



# California Regional Water Quality Control Board

## San Diego Region



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**DATE:** December 10, 2009

**TO:** David T. Barker  
Branch Chief  
**SURFACE WATER BASINS BRANCH**

**FROM:** *Brian D. Kelley*  
Brian D. Kelley  
Senior Water Resource Control Engineer  
**CORE REGULATORY UNIT**

**SUBJECT: APPLICATION OF TECHNOLOGY-BASED EFFLUENT LIMITATIONS FOR DISCHARGES TO THE PACIFIC OCEAN IN THE SAN DIEGO REGION**

### Purpose

This memo evaluates the current NPDES permit regulation of discharges to the Pacific Ocean by the San Diego Regional Water Quality Control Board (Regional Board) in the San Diego Region. The following issues are addressed:

- 1) Discussion of relevant regulations regarding the application of technology-based effluent limitations (TBELs) for discharges to the Pacific Ocean,
- 2) Consistency of current application of TBELs to various individual NPDES permitted ocean discharges in the San Diego Region, and
- 3) Consideration of application of Ocean Plan TBELs for brine discharges to bays, estuaries and inland surface waters in the San Diego Region.

### Relevant regulations regarding the application of TBELs for discharges to the Pacific Ocean

Regulations governing waste discharges to the Pacific Ocean in California are, in part, contained in the State Water Resource Control Board (State Water Board), Water Quality Control Plan for Ocean Waters of California (Ocean Plan). The Ocean Plan was last updated in 2005 and includes effluent limitations for grease and oil, suspended solids, settleable solids, turbidity, and pH as listed in Table A. These effluent limitations apply to publicly-owned treatment works (POTWs) and industrial discharges for which effluent limitations guidelines have not been established pursuant to Sections 301, 302,

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304, or 306 of the Federal Clean Water Act. The *Final Functional Equivalent Document, Amendment of the Water Quality Control Plan for Ocean Waters of California* dated September 1, 2000, refers to the Table A Ocean Plan Effluent Limitations as technology-based effluent limitations (TBELs).

The United States Environmental Protection Agency (USEPA) regulations at 40 CFR 122.44(a)(1) require permits to include TBELs promulgated by the USEPA under Section 301 of the CWA. USEPA promulgated TBELs for POTWs as secondary treatment regulations at 40 CFR Part 133. Secondary treatment is defined in terms of three parameters [5-day biochemical oxygen demand (BOD<sub>5</sub>), TSS, and pH] and TBELs are established for these parameters. The TBELs from the Ocean Plan and the secondary treatment TBELs are compared and the more stringent TBEL is included in NPDES permits. The USEPA also issues Effluent Limitation Guidelines (ELGs) which are technology-based regulations to control industrial wastewater discharges. These regulations are established to protect human health and maintain and enhance water quality. The ELGs are TBELs based on the performance of treatment and control technologies.

The Regional Board has historically considered brine discharges to be industrial discharges. Demineralization/desalination for production of a high quality water supply involves a process of removing minerals or minerals salts from a source water, such as groundwater or seawater. Demineralization/desalination most often uses a reverse osmosis (RO) process resulting in a concentrated brine waste. In addition to the concentrated brine waste, the RO process may result in other wastes generated by filter backwashing, cleaning of other process components, or chemical additions used in the treatment process. All of these wastes may contain pollutants that could cause excursions of narrative or numerical water quality objectives including, but not limited to, the Ocean Plan Table A constituents. Also, because USEPA has not promulgated ELGs for brine discharges, the Ocean Plan Table A TBELs are the applicable limitations for such discharges to the Pacific Ocean. The USEPA has ELGs under development for drinking water treatment facilities including desalination concentrates. The potential ELGs are discussed on USEPA's Industrial Regulations web page. The brine discharge from the Poseidon Resources Corporation was determined to be an industrial discharge during the permitting process. Furthermore, the State Water Board has informed the Regional Board that industrial discharges for purposes of the Ocean Plan are broadly defined and that Ocean Plan Table A TBELs would apply to water treatment and brine waste discharges. Also, in August 2005, State Water Board made available a draft NPDES Permit Development Guide which explicitly classifies water treatment facilities as industrial facilities (page 4-2). Based on all of these considerations, the Ocean Plan Table A TBELs are directly applicable to brine discharges.

USEPA has promulgated regulations on technology-based treatment requirements in permits at Code of Federal Regulations Title 40, Section 125.3 (40CFR125.3). Technology-based treatment requirements cannot be satisfied through the use of "non-treatment" techniques such as flow augmentation and in-stream mechanical aerators [40CFR.125.3(f)]. Based on 40CFR125.3, TBELs including Ocean Plan Table A TBELs, secondary treatment TBELs, and ELGs apply at the facility prior to any mixing with other effluents or dilution with receiving water. The USEPA has repeatedly confirmed this

approach in written comments over the years on various Regional Board tentative NPDES permit actions.

### **Consistency of current application of TBELs among the various ocean discharges in the San Diego Region**

The largest volumes of discharges to the Pacific Ocean in the San Diego Region are from sewage treatment plants (or POTWs) and power plants; there are also several other smaller volume miscellaneous discharges including brine discharges. The attached Table 1 summarizes discharges to the Pacific Ocean regulated by the Regional Board through NPDES permits that contain TBELs.

Appropriate TBELs are applied to all ocean discharges for sewage, brine, and power plant cooling water as shown in the attached Table 1. In some cases, multiple facilities discharge through the same ocean outfall. Table 1 identifies the discharges which have TBELs applied to the individual facility effluent or to the co-mingled (or combined) effluent from several facilities.

There are several brine waste discharges resulting from groundwater desalination and recycled water operations regulated in the San Diego Region. Recently, due to water resource development projects spurred by drought conditions, there has been an increase in proposed projects that would produce a brine waste. Most of these facilities discharge brine waste into an existing ocean outfall that is also used for treated sewage discharge.

As shown in Table 1, for the majority of discharges to the ocean, TBELs are applied correctly at the facility prior to mixing with other effluents or dilution with receiving water. There are, however, a few discharges where the compliance point for TBELs is located downstream of a facility after mixing with other effluents discharging to the same ocean outfall.

Some degree of inconsistency between waste discharge requirements for similar waste discharges is not uncommon. This may be due to the fact that permits are not renewed at the same time or the fact that different permit writers prepare each permit and each permit writer has discretion on where to establish a compliance point. Also, with time, policies are revised and their interpretation is refined and there is a time delay when the updated plans, policies, and regulations are incorporated into existing NPDES permits. This development is reflected subsequently in permits as each one becomes due for reissuance. An example of an inconsistency can be seen between the National Pollutant Discharge Elimination System (NPDES) permit for the City of Oceanside (Order No. R9-2005-0136, adopted on August 10, 2005) and two NPDES permits for South Orange County Wastewater Authority (SOCWA; Order Nos. R9-2006-0054 and R9-2006-0055, adopted August 16, 2006).

The City of Oceanside operates the Brackish Groundwater Desalination Facility (BGDF), which is regulated under Order No. R9-2005-0136. Treatment at the BGDF includes cartridge filtration (microfiltration). Solids removed by the filters are disposed

of, along with the filters, as solid waste. Treated sewage from two City of Oceanside POTWs and brine from the BGDF are discharged to the Oceanside Ocean Outfall. At the three Oceanside facilities regulated under Order No. R9-2005-0136, some of the TBELs are applied to the combined City of Oceanside effluent and some to the individual POTWs. The two POTWs have secondary treatment TBELs applied to each facility, but the BGDF has no individual facility TBELs. Ocean Plan Table A TBELs for oil and grease, settleable solids and turbidity are applied to the combined effluent only.

The South Orange County Wastewater Authority (SOCWA) has a number of industrial discharges to their two ocean outfalls in addition to treated sewage discharges. SOCWA's NPDES Order No. R9-2006-0054 for the San Juan Creek Ocean Outfall regulates discharges from the Segunda Deshecha (M02) Flood Control Channel urban runoff treatment system, the City of San Juan Reverse Osmosis Water Treatment Plant, and the South Coast Water District Groundwater Recovery Facility (GRF). SOCWA's NPDES Order No. R9-2006-0055 for the Aliso Creek Ocean Outfall regulates discharges from the Shallow Groundwater Unit and RO brine discharges from the Irvine Desalter Project. Ocean Plan Table A TBELs have been applied correctly at each of SOCWA's facilities individually and not to the combined ocean outfall discharge.

In those few cases where the TBELs are inconsistent with state and federal regulations, the Regional Board will make changes to the NPDES permits to implement the TBELs at each facility during the next permit reissuance process. It is anticipated that there will continue to be an increase in requests for NPDES permits for brine discharges. It is important to consistently apply the Ocean Plan Table A TBELs to all ocean discharges, including brine discharges. In the future, the Ocean Plan Table A TBELs, and all TBELs, will be appropriately applied to each facility's discharge.

### **Consideration of application of Ocean Plan TBELs for brine discharges to all surface waters in the San Diego Region**

The Ocean Plan Table A TBELs for grease and oil, suspended solids, settleable solids, turbidity, and pH were not developed solely to protect the ocean waters. By definition TBELs are based on the technology available to treat the pollutants. This same technology can be used for discharges to inland surface water or other coastal waters. The Water Quality Control Plan for the San Diego Basin (Basin Plan) contains numeric water quality objectives for pH, but only narrative water quality objectives for grease and oil, suspended solids, and settleable solids. There are no ELGs for brine discharges specifically, but the Ocean Plan Table A TBELs can be used to provide a minimum protection for inland surface waters, enclosed bays and estuaries, and coastal lagoons.

### **Conclusions and Recommendations**

Based on a review of the current state and federal regulations, technology-based effluent limitations (TBELs) have been developed that apply to sewage treatment plants and industrial discharges. TBELs include federally promulgated secondary treatment standards and Effluent Limitation Guidelines (ELGs) as well as State Water Board

adopted Ocean Plan Table A effluent limitations. Brine discharges are industrial discharges for which federal standards have not been promulgated and, thus, Ocean Plan Table A TBELs do apply to brine discharges to the Pacific Ocean. TBELs must be applied to the discharge from a facility prior to any mixing with other effluents or dilution with receiving water.

The application of TBELs to ocean discharges in the San Diego Water Board's jurisdiction is consistent with the above interpretation with a few exceptions. In those few exceptions where the TBELs are inconsistent with state and federal regulations, changes to the NPDES permits to correctly implement the TBELs at each facility will be made during the next permit reissuance process.

In order to implement the narrative and numerical water quality objectives for bays, estuaries and inland surface waters in the San Diego Region, use of the Ocean Plan Table A TBELs for discharges to these waters is an appropriate regulatory approach as a minimum level of protection. It is recommended that Ocean Plan Table A TBELs or other similar limitations be included in NPDES permits in the San Diego Region for bay, estuary, and inland surface water discharges as appropriate.

**Table 1**  
**Summary of San Diego Regional Water Board Individual NPDES Permit Regulated Discharges to the Pacific Ocean**  
**December 10, 2009**

Facility	Waste Type	NPDES Permit Responsible Party	Ocean Outfall Name	NPDES Order No.	Co-Mingled Effluent	Facility TBEL	Co-Mingled TBEL
Joint Regional Plant	Sewage	South Orange County Wastewater Authority	Aliso Creek Ocean Outfall	R9-2006-0055	Yes	Yes	No
Coastal Treatment Plant	Sewage	South Orange County Wastewater Authority	Aliso Creek Ocean Outfall	R9-2006-0055	Yes	Yes	No
Los Alisos Water Reclamation Plant	Sewage	South Orange County Wastewater Authority	Aliso Creek Ocean Outfall	R9-2006-0055	Yes	Yes	No
El Toro Water Recycling Plant	Sewage	South Orange County Wastewater Authority	Aliso Creek Ocean Outfall	R9-2006-0055	Yes	Yes	No
Irvine Desalter Project (Shallow Groundwater Unit)	Treated Contaminated Groundwater	South Orange County Wastewater Authority	Aliso Creek Ocean Outfall	R9-2006-0055	Yes	Yes	No
Irvine Desalter Project (Reverse Osmosis)	Brine	South Orange County Wastewater Authority	Aliso Creek Ocean Outfall	R9-2006-0055	Yes	Yes	No
Jay B. Latham Regional Treatment Plant	Sewage	South Orange County Wastewater Authority	San Juan Creek Ocean Outfall	R9-2006-0054	Yes	Yes	No
Chiquita Water Reclamation Plant	Sewage	South Orange County Wastewater Authority	San Juan Creek Ocean Outfall	R9-2006-0054	Yes	Yes	No
Plant 3A Reclamation Plant	Sewage	South Orange County Wastewater Authority	San Juan Creek Ocean Outfall	R9-2006-0054	Yes	Yes	No
City of San Clemente Reclamation Plant	Sewage	South Orange County Wastewater Authority	San Juan Creek Ocean Outfall	R9-2006-0054	Yes	Yes	No
Segunda Deshecha (M02) Flood Control Channel Urban Runoff Treatment Facility	Treated Urban Runoff	South Orange County Wastewater Authority	San Juan Creek Ocean Outfall	R9-2006-0054	Yes	Yes	No
City of San Juan Capistrano Reverse Osmosis Water Treatment Plant	Brine	South Orange County Wastewater Authority	San Juan Creek Ocean Outfall	R9-2006-0054	Yes	Yes	No
South Coast Water District Groundwater Recovery Facility	Brine	South Orange County Wastewater Authority	San Juan Creek Ocean Outfall	R9-2006-0054	Yes	Yes	No
SONGS Unit 2	Power Plant Cooling Water	Southern California Edison	SONGS Unit 2 Outfall	R9-2005-0005	Yes	Yes	No
SONGS Unit 2	Sewage	Southern California Edison	SONGS Unit 2 Outfall	R9-2005-0005	Yes	Yes	No
SONGS Unit 3	Power Plant Cooling Water	Southern California Edison	SONGS Unit 3 Outfall	R9-2005-0006	Yes	Yes	No
SONGS Unit 3	Sewage	Southern California Edison	SONGS Unit 3 Outfall	R9-2005-0006	Yes	Yes	No
San Luis Rey Wastewater Treatment Plant	Sewage	City of Oceanside	Oceanside Ocean Outfall	R9-2005-0136	Yes	Yes	Yes
La Salina Wastewater Treatment Plant	Sewage	City of Oceanside	Oceanside Ocean Outfall	R9-2005-0136	Yes	Yes	Yes
Brackish Groundwater Desalination Facility	Brine	City of Oceanside	Oceanside Ocean Outfall	R9-2005-0136	Yes	No	Yes
Wastewater Treatment Plant No. 1	Sewage	Fallbrook Public Utility District	Oceanside Ocean Outfall	R9-2006-0002	Yes	Yes	No
Genentech, Inc.	Brine	Genentech, Inc.	Oceanside Ocean Outfall	R9-2008-0082	Yes	Yes	No
Southern Region Tertiary Treatment Plant	Sewage	Marine Corps Base, Camp Pendleton	Oceanside Ocean Outfall	R9-2008-0096	Yes	Yes	No
Encina Power Plant	Power Plant Cooling Water	Cabrillo Power LLC, Carlsbad	Encina Discharge Channel	R9-2006-0043	Yes	Yes	No
Carlsbad Desalination Project	Brine	Poseidon Resources Corporation	Encina Discharge Channel	R9-2006-0065	Yes	Yes	No
Encina Water Pollution Control Facility	Sewage	Encina Wastewater Authority	Encina Ocean Outfall	R9-2005-0219	Yes	No	Yes
Meadowlark Water Reclamation Plant	Sewage	Encina Wastewater Authority	Encina Ocean Outfall	R9-2005-0219	Yes	No	Yes
Shadowridge Water Reclamation Plant	Sewage	Encina Wastewater Authority	Encina Ocean Outfall	R9-2005-0219	Yes	No	Yes

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Facility	Waste Type	NPDES Permit Responsible Party	Ocean Outfall Name	NPDES Order No.	Co-Mingled Effluent	Facility TBEL	Co-Mingled TBEL
San Elijo Water Reclamation Facility	Sewage	San Elijo Joint Powers Authority	San Elijo Ocean Outfall	R9-2005-0100	Yes	Yes	No
Hale Avenue Resource Recovery Facility	Sewage	City of Escondido	San Elijo Ocean Outfall	R9-2005-0101	Yes	Yes	No
Industrial Brine Collection System	Brine	City of Escondido	San Elijo Ocean Outfall	R9-2005-0139	Yes	Yes	No
Scripps Institute of Oceanography	Aquaria	University of California	Scripps Institute Outfalls	R9-2005-0008	No	Yes	No
Point Loma Ocean Outfall	Sewage	City of San Diego	Point Loma Ocean Outfall	R9-2002-0025	No	Yes	No
South Bay Water Reclamation Plant	Sewage	City of San Diego	South Bay Ocean Outfall	R9-2006-0067	Yes	Yes	No
International Wastewater Treatment Plant	Sewage	International Boundary and Water Commission	South Bay Ocean Outfall	96-50	Yes	Yes	No