describing the toxicological effects of exposure to the priority pollutants by California marine organisms.

Estimated Staff Effort: 0.7 PY per year over a three-year period

Estimated Contract Commitment: Baseline funding of $35,000 for FY 1999/2000, $8,000 for FY 2000/2001, and $7,000 for FY 2001/2002

Staff Recommendation: Alternative 2 - Baseline Effort

Recommended Priority: Higher Priority

References:

U.S. EPA. 1998. *Draft Water Quality Criteria Methodology Revisions: Human Health*. Federal Register 63 (157): 43756 - 43828, 8/14/98.

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Issue C.4.a: Regional Ambient Water Quality Monitoring and the Ocean Plan (August 1998 Staff Report Issue C.4.a).

Should the California Ocean Plan contain regional ambient water quality provisions?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) contains provisions largely focused on the regulation of individual point source pollution discharges. There are no provisions in the Ocean Plan for monitoring collective pollution inputs to a marine region.

Issue Description: This issue was discussed as a high priority issue in the 1992 Triennial Review and Workplan. At that time, recommendations were made to take an ecosystem-wide approach to water quality monitoring, and to coordinate monitoring efforts of all of the Regional Water Quality Control Boards (RWQCBs). Staff at that time recommended building upon the efforts and prototype of the Santa Monica Bay Regional Monitoring Program for guidance**.**

In 1997, Governor Wilson signed Executive Order W-162-97 and AB 1581 (Keeley), both of which required the SWRCB to prepare an inventory of existing water quality monitoring activities statewide, a monitoring website, and a coastal water quality monitoring plan recommending a comprehensive program to monitor the quality of State coastal watersheds. In 1998, with assistance from of Southern California Coastal Water Research Project (SCCWRP), the San Francisco Estuary Institute (SFEI), and the Department of Fish and Game-- Marine Pollution Studies Laboratory, the Website, coastal inventory, and a draft coastal monitoring plan (The Coastal Monitoring Strategy) were completed. Also approved in 1997, AB 1429 (Shelley) requires the SWRCB to complete a number of tasks for a comprehensive monitoring plan by 2001. These tasks include 1) comparing current coastal water quality conditions with water quality objectives/ standards, and 2) estimating mass loading of pollutants from all sources into coastal waters. Efforts are currently underway to seek funding in order to complete tasks required in AB 1429 by 2001.

List of Commenters: Terry Oda (United States Environmental Protection Agency, Region IX); Edward Kimura (Sierra Club, San Diego Chapter); G. Fred Lee, and Anne Jones-Lee, (G. Fred Lee & Associates); Linda M. Sheehan (Center for Marine Conservation) and Ann Notthoff (Natural Resources Defense Council); Jim Curland (Friends of the Sea Otter); William J. Douros (NOAA, Monterey Bay National Marine Sanctuary; Robert W. Horvath, (County Sanitation Districts of Los Angeles County); Robert P. Ghirelli, D.Env. (Orange County Sanitation District); Alan C. Langworthy (City of San Diego); Vicki Nichols (Save Our Shores); Margaret H. Nellor (Tri-TAC, SCAP, CASA); Mark Gold (Heal the Bay); Donald L. Lollock (CA Department of Fish and Game).

Summary of Comments:

Support to Add Regional Monitoring Provisions to the California Ocean Plan: The majority of commenters supported the addition of regional monitoring provisions in the Ocean Plan, stating that this issue should be ranked high. However, there were few specific recommendations for amending language in the Ocean Plan. Those in support of adding provisions commented on the need for information concerning region-wide assessments of

water quality and marine resources. Several commenters recommended that a link be made between coastal monitoring and watershed monitoring, incorporating the "integrated coastal management approach" for coastal monitoring. Related to this, several commenters suggested that Ocean Plan staff make recommendations for regional monitoring that are consistent with the Coastal Monitoring Strategy, [a CalEPA/SWRCB document that was completed as a result of AB1581 (Keeley) in 1998], as well as implement the tasks remaining from AB1429 (Shelley) regarding monitoring for coastal watersheds. One discharger supported adding regional monitoring provisions to the Ocean Plan stating that such monitoring has been important in the establishment of baseline and status information for the San Diego-Tijuana region, where there are currently no water quality standards in place. NOAA recommended that the SWRCB closely coordinate its efforts with those being conducted by the Central Coast Regional Water Quality Control Board.

Opposition to adding Regional Monitoring Provisions to the California Ocean Plan: Comments from the discharger community expressed support for regional monitoring, but ranked this issue as a low priority issue for a number of reasons. Commenters suggested that it is "inappropriate" and "bad policy" to add regional monitoring specifics to the Ocean Plan, as it is a regulatory document, not a regional monitoring plan. One cited the mandate to require enterococcus monitoring as an example of a mandate that leads to monitoring inefficiency. Numerous dischargers said that adding such provisions to the Ocean Plan would reduce the flexibility now enjoyed for volunteer regional monitoring efforts by groups such as SCCWRP and SFEI, that are currently widely accepted, designed, and conducted. Another concern, cited by those in opposition to this issue, is that the Ocean Plan is not updated frequently enough to reflect current needs for information. Commenters suggested that the authority for permit flexibility and supplemental monitoring continue to be left to the discretion of the RWQCB's.

Staff Comments: SWRCB staff do not propose to recommend regional monitoring requirements for the Ocean Plan that are either so specific they limit monitoring options, or that reduce the flexibility of supplemental monitoring agreements negotiated between RWQCB staff and the discharger Community. Instead, staff wish to promote integrated, non-regulatory approaches to regional monitoring that encourage cooperation, efficient use of monitoring resources, and provide the State with the marine ambient monitoring data needed to assess the status of water and marine resource health. Because no single agency or monitoring program can afford to conduct large-scale marine monitoring projects, multi-agency participation in the design and implementation of monitoring programs is essential. Staff concedes that voluntary monitoring approaches may be the best approaches. Volunteer efforts are working particularly well in certain areas of the state where partnerships have been established in the planning, research, and funding of monitoring efforts. However, the condition of many areas of the central and northern coast currently remains largely unknown.

Information from well-designed ambient monitoring programs is useful for the following applications:

1. To periodically collect data on the chemistry and toxicity of water and sediments, pollutant bioaccumulation in fish and shellfish tissue, and biological impacts. State and

Regional Boards will be able to utilize this information when evaluating if marine resources are protected;
2. To gain a more complete 'ocean-based' picture of the amount and types of point and non-point sources of pollution entering coastal waters from watersheds and land-based activities;
3. To collect the necessary information on region-wide mass loadings of significant pollutants as a first step toward developing mass emissions regulations; and
4. To collect information needed to formulate Total Maximum Daily Loads (TMDLs) for sites known to be polluted, as well as to rank such sites based on regularly measured parameters;

The CalEPA/SWRCB document "Coastal Water Quality Monitoring Strategy" (Strategy) listed broad objectives and several goals toward establishing a comprehensive monitoring effort in California. SWRCB staff consider this a starting point, and are currently seeking funding alternatives to further develop and implement a comprehensive coastal monitoring plan for California.

Alternative(s) for Staff Action:

1. No Effort

2. *Baseline Effort*
Staff would continue to participate in existing regional monitoring efforts to conduct coastal monitoring of trace metals, bacterial contamination, storm water run-off, and bioaccumulation in fish tissues. The State Board would continue to fund monitoring efforts and the development of monitoring and assessment tools (for example, the Benthic Response Index [BRI], community assemblage measures, and biological monitoring advances).

Additionally, as resources allowed, staff would provide RWQCB staff with resources to help establish working partnerships in coastal monitoring to develop monitoring plans, and to conduct large-scale, regional monitoring surveys.

Estimated Staff Effort: 0.6 PY per year over a three-year period
Estimated Contract Commitment: $130,000 for FY 1999-2000 ($100,000 from PCA# 341-01 and $30,000 from PCA# 115-01); $100,000 from PCA# 341-01 for FY 2000-2001; and $100,000 from PCA# 341-01 for FY 2001-2002.

3. *Augmented Budget Effort*
a) In addition to the baseline effort listed above, SWRCB staff would design and oversee a one-time monitoring and assessment project on a statewide marine resource basis where monitoring information is needed (for example, assess mass emission loadings of certain priority pollutants to coastal waters from point sources, non-point pollution sources, or both). Sampling would be conducted by RWQCB staff and by contractors. Standardization of study design and methods would ensure that data are comparable statewide. Funding would be provided to conduct sampling, process samples, conduct data analysis, and evaluate results for management. The SWRCB would be responsible for the final evaluation and presentation of results.

Estimated Staff Effort: 1 PY (over three years)
Estimated Contract Commitment: $400,000 over two years.

b) In addition to the Baseline work listed above, beginning in FY 2000-2001, SWRCB staff would establish a permanent marine monitoring trends and analysis program within the SWRCB's Division of Water Quality to:

- Evaluate the results of marine monitoring studies conducted across multiple regions for statewide assessments of water quality, sediment, and marine resource health;

- Report on the status of beneficial uses based on monitoring results, and make recommendations to improve SWRCB water quality objectives and policies.

Estimated Staff Effort: Baseline of 0.6 PY per year over a three-year period, plus 2.0 PY augmented annually beginning in FY 2000-2001

Estimated Contract Commitment: Baseline of $130,000 for FY 1999-2000 and $100,000 annually for succeeding years, plus $400,000 augmented annually beginning in FY 2000-2001.

Staff Recommendation: Alternative 3.b - Augmented Budget Effort

Recommended Priority: Higher Priority

References:

Southern California Coastal Water Research Project. 1998. *Southern California Bight 1994 Pilot Project: I. Executive Summary, Vol. I.* p. 2.

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Issue C.4.b: Review of Standardized Monitoring and Reporting Requirements (August 1998 Staff Report Issue C.4.b).

Should modifications be made to Appendix II of the California Ocean Plan to provide additional guidance to the RWQCBs and discharger community regarding monitoring and reporting requirements?

Current Ocean Plan: Appendix II of the California Ocean Plan (Ocean Plan) includes standard monitoring procedures that provide direction to the Regional Water Quality Control Boards (RWQCBs) in developing monitoring programs to accompany discharge permits. These standard monitoring procedures reference analytical methods required for compliance with the bacterial, chemical, and toxicity requirements.

Issue Description: Monitoring and reporting requirements have been left to the discretion of each RWQCB. Several commenters during the 1992 Triennial Review noted that there should be greater statewide standardization of monitoring requirements. The procedures in Appendix II of the Ocean Plan need to be updated and reviewed to include the most current methods of sampling and analysis.

List of Commenters: David A. Caretto (Aliso Water Management Agency/ South East Regional Reclamation Authority); Terry Oda (US EPA, Reg. IX); Linda M. Sheehan (Center for Marine Conservation) and Ann Notthoff (Natural Resources Defense Council); Jim Curland (Friends of the Sea Otter); William J. Douros (NOAA, Monterey Bay National Marine Sanctuary; Judith A. Wilson (City of Los Angeles, Bureau of Sanitation); Robert W. Horvath , (County Sanitation Districts of Los Angeles County); Robert P. Ghirelli, (Orange county Sanitation District); Alan C. Langworthy (City of San Diego); Vicki Nichols (Save Our Shores); Margaret H. Nellor (Tri-TAC, SCAP, CASA); Donald L. Lollock (CA Department of Fish and Game).

Summary of Comments: On the topic of standardized monitoring, numerous districts and dischargers expressed the opinion that the Ocean Plan is not the place to specify monitoring requirements. It was stated that because the best efforts toward "standardizing methods and techniques have been a natural outgrowth of regional monitoring", those planning and conducting regional monitoring efforts should be the ones to select and advocate standardized methods. Another argument against standardizing methods in the Ocean Plan was that the Ocean Plan is too infrequently updated. Most commenters thought this issue should be a low priority.

Most all of the commenters indicated support of standardized reporting through a database like the proposed System for Water Information Management (SWIM). The main objective of SWIM is to provide a well-coordinated system that has a standardized database structure used by each region and the State (The Warner Group, 1998). Significant concerns among those supportive of modifications stated that any proposed reporting requirements should be flexible, frequently updated, consistent statewide, user-friendly, built with adequate QA/QC, and made useful through enforcement. Specifically, USEPA commented, "We recommend...that...reporting requirements be worded carefully so as not to lock-in sampling, monitoring, or data management protocols that may quickly become outdated." Most

dischargers indicated that they wanted to continue working on standardizing reporting techniques and needs through the SWIM process and current negotiations with SWRCB staff, and not by amendments to the Ocean Plan.

Additional suggestions included the following: both point and non-point pollution data should be reported in any standardized reporting system, and the SWRCB should link ocean monitoring with watershed monitoring.

Alternative(s) for Staff Action:

1. ***Minimum Effort***
Continue to request general information on the importance of this issue every Triennial Review.

Estimated Staff Effort**:** 0.1 PY (over three years)

2. ***Baseline Effort***

a) Focus the discussion on generating specific recommendations to improve Appendix II;
b) Derive potential amendment(s) to Appendix II linking compliance monitoring requirements with supplemental monitoring needs of the RWQCBs, SWRCB, and regulated community-- create flexibility for regional monitoring and coastal watershed monitoring; and
c) Actively track the development of the SWIM database and determine if implementation of SWIM will require amendments to the Ocean Plan.

Estimated Staff Effort: 0.2 PY per year over a three-year period

Staff Recommendation: Alternative 2 - Baseline Effort

Recommended Priority: Higher Priority.
This issue should be high priority due to its link to Issue C.4.a (Regional Ambient Monitoring), and Issue C.1.b (Mass Emissions).

References:

The Warner Group. May 1998. *CA state Water Resources Control Board and the Regional Water Quality Control Boards, System for Water Information Management Feasibility Study Report (SWIM FSR).*

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Issue C.4.c: Statistical Interpretation of Chronic Toxicity Data Testing (August 1998 Staff Report Issue C.4.c).

Should the point estimate method be used instead of hypothesis testing for statistical analysis of chronic toxicity test data?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) utilizes different statistical approaches for interpreting acute and chronic toxicity test data. For chronic toxicity tests, hypothesis testing is used (i.e., NOEC) and for acute toxicity tests the point estimate (LC50) approach is followed.

Issue Description: Table B of the 1997 Ocean Plan lists water quality objectives for protection of aquatic life. This list includes an objective for chronic toxicity used "to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological responses". The Ocean Plan requires chronic toxicity to be measured by exposing aquatic organisms to varying concentrations of effluent according to specific test protocols as listed in Appendix II of the Ocean Plan. Chronic toxicity is measured in toxic units chronic (Tu_c), defined as 100/No Observable Effect Concentration (NOEC). NOEC is a statistical endpoint used in hypothesis testing.

The 1992 Triennial Review and Workplan (SWRCB 1992) called for a comparison of the precision of the hypothesis testing approach versus the point estimate approach. The following efforts were pursued in order to improve general knowledge of toxicity test precision:

1. State Water Resources Control Board (SWRCB) staff collected reference toxicant test results from marine and freshwater tests in order to examine the test precision. The analysis of this data showed that marine tests, in general, are more sensitive than freshwater tests. A precision criterion was suggested for each of the test protocols examined. These protocol-specific criteria will ensure that tests are conducted with an acceptable degree of precision.

2. An analysis of the reference toxicant data set was conducted by staff in order to determine which point estimate value most closely approximates a NOEC value. This analysis showed that NOEC measurements are most closely approximated by point estimates in the IC_{10} to IC_{15} range. This finding, however, was limited to *Ceriodaphnia* (a freshwater species) data sets only. Moreover, this analysis did not compare the precision of the point estimates and the NOEC estimates.

3. Staff contracted with private consultants in order to better describe the relationship between the precision of toxicological tests (as measured by *power*) and the value of the Minimum Significant Difference (MSD). The MSD is based on the variance of the replicates within groups (called the MSE), the number of groups, and the number of replicates in the groups. If the numbers of groups and replicates are held constant, the MSD will increase and decrease as the MSE increases and decreases (EcoAnalysis, Inc., 1994).

With the recent addition of acute and chronic toxicity test methods to Table A of 40 CFR 136, all toxicity test methods used in the NPDES permits now fall under the purview of U. S. Environmental Protection Agency (U.S. EPA). It is the view of SWRCB staff that further progress on this issue should be conducted by U.S. EPA because NPDES permittees are required to use 40 CFR Part 136 test methods which specify the statistical approach to use in analyzing toxicity test data.

List of Commenters: Alan C. Langworthy and Tim Rothans, City of San Diego; Judith A. Wilson, City of Los Angeles; Robert W. Horvath, County Sanitation Districts of Los Angeles County; Margaret H. Nellor, Tri-TAC Chair, County Sanitation Districts of Los Angeles County; Judith A. Wilson and Mas Dojiri, City of Los Angeles.

Summary of Comments: All of the commenters recommended that point estimation methods and the confidence intervals that can be derived from the regression models used to calculate point estimate effects be used for compliance monitoring. They also stated the hypothesis statistical approach and the associated NOEC are too dependent upon dilutions; as a result, statistical significance may not necessarily denote biological significance in toxicity testing.

Several commenters suggested the SWRCB rather than U.S. EPA take the lead in requiring that all toxicity tests used for compliance monitoring of ocean waste discharges use the point estimate approach in analyzing toxicity test data.

Alternative(s) for Staff Action:

1. ***Baseline Effort***
Work with U.S. EPA staff reviewing the current statistical approaches utilized in analyzing toxicity test data. The knowledge gained as a result of this cooperative effort could then be used to provide guidance to Regional Water Quality Control Boards on which statistical method to require in NPDES permits for ocean discharges.

Estimated Staff Effort: 0.1 PY per year over a three-year period

2. ***Augmented Budget Effort***
Hire a biostatistician to: (1) evaluate different statistical methods used in the analysis of toxicity test data and (2) recommend to staff the most suitable approach. The biostatistician may consider approaches other than hypothesis and point estimate statistical methods.

Estimated Staff Effort: 0.8 PY (over a three year period).
Estimated Contract Commitment: $50,000.00

Staff Recommendation: Alternative 1 - Baseline Effort

Recommended Priority: Higher Priority

References:

EcoAnalysis, Inc., 1994. *MSD and Test Precision.*

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Issue C.4.d: Implementation of Toxicity Reduction Evaluations (TREs) (August 1998 Staff Report Issue C.4.e).

Should chronic marine TIE methods be developed for toxicity test methods listed in the California Ocean Plan?

Current Ocean Plan: If a discharge consistently exceeds an effluent limitation based on a toxicity objective in Table B, a Toxicity Reduction Evaluation (TRE) is required. The TRE shall include all reasonable steps to identify the source of toxicity. Once the source(s) of toxicity is identified, the discharger shall take all reasonable steps necessary to reduce toxicity to the required level.

Issue Description: A TRE is a site-specific study conducted in four stages to: 1) identify the sources of toxicity in the effluent, 2) isolate these sources, 3) evaluate the possible mitigatory responses to control the toxicity, and 4) confirm toxicity has been removed from the effluent. A TIE is the identification phase of a TRE in which a series of chemical analytical procedures, combined with the toxicity test procedures, are used to identify the specific chemicals causing the toxicity in the effluent.

The issue of which criteria are to be used in triggering a TRE is being investigated by members of Southern California Toxicity Assessment Group's (SCTAG) methods and policy committees. SCTAG is comprised of representatives from the waste discharger community, consultant laboratories, and government, including SWRCB staff. The organization has been very active in addressing the TRE issue. Among their accomplishments is a report titled "TRE/TIE Background Paper" which investigated the policy component process of the TRE. The SCTAG methods committee has also developed a TRE/TIE guidance document to familiarize interested parties in the TRE process. The North West Toxicity Assessment Group (NWTAG), a similar organization based in Oregon and Washington, has collaborated with SCTAG in the development of this guidance document.

As for TIE method development, six of the seven tier 1 critical life stage test methods currently listed in the Ocean Plan (Appendix II) now have TIE methods (U.S. EPA, 1996). Those protocols are the following: 1) *Macryocystis pyrifera* germination/growth test method, 2) *Strongylocentrotus purpuratus* fertilization or development test method, 3)*Dendraster excentricus* fertilization or development test method, 4) *Crassostrea gigas* and *Mytilus spp*. development test methods, 5) *Haliotis rufescens* development test method, and 6) *Atherinops affinis* mortality/growth test method.

Holmesimysis costata is the remaining tier 1 critical life stage protocol for which a TIE test method has not yet been fully developed.

List of Commenters: Robert P. Ghirelli, Orange County Sanitation District; Alan C. Langworthy, City of San Diego; Judith A. Wilson and Mas Dojiri, City of Los Angeles; Margaret H. Nellor, Tri-Tac Chair, County Sanitation Districts of Los Angeles County; Robert W. Horvath, County Sanitation Districts of Los Angeles County; Mark Gold, Heal the Bay.

Summary of Comments: Two commenters recommended dropping this issue as part of the Triennial Review because most ocean dischargers have not experienced problems with exceeding toxicity limits and relatively few full blown TREs are in fact necessary. In addition, the level of effort required to develop more TIE methods is unnecessary.

One commenter strongly supported efforts made in the development of TIE methods for chronic marine toxicity tests. This same commenter urged the SWRCB to provide more guidance to RWQCBs on (1) what procedures to follow in the event of a chronic toxicity violation, and (2) how many violations necessitate conducting a TRE/TIE.

One commenter requested that "consistent toxicity" be clarified in the California Ocean Plan, especially since it acts as a trigger for the initiation of a TRE. Another commenter recommended that there not be a more concise definition for a TRE trigger because the current definition promotes dialogue between Regional Boards and the regulated community as to what warrants a TIE/TRE study.

Alternative(s) for Staff Action:

1. ***Baseline Effort***
Defer the determination of a TRE trigger to the Regional Water Quality Control Boards.

Estimated Staff Effort: 0.1 PY per year over a three-year period

2. ***Augmented Budget Effort***
Provide guidance to Regional Boards on what procedures to follow in the event of a chronic toxicity violation, and how many violations necessitate conducting a TRE/TIE. Consider the contributions of SCTAG in issuing the guidelines.

Estimated Staff Effort: 1.5 PY (over a three-year period).

Staff Recommendation: Alternative 1 - Baseline Effort

Recommended Priority: Higher Priority

References:

U.S. EPA. 1996. *Marine Toxicity Identification Evaluation (TIE), Phase I Guidance Document.*

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Issue C.4.e: Acute Toxicity Test Methods (August 1998 Staff Report Issue C.4.f).

Should the SWRCB use existing acute toxicity test methods approved by U.S. EPA, or develop new test methods?

Current Ocean Plan: The California Ocean Plan (Ocean Plan) requires that compliance with the acute toxicity limitation (TUa) in Table A shall be determined "using an established protocol, e.g., American Society for Testing Materials, U. S. Environmental Protection Agency (U.S. EPA), American Public Health Association, or State Board."

Issue Description: The Ocean Plan requires that "compliance with the acute toxicity limitation (TUa) shall be determined using an established protocol, e.g., American Society for Testing Materials (ASTM), EPA (i.e. U.S. EPA), American Public Health Association, or State Board"(i.e. SWRCB). With the addition of acute toxicity test methods to U.S. EPA's 40 CFR 136 in 1994, permitted dischargers are now required to use only U.S. EPA approved acute toxicity test methods.

The issue of acute test methods was raised because some newer acute tests are more sensitive than older tests and because some protocols are more rigorously defined than others. For example, the Fourth Edition U.S. EPA acute toxicity methods manual (U.S. EPA, 1993) recommends that younger test organisms be used than those recommended in the Third Edition (U.S. EPA, 1985). In practical terms, this meant that an effluent may "pass" a test based on the third edition manual but "fail" if a more recent test is used.

One commenter in the 1992 Triennial Review recommended the SWRCB convene an acute toxicity test review committee. This would be similar to the Protocol Review Committee previously formed to review critical life stage protocols.

This issue may have been resolved with the promulgation of U.S. EPA's fourth edition manual acute toxicity tests into 40 CFR 136, in 1994. NPDES permittees are now required to use only U.S. EPA approved toxicity test methods for measuring the acute toxicity of ocean discharges.

SWRCB staff may convene an acute toxicity test review committee to select among U.S. EPA's approved test list, or examine the possibility of developing new acute toxicity test methods. The latter option (development of new acute toxicity tests for compliance monitoring) is not under consideration at this time.

List of Commenters: Robert P. Ghirelli, Orange County Sanitation District; Alan C. Langworthy and Tim Rothans, City of San Diego; Mas Dojiri and Judith Wilson, City of Los Angeles; Robert W. Horvath, County Sanitation Districts of Los Angeles County; Margaret H. Nellor, Tri-Tac Chair, County Sanitation Districts of Los Angeles County.

Summary of Comments: All of the commenters stated the importance of this issue is dependent upon the outcome of Issue 1 (Replacement of the Acute Toxicity Effluent Limitation in Table A with an Acute Toxicity Water Quality Objective) which is proposed for amendment to the California Ocean Plan. If a mixing zone is not adopted for acute toxicity

then this issue should become a high priority. Several commenters also stated the current technology based limitation used in combination with the newer, more sensitive acute toxicity test methods is needlessly overprotective.

Two commenters stated there is no reason to disregard the U.S.EPA approved acute toxicity test methods and develop new acute protocols. If refinements are necessary to the U.S.EPA protocols there is a mechanism in place to revise them.

One commenter stated that according to current Ocean Plan language the State Water Resources Control Board is not required to use only U.S.EPA promulgated protocols. In addition, the commenter argues that "the Third Edition U.S.EPA methods are "established" in that they have been purportedly subjected to peer review and interlab testing by U.S.EPA, and have been in use for over a decade".

Alternative(s) for Staff Action:

1. ***Baseline Effort***
Staff will evaluate the need to develop new acute toxicity test methods to supplement the current list of U.S.EPA approved test protocols in 40 CFR 136. The outcome of Issue 1 (Replacement of the Acute Toxicity Effluent Limitation in Table A with an Acute Toxicity Water Quality Objective) proposed for amendment to the 1997 California Ocean Plan will be a consideration in the evaluation.

Estimated Staff Effort: 0.8 PY over a three-year period

2. ***Augmented Budget Effort***
In addition to the minimum effort staff will contract with researchers from U.C. Santa Cruz to develop new acute toxicity test methods utilizing indigenous organisms. These test methods may be adopted as part of a newly established Ocean Plan acute toxicity test list. Staff commitment on Issue 1 proposed for amendment to the Ocean Plan will require 0.5 PY for the 1999-2000 fiscal year.

Estimated Staff Effort: 1.8 PY (over a three year period).

Estimated Contract Commitment: 300,000.00

Staff Recommendation: Alternative 1 - Baseline Effort

Recommended Priority: Higher Priority

References:

U.S. EPA. 1993. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters* to *Freshwater and Marine Organisms* (Fourth Edition). EPA/600/4-90/027F.

U.S. EPA. 1985. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms* (Third Edition). EPA/600/4-85/013.

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Issue C.4.f: Regulatory Control of Storm Water Discharge (August 1998 Staff Report Issue C.1.c).

Should the California Ocean Plan be amended to assist storm water dischargers and regulators in achieving the standards contained in the Plan?

Current Ocean Plan: The introduction to the California Ocean Plan (Ocean Plan) states that it "...is applicable, in its entirety, to point source discharges to the ocean". This language has remained unchanged in the Ocean Plan since 1978. Based on the definition of "point source" in federal regulations (as defined in 40 CFR Part 122.2), much of the storm water being discharged to the ocean is considered to be point source pollution. To date, however, the State Water Resources Control Board (SWRCB) has determined that implementation of Ocean Plan water quality standards must be integrated with the federal concept of storm water regulation which emphasizes "best management practices" rather than compliance with numeric effluent limitations.

Issue Description: Only one set of written comments were received on this topic during the 1992 Triennial Review (submitted jointly by Heal the Bay, American Oceans Campaign and NRDC). The issue was assigned a high priority by the SWRCB in adopting the October 1992 Triennial Review and Workplan. Due to subsequent budget cutbacks, there were not adequate staff resources to address this issue until 1998.

The 1992 Triennial Review comments requested that numeric limits be developed for storm water/urban runoff. Unless numeric limits are specified, and receiving waters adjacent to storm drains are monitored, the commenter questioned how the SWRCB can determine whether beneficial uses are being protected and if nearshore waters are in compliance with Table B objectives?

In the 1992 Triennial Review and Workplan, staff concluded that the Ocean Plan should be amended to clarify its applicability to storm water discharges. At the time, staff recommended that a schedule of compliance for discharges be considered for the Ocean Plan, similar to the schedule in the non-rescinded Inland Surface Waters Plan (ISWP) and the Enclosed Bays and Estuaries Plan (EBEP). The schedule would have required that all storm water dischargers be given a maximum of ten years from the date of adoption of the numeric objectives to come into compliance with the objectives. Upon review of the ISWP and EBEP, the U.S. Environmental Protection Agency (U.S. EPA) approved the compliance schedule, and determined that implementation of the concept should be governed by the National Pollutant Discharge Elimination Permit System (NPDES) requirements adopted by the State.

The focus of this issue will be to address the comments raised during both the 1992 and 1998-1999 Triennial Reviews and: a) determine whether existing storm water control programs (utilizing whatever implementation strategies are deemed appropriate) are adequate to ensure compliance with Ocean Plan standards; and b) recommend appropriate amendments to the Ocean Plan which will assist storm water dischargers and regulators in achieving the standards.

List of Commenters: Linda M. Sheehan, Center for Marine Conservation / Ann Notthoff, Natural Resources Defense Council; Donald L. Lollock, California Dept. of Fish & Game (OSPR); Robert P. Ghirelli, Orange County Sanitation District; Chris Crompton, Orange County Public Facilities & Resources Dept; Robert W. Horvath, County Sanitation Districts of Los Angeles County; Arthur E. Goulet, Ventura County Public Works Agency; Jim Curland, Friends of the Sea Otter; Mark Gold, Heal the Bay; G. Fred Lee, G. Fred Lee & Associates; Fred Krieger; William J. Douros, Monterey Bay National Marine Sanctuary (U.S. Dept of Commerce - NOAA); John Hannum, Regional Water Quality Control Board No. 1 (North Coast); Catherine Tyrrell, Regional Water Quality Control Board No. 4 (Los Angeles); Vicki Nichols, Save Our Shores; Edward Kimura, Sierra Club (San Diego Chapter); Terry Oda, U.S. Environmental Protection Agency (Region IX).

Summary of Comments: The number of commenters on this issue has increased from one in 1992, to sixteen during the 1998-1999 Triennial Review. The current comments reflect an increased awareness of the significance of storm water runoff as a major source of water pollution, as well as a broader perspective and understanding of how the issue should be addressed in the Ocean Plan.

Ocean Plan should provide guidance for implementing storm water programs:
Commenters noted that efforts by the Southern California Coastal Water Research Project and the Santa Monica Bay Restoration Project have shown that both storm water and dry weather runoff are significant contributors to coastal pollution and often are the dominant sources affecting beaches, intertidal areas, and other near coastal resources throughout the State. However, regulation and control of these sources are relatively crude compared to POTWs and other point sources, which have been subject to evolving and increasingly stringent regulation for over 25 years.

Most commenters agreed that it is time for the SWRCB to begin a concerted effort to sort through the Ocean Plan and determine which provisions can be directly applied to storm water and non-point sources, and which are inappropriate and require a different approach. In either case, guidance for implementing the State's storm water program in coastal waters should be an integral part of the Ocean Plan - including appropriate amendments to assist regulators and storm water management agencies to achieve applicable standards.

Many commenters also urged SWRCB staff to work closely with groups conducting storm water control efforts and promote and/or incorporate successful strategies into the Ocean Plan, such as the Model Urban Runoff Program (MURP), as a means of addressing this issue. The MURP program, funded by a grant from the SWRCB, was developed by the cities of Monterey and Santa Cruz, the Monterey Bay National Marine Sanctuary and the Coastal Commission. It provides an easy to use cookbook of management measures, institutional arrangements and educational tools for small cities to use to address urban runoff.

Suggestions were also made that as the U.S. EPA moves to finalize and implement the "Phase II," NPDES storm water permit program, the SWRCB should seize this important opportunity to expand and improve upon storm water regulation by closely coordinating the Phase II changes with provisions of the Ocean Plan.

Effectiveness of existing SWRCB storm water program in meeting Ocean Plan water quality standards: Historically, there have always been overlaps and ambiguity between programs designed to control point and nonpoint sources of storm water runoff. For example, runoff may often originate as a nonpoint source but ultimately be channelized and become a point source.

The 1987 amendments to the CWA added Section 402 (p) which established a framework for regulating municipal and industrial storm water discharges under a two-phased NPDES permit program. Phase 1 of the program requires NPDES permits to be issued for "municipal separate storm sewers" serving medium to large-sized populations (greater than 100,000 people), and for storm water discharges associated with industrial activity. Permits are also to be issued on a case-by-case basis if U.S. EPA or a State determines that a storm water discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. Under Phase 2 of the program, U.S. EPA is expected to issue regulations which apply to all other storm water discharges.

As noted in the August 1998 *Staff Report: Issues For Review*, it is intent of staff to address the storm water issue during the 1998-1999 Triennial Review by obtaining answers to the following questions:

1. *Do we have adequate information on the character, volume and location of storm water discharges to the ocean?*

2. *Do we have adequate information on the extent to which storm water discharges may contribute to the exceedance of water quality standards contained in the Ocean Plan?*

3. *Do we have adequate monitoring information and programs in place to answer the first two questions?*

4. *What amendments, if any, should be made to the Ocean Plan to assist dischargers and regulators in their efforts to achieve the standards contained in the Ocean Plan?*

Commenters suggested that although we don't have completely comprehensive answers to these questions, there is enough information for the SWRCB to move forward in determining how the Ocean Plan should best address storm water impacts in ocean waters. We have enough information to know that storm water causes exceedances of Ocean Plan standards (as those standards are currently interpreted and applied), including violations of water quality objectives in each of the following categories: bacterial standards, protection of aquatic life, protection of human health, general requirements for management of waste, and perhaps chemical and physical characteristics. One commenter stated that it is also equally clear that currently available Best Management Practices (BMP), even if fully implemented, will not provide compliance.

Another commenter stated his belief that the questions listed by staff raise issues that are not necessarily appropriate to protect the public's interests. He believes that constituent control of NPDES-permitted urban area and highway storm water runoff would require a significant (and un-necessary) expenditure of public funds.

One commenter summarized the issue as follows:

1. Constituents in storm water frequently exceed Ocean Plan objectives.

2. The Clean Water Act requires that discharges comply with Ocean Plan water quality standards

3. Requiring all storm water discharges to comply with existing Ocean Plan standards is probably not economically feasible at this time.

4. An alternative approach is to require implementation of BMPs, however, the currently available BMPs will not provide for complete compliance.

5. If the Ocean Plan requirements appear unattainable, the SWRCB should request assistance/proposals on how to resolve this dilemma.

Watershed management approach should be applied to coastal waters: Several commenters suggested that an integrated "watershed management" concept must be extended to coastal waters as the appropriate means for protecting beneficial uses and solving complex water quality problems. To do so, the SWRCB must develop a more effective program for regulating storm water discharges, non-point sources (and perhaps other sources such as dredged material). Point sources have a finely tuned pollution control program after over 25 years of regulation under the Ocean Plan, while other significant sources are only crudely regulated or not at all.

One commenter offered specific ideas on how the Ocean Plan could implement a watershed approach. First, water quality use impairments associated with storm water runoff should be identified. Where such use impairments are found, then a watershed-based, stakeholder-driven, consensus approach should be developed on how best to manage the use impairments to protect the public's interest without unnecessary expenditures for constituent control.

Where exceedances of Ocean Plan objective are found, the Ocean Plan should include an approach that enables the storm water dischargers, the public, and others to work together to determine whether these exceedances represent significant adverse impacts on the beneficial uses of the receiving waters or are administrative exceedances reflecting (in the opinion of the commenter) the overly-protective nature of the Ocean Plan objectives.

Further, since rarely are storm water runoff-associated constituents the only source of the constituents that could be adversely impacting the beneficial uses of nearshore marine waters, it is important to develop an approach whereby the potential benefits associated with spending public funds on controlling storm water discharges will result in a significant improvement in the beneficial uses of the receiving waters. There is little point in spending large amounts of public funds controlling NPDES-permitted sources of storm water constituents when the same constituents are derived, to a significant extent, from non-permitted (non-point) sources and therefore are unregulated.

More information needed to characterize and monitor storm water discharges: Recognizing the complexity of storm water discharge, commenters suggested that every effort should be made to collect adequate information to answer questions regarding storm water flows, chemical and toxicological characteristics, locations, and overall impacts of storm water discharges to aquatic organisms and human health. The present state of knowledge regarding the impacts of storm water discharge on receiving waters and the effectiveness of BMPs is limited and many times non-conclusive.

Several commenters suggested that additional monitoring is needed to define the character, volume, and locations of storm water discharges, identify actual impairment of beneficial uses caused by storm water and other discharges (not necessarily only identifying exceedances of water quality standards), and the effectiveness of BMPs. The June 1994 *Regional Board Consistency Task Force Report* of the SWRCB's External Review Program recommended that characterization of waste discharges and data from impact monitoring should precede the development of water quality plans, objectives, effluent limits, and other performance criteria.

Schedule of compliance for meeting Ocean Plan water quality objectives: The 1992 Triennial Review and Workplan recommended that storm water dischargers be given a schedule for compliance for meeting the Ocean Plan's numeric water quality objectives. However, since the proposed amendment was not adopted, the subsequent permitting approach for storm water discharges has been based on the concept of implementation of BMPs to attain water quality standards, rather than compliance with numerical effluent limitations. Commenters requested reconsideration of this issue, and suggested that the provisions of the Ocean Plan (which includes both narrative and numeric water quality objectives) should apply to all storm water dischargers.

In view of concerns that some storm water dischargers may not be able to comply with Ocean Plan limits immediately, compliance schedules should be structured to meet specific needs on a case-by-case basis at the discretion of the Regional Boards. A similar provision has been included in the proposed September 1997 *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*.

Storm water effluent limitations - numeric limits vs BMPs: By far the greatest number of comments focused on the issue of compliance with Ocean Plan water quality standards. Although some commenters may disagree, the SWRCB and the U.S. EPA have determined that storm water discharges (including NPDES permits for municipal separate storm sewer systems) must contain effluent limitations based on compliance with water quality standards - even if those requirements would be more stringent than MEP (Maximum Extent Practicable). Effluent limitations need not be numeric, but may include any measure to reduce pollutants in the discharge, including BMPs. The debate seems to center on the most appropriate means, cost, and timeframe for accomplishing this requirement.

(**Staff Note:** If the SWRCB determines that this issue is a high priority, the staff will then a) gather information to determine whether existing storm water control programs are adequate to ensure compliance with Ocean Plan standards; and b) recommend appropriate amendments to the Ocean Plan which will assist storm water dischargers and regulators in achieving the standards).

Regarding the use of BMPs, some commenters support the current SWRCB implementation strategies for storm water discharges (i.e., the use of BMPs and the implementation of an approved storm water management plan) as the standard of compliance with Ocean Plan requirements. One jurisdiction stated that any suggestion that municipal dischargers must meet water quality standards as well as MEP is not supported by municipalities in California, although there is support for making timely progress toward the goal of meeting water quality standards. In addition, the focus of SWRCB activities should reflect a more programmatic, BMP-driven approach, to storm water discharges that should include:

1. Defining the character, volume and locations of storm water discharges to the ocean.

2. Identifying actual impairments of beneficial uses caused by storm water and other discharges.

3. Evaluating the economic and technical feasibility of alleviating impairments to beneficial uses attributable to storm water and attaining water quality standards.

Given the complexity of source control and the cost of treatment, the SWRCB has not implemented numeric effluent limitations for storm water discharges. Instead, the U.S. EPA has interpreted the CWA and implementing regulations to allow for the use of BMPs in lieu of numeric limits to regulate storm water discharges.

Commenters stated the regulation of storm water as a "point source" discharge, and the subsequent application of appropriate numerical and narrative water quality standards, is essential for the attainment and protection of the beneficial uses established in both the Ocean Plan and the various coastal RWQCB Basin Plans. Storm water programs will not lead to beneficial use protection until all numeric criteria, water quality objectives and standards in the Ocean Plan are applied to all sources of discharge to ocean waters.

The objectives were developed based on risks to human health and marine life. They were not developed based on the source of the contaminants. If a sea urchin encounters waters with high concentrations of TBT or PAHs, the negative impact on fertilization success and embryo development due to exposure to those toxicants will occur regardless of whether or not the contaminants came from a POTW or a storm drain. The SWRCB is urged to clarify this issue as soon as possible so the RWQCB's, the regulated community, and the public can get on with the long-overdue task of protecting the beneficial uses of our coastal waters

Review of Ocean Plan water quality objectives: Several commenters recommended that it is time for the SWRCB to begin a concerted effort to sort through the Ocean Plan and determine which objectives can be directly applied to storm water and nonpoint sources, and which are inappropriate and require a different approach. For example, bacterial standards are readily applied to these sources, whereas the toxics limitations of Table B are not easily applied to storm water discharges, and a new approach may be needed.

One commenter stated that it is important to make progress on these issues now, because regulatory approaches such as BMPs are being adopted without clear endpoints and direction

on how storm water and non-point discharges should be integrated with control of conventional point sources to protect coastal waters. Additionally, several coastal RWQCB's have identified coastal waters as impaired for a variety of pollutants and are moving toward the development of Total Maximum Daily Loads to achieve water quality standards. There is virtually no guidance as to how this should be done for storm water and nonpoint sources.

It was suggested that the SWRCB needs to take a look at each standard which is typically exceeded and determine whether 1) the standard should be changed, 2) the mode of employing the standard should change, or 3) the standard is valid and public monies and effort should be directed to insuring that storm water does not exceed the standard.

Commenters suggested that the current standards, as currently applied, are not that helpful when it comes to storm water discharge, and may result in chasing "non-problems" which will delay developing new standards to address the real adverse effects of runoff. An example of a non-problem is PAHs. Storm water often exceeds these criteria, which are human health-based and assume bioconcentration in biota and fish and consumption by humans. If bioconcentration is not occurring, (which, according to the commenter, appears to be the case in most waters), then no risk is present.

The Ocean Plan should also address how the water quality objectives apply during wet weather versus dry weather. Criteria are needed to address waterway scouring and freshwater flooding, and objectives for currently unregulated pesticides (such as diazinon, chlorpyrifos, etc). Land use and the rapid conversion from permeable to impermeable surfaces is probably the number one source of storm water problems and yet isn't addressed by current standards. Bacteria of non-human origin may also be part of the overall problem. Storm water frequently exceeds the standards but often the bacteria is of animal origin. Bacteria (and other pathogens) from animals may have public health consequences but the sources are very hard to address. Certainly, the current batch of BMPs have not focused on this problem.

Comments suggested that Ocean Plan objectives were not developed for the purpose of regulating largely non-toxic, non-available constituents associated with short-term pulses such as occur with urban storm water runoff events. Rather than revising the Ocean Plan to more readily implement regulation of storm water runoff from urban areas and highways so that the runoff is in compliance with the water quality objectives set forth in the Ocean Plan, the SWRCB should be focusing on how to revise the Ocean Plan to protect the designated beneficial uses of the ocean receiving waters

One commenter stated that while it appears that the U.S. EPA, SWRCB and RWQCBs will not require NPDES-permitted storm water dischargers to comply with Ocean Plan objectives in the near future, this situation could change because of environmental groups' lawsuits. The courts could force water quality managers to implement what are known to be technically invalid (in the opinion of the commenter) approaches for managing real, significant water quality problems associated with urban area and highway storm water runoff to marine waters. It is important to address this issue as part of the proposed revisions of the Ocean Plan.

Applicability of Table A effluent limitations to storm water discharges: One commenter noted that the Table A Effluent Limitations were developed at a time when storm water was considered to be a "non point" discharge, and asked whether they apply to storm water discharges. The answer to this question is "no". Page 6 of the Ocean Plan indicates that Table A applies only to publicly owned treatment works (POTWs), and to industrial discharges for which effluent limitations have not been established pursuant to the federal Clean Water Act. However, except for acute toxicity, constituents listed in Table A effluent limitations are also generally addressed by narrative water quality objectives which are applicable to ocean waters impacted by storm water discharges.

Economic analysis: Commenters stated that amendments to the Ocean Plan need to properly consider the economic and technical feasibility of requiring storm water dischargers to comply with water quality standards. An in-depth review of the costs of imposing Ocean Plan requirements on NPDES-permitted highway storm water runoff should also be developed as part of revising the Ocean Plan. In reply, the SWRCB has previously determined that storm water dischargers are required to comply with Ocean Plan water quality standards. As a result, the threshold question of applicability of current Ocean Plan water quality standards to storm water discharges will not be the subject of economic or technical feasibility studies during the 1998-1999 Triennial Review. However, economic or technical feasibility studies of specific implementation proposals may be prepared.

Clarification of permit requirements: One commenter noted that the SWRCB's current BMP-based approach to attaining water quality standards for storm water discharges (as opposed to establishing numeric effluent limits) becomes confused when permits contain the following typical boilerplate language: "The discharge shall comply with all applicable water quality standards". Even though a permit may not have numeric effluent limits, the boilerplate quoted above has the effect of making all standards (e.g. all Table B plus the narrative standards) applicable to the discharge. Since storm water discharges are not likely to be granted a mixing zone, Table B effectively becomes the discharge's effluent limits. Some of the Basin Plans and storm water permits get around this problem by stating that compliance with water quality standards is determined by implementation of a Storm Water Management Plan. It would be preferable to develop a straight-forward approach that everyone, permittees, regulators, and the public could understand.

Combined storm sewers: One commenter noted that San Francisco has a combined sewer system which presents a special case with respect to water quality standards compliance. This issue needs to be addressed, perhaps by reference to the National "CSO Control Policy" which established several approaches for demonstrating compliance.

Storm water discharge is a trans-border issue: The impact of storm water runoff on coastal water quality is a trans-border issue in the San Diego area due to a shared watershed with Mexico. One commenter suggested that even the new South Bay International Wastewater Treatment Project, constructed to address the pollution of the Tijuana River, will not fully control the storm water runoff from this watershed. Cooperative arrangements with Mexico need to be established to address the storm water run-off into the Tijuana River.

Staff Comments: Point sources of storm water discharge are a significant source of beach closure and impairment of beneficial uses in coastal waters of the State. Control of these discharges is under the jurisdiction of the SWRCB Storm Water Management Program (industrial and construction discharges) and RWQCB Municipal Separate Storm Sewer (MS4) NPDES Programs. However, staff has concluded that there is not sufficient information (on a statewide basis) to determine whether existing storm water control programs are adequate to ensure compliance with Ocean Plan water quality standards. Additional efforts are necessary to a) identify and characterize point sources of storm water discharge, b) review the appropriate manner for applying water quality objectives to storm water discharges, c) determine the effectiveness of BMPs in meeting Ocean Plan water quality standards, d) consider a schedule for compliance with water quality objectives, and e) propose trigger criteria for moving between voluntary compliance with BMPs and more stringent requirements for discharges to impaired waterbodies.

Alternative(s) for Staff Action:

1. ***Minimum Effort:*** Monitor progress of the current SWRCB Storm Water Management Program (industrial and construction discharges) / RWQCB Municipal Separate Storm Sewer (MS4) NPDES Program, and local / regional efforts such as the Southern California Coastal Water Research Project, the Santa Monica Bay Restoration Project and the Monterey Bay National Marine Sanctuary in meeting Ocean Plan water quality standards for point source storm water discharges. Staff will also review the relationship between the current Storm Water Management Program and requirements of CWA Section 403 (c)(2) - *Ocean Discharge Criteria* for point source storm water discharges, including the U.S. EPA's implementing guidelines (see 40CFR125), as well as anti-degradation requirements.

Estimated Staff Effort: 0.1 PY per year over a three-year period

2. ***Baseline Effort:*** In addition to the Minimum Effort, the current Ocean Standards Unit staff allocation for this issue will permit a more detailed investigation (including formulation of conclusions and recommendations) for each of the comments and suggestions raised during both the 1992 and 1998-1999 Triennial Reviews. In addition, staff will collect and evaluate existing information from the RWQCB's, dischargers, and other interested parties to determine the effectiveness of existing (and proposed MS4 Phase II) storm water control programs in meeting Ocean Plan requirements. Amendments will be developed with the assistance of stakeholders to provide guidance for the phased implementation of appropriate Ocean Plan objectives to ensure protection of beneficial uses.

Baseline budget resources are currently available to assist with efforts to characterize and map the geographic location and extent of point sources of storm water discharging directly to coastal and ocean waters within the jurisdiction of the Ocean Plan. Such an effort is a necessary first step in developing guidance for a phased implementation program for appropriate Ocean Plan objectives. These budget resources will be used to augment existing information with field work by the six coastal RWQCB's to ensure that all point sources of storm water discharging directly to coastal and ocean waters are identified, characterized and mapped in a timely manner. All efforts will be coordinated with the SWRCB Storm Water

Management Program (industrial and construction discharges) and RWQCB Municipal Separate Storm Sewer (MS4) NPDES Programs.

Estimated Staff Effort: 0.3 PY per year over a three-year period

Baseline Budget Commitment: Baseline funding of $90,000 per year for FY 2000/2001 and FY 2001/2002

Staff Recommendation: Alternative 2 - Baseline Effort

Recommended Priority: Higher Priority

Staff Contact For This Issue:

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Issue C.4.g: Regulatory Control of Nonpoint Source Discharge (August 1998 Staff Report Issue C.4.g).

Should the California Ocean Plan include a specific implementation program for the control of nonpoint sources of pollution?

Current Ocean Plan: The introduction to the California Ocean Plan (Ocean Plan) states that:

> "Nonpoint sources of waste discharges to the ocean are subject to Chapter I - Beneficial Uses, Chapter II - Water Quality Objectives, Chapter III - General Requirements, Chapter IV - Table B (*wherein compliance with water quality objectives shall, in all cases, be determined by direct measurements in the receiving waters*) and Chapter V - Discharge Prohibitions."

This language has remained unchanged in the Ocean Plan since 1978. However, the Ocean Plan does not contain any program of implementation for nonpoint sources. Ocean Plan water quality standards must be integrated with the State concept of nonpoint source control, which is based on a tiered management approach ranging from voluntary implementation of "best management practices" (BMP) to the establishment of specific effluent limitations.

Issue Description: Three sets of written comments were received on this topic during the 1992 Triennial Review. The issue was assigned a high priority by the State Water Resources Control Board (SWRCB) in adopting the October 1992 Triennial Review and Workplan. Due to subsequent budget cutbacks, there were not adequate staff resources to address this issue until 1998. In addition, the U.S. EPA and SWRCB recently agreed to implement California's Coastal Zone Act Reauthorization Amendments / Nonpoint Source Program ("CZARA Action Plan") over a 15-year period. It would have been premature to consider amendments to the Ocean Plan while the SWRCB and other agencies were in the initial stages of developing nonpoint source control policy and implementing regulatory programs.

The SWRCB adopted a Nonpoint Source Management Plan in 1988 which, as subsequently revised, will be a guide for additional control measures in water quality control plans such as the Ocean Plan. In adopting the 1990 amendments to the Ocean Plan, the SWRCB indicated that as new nonpoint source control strategies are developed, applicable portions will be incorporated into the Ocean Plan. In their letter approving the 1990 Ocean Plan, the U. S. Environmental Protection Agency (U.S. EPA) requested that this issue be addressed in the next (i.e. 1992) Triennial Review.

Other 1992 Triennial Review comments supported U.S. EPA's recommendation to develop requirements which address nonpoint pollution of marine waters. Specific comments suggested that the NPDES storm water permit issued to the County of Orange should serve as a model for how the permitting process can work to better our understanding of nonpoint sources, and to move towards more aggressive BMPs and comprehensive watershed planning.

Staff concluded that nonpoint source control is, in large part, under the jurisdiction of the now-rescinded Inland Surface Waters Plan or the Enclosed Bays and Estuaries Plan.

However, permitted discharges to upstream waters must not result in a violation of water quality standards for downstream water bodies such as the ocean.

The focus of this issue will be to address the comments raised during both the 1992 and 1998 Triennial Reviews and: a) determine whether existing nonpoint source control programs (utilizing whatever implementation strategies are deemed appropriate) are adequate to ensure compliance with Ocean Plan standards; and b) recommend appropriate amendments to the Ocean Plan which will assist nonpoint source dischargers and regulators in achieving the standards.

List of Commenters: Linda M. Sheehan, Center for Marine Conservation / Ann Notthoff, Natural Resources Defense Council; Donald L. Lollock, California Dept. of Fish & Game (OSPR); Judith A. Wilson, City of Los Angeles Bureau of Sanitation; Alan C. Langworthy, City of San Diego Metropolitan Wastewater Dept; Robert P. Ghirelli, Orange County Sanitation District; Chris Crompton, Orange County Public Facilities & Resources Dept; Robert W. Horvath, County Sanitation Districts of Los Angeles County; Jim Curland, Friends of the Sea Otter; Mark Gold, Heal the Bay; G. Fred Lee, G. Fred Lee & Associates; William J. Douros, Monterey Bay National Marine Sanctuary (U.S. Dept of Commerce - NOAA); Vicki Nichols, Save Our Shores; Edward Kimura, Sierra Club (San Diego Chapter); Margaret H. Nellor, Tri-TAC/SCAP/CASA; Terry Oda, U.S. Environmental Protection Agency (Region IX).

Summary of Comments: The number of commenters on this issue has increased from three in 1992, to fifteen during the 1998 Triennial Review. The current comments reflect the fact that nonpoint discharges are the greatest cause of impaired water bodies in the State, as well as a broader understanding of how the issue should be addressed in the Ocean Plan through implementation of the CZARA Action Plan.

Ocean Plan should provide guidance for implementing nonpoint source programs:
Commenters noted that coastal nonpoint source control is a national priority, reflected in the federal *Clean Water Action Plan*, as well as "Year of the Ocean" activities. According to *"California's Ocean Resources: An Agenda for the Future"* released by the California Resources Agency in March 1997, polluted runoff is the number one source of pollution in California's coastal and ocean waters. Nonpoint source pollution, or polluted runoff, results in beach closings and advisories, habitat degradation, closed or harvest-limited shellfish beds, (*and may result in*) declining fisheries, red tides and other harmful plankton blooms, health risks to marine wildlife and threats to the drinking water of coastal communities.

Commenters also indicated that efforts by the Southern California Coastal Water Research Project (SCCWRP) and the Santa Monica Bay Restoration Project (SMBRP) have shown that nonpoint discharges (including storm water and dry weather runoff) are significant contributors to coastal pollution and often are the dominant sources affecting beaches, intertidal areas, and other near coastal resources throughout the State. However, regulation and control of these sources are relatively crude compared to other point sources, which have been subject to evolving and increasingly stringent regulation for over 25 years. The intense scrutiny that was lavished on problematic point source inputs and which led to effective control and mitigation of those sources is long overdue for nonpoint sources.

Commenters agreed that it is time for the SWRCB to begin a concerted effort to sort through the Ocean Plan and determine which provisions can be directly applied to storm water and nonpoint sources, and which are inappropriate and require a different approach. In either case, guidance for implementing the State's nonpoint source program in coastal waters should be an integral part of the Ocean Plan - including appropriate amendments to assist regulators and those responsible for nonpoint source discharges to achieve applicable standards.

Commenters suggested that the focus of 1998-1999 Triennial Review activities should be similar to those identified for storm water, namely:

1. Defining the character, volume and locations of nonpoint source pollution discharges.

2. Identifying actual impairments of beneficial uses caused by nonpoint source pollution

3. Evaluating the economic and technical feasibility of alleviating impairments to beneficial uses attributable to nonpoint source pollution and attaining water quality standards.

Effectiveness of existing SWRCB nonpoint source program in meeting Ocean Plan water quality standards: As noted in the August 1998 *Staff Report: Issues For Review*, it is the intent of staff to address the nonpoint source discharge issue during the 1998-1999 Triennial Review by obtaining answers to the following questions (which also include a summary of responses provided by commenters):

1. *Do we have adequate information on the character, volume and location of nonpoint source discharges to the ocean?*

   In southern California, knowledge of pollutant loads carried into the ocean from runoff has increased over the years through studies by SCCWRP and the SMBRP. These studies mainly have focused on estimating flows and the mass of various contaminants associated with runoff events. What is missing is specific information regarding runoff-derived pollutants that harm marine organisms in receiving waters, and the source of these pollutants. To our knowledge, the State has not compiled such information. While the character, volume and locations of these discharges are beginning to be understood, we have very little information on their origins and fates. Monitoring of flows entering coastal waters is not conducted although some dispersion studies have been sponsored by Los Angeles County.

2. *Do we have adequate information on the extent to which nonpoint source discharges may contribute to the exceedance of water quality standards contained in the Ocean Plan?*

   As related to the public health swimming issue, bathing water criteria are often exceeded. Quantitative data are available through many monitoring programs, mainly in southern California. It is also known, through the SMBRP-sponsored epidemiological study in 1994, that swimmers have an increased chance of becoming ill when swimming next to flowing storm drains, so microorganisms need to be controlled. The long-term effect of other contaminants (e.g. metals, organics) on swimmers is unknown.

It does not appear that adequate data are available on the characteristics of chemical pollutants discharged from specific freshwater outlets during dry and wet weather flows. Such information would be gathered through routine monitoring. In addition to characterizing the effluent, flow information is needed to determine mass emissions, and dispersion studies to determine dilution rates. Such monitoring is well beyond what is now performed under most NPDES permits, where monitoring is conducted at upstream stations, not where flows meet the ocean.

3. *Do we have adequate monitoring information and programs in place to answer the first two questions?*

   Only general knowledge currently exists of the nature of containment flows from larger freshwater outlets in southern California. We lack specific information, for both dry and wet weather flows. Further, more information is needed on bioaccumulation of pollutants in marine organisms. The SWRCB's Mussel Watch program is an excellent approach. Additional *in situ* toxicity studies like SCCWRP is doing also are needed. Combined, such information will point to the pollutants that cause harm (and / or the need for revised water quality objectives). Emphasis can then be placed on BMPs to reduce these pollutants.

4. *What amendments, if any, should be made to the Ocean Plan to assist dischargers and regulators in their efforts to achieve the standards contained in the Ocean Plan?*

   When approaching this question, consideration should be given to shifting resources from point source monitoring to nonpoint sources. Although significant advances have been made in improving the quality of effluents discharged from point sources in California, many still have large monitoring programs. Through the NPDES permits, the SWRCB should determine a way to shift monitoring intensity from one to the other, such as through regional monitoring programs now being developed by SCCWRP. This needs to be done so that municipalities can avoid the inefficient expenditure of even more funds.

Watershed management approach should be applied to coastal waters: Several commenters suggested that an integrated "watershed management" or "coastal management" concept (consistent with the CZARA Action Plan) must be extended to coastal waters as the appropriate means for protecting beneficial uses and solving complex water quality problems. To do so, the SWRCB must develop a more effective program for regulating storm water discharges, non-point sources (and perhaps other sources such as dredged material). As the leading cause of impaired water bodies in the State, the control of nonpoint sources of pollution is critical to addressing watershed-based solutions to water quality problems. Point sources have a finely tuned pollution control program after over 25 years of regulation under the Ocean Plan, while other significant sources are only crudely regulated or not at all.

One commenter offered specific ideas on how the Ocean Plan could implement a watershed approach. First, water quality use impairments associated with nonpoint source discharges should be identified. Where such use impairments are found, then a watershed-based, stakeholder-driven, consensus approach should be developed on how best to manage the use

impairments to protect the public's interest without unnecessary expenditures for control of all constituents.

Where exceedances of Ocean Plan objective are found, the Ocean Plan should include an approach that enables those responsible for nonpoint source discharges, the public, and others to work together to determine whether these exceedances represent significant adverse impacts on the beneficial uses of the receiving waters or are administrative exceedances reflecting (in the opinion of the commenter) the overly-protective nature of the Ocean Plan objectives.

More information needed to characterize and monitor nonpoint source discharges: Commenters strongly support an increased emphasis by the SWRCB on characterizing nonpoint source pollutant contributions and, as necessary, developing a program of implementation to ensure that ocean water quality standards are met. These steps are absolutely essential if the State is to make substantial progress in meeting water quality standards in California

Monitoring as well as control measures are needed. Although the Ocean Plan requires measurement of receiving waters for compliance with water quality objectives, this is not done on a consistent basis for ocean waters impacted by nonpoint source discharges. San Diego has had more than its share of beach closures due to urban run-off. The Los Angeles Times (October 5, 1998 issue) reported on pollution at Rincon Point. While the sources of the pollution remain unknown, septic tanks, horse corrals, and area farms are suspected. The article notes that septic systems are used by homes along the coast. As a result, the commenter suggested that nonpoint source control should not be deferred to the jurisdiction of the SWRCB's *Inland Surface Water Plan* or the *Enclosed Bay and Estuaries Plan* (or individual Basin Plans, since these two plans have now been rescinded) as might be inferred in the August 1998 *Staff Report: Issues For Review*.

Schedule of compliance for meeting Ocean Plan water quality objectives: Given the complexity of source control, specific effluent limitations and waste discharge requirements have not been used extensively for nonpoint discharges. Instead, the SWRCB developed three general management approaches in the 1988 Nonpoint Source Management Plan that are to address nonpoint source problems. In general, the least stringent option that successfully protects or restores water quality is employed, with more stringent measures considered if timely improvements in beneficial use protection are not achieved. The three options are listed in order of increasing stringency:

Tier I:	Voluntary implementation of Best Management Practices;
Tier II:	Regulatory-based encouragement of Best Management Practices; and
Tier III:	Establishment of Effluent Limitations in Waste Discharge Requirements.

One commenter recommended that the Ocean Plan include language regarding enforcement of the proposed management measures. For example, the Ocean Plan should identify clear, specific and automatic triggers for moving from Tier I (voluntary) enforcement to Tiers II and III. The need for such enforcement is critical to controlling nonpoint source pollution in state ocean waters.

Coordinate Ocean Plan Water Quality Standards with California Action Plan: Section 6217 of the federal Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 requires that states with an approved coastal zone management program (including California) develop a coastal nonpoint source pollution control program. In August 1997, the U.S. EPA and the National Oceanic and Atmospheric Administration (NOAA) reached agreement with the SWRCB and the California Coastal Commission on the CZARA Action Plan to more fully protect water quality and comply with the requirements of Section 6217 of CZARA. The CZARA Action Plan outlines key activities that the State will undertake to improve its nonpoint source management program - such as preparing a management measure review document and an implementation strategy. The goal of the program is to implement necessary management measures within 15 years.

Several commenters suggested that the SWRCB should identify and consider possible amendments to the Ocean Plan that would enhance the State's ability to address nonpoint source pollution of marine waters, consistent with the requirements of CZARA and the management measures and implementation strategies that are currently being prepared. California should have a final Coastal Nonpoint Pollution Control Program, along with a detailed five-year implementation strategy, by the end of 1999. Therefore, there should be enough detail available to incorporate specific nonpoint pollution control provisions into the Ocean Plan. To help ensure enforceability, the SWRCB should also incorporate controls identified in portions of the Action Plan into the Ocean Plan.

Ocean Plan should include guidance for implementing nonpoint source discharge control programs: The August 1998 *Staff Report: Issues For Review*, poses the question: *"Should the California Ocean Plan include a specific implementation program for the control of nonpoint sources of pollution?"* One commenter indicated that the answer is obviously "yes", - where pollution is defined in accord with the Porter-Cologne Act as an impairment of the beneficial uses of the waters, not as simply the presence of a constituent that under some conditions at some locations may be a pollutant. The commenter suggested that pollution should be defined based on a 1990's level of aquatic chemistry, toxicology and biology.

Many commenters suggested that the development and implementation of a program for the control of nonpoint sources should be a very high priority for the SWRCB in terms of resource allocation and completion schedules. The Ocean Plan should include a specific implementation plan for controlling nonpoint sources of pollution into ocean waters of the State, including specific measures and appropriate policies such as detailed provisions for implementing a Total Maximum Daily Load (TMDL) that must address nonpoint source pollution. These types of measures and policies are already beginning to be included in various RWQCB Basin Plans, and should be included in the Ocean Plan as well.

Many commenters also urged SWRCB staff to work closely with groups conducting storm water control efforts and promote and/or incorporate successful strategies into the Ocean Plan, such as the Model Urban Runoff Program (MURP), as a means of addressing the nonpoint source issue. The MURP program, funded by a grant from the SWRCB, was developed by the cities of Monterey and Santa Cruz, the Monterey Bay National Marine Sanctuary and the

Coastal Commission. It provides an easy to use cookbook of management measures, institutional arrangements and educational tools for small cities to use to address urban runoff.

Suggestions were also made that as the U.S. EPA moves to finalize and implement its "Phase II," NPDES municipal storm water permit program in March 1999, the SWRCB should seize this important opportunity to expand and improve upon storm water regulation by closely coordinating the Phase II changes with provisions of the Ocean Plan.

Review of Ocean Plan water quality objectives: Commenters suggested that it is time for the SWRCB to begin a concerted effort to sort through the Ocean Plan and determine which objectives can be directly applied to storm water and nonpoint sources, and which are inappropriate and require a different approach. For example, bacterial standards are readily applied to these sources, whereas the toxics limitations of Table B are not easily applied to storm water discharges, and a new approach may be needed.

It is important to make progress on these issues now, because regulatory approaches such as BMPs are being adopted without clear endpoints and direction on how these sources should be integrated with control of conventional point sources to protect coastal waters. Additionally, several coastal Regional Water Quality Control Boards (RWQCB) have identified coastal waters as impaired for a variety of pollutants and are moving toward the development of Total Maximum Daily Loads to achieve water quality standards. There is virtually no guidance as to how this should be done for storm water and nonpoint sources.

One commenter recommended that nonpoint source dischargers as well as the public should be required to pay for the investigations needed to reliably define whether constituents, such as pesticides, nutrients, etc., derived from agricultural and other non-NPDES-permitted sources are significant causes of impairment of the nearshore marine waters of the State.

Nonpoint source discharge is a trans-border issue: The impact of nonpoint source discharges on coastal water quality is a trans-border issue in the San Diego area due to a shared watershed with Mexico. One commenter suggested that cooperative arrangements with Mexico need to be established to address this issue.

Staff Comments: Although nonpoint source discharges (including storm water runoff) are the primary cause of pollution in California's coastal and ocean waters, it appears that most of these discharges reach coastal waters by first entering up-gradient waterways rather than flowing directly into the ocean. Control of these discharges is, in large part, under the jurisdiction of other regional water quality control plans (Basin Plans) and the CZARA Action Plan. However, for those nonpoint sources discharging directly to coastal and ocean waters, staff has concluded that additional efforts are necessary to locate and identify such discharges, and determine the effectiveness of existing and proposed programs in meeting Ocean Plan water quality standards. Additional efforts are necessary to a) identify, and characterize nonpoint sources of discharge to coastal waters, b) review the appropriate manner for applying water quality objectives to such nonpoint discharges, c) determine the effectiveness of BMPs in meeting Ocean Plan water quality standards, d) consider a schedule for compliance with water quality objectives, and e) propose trigger criteria for moving between

voluntary compliance with BMPs (Tier I) and more stringent requirements (Tier II and Tier III) for discharges to impaired waterbodies.

Alternative(s) for Staff Action:

1. ***Minimum Effort:*** Monitor progress of the current SWRCB nonpoint source management program / CZARA Action Plan, and local / regional efforts such as the Southern California Coastal Water Research Project, the Santa Monica Bay Restoration Project and the Monterey Bay National Marine Sanctuary in meeting Ocean Plan water quality standards.

Estimated Staff Effort: 0.1 PY per year over a three-year period

2. ***Baseline Effort:*** In addition to the Minimum Effort, the current Ocean Standards Unit staff allocation for this issue will permit a more detailed investigation (including formulation of conclusions and recommendations) for each of the comments and suggestions raised during both the 1992 and 1998-1999 Triennial Reviews. In addition, staff will collect and evaluate existing information from the RWQCB's dischargers, and other interested parties to determine the effectiveness of existing and proposed nonpoint source control programs in meeting Ocean Plan requirements. Appropriate amendments will be developed with the assistance of stakeholders to provide guidance for implementing nonpoint source discharge control programs such as the CZARA Action Plan to ensure protection of beneficial uses.

Estimated Staff Effort: 0.3 PY per year over a three-year period

3. ***Augmented Budget Effort:*** In addition to the Baseline Effort, augmented budget resources are necessary to define and map the geographic location and extent of nonpoint sources discharging directly to coastal and ocean waters within the jurisdiction of the Ocean Plan. Such an effort is a necessary first step in meeting the existing receiving water sampling requirements of the Ocean Plan. Resources are necessary to augment existing information with field work by the six coastal RWQCB's to ensure that all nonpoint sources discharging directly to coastal and ocean waters are identified and mapped in a timely manner. All efforts will be coordinated with the CZARA Action Plan.

Estimated Staff Effort: (See Baseline Effort)

Estimated Contract Commitment: $100,000 augmented one year only for FY 2000/2001

Staff Recommendation: Alternative 3 - Augmented Budget Effort

Recommended Priority: Higher Priority

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Issue C.4.h: Review Monitoring Requirements for Bacterial Standards in Appendix II (August 1998 Staff Report Issue E.4.a)

Should the Bacterial Standards section of Appendix II, Standard Monitoring Procedures be clarified and the references updated?

Current Ocean Plan: Appendix II of the California Ocean Plan (Ocean Plan) contains information on the range of sample dilutions to be used for bacterial analysis. It also references which analytical methods are to be used.

Issue Description: Staff has received comments from dischargers and environmental groups that this section is worded unclearly and needs to be re-written.

List of Commenters: Donald P. Schulz, P.E., Surfrider Foundation Blue Water Task Force; Terry Oda, United States Environmental Protection Agency; Charles W. Carry and Robert W. Horvath, County Sanitation Districts of Los Angeles County; Robert P. Ghirelli, D. Env., Orange County Sanitation District.

Summary of Comments: Two commenters recommended that the State Water Resources Control Board (SWRCB) consider this issue a high priority. One person stated that the Ocean Plan defines test limits for bacterial concentration in terms of absolute numerical values. The analytical methods approved for use are statistical in nature, do not necessarily have the same relative precision, and are not numerically equal to the absolute values listed for the bacterial standards. It is recommended that Appendix II of the Ocean Plan be modified to add a compliance reporting standard for coliform testing at or above the 95% confidence limit. Using the 95% confidence limit would be consistent with other health and safety standards, and would further serve to encourage U.S. EPA approval and adoption of more precise testing methods as they become available.

The second commenter requested that the low detection limit for indicator bacteria should be raised to <20 from the <2 currently in the Ocean Plan. In terms of risk to the swimming public, there is no difference between 20 and 2 organisms to offset the additional cost for analyses using the multiple tube fermentation technique. Also, if enterococci monitoring remains in the Ocean Plan, EPA Method 1600 should be added to Appendix II as an acceptable method for detection and enumeration of enterococci. This is a 24 hour method.

Two commenters felt that the bacterial monitoring section of Appendix II should be modified, but that this issue should be of medium priority. There is increasing interest in chromogenic substrate tests for total coliform and *Escherichia coli*. However, these tests are not currently approved by U.S. EPA for use in marine waters. Many agencies directly responsible for public health may have prematurely incorporated or substituted these unapproved test methods. There is minimum or no documentation of comparability of the chromogenic tests with approved methods (in specific water types and in wet vs. dry season samples). The chromogenic substrate tests are designed to measure *E. coli*, and this value is then substituted for fecal coliform. And, there is no accreditation or oversight process of these new methods.

Alternatives for Staff Action:

1. ***Baseline Effort***

a. Change the sample dilution lower limit from 2 to 20;

b. Change the third paragraph of Chapter II to read as follows:
"Detection methods used for entereococcus shall be those presented in EPA publication EPA 600/4-85/076, Test Methods for Escherichia coli and Enterococci in Water By Membrane Filter Procedure, EPA-821-R-004, Method 1600: Membrane Filter Test Method for Enterococci in Water, or any improved method determined by the Regional Board (and approved by EPA) to be appropriate".

c. Investigate the suggestion to add a compliance reporting limit for coliform testing at or above the 95% confidence level. Investigate the need for separate standards for each bacterial test method.

Estimated Staff Effort: 0.8 PY over a three-year period

2. ***Augmented Budget Effort***

Encourage and provide funds for tests to verify the comparability of the chromogenic tests with approved methods (in specific water types and in wet vs. dry season samples). If it is determined that there is a need to modify Appendix II to improve compliance reporting, provide the funding to achieve this.

Estimated Contract Commitment: $100,000 (over a three-year period).

Staff Recommendation: Alternative 1 - Baseline Effort

Recommended Priority: Higher Priority

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Issue C.4.i: On-going Review of the Ocean Plan's Critical Life Stage Tests (August 1998 Staff Report Issue E.4.b)

Should there be an on-going review of the critical life stage test list in the California Ocean Plan?

Current Ocean Plan: In 1997, the State Water Resources Control Board (SWRCB) adopted an updated list of critical life stage tests. Toxicity tests on the list are used to monitor compliance with the water quality objective for chronic toxicity.

Issue Description: The Toxic Unit chronic (TUc) listed in Table B of the California Ocean Plan (Ocean Plan) is used to monitor compliance of permitted ocean waste discharges for chronic toxicity. Marine critical life stage toxicity tests is the tool used to measure the chronic toxicity of the discharges and to determine whether compliance is met.

The Ocean Plan list, adopted in 1990, contained seven critical life stage protocols. These protocols were developed and selected for the list in response to Section 13170.2 (c) of the Porter-Cologne Water Quality Control Act which requires the SWRCB to "develop bioassay protocols to evaluate the effect of municipal and industrial waste discharges on the marine environment."

Each protocol on the 1990 Ocean Plan list, had to meet seven criteria in order to be included on the list:

1. The existence of a detailed written description of the test method;
2. A history of testing with a reference toxicant;
3. Interlaboratory comparisons of the method;
4. Adequate testing with wastewater;
5. Measurement of an effect that is clearly adverse;
6. Measurement of at least one nonlethal effect; and
7. Use of marine organisms native or established in California.

In 1993, SWRCB staff convened a ten member external advisory group known as the Protocol Review Committee (PRC) to review the protocol selection criteria and to consider updating the existing protocol list. The PRC is an assemblage of aquatic toxicology experts representing industry, academia, and government.

In 1994, the PRC recommended to SWRCB staff a revised list of critical life stage protocols acceptable for use in measuring compliance (Bay et al., 1994) of waste discharges into the ocean. This list was the culmination of four additional years of test method refinement and development since the use of specific toxicity tests was first included in the 1990 Ocean Plan.

As with the 1990 Ocean Plan amendments, the revised list proposed by the PRC in 1994 had to satisfy several protocol selection criteria. The PRC added two additional criteria to the seven criteria used in compiling the 1990 list:

1. The protocol must have information that documents relative sensitivity to toxic/reference materials and compares it to the 1990 Ocean Plan-listed tests; and

2. The organism(s) specified in the protocol must be readily available either by field collector or by laboratory culture.

The revised list of critical life stage protocols recommended by the PRC was later adopted by the SWRCB for the 1997 Ocean Plan. The 1997 list includes four west coast protocols (giant kelp, red abalone, mysid shrimp, and topsmelt fish) that have been developed by the SWRCB's Marine Bioassay Project. Also included are methods that utilize sea urchins, silversides (fish), east coast mysid shrimp, oysters and mussels that are included in the U. S. Environmental Protection Agency's *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*.

As the field of aquatic toxicology continues to evolve, the tests used to measure the toxicity of waste discharges continue to improve. As a result, ongoing review of currently listed and newly proposed critical life stage test methods are essential in keeping pace with improvements in the field.

List of Commenters: Robert P. Ghirelli, Orange County Sanitation District; Alan C. Langworthy and Tim Rothans, City of San Diego; Robert W. Horvath, County Sanitation Districts of Los Angeles County; Margaret H. Nellor, Tri-Tac Chair, County Sanitation Districts of Los Angeles County; Judith A. Wilson and Mas Dojiri, City of Los Angeles.

Summary of Comments: All of the commenters recommend that resources be made available to continue reviewing the Ocean Plan list and to propose necessary revisions to keep pace with the evolving field of aquatic toxicology and critical life stage test method development.

Alternative(s) for Staff Action:

1. ***Minimum Effort***
Staff would review the current list of critical life stage test protocols on a continuing basis to determine if revisions are necessary to keep pace with the latest developments in aquatic toxicology.

Estimated Staff Effort: 0.5 PY (over a three-year period).

2. ***Baseline Effort***
In addition to the baseline effort, staff would work with the Protocol Review Committee and contract with researchers from U.C. Santa Cruz to continue evaluating and updating the current Ocean Plan list of critical life stage test methods. The contractor would also provide technical expertise to laboratories performing the marine toxicity tests and conduct workshops for State and Regional Board staff on WET test procedures.

Estimated Staff Effort: 0.8 PY over a three-year period

Estimated Contract Commitment: Baseline funding of $70,000 per year over a three year period

Staff Recommendation: Alternative 2 - Baseline Effort.
Work with recognized experts in the field of aquatic toxicology in reviewing and revising the Ocean Plan list of critical life stage protocols.

Recommended Priority: Higher Priority

References:

Bay et al., 1994. *Proposed California Ocean Plan Protocols for Critical Life Stage Tests and Examination of Toxicity Test Variability. Recommendations by the Ocean Plan Protocol Review Committee to the State Water Resources Control. Board*

U.S. EPA. 1989. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (Second Edition). EPA/600/4-89/001.

U.S. EPA. 1995. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA/600/R-95/136).

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Issue C.5.a: Clarification of Terminology in Ocean Plan (August 1998 Staff Report Issue E.5.a)

Should any existing definitions be changed, new definitions added, or other changes made to clarify the meaning of the California Ocean Plan?

Current Ocean Plan: Many terms used in the 1997 California Ocean Plan (Ocean Plan) are clarified in Appendix I. Several terms require a technical definition which may include a mathematical formula or an example.

Issue Description: A number of technical terms in the California Ocean Plan are not defined. Although they may be understood by persons involved in the management or regulation of waste discharges, other persons affected by the Ocean Plan provisions may find the terms confusing. Certain terms have a special meaning because they are defined in a State or federal law which is related to State Water Resources Control Board (SWRCB) or Regional Water Quality Control Board (RWQCB) activities. Some people reading or implementing the Ocean Plan may not be aware of the special meaning of these terms. Some terms are perceived to be confusing because they are not precise.

List of Commenters: Linda M. Sheehan, Center for Marine Conservation; Ann Notthoff, Natural Resources Defense Council; and Vicki Nichols, Save Our Shores.

Summary of Comments: The commenters supported the proposed issue and all recommended clarification of the definitions for ocean waters and enclosed bays. Each commenter suggested preparation of a more complete list of examples for the definitions of "ocean waters" and "enclosed bays" and stated that, ideally, a map of the ocean waters boundary would be very helpful. Commenters also suggested that staff schedule a workshop midway through the triennial review process as a means for assessing (and informing the public on) progress to date.

Staff Comment: Staff concurs that a more complete list of "enclosed bays" would be helpful to all concerned. Good maps for use as reference maps are more readily available to the public than when the definition originated so it should not be difficult to prepare a State map of ocean waters and enclosed bays.

Alternative(s) for Staff Action:

1. ***No Effort***

2. ***Baseline Effort***
Examine all comments for terms or definitions in the Ocean Plan that have caused confusion. Prepare a list of terms or definitions which appear to need clarification. Determine if any term or definition on the list appears in state or federal laws or regulations in a related context. Prepare a proposed amendment including those terms and definitions which appear to need clarification. Clarification of Ocean Plan terminology would be performed with each subsequent group of proposed amendments, on an as needed basis. Select "enclosed bays" for use as additional examples in the definition and coordinate with staff working on developing a

new "Bays and Estuaries Plan" and the "Thermal Plan" so that a common definition could serve all plans. Prepare a proposal for amending Section 13391.5(a) CWC and any water quality control plans in which the definition appears. Investigate the possibility of (a) using electronic mapping equipment to identify all "enclosed bays" along the California coast and (b) making the results available to the public.

Estimated Staff Effort: 0.1 PY per year over a three year period.

Staff Recommendation: Alternative 2 - Baseline Effort

Recommended Priority: Higher Priority

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D. ABBREVIATIONS

ASBS	Areas of Special Biological Significance
ATEL	Acute Toxicity Effluent Limitation
BCF	Bioconcentration Factor
BMPs	Best Management Practices
BOD	Biological Oxygen Demand
BRI	Benthic Response Index
BWT	Body Weight
Cal/EPA	California Environmental Protection Agency
CAS	Chemical Abstracts Service
CEQA	California Environmental Quality Act
CPF	Cancer Potency Factor
CV	Coefficient of Variation
CWC	California Water Code
CWA	Clean Water Act
Dm	Minimum Probable Initial Dilution
DNQ	Detected, But Not Quantified
FCR	Fish and Shellfish Consumption Rate
IRIS	Integrated Risk Information System
LC 50	Lethal Concentration 50
MER	Mass Emission Regulations
MDL	Method Detection Limit
ug/l	micrograms per liter
ML	Minimum Level
ng/l	nanograms per liter
ND	Not Detected
NMS	National Marine Sanctuaries
NPDES	National Pollutant Discharge Elimination System
ONRW	Outstanding National Resource Water
OSRW	Outstanding State Resource Water
PCB's	Polychlorinated Biphenyls
PMP	Pollutant Minimization Program
POTWs	Publicly Owned Treatment Works
PQL	Practical Quantitation Level
Rfd	Reference Dose
RL	Risk Level
RWQCB	Regional Water Quality Control Board
SCTAG	Southern California Toxicity Assessment Group
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SWRCB	State Water Resources Control Board
TIE	Toxicity Identification Evaluation
TRE	Toxicity Reduction Evaluation
TUa	Toxicity Unit Acute
U.S. EPA	United States Environmental Protection Agency

WET	Whole Effluent Toxicity
WQBEL	Water Quality Based Effluent Limit
WQO	Water Quality Objective
WQPP	Water Quality Protection Plan
ZID	Zone of Initial Dilution