

Contaminants of Emerging Concern (CECs) In California's Coastal and Marine Ecosystems

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Water Quality Standards

- Under water quality laws, the State Water Board promulgates water quality standards to protect “beneficial uses” designated by Regional Water Boards, such as municipal water supply and aquatic life protection
- Water quality standards for surface waters currently focus on specific chemicals:
 - Conventional Pollutants
 - the USEPA-designated 129 “priority pollutants.”
- Emerging chemicals were unrecognized as potential threats to water quality when the “priority pollutant” list was established 30 years ago

Monitoring of Discharges and Receiving Water

- We require monitoring of effluent to establish that the permit's effluent limits are being met
- We require monitoring of receiving water to establish the impact of the discharge and that water quality objectives are being met
- A level of quality assurance is required
- We interpret the monitoring data using standard thresholds

Traditional Regulatory Paradigm

For the 129 Priority Pollutants and Others:

- a risk-based approach that considers allowable exposure & potency of effect is used
- requires a wealth of exposure & toxicological information
- results in chemical-specific criteria and standards development
- requires chemical-specific analytical methods

Why Are CECs Different From a Regulatory Perspective?

- Newly recognized constituents in the environment, largely of synthetic chemical industrial origin
- New, therefore not generally monitored for nor do standard methods exist
- Includes a multitude of pharmaceuticals, personal care products, commercial and industrial chemicals
- Unconventional (i.e. non-carcinogenic) or unknown toxicological concerns (e.g. chronic reproductive effects)

New Regulatory Paradigm

- Need more efficient prioritization approach & new research/monitoring tools
- Group CECs by type of effect (“mode of action”) when assessing risk
- Identify appropriate indicators/surrogates to reduce complexity of monitoring
- Subject of multiple ongoing initiatives, including
 - CA CEC Workshop held in Apr 2009 (final report available)
- Success will depend considerably on keeping chemicals out of the waste stream, surface & ground water.

Examples of Current Water Board Required CEC Monitoring

- Los Angeles Regional Water Board requires monitoring of over 20 ECs in direct injection water recycling permits and some recently adopted POTW permits. Based on California Department of Public Health (CDPH)'s draft recharge reuse regulations "End Note #5" list of ECs
- Santa Ana Regional Water Board requires monitoring for Orange County Groundwater Replenishment System and a Chino Basin groundwater recharge project

Water Quality Regulations in California

- State Water Resource Control Board
- Nine Regional Water Quality Control Boards
- Roles & Responsibilities
- State Wide Plans & Policies
- Basin Plans
- NPDES Permits

CEC Coastal and Marine Ecosystems Science and Advisory Panel Charge

Provide expert advice in response to following questions:

- *What are the relative contributions of contaminants of emerging concern (CECs) discharged into coastal aquatic systems* from wastewater and stormwater?*
- *What specific CECs, if any, are most appropriate for monitoring in discharges to coastal aquatic systems and what are the applicable monitoring methods and detection limits?*
- *How are these priority constituents affected by the chemistry, biology and physics of treatment in wastewater systems, by discharge into and transport by coastal streams, rivers and estuaries, and as a result of mixing and dilution with receiving coastal and ocean waters?*

CEC Coastal and Marine Ecosystems Science and Advisory Panel Charge (cont.)

Provide expert advice in response to following questions:

- *What approaches should be used to assess biological effects of CECs to sentinel species in coastal aquatic systems?*
- *What is the appropriate design (e.g. media, frequency, locations) for a CEC monitoring and biological effects assessment program given the current state of the art for monitoring methods, and what level of effects will be detectable with such a monitoring program? How does the sensitivity of the monitoring and assessment program vary with investment?*
- *What concentrations of CECs or levels of biological effects should trigger further actions and what options should be considered for further actions?*

Focus

- Panel to focus on
 - Coastal and marine receiving waters
 - Consider watersheds and drainages leading to the ocean
- Summarize current state of knowledge regarding risks of CECs to coastal/marine ecosystem & public health
- Recommend appropriate monitoring approach to improve understanding of CECs, and, as appropriate, to protect human health & the marine environment

Expectations

- Consistent Approach to CEC Monitoring Statewide
- Trigger Levels of CECs and Options for Further Actions
- Areas in Need of Future Study