UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

DEC 3 1 2014

Thomas Howard
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

FINAL NATIONAL POLLUTION ELIMINATION SYSTEM (NPDES) PROGRAM REVIEW REPORT

Dear Mr. Howard:

EPA Region 9 is pleased to provide you with the final report describing findings of the NPDES program Permit Quality Review (PQR) conducted for California in 2012-14. The final report summarizes our analysis based on permit file reviews and discussions held with managers from State Board and Regional Boards 2, 4, 5, and 9 in 2012-13. We greatly appreciate the cooperation we received from the State and Regional Boards during our performance of the review. We provided the State a draft PQR report in March, 2014 and received draft comments in June 2014. The State submitted no further comments. After carefully reviewing the draft comments, we made some changes in the report. For example, we updated permit issuance status information and acknowledged actions already underway to address several issues raised in the report. Most of our analysis and findings were not changed, and the final report identifies several areas in which certain permitting procedures need to be modified to meet federal requirements.

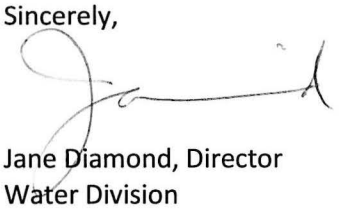
The PQR includes action items for the State and Regional Boards that identify actions needed to address permitting issues identified in the PQR. The Action Items are divided into three categories to identify the relative priority that should be placed on each item:

- Category One- Most Significant: Action Item will address a current deficiency or noncompliance with a federal regulation.
- Category Two – Recommended: Action Item will address a current deficiency with EPA guidance or policy.
- Category Three – Suggested: Action Item are listed as recommendations to increase the effectiveness of the State's NPDES permit program.

We look forward to working with you to determine the next steps and a schedule to promptly implement these Action Items with a focus on the Category 1 Action Items. We appreciate that the State has begun to take action to address several of the action items through revisions of its permit templates, development or revision of training materials, and development of an NPDES quality assurance program plan. We understand it may be possible to address some action items through approaches other than those recommended in the PQR. We anticipate that additional key actions identified to improve the program will be incorporated in the Section 106 grant workplan agreement.

We found the PQR helped us better understand California's NPDES program and identify strengths and opportunities for improvement. We look forward to our continued partnership to achieve clean water goals through the NPDES program. If you have any questions regarding the report, please call me at (415) 972-3275 or David Smith at (415) 972-3464.

Sincerely,



Jane Diamond, Director
Water Division

cc: Executive Officers, Regional Boards 1-9

NPDES PERMIT QUALITY REVIEW

STATE OF CALIFORNIA

San Francisco, Los Angeles, Central Valley, and San Diego Regional Water Quality Control Boards

December 2014

EPA Region 9
75 Hawthorne St. (WTR-2-3)
San Francisco CA 94105

EXECUTIVE SUMMARY

EPA Region 9's National Pollutant Discharge Elimination System (NPDES) Permit Quality Review (PQR) for California found that permits issued in the state were generally of excellent quality and appropriately implemented applicable federal and state regulations. However, we found a pattern of significant deficiencies in permits developed by the Central Valley Regional Water Quality Control Board (RB5) and significant but isolated deficiencies in permits prepared in the San Francisco Bay, Los Angeles, and San Diego Regional Water Quality Control Boards (RBs 2, 4, and 9). We also found some inconsistencies in how different Regional Boards address similar permitting issues. Many of these deficiencies seem to be linked to how the Regional Boards interpret discretion afforded in state-wide policies and guidance.

The PQR examined 28 permits for discharges in the San Francisco Bay, Los Angeles, Central Valley and San Diego Regional Boards along with one General Permit issued by the State Water Resources Control Board (State Board), several State Board permitting policies, and the statewide permit template. EPA plans to review permits from the remaining Regional Boards in a future PQR. The PQR focused on several national and regional priority areas including reasonable potential analysis, enforceability of permits, and provisions for low impact development. The PQR recognizes the many state and region-specific challenges faced by the State of California, including its unique environmental diversity, institutional complexity, resource limitations, and new pollution control challenges. State and Regional Board staff are generally adept at navigating a complex array of policies and guidance, while considering the State's diverse environment, to determine the best permitting approaches. The State Board also continues to develop badly needed statewide policy and guidance, such as Whole Effluent Toxicity and nutrient standards and implementation procedures.

Although permits commonly conformed to national requirements, we identified several problems, principally in how reasonable potential analyses were conducted and water quality based effluent limitations were developed. Since many of the deficiencies seem to stem from different interpretations of state-wide policy and guidance, we believe they can be best resolved if the State Board provides policy clarification and training concerning permitting requirements. Based on this PQR, EPA is recommending modifications to the statewide permit template, State Implementation Policy (SIP), and other permitting policies and guidance. Specifically, the state should develop or clarify policies to address and standardize approaches for:

- evaluating effluent and receiving water data in reasonable potential analyses,
- calculating numeric limitations for toxic pollutants and whole effluent toxicity,
- conducting antidegradation analyses,
- authorizing and developing compliance schedules,
- tailoring monitoring requirements to inform compliance determinations, and
- incorporating numeric limitations for stormwater permits where TMDLs are applicable.

Permits reviewed from the Central Valley Regional Water Quality Control Board used many approaches different from those used by the other three Regional Boards we evaluated in development of reasonable potential analyses, calculation of effluent limits, and establishment of compliance schedules. In order to improve permit consistency and ensure compliance with federal permitting requirements, the Central Valley Regional Water Quality Control Board should:

- cease removing data points from data sets to exclude outliers unless there is a strong and documented empirical basis for doing so,
- apply the State Implementation Policy (*Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, 2005) or EPA's TSD (*Technical Support Document for Water Quality-based Toxics Control, 1991*) procedures for conducting reasonable potential analyses for non-priority pollutants,
- provide clearer justifications for compliance schedules and incorporate action-based interim milestones consistent with federal regulatory requirements, and
- improve fact sheet justification and documentation for all reasonable potential analyses.

In addition to the items listed above, the report provides an overview of the California NPDES permitting program and identifies areas where EPA and the California State and Regional Water Quality Control Boards can work together to continue to strengthen permit language and documentation in state NPDES permits.

The State of California reviewed and provided draft comments on the draft PQR (draft undated letter received June 12, 2014). In October, 2014, the State indicated it would not be submitting further comments. The State agreed with many of the draft PQR's findings and recommendations, and committed to take action to address many of the proposed action items. Several of these actions, such as revisions to permit templates and training programs are already underway. The state expressed concerns about the recommendation to reopen the State Implementation Plan (SIP) to resolve some issues as EPA recommended and suggested other mechanisms through which some action items can be addressed. We recognize that it may prove most efficient to address some of these action items through other methods. For example, the State is now developing a revised NPDES Quality Assurance Program Plan that will address many data quality and data utilization issued identified in the draft PQR. EPA carefully considered the State's draft comments in finalizing this report. We made some changes in the report to address California's draft comments and suggested response mechanisms; however, most of the PQR analysis and recommended actions to address program issues were not changed.

Contents

I. PQR BACKGROUND

National Pollutant Discharge Elimination System (NPDES) Permit Quality Reviews (PQRs) evaluate a select set of NPDES permits to determine whether permits are developed in a manner consistent with applicable requirements established in the Clean Water Act (CWA) and NPDES regulations. Through this review mechanism, EPA promotes national consistency and identifies both successes in implementation of the NPDES program and opportunities for improvement in the development of NPDES permits.

California was authorized by EPA to issue NPDES permits pursuant to the Clean Water Act in 1973. NPDES permits in California are typically issued by nine separate Regional Water Quality Control Boards (Regional Board, RB), each responsible for issuing and overseeing permits in its respective region. Permitting policies and procedures for the regional boards are established by the State Water Resources Control Board (State Board, SB). The State Board also issues general permits that apply throughout California. To follow up on results of the *2008 Regional NPDES Program Review, EPA Region 9,* conducted by EPA's Office of Wastewater Management Water Permits Division, EPA Region 9 selected a representative sample of permits for review from the following four Regional Boards: San Francisco Bay Region (RB2), Los Angeles Region (RB4), Central Valley Region (RB5), and San Diego Region (RB9). We also reviewed one general permit issued by the State Board along with State Board permitting policies and its permit template.

This PQR includes both core permit reviews and special focus area reviews. The core permit reviews focused on permit quality, including review of the permit application, permit, fact sheet, correspondence, documentation, and administrative process. As part of the core permit review, core topic areas were selected by EPA Headquarters to evaluate specific issues or types of permits on a national scale. Selected core topic areas include: nutrients, pesticide general permits, pretreatment, and municipal stormwater. Additionally, EPA Region 9 selected special focus areas for review, including reasonable potential, enforceability of permits, and low impact development provisions of stormwater permits.

The core review focused on evaluation of the aspects identified nationally as the Central Tenets of the NPDES Permitting Program. Reviewers completed the core review by examining selected permits and supporting documentation, assessing these materials using standard PQR tools (e.g., checklists), and talking with permit writers regarding technical questions related to the permit development process. Discussions between EPA Region 9 and the state also addressed program progress and concerns, the permitting process, relative responsibilities, organization, and staffing.

EPA's permit selection focused on obtaining a variety of permits (major/minor and facility type) issued in the past 2-3 years. For RB2, EPA selected a total of seven permits to review, including three major POTWs, one major non-POTW, one minor non-POTW, one municipal separate storm sewer system (MS4), and one TMDL-based watershed permit. For RB4, EPA selected a total of three permits to review, including two major POTWs and one major non-POTW. For RB5, EPA selected a total of nine permits to review, including three major POTWs, one major non-POTW, three minor non-POTWs, one MS4, and one general permit. For RB9, EPA selected

a total of eight permits to review, including two major POTWs, two major non-POTWs, two minor non-POTWs, one MS4, and one general permit.

For this PQR, representatives from EPA conducted on-site visits to RB2's office in Oakland and RB9's office in San Diego. EPA also reviewed permits, fact sheets, and supporting documentation from RB4, RB5, and one general permit, permitting policies, and the permit template issued by State Board.

II. STATE PROGRAM BACKGROUND

A. Program Structure

The State Board was created by the California State Legislature in 1967. In 1969, the state passed the Porter-Cologne Water Quality Control Act which delegated the responsibility for protecting water quality, including control of point source discharges to the State Board. The Act also specified the organizational structure in use today. As indicated above, California was authorized to issue NPDES permits pursuant to the Clean Water Act in 1973.

The State Board consists of five full-time salaried members, each filling a different specialty position. Each Board member is appointed to a four-year term by the governor and confirmed by the State Senate. The Board members are supported by staff, who develop state-wide permits, policy, and guidance and present these items to the Board for adoption.

Permit issuance authority is redelegated from the State Board to nine Regional Boards. Each Regional Board has seven part-time members, who are also appointed by the governor and confirmed by the State Senate. Like the State Board, these Board members are also supported by staff, who develop "basin plans" for their hydrologic areas, issue waste discharge permits, take enforcement action against violators, and monitor water quality. The nine Regional Boards include:

- **North Coast Region (RB1):** Del Norte, Glenn, Humboldt, Lake, Marin, Mendocino, Modoc, Siskiyou, Sonoma, and Trinity counties.
- **San Francisco Bay Region (RB2):** Alameda, Contra Costa, San Francisco, Santa Clara (north of Morgan Hill), San Mateo, Marin, Sonoma, Napa, and Solano counties.
- **Central Coast Region (RB3):** Santa Clara (south of Morgan Hill), San Mateo (southern portion), Santa Cruz, San Benito, Monterey, Kern (small portions), San Luis Obispo, Santa Barbara, and Ventura (northern portion) counties.
- **Los Angeles Region (RB4):** Kern (small portions), Los Angeles, Santa Barbara (small portions), and Ventura counties.
- **Central Valley Region (RB5):** Modoc, Shasta, Lassen, Plumas, Butte, Glen, Colusa, Lake, Sutter, Yuba, Sierra, Nevada, Placer, Yolo, Napa (north east portion), Solano (western portion), Sacramento, El Dorado, Amador, Calaveras, San Joaquin, Contra Costa (eastern portion), Stanislaus, Toulumne, Merced, Mariposa, Madera, Kings, Fresno, Tulare, and Kern counties.

- **Lahontan Region (RB6):** Modoc (eastern portion), Lassen (eastern portion), Sierra, Nevada, Placer, El Dorado, Alpine, Mono, Inyo, Kern (eastern portion), San Bernardino, and Los Angeles (small portion) counties.
- **Colorado River Region (RB7):** Imperial, San Bernardino, Riverside, and San Diego (small portion) counties.
- **Santa Ana Region (RB8):** Orange, Riverside, and San Bernardino (small portion) counties.
- **San Diego Region (RB9):** San Diego, Imperial, and Riverside (small portion) counties.

Due to their large geographic footprints, RB5 and RB6 are further broken down into sub-regional boards. RB5 consists of Redding (RB5R), Sacramento (RB5S), and Fresno (RB5F) offices, while RB6 has Northern (RB6N) and Southern (RB6S) offices.

NPDES requirements are fulfilled through the adoption of Waste Discharge Requirements (WDRs) by the Regional Boards. The complete package, including the permit and fact sheet is referred to as a "Tentative Order." Each Order is public-noticed and then brought to a regularly scheduled Board meeting. At the hearing, Board members hear comments from the applicant and members of the public and receive input from staff, before adopting, modifying or deferring the Order. An "Adopted Order" comprises the final WDR and NPDES permit. Depending on the region, Boards will meet six to 12 times per year.

The State Board has adopted a complex set of statewide policies and precedential orders that guide development of NPDES permits by Regional Boards. As Regional Boards rely principally on these policies and orders as the basis for permitting decisions, EPA considered several of these policies and orders during reviews of Regional Board permits.

In order to ensure consistency, the state uses a statewide template in drafting permits. Regional Boards may alter templates to better fit regional requirements; however, at a minimum, the permits include sections on:

I. Facility Information;
II. Findings;
III. Discharge Prohibitions;
IV. Effluent Limitations and Discharge Specifications;
V. Receiving Water Limitations; and
VI. Provisions.

Included as attachments to Orders, at a minimum, are:

A. Definitions;
B. Map;
C. Flow Schematic;
D. Standard Provisions;
E. Monitoring and Reporting Program; and
F. Fact Sheet.

Fact sheets are also standardized and include, at a minimum:

I. Permit Information;
II. Facility Description;
III. Applicable Plans, Policies, and Regulations;
IV. Rationale for Effluent Limitations and Discharge Specifications;
V. Rationale for Receiving Water Limitations;
VI. Rationale for Monitoring and Reporting Requirements;
VII. Rationale for Provisions; and
VIII. Public Participation.

B. NPDES Permits Universe and Issuance

California administers 234 major permits, 245 minor permits, 24 MS4 permits, and 52 general permits, for a total of 555 permits. As of November, 2014, 75 percent of NPDES permits in California were current. The four Regional Boards evaluated for this PQR are responsible for issuance of 68% of all permits issued in California.

San Francisco Bay Region. RB2 administers 48 major permits, 25 minor permits, one MS4 permit covering several dozen jurisdictions, and seven general permits, for a total of 81 permits. As of November, 2014, 92 percent of NPDES permits in RB2 are current.

Los Angeles Region. RB4 administers 50 major permits, 53 minor permits, three MS4 permits including one permit that covers several dozen jurisdictions, and seven general permits, for a total of 113 permits. As of November, 2014, 70 percent of NPDES permits in RB4 are current.

Central Valley Region. RB5 administers 51 major permits, 84 minor permits, seven MS4 permits, and five general permits, for a total of 147 permits. As of November, 2014, 76 percent of NPDES permits in RB5 are current.

San Diego Region. RB9 administers 23 major permits, six minor permits, four MS4 permits, and six general permits, for a total of 39 permits. As of November, 2014, 64 percent of NPDES permits in RB9 are current.

Applicants applying for a permit in California must use both state and EPA permit application forms. Permit writers ensure that applications are complete and use this data along with other available data, such as discharge monitoring report (DMR) data from a previous permit term, to develop the permit requirements.

Individual permits are often drafted by EPA contractors and completed by Regional Board staff. These contractors are funded with state grant funds at the state's request. Once a tentative order/draft permit is developed it undergoes internal review, then stakeholder review (agencies, permittee, and identified stakeholders), then public notice and comment. A public hearing in front of the Board is held for all NPDES permits. After hearing all public comments, the Order is adopted, modified or tabled for future consideration. For general permits and highly contested permits, Regional Board staff hold public workshops to gauge interest and solicit comments prior to proposing a draft permit for adoption. Permit appeals are considered by the State Board under their petition process.

C. State-Specific Challenges

California's NPDES program generally does a good job issuing high quality permits; however, the state faces several significant challenges that affect its ability to issue timely, high quality, consistent permits:

● *Environmental Diversity*. California is home to a wide range of environmental settings ranging from very wet forest lands to dry deserts and from very large, densely populated urban centers to sparsely populated rural areas. Similarly, California is home to a full range of water settings including open ocean, coastal areas, embayments, large rivers and wetland areas, small streams and wetland complexes, and ephemeral washes. In many settings, these receiving waters provide little dilution capacity for point source discharges, which leads to very stringent permitting requirements in much of inland California. These waters frequently support habitat for many sensitive species and are heavily used for water supply and public recreation, so they are highly sensitive to pollutant discharges.

● *Institutional Complexity*. The State Board-Regional Board system distributes authority for permit decision making among several quasi-independent, politically appointed Boards. Mechanisms to ensure consistency and legal sufficiency of permitting decisions are scattered among many policies and State Board precedential orders with varying levels of clarity and force. Boards are influenced in permit decision-making by a wide variety of stakeholder interests that vary substantially across the state.

● *Resource Limitations*. The state experienced significant resource challenges starting in 2009, which has reduced the amount of state revenues dedicated to the permits program and a reduction in staff allocated for permit issuance and enforcement. The State and Regional Boards have had difficulty filling staff vacancies in permitting programs. Moreover, other aspects of the water program (e.g., water rights issues addressed by State Board) are higher priorities than NPDES permitting in some parts of the state, which has resulted in redirection of resources toward other programs.

● *New Control Challenges*. California's permits program has faced significant challenges in determining how to implement stringent new water quality standards and TMDLs, and address emerging contaminants, through NPDES permits. State and federal regulations and guidance have been updated infrequently over the past decade, so existing program guidance often does not fully address new permitting technical and legal challenges. The State Board is working to develop new or revised policy initiatives to address a range of issues that affect the NPDES program, including:

- municipal stormwater permitting to address an unusually large number of TMDL wasteload allocations,
- Whole Effluent Toxicity standards and implementation procedures, and
- statewide nutrient standards and implementation procedures.

D. Current State Initiatives

The State Board is currently developing important new or revised policies to address several challenges that affect the NPDES program. The State Board is slated to adopt a new Toxicity Plan that will establish statewide toxicity standards and permits implementation procedures in 2014. The State Board is considering revisions to a past precedential order that has guided the inclusion of water quality-based requirements (receiving water limitations) in stormwater permits. Finally, the State Board and Regional Boards are developing methods for determining site specific nutrient goals for different waterbody types, along with procedures for implementing these site specific goals through TMDLs and NPDES permits.

The State Board contracted an outside auditor in 2013 to evaluate the NPDES permit issuance process with the intent of identifying opportunities to improve permitting efficiency. At the same time, the State Board is evaluating potential methods for streamlining the permits process and reducing permittee compliance costs, largely at the urging of discharger groups that expressed concerns about permit implementation and compliance costs.

Each of these efforts involves an intensive stakeholder process to consider a wide range of stakeholder interests and discharge settings around the state. EPA has regularly participated in these processes.

Over the past 10 years, the State Board and many Regional Boards have gradually moved toward use of regional scale and general permits to address large numbers of similar facilities under a smaller number of permitting actions. These efforts are intended to encourage cooperation at the regional and watershed scales among dischargers, improve consistency in permitting and monitoring requirements, and increase the efficiency of the permit development and adoption process. Greater use of regional and general permit approaches yields some benefits but presents new challenges as it is often difficult to craft broadly applicable permit requirements that account for local discharge settings and receiving water protection needs.

III. CORE REVIEW FINDINGS

A. Basic Facility Information, Permit Application, and Permit Provisions

1. Facility Information

Basic facility information is necessary to properly establish permit conditions for a facility. For example, information regarding facility type, location, processes and other factors is required by NPDES permit application regulations (40 CFR 122.21) because such information is essential for developing technically sound, complete, clear and enforceable permits. Similarly, fact sheets must include a description of the type of facility or activity subject to a draft permit.

The individual NPDES permits and fact sheets reviewed during the core review consistently identified outfalls and location information relative to receiving waters. The permits included permit issuance, effective, and expiration dates, authorized signatures, and standard conditions. Fact sheets included good descriptions of the relevant facilities, including the activity, treatment processes and disposition of effluent, consistent with the permit applications.

2. Permit Application Requirements

Federal regulations at 40 CFR 122.21 and 122.22 specify application requirements for facilities seeking NPDES permits. Federal forms are available, but authorized states are also permitted to use their own forms provided they include all information required by the federal regulations. This portion of the review assesses whether appropriate, complete, and timely application information was received by the state and used in permit development.

In general, the California permit files we reviewed contain current, appropriate, and complete permit applications, including both the applicable EPA form and a California statewide form. Generally, in accordance with federal requirements, applications are submitted at least 180 days prior to the previous permit's expiration date. Permits clearly indicate that a new permit application is required 180 days prior to expiration. Regional Board staff actively review permit applications and work with dischargers to ensure that complete applications are received. Permit applications reviewed for RB2 and RB4 were complete and timely.

In RB5, permits clearly indicate that a new permit application is required 180 days prior to expiration; however two fact sheets indicated that applications were submitted late. Similarly, all permits in RB9 indicate on the cover sheet that a new permit application is required 180 days prior to expiration; however, two applications were also submitted late. One of these applications was a unique circumstance, though, where RB9 disagreed with the applicant about whether the applicant was required to submit an application at all.

3. Basic Permit Provisions

During review of basic permit provisions, three issues were discovered. First, some of the permit terms did not meet the requirement of 40 CFR 122.46, which requires permits be effective for a fixed term not to exceed five years. Two RB4 permits and one RB5 permit were identified with a term of five years plus one day. This problem has been corrected in RB4 permits issued

beginning in November 2013. This issue was also found in two RB9 permits; however, these were the two oldest permits reviewed and RB9 has since been more diligent to ensure effective and expiration dates are no more than five years apart.

Second, some of the permit fact sheets did not clearly identify whether or not there are applicable TMDLs associated with the listed receiving water impairments. For one RB2 permit (Mid-Coastside) and two RB9 permits, the receiving water was listed as impaired. The fact sheets did not indicate whether the discharge was a contributing source of the water quality impairment. Although no applicable TMDL had been drafted for the listed parameters, there was no indication of this in the fact sheet either. RB9 has since been more diligent to ensure applicable TMDLs are identified in the fact sheet as complete, being drafted, or planned for completion at a later date.

Lastly, explicit authorization-to-discharge language is not included in any of the permits. The language is not in the statewide permit template. Although the authorization is implicit in the listing of the outfall locations and identification of discharge, the permits do not clearly state that the permittees are authorized to discharge to waters of the United States.

B. Effluent Limitations

Effluent limits serve as the primary mechanism in NPDES permits for controlling discharges of pollutants to receiving waters. When developing effluent limits for an NPDES permit, a permitting authority must consider limits based on both the technology available to control the pollutants (i.e., technology based effluent limits or TBELs) and limits that protect the water quality standards of the receiving water (i.e., water quality based effluent limits or WQBELs).

General

As discussed above, the State Board has adopted many policies, precedential orders, and a permit template to guide development of permits including effluent limitations. (e.g., the State Implementation Plan and Ocean Plan); these policies provide fairly detailed guidance and also provide significant discretion to individual Regional Boards in the development of limitations. California permits consider and incorporate both applicable TBELs and WQBELs, as needed; however, some clarification of these requirements is needed to ensure applicable requirements are consistently applied. First, in RB2, RB5, and RB9 permit fact sheets, it is not clear that the more stringent TBEL or WQBEL is selected for the effluent limit, since fact sheets do not discuss this comparison. Fact sheets do discuss the need to assess both; however, fact sheets should include a more clear comparison of potential TBELs and WQBELs for each pollutant.

Second, our review found a special case, where choosing the most stringent of the TBEL or WQBEL was not protective of water quality. In one RB2 permit (Ox Mountain), there was no reasonable potential for a pollutant to cause or contribute to an excursion of a water quality criteria, therefore no WQBEL was established. However, the applicable TBEL was less stringent than the applicable WQS. This raises antidegradation concerns since, by including the TBEL, the permittee was authorized to discharge up to that level, which was not protective of water quality. Thus, a WQBEL may be necessary to comply with antidegradation requirements, even when reasonable potential is not determined by the typical RPA procedure. The requirement to

consider antidegradation requirements in evaluating the need for WQBELs should be clarified in State policy.

Antibacksliding, Antidegradation, and Compliance Schedules

In addition to technology and water quality-based effluent limitation development, a permitting authority must assure compliance with antibacksliding provisions to ensure limits are at least as stringent as in the previous permit, antidegradation provisions to ensure a new or increased loading does not degrade water quality, and compliance schedules consistent with 40 CFR 122.47 and EPA's May 2007 memorandum[1].

Antibacksliding

Backsliding provisions under 40 CFR 122.44(l) for TBELs and CWA sections 402(o)/303(d)(4) for WQBELs outline when it may be permissible for a permitting authority to allow limitations that are less stringent than in the previous permit. Generally, RB2 and RB4 permits and fact sheets are specific when discussing effluent limits and antibacksliding. RB2 fact sheets typically incorporate pollutant-specific antibacksliding discussions for WQBELs (San Mateo/Foster City), as we have recommend for both TBELs and WQBELs in the California NPDES permit template. RB2 permit fact sheets do not discuss compliance with antibacksliding and antidegradation requirements for conventional/non-conventional pollutants. The structure of RB2 fact sheets should be revised to discuss antibacksliding and antidegradation for each limited pollutant, as is currently done for toxics.

Additionally, we found two permits in RB2 (Mid-Coastside, Sausalito-Marin) where antibacksliding requirements were incorrectly addressed for changes in effluent limits (either increase in magnitude or removal):

First, the backsliding rationale for some pollutants was incorrectly based on a comparison of limits with different averaging periods. In one permit (Sausalito-Marin), the backsliding rationale for two pollutants (copper maximum daily effluent limit (MDEL) and cyanide MDEL) was incorrectly based on the statistically calculated more stringent Long Term Average, rather than the statistically calculated more stringent short-term WQBELs. We note that the RB corrected this general practice in January 2013, following EPA comment on the San Mateo/Foster City draft permit, and no longer occurs in RB2 permits issued under the State Implementation Policy; however, our review found a similar issue in one Ocean Plan permit (Mid-Coastside) issued in 2012. The backsliding rationale for one effluent limit (total chlorine residual 6-month median effluent limit) was that the new daily maximum and instantaneous maximum effluent limits for this pollutant were more stringent; however, because the new 6-month median WQBEL is based on a less stringent initial dilution ratio, the limit is actually less stringent than the requirements of the previous permit. A correct backsliding rationale should compare WQBELs with the same averaging periods.

Second, an incorrect reading of the applicability of the TBELs in Table 2 of the Ocean Plan to POTWs resulted in removal of limits that should have been retained.

[1] http://water.epa.gov/lawsregs/guidance/wetlands/upload/signed-hanlon-memo.pdf

Lastly, typographical errors caused numeric discrepancies between the permit and fact sheet limits, which raised antibacksliding concerns. In two RB2 permits (C&H, Ox Mountain), the PQR checklist flagged the potential for backsliding due to numeric discrepancies between less stringent WQBELs in the issued permits and WQBELs described in the fact sheets (for Ox Mountain, selenium AMEL and MDEL and benzene AMEL and MDEL; for C&H discharge point 001, selenium AMEL and MDEL). We subsequently notified RB2, who modified these permits to correct the noted typographical errors. The corrected WQBELs in the modified permits are not less stringent than WQBELs in the previously issued permits.

In RB5 and RB9, fact sheets are not specific enough when discussing antibacksliding. In three RB5 permit fact sheets (Tracy, Modesto, Willows), antibacksliding requirements were not addressed for changes in effluent limits (either increase in magnitude, change in averaging period, or removal).

Our review found some fact sheets in RB5 included inadequate justification for removal of effluent limits from the previous permit. In one permit (Vendo), TBELs were removed based on the "new information" exception under 40 CFR 122.44(l), since the pollutants were "not consistently detected." The permit fact sheet explains that this is new information that was not available at the time the previous permit was issued; however, it is not new information, since the pollutants were not detected prior to issuance of the previous permit, which included these TBELs. Thus, the use of the "new information" exception does not appear to be justified, and the limits should have been retained.

Another permit fact sheet (Tracy) cited the "material and substantial alterations" exception under CWA 402(o), since the plant had been upgraded; however, the fact sheet did not discuss how this upgrade would impact concentrations of the pollutant of concern. As additional justification for removal of the limit, the fact sheet also cites CWA 303(d)(4) and states that since the receiving water is not listed under CWA 303(d) for the pollutant, the receiving water is an attainment water. This assessment does not consider the receiving water data included in the fact sheet, which shows the receiving water exceeds the applicable water quality objective. This justification was also cited in another permit fact sheet (Vendo), without additional information on the receiving water.

At least three fact sheets in RB9 (Fallbrook, Oceanside, Palomar) stated that limits are not as stringent as those in the previous permit, yet fail to specify which pollutants are less stringent. Although the fact sheets give rationale for why anti-backsliding provisions of 40 CFR 122.44 and CWA sections 402(o)/303(d)(4) are met, they do not describe the parameters for which the rationale applies.

Antidegradation

California's antidegradation policy is found in State Water Resources Control Board (SWRCB) Resolution No. 68-16 and is referenced in California's Basin Plans (or water quality standards). California's antidegradation implementation methods are described in the SWRCB Administrative Procedures Update No. 90-004, effective July 1990, titled "Antidegradation Policy Implementation for NPDES Permitting." The methods require permit writers to consider

both SWRCB Resolution No. 68-16 and the federal antidegradation requirements in 40 CFR 131.12.

In 2009, we released the draft *U.S. EPA Region 9 Antidegradation Policy Implementation Review* and, as a result, have observed improvements in the quality of antidegradation analyses in California permits.

Although California permit fact sheets reviewed for the PQR generally contain adequate antidegradation analyses, there is room for improvement. We found several examples in RB5 permits that illustrate the need for clarification in how antidegradation analyses should be conducted. First, the circumstances necessary to trigger an antidegradation analysis need to be clarified. In addition to an increase in flow, less stringent effluent limits and/or a change in discharge location should, at a minimum, trigger an antidegradation assessement by the permit writer. In RB5, two fact sheets (Willows, Vendo) do not assess antidegradation regarding less stringent effluent limits, and one fact sheet (Empire Mine) does not assess antidegradation regarding the movement of the discharge location downstream.

Second, our review also found some conflicting fact sheet information for two RB5 permits, which makes it unclear whether antidegradation requirements were met. One fact sheet (Tracy) justifies that the permit meets antidegradation requirements because there is no reasonable potential for some pollutants; however, receiving water data that exceeded water quality objectives were excluded from the reasonable potential analysis (see section IV.A. for further discussion of the reasonable potential analysis procedure). This demonstrates a shift in practice, since reasonable potential was determined and limits were included for these pollutants in the previous permit based on the receiving water data. In this case, a determination of no reasonable potential does not appear to provide adequate justification that antidegradation requirements were met.

Also, one RB5 permit fact sheet (Modesto) summarizes the antidegradation analysis performed by the discharger for an increase in flow, with an upgrade to year-round tertiary treatment from a combination of tertiary and secondary-treated (seasonal) discharges. The information is very general and does not include specific pollutant tier designation of the receiving water or assessment of the assimilative capacity. It also states, “the near-field water quality impact assessment also shows exceedance of the aluminum, iron, manganese, and EC water quality objectives in the receiving water. However, these exceedances are the result of the ambient levels of these four parameters already exceeding water quality standards upstream of the WQCF discharge. The WQCF discharge acts to slightly decrease downstream concentrations of these four parameters compared to their upstream concentrations.” It appears that the discharger asserted that the concentration of these pollutants in the receiving water will decrease due to the discharge flow increase; however, the antidegradation analysis should have considered the increase in mass loading of these pollutants.

Lastly, one of these facilities (Tracy) is on a schedule to increase in flow, which crosses several permit terms; however the fact sheet did not discuss this increase in flow within the antidegradation section and stated instead, “this Order does not allow for an increase in flow or mass of pollutants to the receiving water.” The fact sheet should have referenced or updated the antidegradation analysis performed in a previous permit for this implementation schedule.

Compliance Schedules

In 2007, EPA Region 9 performed a PQR, specifically focused on compliance schedule implementation in California permits. Permits in RB2, RB4, and RB5 were randomly selected for review at that time. The 2007 PQR found that permit fact sheets did not include adequate rationales to support the determinations required by 40 CFR 122.47 that the compliance schedule is "appropriate," the schedule required compliance with the final WQBEL "as soon as possible," and the schedule included an enforceable "sequence" of actions "leading to compliance" with the final WQBEL. Additionally, the PQR found some permit compliance schedules did not include a final WQBEL and some compliance schedules were inappropriately included to provide time solely to develop a TMDL or site-specific objective. The PQR noted that the state had drafted a compliance schedule policy, which later was finalized as the 2008 *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*, SWRCB Resolution No. 2008-0025. That policy remains in effect and constrains the authority to provide compliance schedules.

The state compliance schedule policy has helped to improve compliance schedule implementation and permit writers are generally using the policy to determine whether or not a discharger's application for a compliance schedule results in a permit compliance schedule that is "appropriate" and "as soon as possible". Good examples were found in an RB4 permit (Ojai) implementing TMDLs. Recent RB2 permits with compliance schedules generally have incorporated sound documentation of the basis for, and interim requirements of, compliance schedules.

In our liaison work with RB4 TMDL and NPDES permitting programs, we noted two implementation issues where additional state-wide compliance schedule training is needed. First, TMDL writers, permit writers, and permittees need to be reminded that the 2008 Compliance Schedule Policy does not authorize permit compliance schedules for National Toxics Rule (NTR) or California Toxics Rule (CTR) pollutants; nor does it automatically authorize a particular permit compliance schedule for a non-NTR/CTR pollutant based on a schedule in a TMDL implementation plan.

After the May 18, 2010 sunset date for the NTR/CTR compliance schedule authorizing provision in the State Implementation Policy, new permit compliance schedules for NTR/CTR pollutants must now be obtained through a new compliance schedule authorizing provision, requested under CWA section 303(c) by Regional Boards or the State Board, and approved by EPA.

Also, in accordance with the 2008 Compliance Schedule Policy and 40 CFR 122.47 for non-NTR/CTR pollutants (or 40 CFR 122.47 for NTR/CTR pollutants), a discharger's application for permit compliance schedule based on a schedule in a TMDL implementation plan must be reviewed by the permitting authority to determine whether the compliance schedule is "appropriate" and "as soon as possible".

RB5 permits include final WQBELs and some information in the fact sheet to demonstrate the compliance schedule is "appropriate;" however, some permits in RB5 still include insufficient rationale to demonstrate compliance with 40 CFR 122.47 requirements. Three permits (Tracy, Modesto, and SCE Big Creek) include insufficient rationale for compliance schedules, two of

which (Tracy and Modesto) include compliance schedules to implement TMDLs (meHg and EC, respectively). The compliance schedules mirror the TMDL implementation schedules and provide the full length of time the TMDL provides for compliance. The fact sheets do not provide information to demonstrate that the lengths of these schedules are "as soon as possible," and that the discharger needs the full length of the TMDL implementation schedule in order to comply with the final WQBELs.

As a result of mirroring the TMDL implementation schedules, some compliance schedules also lack interim requirements sufficient to ensure compliance by the end of the schedule with the final WQBEL. The interim requirements consist solely of workplans, pollution prevention plans, studies, and progress reports, and are therefore inconsistent with the examples provided in 40 CFR 122.47(a)(3), which provides the following examples of interim requirements: "(a) submit a complete Step 1 construction grant (for POTWs); (b) let a contract for construction of required facilities; (c) commence construction of required facilities; (d) complete construction of required facilities." The fact sheets do not demonstrate that RB5 has considered the specific steps needed to modify or install treatment facilities, operations or other measures and the time those steps would take in determining the interim requirements for the compliance schedules.

Three of the RB9 permits included compliance schedules for chlorine (Oceanside), toxicity (Sweetwater) and bacteria (Fallbrook). All compliance schedules include discrete milestones for achieving full compliance with final effluent limitations, including design, funding and construction deadlines. The Fallbrook permit was issued with an accompanying Time Schedule Order; however, the permit does not make reference to the accompanying order.

1. Technology-based Effluent Limitations

NPDES regulations at 40 CFR 125.3(a) require that permitting authorities develop technology-based treatment requirements. Permits, fact sheets and other supporting documentation for POTWs and non-POTWs were reviewed to assess whether these "technology-based effluent limitations" (TBELs) represent the minimum level of control that must be imposed in a permit.

a. TBELs for POTWs

POTWs must meet secondary or equivalent to secondary standards (including limits for BOD_5, TSS, pH, and percent removal). Thus, permits issued to POTWs must contain limits for all of these parameters (or authorized alternatives) in accordance with the Secondary Treatment Regulations at 40 CFR Part 133.

In RB2, RB4, and RB9, the permits and fact sheets developed for municipal facilities that were part of the core review provide a good description of wastewater treatment processes and discussions of the basis of TBELs. The permits reviewed consistently apply secondary treatment standards appropriately, or more stringent tertiary treatment standards for TSS and BOD_5 required by the state for facilities conducting water reuse/recycling. Effluent limitations were established using the appropriate units and forms (i.e., concentration or mass; average weekly and average monthly), and include the appropriate percent removal requirements. Tables in the fact sheets summarize the parameters that are limited and the rationale for those limits (i.e., 40 CFR 133.102). Like RB2, RB4, and RB9 POTW permits, the three RB5 POTW permits

and fact sheets reviewed provide good wastewater treatment process descriptions and discuss the basis for the TBELs. One permit (Modesto), however, includes equivalent-to-secondary requirements for TSS, but the fact sheet does not include specific information to demonstrate how the facility meets the requirements.

Also, RB5 applies more stringent "tertiary treatment" requirements for BOD and TSS in many POTW permits, but the fact sheets do not provide clear rationale for these limits (e.g., water reuse/recycling, etc.). Specifically, it is unclear whether these limits are TBELs or WQBELs, which is needed to properly assess permit conditions (e.g., antibacksliding, etc.).

For POTW discharges to the ocean in RB2, RB4 and RB9, technology-based limits are appropriately assigned based on Table 2 of the Ocean Plan. This includes limitations for grease & oil, suspended solids, settleable solids, turbidity and pH.

b. TBELs for Non-Municipal Dischargers

Permits issued to non-municipal dischargers must require compliance with a level of treatment performance equivalent to "Best Available Technology Economically Achievable (BAT)" or "Best Conventional Pollutant Control Technology (BCT) for existing sources, and consistent with "New Source Performance Standards (NSPS)" for new sources. Where effluent limitations guidelines (ELGs) have been developed for a category of dischargers, the technology-based effluent limits (TBELs) in a permit must be based on the application of these guidelines. If ELGs are not available, a permit must include requirements at least as stringent as BAT/BCT developed on a case-by-case basis, or best professional judgment (BPJ) basis, in accordance with the criteria outlined at 40 CFR 125.3(d).

In RB2, the two non-municipal individual permits reviewed were a landfill (Ox Mountain) and a sugar refinery (C&H). Both facilities are subject to TBELs based on ELGs and BPJ, in accordance with 40 CFR 125.3(d). In general, the permit fact sheets include a good description of the facility, including process, waste streams, pollutants, and treatment, as well as the applicable treatment standards and any special considerations. ELGs and BPJ appear to be properly applied and TBELs are properly expressed.

TBELs reviewed for RB4 permits were clear and properly applied.

In RB5, the three non-municipal individual permits reviewed (Empire Mine, Vendo, and Pactiv) consisted of an inactive mine, a groundwater treatment facility, and a molded pulp mill. One general permit for concentrated aquatic animal production facilities was also reviewed. One of the individual permits and the general permit were subject to ELGs, which were properly applied. One of the individual permits included TBELs based on BPJ; the fact sheet provides justification for how these limits meet the requirements of 40 CFR 125.3.

The RB5 general permit includes limits for TSS and settleable solids based on BPJ; however, the fact sheet does not provide specific information to show how the criteria at 40 CFR 125.3 are met. These limits were carried over from the prior individual permits for these facilities, so those permit fact sheets may have included this information. Even if that is the case, the fact sheet for the general permit should have included this information.

For non-municipal discharges to the ocean in RB2, RB4, and RB9 that are not covered by an ELG, technology-based limits are appropriately assigned based on Table 2 of the Ocean Plan. This includes limitations for grease & oil, suspended solids, settleable solids, turbidity and pH.

In RB9, the four non-municipal individual permits reviewed consisted of a power plant, an animal park, a biotech company and a desalination facility, two of which are subject to ELGs. In general, the fact sheets for these permits include a good description of the facility including processes, waste streams and pollutants, and treatment, as well as the applicable standards and any special considerations. The ELGs appear to be properly applied and expressed.

Generally, RB9 appropriately applies limits based on actual flow production rather than design. An exception are the TBELs for one RB9 permit (Oceanside) calculated based on a design flow well above actual production, as indicated by historical discharge rate data.

2. Water Quality-Based Effluent Limitations

The NPDES regulations at 40 CFR 122.44(d) require permits to include any requirements in addition to or more stringent than technology based requirements where necessary to achieve applicable water quality standards (WQS), including narrative criteria for water quality. To establish such water quality based effluent limits (WQBELs), the permitting authority must evaluate the proposed discharge and determine whether technology based requirements are sufficiently stringent and whether any pollutants could cause or contribute to an excursion above any applicable WQS.

The PQR assessed the processes employed by permit writers to implement these requirements. Specifically, the PQR reviewed permits and fact sheets, and in some cases other documents in the administrative record, to evaluate how the permitting authority identifies applicable WQS, evaluates and characterizes the effluent and receiving water to identify pollutants of concern, determines critical conditions, assesses dilution (if authorized), decides whether WQBELs are required, and calculates and expresses required WQBELs. For impaired waters, the PQR also assessed whether and how the permitting authority develops effluent limits consistent with the assumptions of applicable EPA-approved total maximum daily loads (TMDLs).

In California, applicable WQS, TMDLs, and their implementation provisions are specified in multiple state plans and policies, EPA rules and other documents (e.g., EPA-issued TMDLs), and State Board precedential water quality orders. EPA-approved state-issued TMDLs and associated implementation plans are incorporated into Regional Board basin plans, while EPA-issued TMDLs remain stand-alone documents. Whether or not a WQBEL is incorporated into a California permit is due in large part to how these plans and policies are understood and interpreted by the permitting authority responsible for developing and issuing the permit. Understandings of these requirements vary among the Regional Boards.

Individual Regional Board basin plans, which predominantly address non-ocean waters, incorporate applicable WQS for conventional and non-conventional pollutants, as well as some priority toxic pollutants. Basin plans rarely incorporate detailed implementation procedures for these pollutants; however, they sometimes incorporate detailed implementation procedures for pollutants with state-issued TMDLs. The federal California Toxics Rule (CTR) and National

Toxics Rule (NTR) incorporate applicable water quality criteria and some implementation procedures for priority toxic pollutants for non-ocean waters. In conjunction with these rules, the statewide State Implementation Policy, or SIP, (*Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, 2005), incorporates detailed implementation procedures for priority toxic pollutants for non-ocean waters. The statewide Ocean Plan incorporates applicable WQS for conventional, non-conventional, and priority toxic pollutants and detailed implementation procedures for priority toxic pollutants, total ammonia, and chronic and acute toxicity for all ocean waters. Permit compliance schedule authorization for WQBELs implementing state WQS, but not CTR or NTR criteria, is found in the statewide Compliance Schedule Policy.

As previously mentioned, detailed procedures for conducting a reasonable potential analysis (RPA) and calculating WQBELs are found in the Ocean Plan (for priority toxic pollutants, total ammonia, and chronic and acute toxicity) and the SIP (for priority toxic pollutants). In practice, the Ocean Plan RPA procedure incorporates the minimum probable initial dilution (Dm) authorized for the discharge; generally does not incorporate information regarding background seawater concentration; is statistical (calculates a one-sided upper 95 percent tolerance bound for the 95th percentile (UCB)); and addresses any detected (i.e., quantified) effluent pollutant concentration or calculated UCB that is greater than the water quality objective after initial dilution. Under the Ocean Plan, after initial dilution, if any detected effluent pollutant concentration or UCB is greater than the water quality objective, then a WQBEL must be developed.

Absent a TMDL, the Ocean Plan procedure for calculating WQBELs relies on direct application of multiple steady state wasteload allocations and the minimum probable initial dilution authorized for the discharge. Except for five pollutants, background seawater concentration is not considered. Under the Ocean Plan, WQBELs for priority toxic pollutants, total ammonia, and chronic and acute toxicity are expressed in the averaging period of the applicable WQS (i.e., 6-month median, daily maximum, and instantaneous maximum for aquatic life pollutants, 30-day average for human health pollutants).

The SIP RPA procedure: does not incorporate the mixing zone or dilution factor authorized for the discharge; is not statistically based; addresses any detected (i.e., quantified or estimated/DNQ) effluent pollutant concentration that is greater than the water quality criterion or objective; and, if the pollutant is present in the effluent, addresses any background receiving water concentration that is great than the criterion or objective. Under the SIP, if any detected effluent pollutant concentration is greater than the criterion or objective, or the pollutant is present in the effluent and any background receiving water concentration is greater than the criterion or objective, then a WQBEL is required.

Absent a TMDL, the SIP procedure for calculating WQBELs for priority toxic pollutants relies on multiple-value steady state wasteload allocations, mixing zones or dilution credits authorized for the discharge, background receiving water concentration, and the statistical approach recommended by EPA in the 1991 *Technical Support Document for Water Quality-based Toxics Control* (TSD). Under the SIP, wasteload allocations expressed in the averaging period of the

applicable WQS (e.g., 30-day average, 4-day average, 1-hour average) are statistically translated into average monthly effluent limits (AMEL) and maximum daily effluent limits (MDEL).

While the Ocean Plan incorporates detailed RPA and WQBEL implementation procedures for chronic and acute toxicity numeric objectives and WQBELs, basin plans addressing non-ocean waters contain a patchwork of narrative chronic toxicity objectives, narrative and sometimes numeric acute toxicity objectives, no detailed RPA procedures, and no or limited WQBEL calculation procedures. In addition, the expression of chronic toxicity effluent limits in POTW permits is informed by Water Quality Order 2003-0012, a State Board precedential decision, which determined the use of numeric effluent limits for chronic toxicity in permits for POTW discharges to non-ocean waters is an issue of statewide importance. The order committed the State Board to address this issue in a statewide policy. In the interim, the order replaced numeric effluent limits with narrative effluent limits for chronic toxicity in POTW permits. The State Board has been in the process of developing a statewide Toxicity Plan addressing this issue for several years, but the State Board has not determined a schedule for completing and adopting a final plan.

Most RB2 fact sheets (e.g., Sausalito-Marin) provide a useful tabular format summarizing numerical RPA and WQBEL calculations that we recommend for the California NPDES permit template. However, more attention must be given to how dischargers and their laboratories are reporting quantified data, non-quantified data including estimated data, and the non-detect (ND), detected not quantified (DNQ), minimum level (ML), and reporting level (RL) information populating these tables and underlying RPA and WQBEL decisions. Permitting authorities need to ensure that measurements and reporting comply with the most current edition of 40 CFR 136 and reporting procedures required by the SIP and Ocean Plan.

RB2, RB4, RB5, and RB9 fact sheets identify the receiving water, applicable WQS (designated uses and water quality criteria and objectives), the 303(d) listing status of the receiving water, and relevant TMDLs. Fact sheets also identify whether or not mixing zones or dilution factors and pollutant background concentrations are considered when implementing applicable WQS. Generally, fact sheets include RPA and WQBEL calculations and/or summaries for discharged pollutants that are monitored. We note that desirable, more detailed RPA and WQBEL calculations and/or summaries are included in fact sheets or administrative records when state plans and policies, or state TMDL implementation plans, incorporate detailed implementation procedures.

In RB2, RB4, RB5, and RB9 fact sheets, the documentation for RPAs and WQBELs generally follow applicable plans, policies, and TMDLs; however, some inconsistencies were found, primarily in RB5:

a. **Water Quality Impairments and TMDLs.** Although RB5 fact sheets for POTW permits generally contain information about receiving water impairments and applicable TMDLs, sometimes information demonstrating whether a facility contributes to the impairment is not included. One fact sheet (Willows) provided a general statement that TMDLs have been proposed for the receiving water, but did not list the pollutants that would be addressed. The fact sheet also did not describe whether the facility discharges the pollutants for which the waterbody is listed as impaired on the 303(d) list. Another

permit fact sheet (Pactiv) discussed an applicable TMDL (chlorpyrifos and diazinon); however, the TMDL was not implemented in the permit. A third permit fact sheet (SCE Big Creek) used the tributary rule and beneficial uses of the downstream waterbody to determine applicable water quality objectives, but did not consider the impairments of that downstream waterbody. In a fourth permit (CAAP General Permit), the applicability of TMDLs was not specifically discussed in the fact sheet; however, the general permit requires monitoring data for pollutants on the 303(d) list to be submitted with the NOI, and coverage under the general permit is not allowed if the discharge is found to contribute to an impairment.

Also, one RB2 permit (Mid-Coastside) includes enterococcus bacteria WQBELs, but the fact sheet does not discuss whether the facility contributes to the coliform bacteria impairment at a nearby beach.

b. **Reasonable Potential Analyses.** At minimum, RPA must meet the requirements of 40 CFR 122.44(d). As state approaches to reasonable potential analysis are a regional focus area for this cycle of PQRs, a more detailed evaluation of RPA issues is found below in Section IV.A. We note that RPA procedures in the Ocean Plan are inconsistent with RPA procedures in the SIP. Reasonable potential practices and concerns we identified during the PQR are summarized here. EPA found that most Regional Boards conduct reasonably clear and robust RPAs that are consistent with the provisions of federal regulatory requirements and state policies. However, we found numerous errors in RPAs conducted by RB5 that resulted in erroneous omission of WQBELs in several permits. These errors were occasionally found in permits written by other Regional Boards. The most commonly encountered errors were:

   – eliminating from further consideration data points perceived to be "outliers" without evidence the data points were erroneous or invalid,
   – classification of data points for which the pollutant was detected but not quantified as non-detects,
   – omission of data points for effluent data or receiving waters collected during the current permit term,
   – findings that insufficient data were available to conduct RPAs despite the SIP's provision that RPA can be evaluated based on a single data point,
   – omission of data points with method detection levels higher than the standard from consideration or classification of these data points as evidence objectives were met.

   These issues and recommended measures to address them are discussed in Section IV and in the Action Items.

c. **Bases for WQBELs.** In permits reviewed for RB2, RB4, and RB9, the bases for evaluating and including WQBELs were clearly articulated. One RB5 permit (SCE Big Creek) includes a phosphorus effluent limit based on "algal growth potential studies", but does not cite these studies. Here, it appears RB5 is implementing a narrative water quality objective using a numeric value from these studies; however, since there is no citation

and the fact sheet does not state which narrative water quality objective is being implemented, the basis for the effluent limit is unclear. This permit also includes an effluent limit for settleable solids; however, the fact sheet does not explain the origin of the numeric values used to implement the narrative water quality objective.

d. **Direct Application of Water Quality Objectives/Criteria.** Considering the Ocean Plan provisions, we reviewed how RB2, RB4, and RB9 permits implement numeric water quality objectives for priority toxic pollutants, total ammonia, and chronic and acute toxicity directly (i.e., without a statistical calculation) as WQBELs.

   Reviewed RB2 permits implement Basin Plan numeric or narrative water quality objectives for non-ocean waters either directly (e.g., acute toxicity, bacteria indicators) or statistically (e.g., ammonia, dioxin-TEQ) as WQBELs. Permit writers use the SIP statistical procedure to calculate WQBELs for priority toxic pollutant WQBELs.

   Reviewed RB4 permits implement Basin Plan numeric water quality objectives for non-ocean waters either directly (e.g., acute toxicity, salts and other minerals) or statistically (e.g., ammonia) as WQBELs. Permit writers use EPA's nationally recommended statistical procedure to calculate WQBELs for ammonia.

   RB5 permits implement a number of narrative water quality objectives with available numeric water quality criteria or goals referenced in the Basin Plan. When reasonable potential is established, these numeric criteria or goals are directly implemented as WQBELs. The one exception is when RB5 implements EPA criteria (not CTR or NTR); in that case, WQBELs are calculated using the SIP statistical procedure for priority toxic pollutant WQBELs.

   In general, we found that WQBELs based on direct application of numeric objectives were correctly evaluated and calculated. We found that where there is a sound analytical basis for doing so, the Regional Boards are generally considering application of narrative water quality objectives during the permitting process. In cases where the analytical basis for interpreting narrative objectives remains unclear, the Regional Boards have determined appropriately that the narrative objectives should not be applied during the permits process at this time. We note that Regional Board approaches for interpreting narrative objectives during the permits process vary. When the State revises its permit implementation procedures (e.g., the SIP), the State should consider clarifying procedures for interpreting narrative objectives during the permits process.

   For example, the State is in the process of developing analytical procedures for implementing narrative objectives associated with nutrient enrichment of receiving waters that will account for local relationships between nutrient loading and response variables of concern. We expect this effort will include specification of NPDES permitting procedures to implement the selected nutrient analysis approaches. Upon completion of that process, it will be more appropriate and feasible for the Regional Boards to apply narrative nutrient objectives during the permits process.

e. **Effluent Limit Averaging Periods.** The NPDES regulations at 40 CFR 122.45(d) require that all permit limits be expressed, unless impracticable, as both average monthly and maximum daily limits for all discharges other than POTWs and average weekly and average monthly limits for POTWs. Also, EPA recommends establishing a MDEL for toxic pollutants and toxicity (i.e. a maximum test result for toxicity) because the 7-day average for POTWs is derived from secondary treatment requirements and not related to the need to assure achievement of applicable WQS. Also, for toxic pollutants, a 7-day average which can comprise up to seven or more daily samples could average out peak toxic concentrations, therefore allowing acute and chronic toxic effects.

Following the Ocean Plan, reviewed RB2, RB4, and RB9 permits directly apply numeric water quality objectives for priority toxic pollutants, total ammonia, and chronic and acute toxicity as WQBELs, expressed in the averaging period of the objective (i.e., 6-month median, daily maximum, and instantaneous maximum for aquatic life pollutants, 30-day average for human health pollutants). As a result, WQBELs for human health priority toxic pollutants consist of one long-term effluent limit (i.e., AMEL), rather than both long-term and short-term limits (e.g., AMEL and MDEL). MDELs are applicable for human health protection. While setting a statistical MDEL as an upper bound on effluent values using the AMEL would provide an important measure of effluent compliance during operational periods between (less than) monthly samplings, this omission is of minimal concern because Ocean Plan water quality objectives for human health non-carcinogens and carcinogens and aquatic life toxicants do not overlap. We note that WQBELs for chronic and acute toxicity consist of one short-term effluent limit (i.e., MDEL), rather than both long-term and short-term limits. This approach is fully protective because chronic and acute toxicity excursions above the daily maximum WQSs are not allowed by the toxicity MDELs in permits. Fact sheets generally explained these provisions clearly.

In the non-ocean water permits reviewed, RB2 applies applicable WQS as WQBELs with both long-term and short-term effluent limits.

In the non-ocean water permits reviewed, since RB4 directly applies some Basin Plan numeric water quality objectives as WQBELs, some of these WQBELs consist of one long-term effluent limit (i.e., AMEL for salts and other minerals), rather than both long-term and short term limits. We note that some RB4 TMDL WLAs and, as a result, permit WQBELs specify atypical averaging periods or averaging periods in combination with a particular season and/or weather condition. This increases the complexity of compliance reporting for the effluent limit. The non-ocean water RB4 permits reviewed (Ojai, ExxonMobil) incorporate detailed permit provisions addressing monitoring and reporting to help ensure compliance data is representative of the discharge during the specified averaging period and season and/or weather condition for the effluent limit. Fact sheets generally explained the basis for these approaches accurately.

Since RB5 directly applies Basin Plan numeric water quality criteria or goals as WQBELs to implement narrative water quality objectives, the WQBELs most often consist of one long-term effluent limit (e.g., annual average), rather than both long-term

and short-term limits. This practice was observed in four (Tracy, Willows, SCE Big Creek, Empire Mine) of the permits reviewed. Fact sheets should, but did not, clearly explain the basis for incorporating only a single long-term limit in these situations.

In RB9, permit limits are expressed both as long-term and short-term effluent limits with two exceptions. In one permit, effluent limits protective of marine aquatic life are expressed only as 30-day averages while in a separate permit, non-ocean nutrient limitations are expressed solely as maximum daily limits.

f. **Narrative Chronic Toxicity WQBEL.** As previously explained, most California permits do not currently include numeric effluent limits for chronic toxicity in non-ocean water permits pursuant to the provisions of Water Quality Order No. 2003-012.

The 2008 PQR, conducted by EPA's Office of Wastewater Management,[2] concluded that California's permits should use numeric, rather than narrative, WQBELs for chronic toxicity, and that California's approaches for developing chronic and acute toxicity WQBELs need to achieve applicable WQS in accordance with CWA section 303(b)(1)(C) and NPDES regulations governing reasonable potential determinations for toxicity at 40 CFR 122.44(d)(1). EPA's 2008 report identified this issue as "Category 1—Most Significant" and recommended Proposed Action Items to assist California in addressing this deficiency/noncompliance with federal regulations. Subsequently, the State Board has pursued resolution of this deficiency/noncompliance through development and issuance of a statewide Toxicity Plan, which has not been completed and is not currently scheduled for completion.. As a result, this PQR report carries forward the toxicity WQBEL findings of EPA's 2008 report, that: (1) California's non-ocean water permits would greatly benefit from a statewide policy on chronic and acute toxicity implementation in permits and (2) inclusion of only narrative effluent limits for chronic toxicity is difficult to interpret for compliance purposes and does not meet federal regulatory requirements.

Generally, in reviewed RB2, RB4, RB5, and RB9 fact sheets for non-ocean water permits, when reasonable potential for chronic toxicity is established (e.g., Ox Mountain permit in RB2), permits include a "narrative effluent limit" for chronic toxicity that states there shall be no chronic toxicity in the discharge, in conjunction with a numeric trigger (in chronic toxic units) for chronic toxicity accelerated monitoring and toxicity reduction evaluations. Permits with narrative chronic toxicity effluent limits require the discharger to report chronic toxicity effluent monitoring results in chronic toxic units (see permit Attachment E). However, these permits do not specify or explain compliance reporting for the narrative chronic toxicity effluent limit—which operates as a series of activities or steps a discharger must follow in response to effluent toxicity—in a tabular eSMR/CIWQS-friendly format. This omission renders the narrative expression difficult to use for routine screening evaluations conducted by permitting authorities evaluating facility compliance and enforcing permits. However, this may not matter, as California permitting authorities and dischargers interpret non-ocean dischargers to be in

[2] http://www.epa.gov/npdes/pubs/pqr_region_9_report.pdf

compliance with the narrative effluent limit for chronic toxicity—no matter how toxic the discharge event—as long as dischargers follow a series of steps to address the toxicity over time.

WQBELs must attain and maintain applicable WQS in order to be consistent with the requirements of the CWA. In the most practical sense, the current practice of including narrative effluent limits for chronic toxicity and their implementation results in a regulatory practice which authorizes toxic effluent discharges under a permit as long as dischargers follow a series of steps to address the toxicity. This approach does not attain WQS because the permit does not restrict the quantity, rate, or concentration of toxicity in an effluent. This permitting approach complicates the application of CWA section 309 (enforcement) to toxic effluents in a manner not implemented for toxic pollutants and toxicity when WQBELs are numeric. As such, EPA finds that a narrative effluent limit approach for chronic toxicity is not an appropriate CWA NPDES effluent limit, as defined in federal regulations, and that non-ocean permits with narrative effluent limits for chronic toxicity are inconsistent with CWA sections 301(b)(1)(C) and 502(11) and 40 CFR 122.44(d)(1) (reasonable potential), 122.2, 122.45(d) (long- and short-term effluent limits); 50 *Fed. Reg.* 23868, 23871, 23874 (Jun. 2, 1989). The action items from the 2008 PQR included actions to ensure future permits include appropriate numeric limits for chronic and acute toxicity, and acknowledge the state's plan to issue a Toxicity Policy that sets statewide numeric toxicity objectives and establishes consistent implementation procedures. While not yet complete, the State Board has indicated it's commitment to adopting a Toxicity Plan. In 2014, EPA objected to several permits that did not incorporate properly calculated numeric water quality limits for chronic and/or acute toxicity. EPA reserves its right to object to future permits that do not incorporate properly calculated numeric water quality limits for chronic and/or acute toxicity or which improperly backslide from existing numeric toxicity effluent limits. If the State Board decides to not issue a plan addressing this problem, then EPA asks that precedential Water Quality Order No. 2003-0012 be withdrawn.

We note that in RB2, Water Quality Order No. 2003-0012, which applies only to POTW permits, was incorrectly applied to non-POTW discharge permits (e.g., Ox Mountain). This is not an unusual practice by California permitting authorities. Consequently, the State Board should clarify that this order—addressing only POTWs discharging to non-ocean waters—is not precedential and does not apply to discharges that are not POTWs.

C. Monitoring and Reporting

The NPDES regulations require permittees to periodically evaluate compliance with the effluent limitations established in their permits and provide the results to the permitting authority. Monitoring and reporting conditions require the permittee to conduct routine or episodic self-monitoring of permitted discharges and where applicable, internal processes, and report the analytical results to the permitting authority with information necessary to evaluate discharge characteristics and compliance status.

Specifically, the regulations at 40 CFR 122.44(i) require NPDES permits to contain monitoring requirements sufficient to assure compliance with permit limitations, including specific requirements for the types of information to be provided and the methods for the collection and analysis of such samples. The regulations at 40 CFR 122.48 also require that permits specify the type, intervals, and frequency of monitoring sufficient to yield data which are representative of the monitored activity. The regulations at 40 CFR 122.44(i) further require reporting of monitoring results, with a frequency dependent on the nature and effect of the discharge.

The permits reviewed include appropriate monitoring and reporting requirements based on the facility type, type of discharge, and corresponding limit basis. Influent monitoring is required for BOD_5 and TSS for POTWs. The permits include a general requirement that monitoring must be conducted according to test procedures approved under Part 136. General monitoring locations are stated in the permits. All of the permits reviewed require monitoring for chronic whole effluent toxicity, with some permits requiring additional acute toxicity testing. The fact sheets discuss the rationale for the monitoring requirements for the respective permits.

In RB5, seven permits include monitoring frequency that may not be adequate to determine compliance with the effluent limit. For example, monthly monitoring was required for an average monthly effluent limit. Without more frequent monitoring, the monthly average will be based on one sample. This is not necessarily a legal or technical deficiency, so long as the permitting authority is comfortable with using this limited data to determine compliance and perform future RPAs.

Also, the minimum annual monitoring requirement for pollutants with effluent limits, pursuant to 40 CFR 122.44(i), was not included for two permits in RB5. One permit (Tracy) did not specify effluent monitoring for two pollutants, where effluent limits were included based on TMDL WLAs. Instead, the permit relies on the pollutants to be monitored during one year of bi-monthly priority pollutant scans. Another permit (Willows) included only twice/permit term monitoring for chronic toxicity, for which a narrative effluent limit is included in the permit. Similarly, another permit (Empire Mine) allows monitoring to discontinue for chronic toxicity, if no toxicity is found after 2 years of monitoring, even though there is a narrative effluent limit in the permit.

While all RB5 permits reviewed specify that all monitoring should be conducted in accordance with 40 CFR 136, they do not include language requiring use of sufficiently sensitive 40 CFR 136 methods capable of quantifying pollutants at concentrations equal to or less than the limit. RB2 standard conditions (permit Attachment G, page G-7, section III.A.2) include a requirement for dischargers to select MLs lower than the permit limit, but only for priority toxic pollutants. RB4 general monitoring provisions in permit Attachment E include a requirement for dischargers to select MLs lower than the permit limit; these conditions also specify State Implementation Policy or Ocean Plan MLs for priority toxic pollutants.

In RB9, the permits reviewed typically also include performance goal monitoring, influent monitoring for POTWs, receiving water monitoring and benthic monitoring and additional biological monitoring. Performance goals are not limits but are used solely for informational purposes and may be used in reopening a permit, if necessary. Additional forms of receiving water monitoring are for the purpose of demonstrating consistency with the Ocean Plan.

Both the SIP and Ocean Plan need to be updated to ensure MLs are consistent with the most recent version of 40 CFR 136. The SIP/Ocean Plan MLs were developed using data collected in 1997. Labs can certainly do better now, as more sensitive methods and instrumentation are available.

At a state-wide level, concerns have been raised over permit monitoring requirements being excessive or inappropriate to evaluate compliance with effluent limitations. In considering whether to relax or streamline monitoring requirements, the state will need to balance the desire to reduce monitoring burdens with the need to ensure monitoring requirements are designed to yield data sufficient to properly evaluate permit compliance.

D. Standard Conditions and Special Conditions

The regulations at 40 CFR 122.41 require that all NPDES permits, including NPDES general permits, contain an enumerated list of "standard" permit conditions. Further, the regulations at 40 CFR 122.42 require that NPDES permits for certain categories of dischargers must contain certain additional standard conditions. Permitting authorities must include these conditions in NPDES permits and may not alter or omit any standard condition, unless such alteration or omission results in a requirement more stringent than required by the Federal regulations.

In addition to this required standard permit conditions, permits may also contain additional standard requirements that are unique to a particular category of permittee. These case-specific narrative requirements are generally referred to as "special conditions." Special conditions might include requirements such as: additional monitoring or special studies, best management practices (see 40 CFR 122.44(k)), and/or permit compliance schedules (see 40 CFR 122.47). Where a permit contains special conditions, such conditions must be consistent with applicable regulations.

Standard conditions established at 40 CFR 122.41 and relevant portions of 122.42 are included in the permits reviewed as Attachment D. These conditions were generally found to be consistent with federal requirements, except for in RB2 and RB5 permits.

In RB5 permits, the requirements deviate from 40 CFR 122.41(j)(4) and 40 CFR 122.41(l)(4)(ii) for monitoring and records and monitoring reports. These sections cite 40 CFR 503 instead of subchapters N and O, and therefore, exclude the requirements for pretreatment, ELGs, and additional sewage sludge requirements. This language should be changed to be consistent with the federal requirements.

In RB2 permits (see permit Attachment D), standard conditions based on 40 CFR 122.41 omit the following:

40 CFR 122.41(a) – Duty to comply – Missing 40 CFR 122.41(a)(2) and (3).

40 CFR 122.41(j) – Monitoring and records – Missing 40 CFR 122.41(j)(5).

40 CFR 122.41.(l)(1) – Planned change – Missing "nor to notification requirements under section 122.42(a)(1)" phrase.

40 CFR 122.41(l)(3) – Transfers – Missing "in some cases" phrase.

40 CFR 122.41(l)(6) – Twenty-four hour reporting – Missing 40 CFR 122.41(l)(6)(ii)(C).

40 CFR 122.41(k) – Signatory – Missing 40 CFR 122.41(k)(2).

Some RB2 permits (C&H, Ox Mountain) for non-POTWs contained the additional standard condition for POTWs rather than the non-POTW standard condition (see 40 CFR 122.42).

The state should revise its permit template to properly incorporate federally required standard conditions.

E. Administrative Process

The administrative process includes documenting all permit decisions, coordinating EPA and state review of the draft (or proposed) permit, providing public notice, conducting hearings (if appropriate), responding to public comments, and defending the permit and modifying it (if necessary) after issuance. The PQR team discussed each element of the administrative process with RB2 and RB9 permitting staff, and reviewed materials from the administrative process as they related to permits reviewed for the core permit review.

In California, all permits are heard in a public forum prior to adoption. For every permit, members of the public are invited to testify at the corresponding adoption hearing. Agendas for adoption hearings are circulated via email, mail and posted on the regional board's website, typically several weeks before each meeting. Recordings of each meeting are kept on file and were made available to EPA for review. Oral comments for all permits were captured in the recordings except for one hearing where the audio was incomprehensible.

When permits are prepared for adoption, an Executive Officer Report is completed and submitted to the Board. The report includes all comments received by the Regional Board and the staff's responses to those comments.

California's permit development process is complicated and often lengthy. Regional Board staff often engage in lengthy negotiations with permittees on permits prior to their issuance, which has contributed to delays in issuance and growth in the permit backlog. State Board staff are often unable to participate in detailed discussions of Regional Board permitting issues, particularly regarding interpretation of permitting requirements described in State Board policies and precedential orders, due to the potential for permits to be appealed to State Board following issuance. This limitation on State Board participation in discussions about permitting requirements has exacerbated inconsistencies among Regional Boards in permit development procedures and policy interpretation. Recent efforts by the State and Regional Boards to address procedural and policy interpretation issues through the Statewide Permits Roundtable and through additions to the permit template are beginning to show results. However, revisions and clarifications to statewide permitting policies are warranted to address several issues identified through the PQR analysis.

EPA and the State Board developed a memorandum of agreement concerning NPDES permitting procedures and communication protocols in 1973, which was revised in 1989. While the coordination procedures between EPA and the State and Regional Boards have generally worked well, we note that State Board and some Regional Boards do not always provide EPA with

preliminary draft permits at least 30 days in advance of the public notice. Regional Boards and State Board should be reminded of this requirement.

F. Documentation

The administrative record is the foundation that supports the NPDES permit. If EPA issues the permit, 40 CFR 124.9 identifies the required content of the administrative record for a draft permit and 40 CFR 124.18 identifies the requirements for final permits. Authorized states should have equally strong documentation. The record allows personnel from the permitting agency to reconstruct the justification for a given permit and defend the permit during any legal proceedings regarding the permit. The administrative record for a draft permit consists, at a minimum, of the permit application and supporting data, draft permit, fact sheet or statement of basis, all items cited in the statement of basis or fact sheet, including calculations used to derive the permit limitations, meeting reports, correspondence with the applicant and regulatory personnel, and all other items supporting the file (and, for new sources where EPA issues the permit, any Environmental Assessment, Environmental Impact Statement, or Finding of No Significant Impact).

Generally, Regional Boards are good at documenting administrative records supporting permit decisions. Development of Regional Board electronic permit files further facilitate and have improved permit documentation. For example, the permit records we reviewed in RB9 are kept electronically and appeared to be fairly complete; however, the electronic files were somewhat difficult to navigate. Data and other documents comprising the administrative record can be found within the Electronic Content Management (ECM) and the California Integrated Water Quality System Project (CIWQS). When attempting to navigate the database using standard query terms, it was difficult to locate files by facility without the individual document handle number. RB9 staff stated that the database had recently undergone a transition and that the issue was caused by temporal glitches.

1. Fact Sheet or Statement of Basis

Under 40 CFR 124.8 and 124.56 fact sheets are required for major NPDES permits, general permits, permits that incorporate a variance or warrant an explanation of certain conditions, and permits subject to widespread public interest. Current regulations require that fact sheets include:

- General facility information
  - Description of the facility or activity
  - Sketches or a detailed description of the discharge location
  - Type and quantity of waste/ pollutants discharged
- Summary rationale of permit conditions
  - Summary of the basis for draft permit conditions
  - References to the applicable statutory or regulatory provisions
  - References to the administrative record

- Detailed rationale of permit conditions
  - Explanation and calculations of effluent limitations and conditions
  - Specific explanations of:
    - Toxic pollutant limitations
    - Limitations on internal waste streams
    - Limitations on indicator pollutants
    - Case-by-case requirements
    - Decisions to regulate non-publically owned treatment works under a separate permit
  - For EPA-issued permits, the requirements for any state certification
  - For permits with a sewage sludge land application plan, a description of how all required elements of the land application plan are addressed in the permit
  - Reasons why any requested variances do not appear justified, if applicable
- Administrative requirements
  - A description of the procedures for reaching a final decision on the draft permit, including:
    - Public comment period beginning and ending dates
    - Procedures for requesting a hearing
    - Other procedures for public participation
  - Name and telephone number of the person to contact for additional information.

The fact sheet and supporting documentation were reviewed with the administrative record of the permit file as part of the PQR to assess whether the basis or rationale for limitations and other permit decisions were documented in the development of the final permit.

RB2, RB4, RB5, and RB9 develop very detailed fact sheets. All permits, including minors, have fact sheets that are included as Attachment F of the permit package. In addition to what is included in the permit itself, the fact sheet and permit record generally provide a good description of the facility, treatment process, effluent, applicable plans, policy and regulations, and a clear documentation of the decision-making process employed during permit development or the rationale for final effluent limitations. The fact sheet also describes rationales for any performance goals, interim effluent limitations, receiving water limitations, or special provisions the permit might include.

Despite the amount of information included in fact sheets, we identified some documentation issues, which are discussed under each applicable program element in this PQR. Overall, we found that important information is sometimes buried within boiler-plate or duplicative language from the permit. Therefore, we recommend fact sheets be clear and concise so the basis for the permit requirements is easily understood by permittees and the public.

G. Core Topic Areas

Core topic areas are specific aspects of the NPDES permit program that warrant review based on the specific requirements applicable to the selected topic areas. These topic areas have been determined to be important on a national level**.** Core topic areas are reviewed for all state PQRs.

1. Nutrients

Nitrogen and phosphorus pollution of all types of surface waters has consistently ranked among the top causes of degradation in U.S. waters for more than a decade. EPA has worked at reducing the levels and impacts of this pollution since 1998 and continues to support a range of efforts including the development and implementation of numeric nutrient criteria. In March of 2011, EPA announced a framework for nutrient reductions that in part called for ensuring the effectiveness of point source permits in sub-watersheds targeted or identified as priorities due to nutrient pollution. The framework specifically identified permits for municipal and industrial wastewater treatment facilities that contribute significant nitrogen and phosphorus loadings, CAFOs, and urban stormwater sources that discharge into nitrogen and phosphorus–impaired waters or are significant sources of nitrogen or phosphorus. EPA Region 9 reviewed each of the permits selected for this PQR for nutrient monitoring and limitations.

For ocean discharges, the California Ocean Plan does not contain numeric water quality criteria for phosphorus or nitrogen. The Ocean Plan does contain objectives for ammonia (0.6 mg/l six-month median, 2.4 mg/l daily max, 6.0 mg/l instant max).

A State Board-Regional Board workgroup in which EPA is closely involved is currently developing a methodology for determining site-specific nutrient water quality goals for use in applying narrative nutrient standards and implementing nutrient controls where needed in NPDES permits and other pollution control programs. The California Numeric Nutrient Endpoints methodology has been under development for several years and holds substantial promise as an approach to identify locally appropriate nutrient control requirements that account for the large diversity in environmental settings encountered in the State.

Most Regional Board Basin Plans do not have numeric nutrient standards. For the RB2 non-ocean permits reviewed, the Basin Plan does not include numeric water quality objectives for total nitrogen or total phosphorus and therefore, reasonable potential analyses are not conducted for these pollutants. Generally, these permits contain narrative receiving water limits for nutrients based on narrative water quality objectives in the Basin Plan. Reasonable potential is assessed for other forms of nitrogen (e.g., ammonia toxicity) based on applicable beneficial uses and numeric objectives in the Basin Plan. RB2 fact sheets for the non-ocean permits reviewed discuss the San Francisco Bay Nutrient Strategy addressing nutrient water quality problems in San Francisco Bay and the development of nutrient controls in permits. RB2 recently adopted an innovative watershed permit for nutrient discharges from municipal wastewater dischargers to San Francisco Bay that establishes an effective framework for collecting better information about nutrient loads and effects and will support development of appropriate numeric limitations for nutrients, as necessary, in future permitting cycles.

For the RB4 non-ocean permits reviewed (Ojai, ExxonMobil), the Basin Plan does not include numeric water quality objectives for total nitrogen or total phosphorus. Generally, permits

contain narrative receiving water limits for nutrients based on narrative water quality objectives in the Basin Plan. If nutrient TMDLs are not applicable, reasonable potential is assessed for other forms of nitrogen (e.g., ammonia toxicity; nitrogen parameters protecting the municipal and domestic supply beneficial use; Table 3-8 mineral objectives for nitrogen) based on applicable beneficial uses and numeric objectives in the Basin Plan. If TMDLs implement applicable narrative and numeric Basin Plan objectives for nutrients, permits incorporate numeric WQBELs based on TMDL wasteload allocations (e.g., Ojai).

In RB5, the Basin Plans do not include water quality objectives for total nitrogen or total phosphorus and therefore, reasonable potential analyses are not conducted for these pollutants. Reasonable potential is assessed for other forms of nitrogen (ammonia and nitrate+nitrite) based on narrative objectives. For ammonia, RB5 implements the narrative toxicity objective in its Basin Plan with EPA national criteria. For nitrate+nitrite, drinking water maximum contaminant levels are implemented to protect the municipal and domestic supply beneficial use.

All RB9 permittees that discharge to the ocean are permitted in accordance with the Ocean Plan and not assigned limitations for phosphorus or nitrogen. The permits do include a narrative provision, however, which states, "nutrient materials shall not cause objectionable aquatic growths or degrade indigenous biota."

2. Pesticide General Permit

On October 31, 2011, the EPA issued a final NPDES *Pesticide General Permit (PGP) for Discharges from the Application of Pesticides* in response to a 2009 decision by the U.S. Sixth Circuit Court of Appeals (National Cotton Council of America v. EPA, 553 F.3d 927 (6th Circuit 2009)) in which the court vacated EPA's 2006 Final Rule on Aquatic Pesticides (71 Fed. Reg. 68483, November 27, 2006) and found that point source discharges of biological pesticides and chemical pesticides that leave a residue into water of the U.S. were pollutants under the CWA. California's regulation of pesticide discharges under the CWA / NPDES framework predates, and in part triggered the discussions leading to the 2006 EPA rule and 2009 court decision. The requirements of the California pesticide general permits reissued after the court decision therefore parallel, but are in places more detailed than, those in the federal permit.

On July 19, 2001, the SWRCB adopted an emergency general permit providing coverage for "public entities" which apply pesticides for "resource or pest management control measures" resulting in discharge to waters of the US. This general permit was replaced on May 20, 2004 by a pair of separate general permits for vector control and weed control, respectively. Following further court actions leading to the 2006 EPA final rule and its subsequent vacature in 2009, the state issued four separate general permits to provide tailored coverage and specific monitoring requirements for the most prevalent uses of pesticides which result in discharge to waters of the US:

- Aquatic Animal Invasive Species Control (issued March 1, 2011)
- Spray Applications, coverage limited to CDFA and USDA Forest Service (March 1, 2011)
- Vector Control, covering adulticide (aerial) and larvicide (aquatic) use (March 1, 2011)
- Weed Control (issued March 5, 2013)

For this PQR, EPA focused its review on the California "General NPDES Permit for Residual Pesticide Discharges from Aquatic Animal Invasive Species Control Applications", also known as the aquatic invasives general permit. The language in this permit was cross-checked to ensure it is representative of the approach taken in all 4 general permits, though there are differences in the specific chemical formulations targeted for monitoring.

Unlike the federal PGP, the California aquatic invasives pesticide general permit narrowly specifies the chemistry allowable for the subset of pesticide uses it covers: "point source discharge of pesticide residues resulting from direct applications for aquatic animal invasive species control using pesticides containing Sodium Hypochlorite" (p. 4), targeting mollusks (specifically invasive aquatic species of concern). Coverage for another substance, Rotenone, for which environmental effects are much more sensitive to site-specific conditions, is explicitly excluded. As a result, noncompliance with the permit provisions is easier to identify and the state provides an incentive (simpler permit coverage) to use the less harmful pesticide. Similar chemical specificity is a feature of all four of California's general permits for pesticide applications.

Several §303(d) listed waters in California are identified as having impairment by "pesticides", with no specific identification as to which chemical substance(s) contribute to the impairment. The general permit addresses the 303(d) / impaired waters issue by not granting coverage for discharges to waters impaired by the pesticide(s) being used. Discharges to waters impaired by non-specific "toxicity" are only permissible under the permit if:

1) the proposed project will comply with the limitations and discharge requirements specified in the General Permit; and
2) if required, the proposed pesticide application qualifies for and has been granted a Basin Plan prohibition exception prior to discharge.

This language represents a reasonable attempt to implement protection of a class of 303(d) listed waters for which the cause of impairment is often poorly identified and poorly localized. However, it remains to be seen whether this language will be effective and enforceable over the large number of generally localized and transient pesticide applications.

The antidegradation analysis supporting the permit is vague and could be strengthened by clearer discussion of how new permit provisions relate to those contained in the permit they replace.

The state's treatment of TBELs in this general permit is somewhat vague; while the legal authorities behind TBELs are addressed, the reason this permit does not contain TBELs should be stated more clearly. Additionally, the permit and fact sheet provide brief documentation to support the assertion that the required BMPs constitute BAT and BCT. This documentation is similar to that provided in the EPA-issued PGP.

The RPA discussed in the fact sheet is brief. This analysis is limited in part because almost none of the pesticides of concern have numeric water quality standards in place. The RP calculations in EPA's TSD are acknowledged as a source but the input values that led to the RP determination are not.

Due to the complexity of regulating toxicity from pesticides (which are substances discharged with the intent that their effects be toxic), the state is initially funding toxicity testing with its own resources.

3. Pretreatment

California was authorized by EPA to implement NPDES pretreatment requirements pursuant to the Clean Water Act in 1989. The pretreatment program review assessed specific language in POTW permits. Focus was placed on regulatory requirements for pretreatment activities and pretreatment programs (40 CFR Parts 122.42(b), 122.44(j), 403, and 403.12(i)). California is not classified as a 40 CFR 403.10(e) state.

There are currently 83 approved POTW pretreatment programs in California, as listed in the Integrated Compliance Information System database. EPA contractors perform a majority of the pretreatment program reviews, audits, and inspections in California. These contractors are funded with state grant funds at the state's request. The contractors prepare reports summarizing the findings from each activity they perform and submit the reports to the Regional Board, State Board, and EPA for review. Final reports are transmitted to the subject POTW by the Regional Board. On average, approved POTW pretreatment programs are audited once every five years and inspected twice every five years, consistent with EPA's NPDES Compliance Monitoring Strategy.

Of the three POTW permits reviewed for RB2, only one (San Mateo) includes pretreatment program requirements. Two POTW permits (Sausalito-Marin, Mid-Coastside) do not meet the criteria to require a pretreatment program. These two permits contained the notification requirement at 40 CFR 122.42 to identify SIUs. For the POTW permit with pretreatment program requirements (San Mateo), 40 CFR 403 is incorporated by reference, standard notification requirements under 40 CFR 122.42(b) are included in the permit, and the fact sheet describes why a pretreatment program is required. However, the fact sheet does not state when the pretreatment program was approved or modified, or describe the types of industrial users.

Of the two POTW permits reviewed for RB4 (Ojai, Oxnard), both include pretreatment program requirements. 40 CFR 403 is incorporate by reference, standard notification requirements under 40 CFR 122.42(b) are included in the permits, and the fact sheets describe why a pretreatment program is required. However, the fact sheets do not state when the pretreatment programs were approved or modified or describe the types of industrial users.

Of the three POTW permits reviewed for RB5, two included pretreatment program requirements. The third facility did not meet the criteria to require a pretreatment program, but its permit did contain the notification requirement at 40 CFR 122.42 to identify SIUs. For the two permits with pretreatment program requirements, 40 CFR Part 403 is incorporated by reference, and the standard notification requirements under 40 CFR 122.42(b) are included in the standard conditions (Appendix D). The fact sheets, however, do not describe why a pretreatment program is required or when the pretreatment program was approved.

In RB9, two POTW permits with and without approved pretreatment programs were reviewed and pretreatment elements were complete.

Overall, we conclude the permits reviewed include solid pretreatment provisions although a few points could be clarified in future permit revisions.

4. Stormwater

The NPDES program requires stormwater discharges from certain municipal separate storm sewer systems (MS4s), industrial activities, and construction sites to be permitted. Generally, EPA and NPDES-authorized states issue individual permits for medium and large MS4s and general permits for small MS4s, industrial activities, and construction activities.

RB2 administers one MS4 Phase I permit covering the entire county-wide urban areas of Alameda, San Mateo, Santa Clara and Contra Costa Counties, rather than separate permits for individual cities with populations greater than 100,000. EPA supported many aspects of the current permit, including the inclusion of green infrastructure/low impact development (LID) requirements which were emphasized in the permit; and the inclusion of detailed BMP requirements in minimum control measure areas such as municipal maintenance, illicit discharges, and industrial/commercial site controls.

The next permit should explicitly incorporate applicable TMDL wasteload allocations as numeric effluent limits. Also, in addition to in-stream receiving water monitoring, MS4 outfall monitoring should be used to assess the impacts of discharges and the effectiveness of controls required to meet TMDL wasteload allocations and receiving water limits. LID provisions in the next permit should continue to include measurable requirements to enhance the clarity and enforceability of permit requirements for green infrastructure/LID. The San Diego MS4 permit is a good model for updating LID provisions in the next permit. Also, the next permit should clarify that alternative sites within the watershed for off-site retention projects should address the same pollutants and levels in order to achieve the water quality expectations of applicable standards and TMDL wasteload allocations.

RB5 administers seven individual MS4 permits. EPA reviewed the Contra Costa County MS4 permit. Since the County lies within the jurisdiction of both RB2 and RB5, there are two "sister" permits for this MS4, which contain the same requirements, except where TMDLs differ. Instead of referring to a separate stormwater management program document, those requirements were specifically included in the permit. Specific LID requirements were also included. As a result of review of this permit, EPA has the following recommendations for this permit, which may be applicable to other MS4 permits across the state:

- Include more specific outreach requirements to commercial and industrial businesses.
- Include more specific outreach/training requirements on illicit dischargers for staff other than inspectors.
- Include more specific evaluation of the illicit discharge program.
- At next reissuance, require compliance with the methylmercury TMDL by end of schedule (TMDL was not yet approved when this permit was last issued).
- Include more specific training requirements for staff under the municipal operations program.
- Include minimum inspection frequency for the industrial/commercial program.
- Include a summary table of reporting requirements and deadlines.

RB9 has three individual MS4 permits. Small MS4s, construction activities, and industrial stormwater activities are all covered under statewide general permits. All three individual MS4 permits are current. In May 2013, RB9 issued a single region-wide joint MS4 permit. This permit currently applies in San Diego County and will replace the individual MS4 permits for South Orange County and Riverside County as these permits expire in 2014 and 2015. EPA reviewed the South Orange County Permit. The permit was generally comprehensive and included most provisions expected in an MS4; however, EPA has the following recommendations for this permit, which may be applicable to other MS4 permits across the state:

- Include more specific requirements for storm sewer system mapping including requirements for identifying location of outfalls, names and locations of all WUS/WS associated with outfalls, system inlets and catch basins.
- Include a tracking and reporting system to keep track of illicit discharges.
- Include procedures for tracking construction sites, construction plan reviews, and associated compliance and enforcement actions.

IV. SPECIAL FOCUS AREA FINDINGS

The Region selected reasonable potential analysis, enforceability of permits, and low impact development requirements in MS4 permits as special focus areas.

A. Reasonable Potential

EPA carefully reviewed how the four Regional Boards evaluated for this PQR applied RPA procedures in recently adopted permits. Our review found that RB2, RB4, and RB9 permits incorporate technically correct RPAs that conform with federal regulatory requirements and follow Ocean Plan and SIP provisions. We found that many RB5 permits deviate from the RPA practices used by other Regional Boards and do not meet federal regulatory requirements and/or do not appear to conform to SIP RPA procedural requirements. We recommend the state clarify RPA procedures in the SIP or other policy decision to ensure these errors do not recur in future permit decisions.

RB2 permits follow Ocean Plan RPA procedures for ocean waters and SIP RPA procedures for non-ocean waters. For non-ocean water Basin Plan water quality objectives without RPA procedures, if a numeric objective is exceeded, then the permit incorporates WQBELs. For one RB2 permit (Mid-Coastside), the RPA determination is in error for data reported in the category of quantified. The fact sheet describes that some SMR certified effluent data for TCDD equivalents congeners were reported quantified by the discharger at concentrations above the laboratory's reporting limits. However, because the laboratory's reporting limits are lower than the minimum levels for the analytical method (EPA Method 1613) specified in the permit, rather than treating the data as quantified for the RPA, RB2 assessed the data as DNQ and determined that the RPA was inconclusive. Effluent data that has been certified by the discharger for compliance reporting should not be altered in this manner by the permitting authority, unless an identified error is properly addressed and corrected by both the discharger and permitting authority through the compliance reporting process. As a result, at this juncture, we disagree with

the determination of no reasonable potential for TCDD equivalents for this discharge. This is an exceedingly rare occurrence in RB2 permits.

For another RB2 permit (Ox Mountain), the RPA determined no RP for zinc; however, the permit's TBEL for zinc is less stringent than the applicable WQS. As a result, the permit, in effect, authorizes zinc discharges that exceed applicable WQS, which is an exceedingly rare occurrence in RB2 permits.

RB4 permits follow Ocean Plan RPA procedures for ocean waters and SIP RPA procedures for non-ocean waters. For non-ocean water Basin Plan water quality objectives without RPA procedures, if a numeric objective is exceeded, then the permit incorporates WQBELs. No improper RPA evaluations were noted in the three RB4 permits reviewed.

RB9 permits also follow Ocean Plan and SIP RPA procedures. In all the permits reviewed, effluent limits were established for all that pollutants that were assessed as having reasonable potential to cause or contribute to an excursion of applicable water quality standards. In some permit fact sheets, however, it was unclear for which outfall(s) the RPA was being conducted. After a more detailed review of the permit record, RB9 appears to not retain final RPA and WQBEL calculations in all permit files. In these cases, the full extent of the record is the summary of data presented in the fact sheet. Therefore, we recommend RB9 ensure clear fact sheet documentation of RPAs.

RB5 performs reasonable potential analyses according to the procedure included in the SIP. According to this procedure, reasonable potential is determined either when the maximum effluent concentration of a pollutant exceeds the applicable water quality objective, or the receiving water concentration of a pollutant exceeds the applicable water quality objective and the pollutant has been detected in the effluent. This procedure does not include a statistical calculation to account for effluent variability; however, in considering both the maximum effluent concentration and the receiving water concentration, and not considering dilution, the procedure could be considered more conservative.

EPA Region 9 commented on the RPA procedure included in the SIP in a 2002 letter to the State Board, which urged the State Board to clarify how the procedure accounts for effluent variability, and whether it is fully consistent with the regulations at 40 CFR 122.44(d). In 2003, EPA Region 9 again requested clarification on how the state's reasonable potential procedure accounts for effluent variability when small effluent data sets are used to determine reasonable potential. EPA Region 9 was concerned with section 1.2 of the SIP, where the state allows the RWQCB discretion to consider if any data are inappropriate or insufficient for use in implementing the policy. EPA Region 9's 2002 letter specifically stated, "insufficient data should not be used to delay establishing a WQBEL when reasonable potential has been established" and "such provisions should be revised to conform to the regulatory requirements at 40 CFR 122.44(d)(1)."

The Regional Boards have generally been implementing the SIP RPA procedure in a conservative manner. Specifically, all Regional Boards except RB5 generally base RPAs on a comparison of maximum effluent concentrations with applicable water quality standards and conclude RP exists when maximum effluent concentration exceeds the standard. Except for RB5,

no Regional Boards regularly censor data points submitted by dischargers in permit applications or DMRs from consideration during the RPA process. The other Regional Boards also generally apply SIP procedures for developing RPAs for non-priority pollutants; RB5 often does not follow SIP procedures in evaluating RP for non-priority pollutants.

As RB5's reasonable potential analysis approaches deviate from those provided in the SIP and pursuant to federal regulations, we evaluated those approaches in detail for the PQR. EPA found several areas of concern with respect to reasonable potential analyses in RB5:

1. **Non-priority pollutants** – The SIP provides implementation provisions for priority pollutant criteria promulgated by EPA through the National Toxics Rule, the California Toxics Rule, and for priority pollutant objectives established by RWQCBs in their basin plans. The SIP does not address non-priority pollutants for which, either the RWQCB has established water quality objectives included in their basin plan, or the RWQCB is implementing a narrative water quality objective with available EPA criteria or other numeric goal (ex. drinking water maximum contaminant levels, or MCLs, have been used to implement narrative water quality objectives when the municipal and domestic supply beneficial use is applicable to the receiving water). Thus, the state does not have an established RPA procedure specifically for non-priority pollutants, which has lead to inconsistent reasonable potential determinations for non-priority pollutants. Recent RB5 permits demonstrate the following inconsistencies:

    a. **Shift in Approach –** In one permit (Tracy WWTP), effluent limits for two non-priority pollutants (aluminum and iron) were removed based on a finding of no reasonable potential. The previous permit found reasonable potential for these pollutants according to step 6 of the SIP RPA procedure, which is based on the receiving water data exceeding the water quality objective and the pollutant being detected in the effluent; however, the SIP RPA procedure was not utilized in the reissued permit. Instead, the determination was based on a direct comparison of the effluent data and the water quality objective. The receiving water data was not considered in the reissued permit. Had RB5 used the SIP RPA procedure, reasonable potential for an additional non-priority pollutant (manganese) would have been established according to step 6 of the SIP. This was also the case in another permit (Vendo) with a different non-priority pollutant (iron).

    In contrast, one of the reviewed permits (Modesto WQCF) established reasonable potential for a non-priority pollutant (aluminum) based on step 6 of the SIP RPA procedure.

    b. **Narratives –** RB5 implements narrative water quality standards with available numeric water quality criteria, including EPA National Recommended Water Quality Criteria, MCLs, and agricultural goals (as compiled in *A Compilation of Water Quality Goals*. Central Valley Regional Water Quality Control Board. 2008). Two of the permit fact sheets (Vendo and Empire Mine) provide unclear justification for determining that there is no reasonable potential for a non-priority pollutant (electrical conductivity). The fact sheets discuss use of applicable numeric water quality objectives (MCLs and agricultural goals) to implement the applicable narrative water quality standards; however, reasonable potential is not established, even though levels of the pollutant exceed these objectives.

c. **Basin Plan Objectives –** RB5 Basin Plans contain numeric objectives for some non-priority pollutants, which are based on other objectives (ex. MCLs). In one permit (Modesto WQCF), the RPA for non-priority pollutants with Basin Plan objectives (iron and manganese) was conducted by comparing the maximum effluent concentration to the Basin Plan objective. In most other permits reviewed, the annual average effluent concentration was used for the RPA. The basis included in the fact sheets for the latter is that the Basin Plan objective was based on an MCL, which are levels established for a long-term period of exposure. Another permit (Pactiv) did not establish reasonable potential for a non-priority pollutant (electrical conductivity), due to the distance of the discharge point from the receiving water location where the beneficial use applies, though the effluent concentration exceeded the Basin Plan objective.

2. **Outliers –** In three permits (Tracy, Vendo, and Empire Mine), a determination of no reasonable potential was made by excluding certain high data points from the RPA. The fact sheets justify the exclusion of these data points based on either a visual observation or statistical test that demonstrates the higher data points are apparent outliers. Had these data been included in the RPA, reasonable potential would have been found and effluent limits would have been included in the permit. In all cases, there was no evidence of laboratory error included in the fact sheet to support the determination that these data points were not representative of the effluent. Additionally, the fact sheet does not provide evidence from the permittee that the data points were not representative of the effluent. One fact sheet further justified the determination based on a change in treatment; however no additional data since the treatment change was available. In two of the fact sheets, the fact that the data points were the oldest in the permit term was included as justification for censoring the data set.

3. **Limited Data –** In one permit (Empire Mine), limits were not included for a toxic pollutant (chrysene), though the maximum effluent concentration exceeded the California Toxics Rule criterion and, per the SIP RPA procedure, reasonable potential would be established. The data set consisted of 4 samples: one where the pollutant concentration significantly exceeded the water quality criterion and three where the pollutant was not detected. The fact sheet basis for the determination was that the pollutant was not detected in the downstream receiving water in four samples collected on the same dates and that the source of the pollutant in the discharge is uncertain. The fact sheet states that the data is insufficient and cites step 8 of the SIP RPA procedure to require additional monitoring instead of an effluent limit. There is future potential for this situation to occur more frequently, since many permits require few priority pollutant scans on which to base future RPAs. For example, two of the permits (Pactiv and Vendo) required priority pollutant scans twice/permit term and one permit (SCE Big Creek) required a priority pollutant scan once/permit term.

4. **Treatment of Data Marked "Detected. Not Quantified"**– Two of the permit fact sheets (Tracy and Vendo) state that there is not enough information to determine reasonable potential for a toxic pollutant (lead) pursuant to step 6 of the SIP, which states that RP exists for a pollutant if it is detected in effluent and exceeds applicable objectives in the receiving water. As a result, these permits did not incorporate effluent limits for these pollutants. In both cases, the receiving water concentration exceeds the water quality

objective; however, the effluent is "detected, but not quantified." It appears the determination by RB5 is inconsistent with the SIP.

5. **Insufficiently Sensitive Methods** – In two permits (Modesto and Vendo), monitoring data was analyzed with methods that lacked reporting levels (or minimum levels) sensitive enough to compare the data to the water quality objective. Since the data was detected, but not quantified, reasonable potential was difficult to determine. In one fact sheet, the data shows the permittee switched from a method with a sensitive reporting level to a method with a reporting level much higher than the water quality objective. The SIP does not include an ML for the pollutant of concern in this case (molybdenum). The SIP minimum levels have not been updated in quite some time; however, new methods are now available that attain more sensitive reporting levels. All the permits lack a requirement for the permittee to use the lowest minimum level, which is resulting in unusable data for reasonable potential analyses.
6. **Period of Data** – In four permits (SCE Big Creek, Pactiv, Vendo, Empire Mine), it is not clear why a subset of data was used for the RPA, while other data during the permit term was not used for the RPA. Exclusion of these data may have resulted in an unwarranted finding of no RP.
7. **RPA for all pollutants** – In 5 permits (Tracy, Modesto, Willows, Pactiv, CAAP GP), reasonable potential was not assessed for all pollutants with TBELs and in 4 permits (Tracy, Willows, Pactiv, CAAP GP), reasonable potential was not assessed for all pollutants on the CWA 303(d) list for the receiving water. It is also not clear how RB5 determines which pollutants will be evaluated and documented in the fact sheet RPA discussion and table.

Summary:

The RB5 permits demonstrate a lack of consistency in reasonable potential determinations, which can be partially attributed to a lack of clarity provided by the SIP. First, the SIP does not address non-priority pollutants. The state lacks a specific reasonable potential analysis procedure for these pollutants, which is causing inconsistent permitting decisions. Second, as EPA commented before, it is not clear how the SIP RPA procedure accounts for effluent variability. The combination of a procedure that relies on the maximum effluent concentration for the RPA and the provision in section 1.2 of the SIP, which provides RWQCBs discretion in determining when data are insufficient, can lead to a variety of different reasonable potential determinations that may not be protective of water quality and is inconsistent with federal permit regulations.

The practices described above regarding "outliers" and limited data sets are not consistent with federal regulations and guidance. 40 CFR 122.44(d)(1) requires that effluent limitations be established for all pollutants which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality. EPA's *Technical Support Document for Water Quality-Based Toxics Control* states that when characterizing an effluent for the need for an individual toxicant limit, the regulatory authority should use any available effluent monitoring data as the basis for the decision. The NPDES Central Tenets state, "Data may not be arbitrarily discarded or ignored" and, "additional "studies" or data collection efforts may not be

substituted for enforceable permit limits where "reasonable potential" has been determined." Section 4.4.1 of EPA's *Data Quality Assessment: Statistical Methods for Practitioners*, EPA QA/G-9S (EPA/240/B-06-003) states, "Discarding an outlier from a data set should be done with extreme caution, particularly for environmental data sets, which often contain legitimate extreme values."

Specifically for "outliers," this practice of censoring possible outlier data points is also inconsistent with the finding of the State Board in Water Quality Order No. 2004 – 0013 *In the Matter of the Petition of Yuba City For Review of Waste Discharge Requirements Order No. R5-2003-0085 and Cease and Desist Order No. R5-2003-0086 Issued by the California Regional Water Quality Control Board, Central Valley Region*. This order states, "There is also no basis for the City's claims that all "outlier" data, which are higher than most other data points, should be discarded. While outlier data that are shown to be unreliable should be discarded, such data are not unreliable simply because they are high."

The SIP RPA procedure relies on the maximum effluent concentration, so excluding high data points often results in a finding of no reasonable potential. The SIP also does not address how to evaluate small data sets. Section 1.2 of the SIP provides the RWQCBs discretion in determining when data are inappropriate or insufficient, and provides examples for when such discretion is warranted. These include, but are not limited to, situations where the sample is erroneously reported, was subject to laboratory error, or is unrepresentative of seasonal conditions. These reasons for excluding apparent outliers are likely permissible under federal regulations. The extent of this discretion is not clear, however, when considering small data sets or statistical "outliers."

Additionally, there is a need to clarify step 6 of the SIP RPA procedure regarding whether "detected, but not quantified," or DNQ, data meets the definition and intent of "detected in the effluent." The responses to public comment on the 2005 amendments to the SIP state, "The proposed reasonable potential approach does provide water quality protection. If the ambient background concentration of a pollutant is greater than the criteria and that pollutant is found in the discharged effluent (in any amount), the pollution concentration could possibility contribute to additional impairments. If however, the ambient background concentration of a pollutant is greater than the criterion and the pollutant is not detected in the discharge, periodic monitoring is necessary. This response and other responses within the document show that any amount detected in the effluent should trigger reasonable potential if the receiving water concentration exceeds the water quality objective. A DNQ concentration is an estimated concentration, and per the SIP definition, "is the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value."

To improve monitoring data for use in future RPAs, the SIP minimum levels need to be updated to account for more sensitive methods and permits should require the permittee to select a method with an ML below the applicable water quality objective, if possible. SIP revisions will be necessary in any event to implement the related requirements of the recently adopted Sufficiently Sensitive Test Methods rule published August 19, 2014 (79 FR 49001). It may also be feasible to address some of these data analysis issues through development of a Quality Assurance Program Plan for the NPDES program, which was initiated in 2014.

Finally, permit fact sheets need to demonstrate that RPA was performed for all pollutants of concern and justify why certain periods of data are included or excluded from the RPA.

B. Enforceability of Permits

Based on our permit reviews, discussions with state staff, and discussions with EPA enforcement program staff, we identified several factors that may adversely affect the enforceability of California's NPDES permits. First, permits that incorporate narrative requirements and limitations are difficult to evaluate for compliance, code in tracking databases, and track over time. In particular, we noted this problem with respect to wastewater permit provisions addressing toxicity control and stormwater permits incorporating BMP-based requirements. We found that reliance on "trigger" provisions that are not numeric limitations were rarely enforced and did not result in timely detection of potential compliance problems in many cases. Permits that contain extensive BMP-based requirements were difficult to follow and evaluate for compliance as reporting requirements often provided insufficient information for reviewers and inspectors to evaluate whether required BMPs were actually implemented and effective. In future permits, we recommend inclusion of numeric limitations and specific associated monitoring and reporting requirements in NPDES wastewater and stormwater wherever feasible (and warranted based on reasonable potential evaluations). For permits where the state elects to include triggers to complement numeric limitations (e.g., to assist in ensuring performance-based limitations are not exceeded), the triggers should be facility-specific, quantified, and linked to specific monitoring and reporting requirements necessary to ensure they can be clearly tracked. In cases where BMP-based approaches are used, the requirements should be specific, quantified, and trackable through required reporting provisions in permits.

Second, for a number of reasons, many California permits incorporate receiving water limitations instead of, or in addition to, end-of-pipe effluent limitations. While we understand some of the motivations for using receiving water limitations, their use has made it very difficult to accurately evaluate compliance. In many cases, monitoring requirements at receiving water monitoring stations downstream from discharge points yields data that are difficult to associate specifically with discharges from individual discharge facilities. Where receiving water limitations are included, monitoring of both receiving water quality and effluent quality are necessary to evaluate whether receiving water exceedences are associated with specific discharges. While receiving water limitations can help support a more holistic evaluation of watershed response to various discharges, for most wastewater discharge situations, receiving water limitations are not an appropriate substitute for end-of-pipe limitations.

Third, we found that monitoring requirements are often not designed to provide data necessary to support compliance evaluations. Monitoring locations, frequencies, and durations should be designed to reflect the manner in which numeric limitations are expressed. Monitoring needs to be tailored to how limits are expressed to support compliance assessments.

Fourth, we found that the size and complexity of California permits makes it difficult for permittees and the public to understand their requirements and for inspectors and other state staff to accurately evaluate permit compliance. In response to stakeholder input, MS4 stormwater permits, in particular, have become extremely voluminous as Regional Boards establish

increasingly complex implementation provisions. We understand that the combination of state and federal administrative requirements for permit issuance necessitates issuance of lengthy permits. However, increased use of standard templates and language, reduction in use of language specifically tailored to individual permit settings, and removal of many permit details from the permit document and fact sheet to separate supporting documentation, would help address this problem.

C. Low Impact Development

Low Impact Development has lasting and far-reaching effects on not only water quality, but water supply, as well. The state, in working with EPA, has done significant work in balancing the need for on-site retention with off-site recharge.

As discussed in the stormwater section above, the reviewed MS4 permits included LID provisions, but some included more specific requirements than others. We recommend inclusion of clear LID performance standards in all future MS4s, similar to the requirements included in the MS4 permits for Los Angeles, San Diego, and Orange County.

V. ACTION ITEMS

This section provides a summary of the main findings of the review and provides proposed Action Items to improve California's NPDES permit program. This list of proposed Action Items will serve as the basis for ongoing discussions between Region 9 and California as well as between Region 9 and EPA HQ. These discussions should focus on eliminating program deficiencies to improve performance by enabling the timely issuance of good quality, defensible permits. We acknowledge that the State has begun work to address some of these action items through training, template revisions, and other actions.

The proposed Action Items are divided into three categories to identify the priority that should be placed on each Item and facilitate discussions between regions and states.

- **Critical Findings** (Category One) **-** Most Significant: proposed action items will address a current deficiency or noncompliance with a federal regulation.
- **Recommended Actions** (Category Two) **-** Recommended: proposed action items will address a current deficiency with EPA guidance or policy.
- **Suggested Practices** (Category Three) **-** Suggested: proposed items are listed as recommendations to increase the effectiveness of California's NPDES permitting program.

The critical findings and action items should be used to augment the existing list of "follow up actions" currently established as an indicator performance measure and tracked under EPA's Strategic Plan Water Quality Goals and/or may serve as a roadmap for modifications to the EPA's program management.

The action items include discrete actions to bring State Board and Regional Board attention to permitting improvements needed to ensure permit and fact sheet quality. In addition, Region 9

will continue to review a significant percentage of draft Regional Board permits each year, including the next round of the specific permits reviewed for this PQR, to ensure these issues are addressed.

A. Basic Facility Information, Permit Application, and Permit Provisions

The RB fact sheets and permit files reviewed provide a good level of facility information upon which to base permit requirements. In general, permit applications appear to be appropriate, timely, and complete. Proposed Action Items to help the State Board and Regional Boards strengthen their NPDES permit program include the following:

- The state should ensure that permit terms do not exceed 5 years. [40 CFR 122.46] (Category 1)
- The state should revise its permit template and/or provide permit-writer training to help ensure that permit writers identify and address applicable TMDLs and impaired receiving water settings. (Category 2)
- The state should include "authorization to discharge" language in its permit template upon receipt from EPA. (Category 1) [40 CFR 122.2]

B. Technology-based Effluent Limitations

In general, the RB permits reviewed properly implement TBELs for municipal and non-municipal facilities. Proposed Action Items to help the State strengthen their NPDES permit program include the following:

- The state should, through revisions to the permit template or training, remind permit writers that the most stringent of the applicable TBELs or WQBELs is to be included for each pollutant in permits and documented in fact sheets. (Category 2)

C. Water Quality-Based Effluent Limitations

The permits reviewed include WQBELs and the fact sheets and permit files document the basis for these limits. Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- The state should revise the SIP, incorporate appropriate provisions in its NPDES Quality Assurance Program Plan, and/or otherwise clarify RPA procedures to:
    - Clarify that data points can be censored only with clear evidence of laboratory error, or by demonstrating that data points are unrepresentative based on empirical evidence showing how the data points are unrepresentative (i.e., statistical evaluations of outliers are by themselves insufficient to demonstrate unrepresentativeness) (Category 1). [40 CFR 122.44(d)(1)(i)]
    - Update the minimum levels (MLs) listed in the SIP to include improved and more sensitive analytical methods in accordance with EPA's final rule, *National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods*

for Permit Applications and Reporting, effective September 18, 2014. [79 FR 49001 and 40 CFR 136.1.(c)] (Category 1)

- Require treatment of "detected, but not quantified" (DNQ) data as "detected" for the purposes of RPA (Category 1). [40 CFR 122.44(d)]
- Require use of the most sensitive analytical methods under 40 CFR 136, even if not listed in the SIP (Category 1). [40 CFR 136.1(c)]
- Require evaluation of whether the receiving water exceeds WQSs based on available receiving water data, even if not listed under 303(d) of the CWA (Category 1). [40 CFR 122.44(d)(ii)]
- Require use of all data in the permit record collected since the last permit was issued when conducting RPA, unless specific data are demonstrated to be unreliable or unrepresentative (see first bullet above). (Category 2)

- The state should require inclusion of numeric (not narrative) limits for toxicity in permits where reasonable potential is present and numeric limits are feasible (Category 1). [40 CFR 122.44(d)(iv)]
- The State Board should clarify that Water Quality Order No. 2003-0012—addressing only POTWs discharging to non-ocean waters—does not apply to discharges that are not POTWs (Category 2).
- Regarding antibacksliding and antidegradation requirements, the state should provide permit writers further training on implementation of the antidegradation policy and implementation procedures, specifically clarifying:
  - The permitting actions (such as changes to the discharge, facility, or permit requirements) that may further degrade water quality and therefore require antidegradation review (Category 1). [40 CFR 131.12(a)]
  - The elements of an antidegradation review that need to be documented in permit fact sheets (Category 2).
  - Antidegradation requirements should be considered in evaluating the need for WQBELs in tandem with the RPA (Category 1). [40 CFR 131.12(a)]
  - Requirements to consider changes in averaging periods of limits when assessing whether antibacksliding or antidegradation requirements are met (Category 1). [40 CFR 122.44(l), 131.12(a)]
- The state should provide training to permit writers on requirements for developing and documenting compliance schedules, specifically clarifying the differences between TMDL implementation schedules and permit compliance schedules (Category 1). [40 CFR 122.47]

D. Monitoring and Reporting

Monitoring and reporting requirements in the permits reviewed generally appeared to be consistent with program requirements. Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- The state should provide training and/or guidance to ensure permit writers design monitoring in accordance with duration/frequency components of limits and to ensure data and information necessary for future permit reissuance and compliance evaluations are collected during the permit term (Category 2).
- The state should ensure, at a minimum, annual monitoring for pollutants is required in cases where effluent limits are included in the permit for those pollutants (Category 1). [40 CFR 122.44(i)(2)]

E. Special and Standard Conditions

The standard conditions reviewed were consistent with federal requirements and the special conditions appeared to be appropriate and reasonably documented. Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- The state should incorporate all of the federal standard conditions in the permit template (Category 1). [40 CFR 122.41]
- The state should revise permit template language to clarify the permit is not a shield for pollutants not specifically limited due to inclusion of narrative limits (Category 1).

F. Administrative Process (including public notice)

The permits reviewed appeared to be compliant with the administrative process requirements. Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- The state should remind permit writers that the MOA requires them to provide EPA with copies of preliminary draft permits at least 30 days before public notice (Category 2).

G. Documentation (including fact sheet)

The fact sheets reviewed were of very good quality and the permit files were generally found to be complete. Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- As indicated in other action items, the state should ensure permit writers clearly document the basis for RPA, limits, and compliance schedules, and how antibacksliding and antidegradation requirements are met (Category 2).

H. Core Topic Areas

Proposed Actions Items for core topic areas are provided below.

1. Nutrients

The permit review indicated nutrients limits and monitoring were correctly established in permits. Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- The state should complete development of the CA numeric nutrient endpoint methodology and associated policy and incorporate implementation provisions for developing nutrient control requirements in NPDES permits (Category 3).

2. Pesticide General Permit

No action is required, as the permit review indicated the PGP meets federal requirements.

3. Pretreatment

The permit review indicated permits incorporate appropriate pretreatment language. Proposed Action Items to help the state strengthen its NPDES permit program include the following:

- The state should provide training or written guidance to permit writers to ensure fact sheets clearly document the justification for a pretreatment program and indicate when the program was approved by the State/RB (Category 2).

4. Stormwater

The permit review indicated the stormwater permits meet federal requirements. Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- The state should revise policies, guidance, and/or training for permit writers to ensure stormwater permits include:
  - Numeric, enforceable limits in cases where TMDLs are applicable and numeric limits are feasible to include (Category 2).
  - Clear monitoring requirements that are linked to how limits are expressed and incorporate an appropriate mix of receiving water and end-of-pipe monitoring approaches (Category 2).
  - Provisions that clarify that watershed plans may provide a shield from enforcement action only after those plans are approved by the Regional Board or Executive Officer (Category 2).
  - Specific outreach requirements to commercial and industrial businesses (Category 2).
  - More specific tracking, reporting, and evaluation provisions for the illicit discharge program (Category 3).
  - Minimum inspection frequency for the industrial/commercial program (Category 2).
  - A summary table of reporting requirements and deadlines (Category 3).
  - More specific requirements for storm sewer system mapping including requirements for identifying location of outfalls, names and locations of all WUS/WS associated with outfalls, system inlets and catch basins (Category 2).

- Procedures for tracking construction sites, construction plan reviews, and associated compliance and enforcement actions (Category 2).
- Provisions to identify and control non-stormwater discharges from landscape irrigation, irrigation water, lawn watering and street wash water (Category 3).

I. Special Focus Areas

Proposed Actions Items for special focus areas are provided below.

1. Reasonable Potential

In addition to Action Items under Section C above, proposed Action Items to help the State strengthen its NPDES permit program include the following:

- Specific Recommendations for RB5 permits: The State should ensure thorough issuance or clarification of permitting and data management procedures, and provision of training and guidance for permit writers, that the Regional Board will:
  - Use an established RPA procedure (SIP or TSD) for non-priority pollutants until state provides specific procedures for determining reasonable potential for non-priority pollutants (Category 2).
  - Use all data submitted by a discharger and otherwise available in RPA unless those data are clearly demonstrated to be unreliable or unrepresentative (Category 1). [40 CFR 122.44(d)(1)(ii)]
  - Use all data submitted by a discharger and otherwise available in RPA unless those data are clearly demonstrated to be unreliable or unrepresentative (Category 1). [40 CFR 122.44(d)(1)(ii)]
  - Consider data points marked as "Detected, Not Quantified" as evidence pollutants are present in discharge and/or receiving water for purposes of applying RP analysis methods. Do not consider DNQ data to comprise evidence of compliance with objectives (Category 1). [40 CFR 122.44(d)(1)(ii)]
  - Develop clearer and more concise fact sheet documentation of RPAs for all pollutants of concern, including those on the 303(d) list and those with applicable TBELs (Category 2).
  - Provide clearer fact sheet justification for inclusion or exclusion of data periods in RPA (Category 1). [40 CFR 122.44(d)(1)(ii)]

2. Enforceability of Permits

Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- Include numeric limits where feasible and ensure clear, measurable expressions of non-numeric requirements when used (Category 2).
- Regarding monitoring, see action items under Section D above.

3. Low Impact Development

Proposed Action Items to help the state strengthen their NPDES permit program include the following:

- The state should ensure through provision of guidance or training for permit writers that all MS4 permits incorporate clear numeric performance standards in all MS4 permits enumerating stormwater retention requirements, specifically indicating that offsite retention approaches may be used in lieu of onsite retention approaches only if the offsite retention approaches yield equivalent or greater water quality benefits and do not cause localized water quality problems (Category 2).

Appendix A: List of Reviewed Permits

San Francisco Bay Regional Water Quality Control Board (RB2):

Order No. R2-2012-0061 (NPDES No. CA0038598). Sewer Authority Mid-Coastside; Sewer Authority Mid-Coastside Wastewater Treatment Plant (WWTP) and its associated wastewater collection system.

Order No. R2-2012-0083 (NPDES No. CA003867). Sausalito-Marin City Sanitary District; Sausalito-Marin City Sanitary District Wastewater Treatment Plant and its wastewater collection system.

Order No. R2-2013-0006 (NPDES No. CA0037541). City of San Mateo and City of Foster City Estero Municipal Improvement District, a joint powers authority; City of San Mateo Wastewater Treatment Plant and its wastewater collection system.

Order No. R2-2012-0084 (NPDES No. CA0005240). C&H Sugar Company, Inc. and Crockett Community Services District; C&H Sugar Company Refinery, Joint Use C&H Sugar Company-Crockett Community Services District Philip F. Meads Water Treatment Plant, and Crockett Community Services District collection system.

Order No. R2-2013-0012 (NPDES No. CA0029947). Browning-Ferris Industries, Corinda Los Trancos (Ox Mountain) Landfill.

Order R2-2009-0074 (NPDES Permit No. CAS612008). California Regional Water Quality Control Board, San Francisco Bay Region, Municipal Regional Stormwater NPDES Permit.

Order No. R2-2012-0096 (NPDES No. CA0038849). Waste Discharge Requirements for Mercury and PCBs from Municipal and Industrial Wastewater Discharges to San Francisco Bay (See permit for discharger information).

Los Angeles Regional Water Quality Control Board (RB4):

Order No. R4-2013-0094 (NPDES No. CA0054097). City of Oxnard Municipal Corporation; Oxnard Wastewater Treatment Plant and its associated wastewater collection system and outfalls.

Order No. R4-2013-0173 (NPDES No. CA053961). Ojai Valley Sanitary District; Ojai Valley Wastewater Treatment Plant and its associated wastewater collection system and outfalls.

Order No. R4-2013-0138 (NPDES No. CA0055387). ExxonMobil Oil Corporation; Torrance Refinery.

Central Valley Regional Water Quality Control Board (RB5):

Order No. R5-2011-0072 (NPDES No. CA0078034). City of Willows, Willows Wastewater Treatment Plant.

Order No. R5-2012-0031 (NPDES No. CA0079103). City of Modesto, City of Modesto Water Quality Control Facility.

Order No. R5-2012-0115 (NPDES No. CA0079154). City of Tracy, Tracy Wastewater Treatment Plant.

Order No. R5-2011-0036 (NPDES No. CA0004821). Pactiv Corporation, Molded Pulp Mill.

Order No. R5-2012-0048 (NPDES No. CA0079545). Southern California Edison Company, Big Creek Powerhouse No. 1 Domestic Wastewater Treatment Plant.

Order No. R5-2012-0050 (NPDES No. CA0085171). State of California, Department of Parks and Recreation, Empire Mine State Historic Park.

Order No. R5-2013-0018 (NPDES No. CA0083046). The Vendo Company, Groundwater Remediation System.

Order No. R5-2010-0102 (NPDES No. CAS083313). East Contra Costa County Municipal NPDES Permit.

Order No. R5-2010-0018-01 (NPDES No. CAG135001). Waste Discharge Requirements for Cold Water Concentrated Aquatic Animal Production Facility Discharges to Surface Waters.

San Diego Regional Water Quality Control Board (RB9):

Order No. R9-2008-0082 (NPDES No. CA0109193). Genentech, Inc. San Diego County.

Order No. R9-2009-0002 (NPDES No. CAS0108740). Municipal Separate Storm Sewer Systems Draining to the Watershed of the County of Orange, the Incorporated Cities of Orange County, and the Orange County Flood Control District within the San Diego Region.

Order No. R9-2010-0012 (NPDES No. CA0108952). Sweetwater Authority Richard A. Reynolds Desalination Facility.

Order No. R9-2011-0016 (NPDES No. CA0107433). City of Oceanside San Luis Rey Water Reclamation Facility, La Salina Wastewater Treatment Plant, and Mission Basin Desalting Facility.

Order No. R9-2011-0022 (NPDES No. CAG999002). General Permit for Residual Firework Pollutant Waste Discharges.

Order No. R9-2011-0032 (NPDES No. CA0107336). Seaworld Parks & Entertainment, Inc.

Order No. R9-2012-0004 (NPDES No. CA0108031). Fallbrook Public Utility District Wastewater Treatment Plant No.1.

Order No. R9-2012-0015 (NPDES No. CA0109215). San Diego Gas & Electric Company Palomar Energy Center.

Appendix B: Draft Comment Letter from State Water Resources Control Board, June, 2014