WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

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STEPHEN R. MAGUIN
Chief Engineer and General Manager

March 27, 2007

3/20/07 BdWkshp Item 8
Water Recycling
Deadline: 3/27/07 5 pm

Ms. Song Her, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
P.O. Box 100
Sacramento, CA 95812-0100

Dear Ms. Song Her:

Development of a Statewide Water Recycling Policy

The County Sanitation Districts of Los Angeles County (Districts) are pleased to offer the following comments regarding the need for the State Water Resources Control Board (State Water Board) to develop a statewide Water Recycling Policy. These comments supplement the Districts' oral testimony at the March 20, 2007 Workshop on this matter. The Districts provide for the wastewater and solid waste management needs of over five million people in 78 cities and unincorporated areas within Los Angeles County. As part of that program, the Districts operate ten water reclamation plants that currently provide some 83,000 AFY of recycled water to over 500 sites for a variety of uses, including landscape irrigation, agricultural irrigation, industrial processing, environmental enhancement and groundwater recharge. Since the inception of our program in 1962, the Districts have delivered over 2 million acre-feet of recycled water. The Districts wish to continue its longstanding support for water reclamation in California through practices that promote recycling, while protecting the region's beneficial uses in a reliable and cost effective manner. For this reason, the Districts strongly support the development of a statewide Water Recycling Policy (Water Recycling Policy). The Districts have been participants in the WateReuse Association (Association) since its formation in 1990, and thus, also support comments submitted by the Association on the need to develop the Water Recycling Policy.

Of note, the Districts originally collaborated with State Water Board staff in the development of what was to have been water recycling guidance ("Draft Guidance for Implementing State Statutes, Regulations and Policies for Recycled Water Projects," November 2005, referred to herein as the 2005 Recycling Document). That deliberative process was viewed as very important by the Districts and members of the recycling community to address inconsistencies in the application of state law, regulations and policies by regional water boards in approving and permitting recycling projects. While we recognize that the 2005 Recycling Document has no "formal" status, especially in light of the Water Board's decision to develop a formal Water Recycling Policy, the document does contain information and approaches that have relevance for the current Water Recycling Policy development, and which the Districts plan to reference in these comments. Nevertheless, the Districts are pleased that the State Water Board is considering moving beyond guidance to development of the Water Recycling Policy, which will provide a stronger basis to address some of the regulatory inconsistencies and to promote legislative recycling goals in a protective manner.

The Districts' comments are organized in two parts: general comments included in this cover letter, and more detailed comments set forth in the attachment. The Districts address the issues raised in the notice for the March 20, 2007 Workshop on the Water Recycling Policy, issues raised during the March 20th Workshop, as well as several other issues that the Districts believe should be dealt with in the Water Recycling Policy.

General Comments

Other Environmental Benefits of Water Recycling

In addition to providing a viable high quality and reliable water resource, one of the important aspects of water recycling that the State Water Board should consider in the development of the Water Recycling Policy is the significant energy savings and avoidance of releases of greenhouse gases associated with provision of recycled water in leiu of potable water. In 2006, Assembly Bill 32 (Nunez) enacted the Global Warming Act of 2006, which created a statewide greenhouse gas emission limit to reduce emissions by 25% by 2020. An important element in achieving this goal will be the increased promotion and continued implementation of water recycling. For example, since 1962, the Districts' water reuse program alone has saved over 6 billion kilowatt-hours of energy and prevented the emission of approximately 5 million tons of carbon dioxide, as compared with the delivery of the same amount of imported potable water. This type of information should be considered by the State Water Board in developing the Water Recycling Policy, and by regional water boards in approving and permitting recycling projects. Additional comments related to this matter are provided in the attachment with regard to anti-degradation and assimilative capacity.

Uncertainty Regarding Future Liability for Recycled Water Projects

At the March 20, 2007 Workshop, State Water Board staff raised the following concern: if water quality objectives are modified (e.g., made more stringent) in the future, and a recycling project that was properly permitted and compliant violates those new objectives and groundwater is affected, should recycled water project sponsors be required to provide financial assurance mechanisms now? The Districts do not believe that this issue needs to be addressed in the Water Recycling Policy.

First, the issue is not just a recycled water issue, but an issue for all types of discharges, including potable water, to waters of the state that could impact drinking water beneficial uses. Requiring financial assurance mechanisms only for recycled water projects might have a chilling effect on these projects, an outcome that is contrary to the purpose of establishing a Water Recycling Policy. Second, for groundwater recharge projects, conditions established by the Department of Health Services (DHS) and included in permits by regional water boards, have provisions not for financial mechanisms, but for plans approved by DHS to provide an alternative source of water or to treat an impacted well if the recharge has caused the well to violate drinking water standards, or if the well has been degraded by the recharge so it is not safe, or if the well does not meet the setback/retention time requirements established by DHS.[1] Proponents of groundwater recharge projects support these types of conditions, which have been included in a number of permits for projects, including the Alamitos Barrier Project.[2] Earlier versions of the DHS draft groundwater recharge regulations (e.g., 2001) included provisions for project sponsors to establish financial assurance mechanisms if wells became unusable as a result of recharge, but after further stakeholder deliberation it was felt that this approach was too vague and indirect, compared with having a specific approved response plan in place. Consequently, the financial mechanism approach was not included in subsequent versions of the draft groundwater recharge regulations and, instead, was replaced with the response plan approach. For these reasons, the Districts do not believe this issue needs to be addressed in the Water Recycling Policy.

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[1] DHS Groundwater Recharge Reuse Draft Regulations, Section 60320(e), January 4, 2007.

[2] This issue is of great importance to the Districts in light of the Districts' participation in two groundwater recharge projects (Montebello Forebay and Alamitos Barrier) and the Districts long collaboration with DHS in the development of groundwater recharge regulations.

Salinity/Nitrogen Planning and Management

A primary theme at the March 20, 2007 Workshop was the need for regional water boards to develop Basin Management Plans for salts and nitrogen, similar to the plan developed for the Santa Ana Region and incorporated into its Basin plan. It was noted by one commenter that if regional water boards allocate assimilative capacity to recycling projects in the absence of Basin Management Plans (BMPs), there will be no incentive to develop the plans. Yet, the regional water boards are reluctant to allocate assimilative capacity for recycling projects now because of concerns that in the future this may result in capacity no longer being available. At the same time, as Board Member Spivy-Weber pointed out, planning can take a long time and requires significant resources to accomplish. The Santa Ana Plan and subsequent Basin plan amendments that were adopted in 2004 were the culmination of a multi-year, multi-million dollar stakeholder effort. In addition, the planning effort was supported by all stakeholders because all parties had a regulatory stake in the process. Without a common regulatory stake, the incentive for stakeholders to come together and commit to participate in and fund such a substantial effort is questionable.

Salt and nitrogen management and allocation of assimilative capacity are very important matters for many of the Districts' reuse projects. The Districts believe that it is ill-advised to delay the implementation of recycling projects until Basin Management Plans are completed and Basin plan are amended. However, the Districts do believe that the Water Recycling Policy can address both concerns by including provisions for both long-term and short-term options for managing salts and nitrogen based on empirical assessments of salt loadings (e.g., mass balances), approaches for determining if assimilative capacity is available, and approaches when assimilative capacity is not available. Recommendations are included in our detailed comments in the attachment. Thus, it appears that both long-term and short-term planning and management solutions are needed to further recycling.

Anti-degradation/Assimilative Capacity

These issues were included in the Workshop notice and discussed by many of the Workshop participants on March 20th. The Districts concur that there is no need to modify Resolution No. 68-16 (Anti-degradation Policy) to encourage water recycling or to clarify the language. However, we also believe that the Water Recycling Policy can include provisions to interpret the Anti-degradation Policy that will facilitate recycling projects yet still be protective of water quality, as well as approaches for determining if assimilative capacity is available and approaches when assimilative capacity is not available. Additional information and recommendations are included in the attachment.

Toxics & Chemicals of Emerging Concern

One of the issues raised in the Workshop notice and by Chair Dudoc at the Workshop was what should be done in the absence of drinking water standards to protect the pubic from toxic constituents and chemicals of emerging concern (COCs) for groundwater recharge projects. This issue is not unique to recycling, but is an issue for drinking water in general because these chemicals have been detected in potable source waters globally. As analytical methods continually provide lower detection limits, which permit the detection of ultra-trace levels of contaminants (e.g., nanograms per liter or less), more and more compounds will be found. However, the ability to detect a compound does not necessarily translate to health concerns. DHS is very aware of this issue, and is proactively addressing the issue in the development of groundwater recharge regulations and establishing conditions for recharge projects by using a multiple barrier approach. This approach consists of industrial pretreatment, recycled water treatment for control of unregulated chemicals, blending provisions, provisions for minimum retention time of the recycled water underground, monitoring, and the requirement to develop a plan for providing drinking water if a well cannot be used to serve water for drinking purposes (see comments above for "Uncertainty Regarding Future Liability for Recycled Water Projects"). For groundwater recharge projects, DHS holds a public hearing and issues findings and conditions that address COCs. The findings and conditions are included in permits issued by the regional water boards. The issue of DHS

recommendations for COC limits in groundwater recharge permits was addressed last year by the State Water Board with regard to the Alamitos Barrier project.[3] Thus, there are procedures and provisions in place to deal with the toxics issue in the absence of specific regulations and this issue should not be addressed anew in the Water Recycling Policy. The recycling community, including the Districts, is also engaged in research to better understand the health significance of COCs, how well they are removed by wastewater treatment and soil aquifer treatment, and improved analytical and monitoring methods. The Districts would be glad to brief the Water Board and Water Board staff on the latest information related to this work.

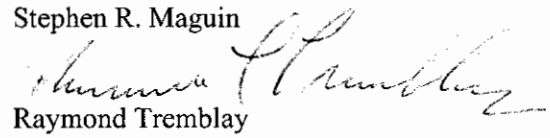
Disposal Versus Recycling

The Workshop notice as well as several participants in the Workshop, noted that the Water Recycling Policy should delineate between wastewater disposal and water recycling. This is an important issue for the Districts in our Antelope Valley service area, where discharge to surface water bodies is not always an option. This issue has arisen most frequently in the context of agricultural reuse projects. The Districts believe that this matter could be aided by including criteria in the Water Recycling Policy that clarifies this delineation. For example, for recycling projects which irrigate new agricultural sites that would not otherwise be developed, if the project produces a marketable crop, that would constitute recycling, and not disposal. Recommendations on potential criteria are included in our detailed comments. To universally define recycling to occur only as a replacement to potable water use is not logical since many projects (industrial users, housing developments, parks) start out using recycled water. If water recycling is narrowly defined as a replacement of potable water then it would encourage the use potable supplies for start-up of projects, which would conflict with water conservation goals. This type of narrow definition also presents other concerns such as, how long would potable water have to be used at a site before switching to recycled water and not be considered a disposal operation; a day, a week, a year?

The Districts appreciate the opportunity to provide these comments and look forward to reviewing the Water Recycling Policy when it is released. In the interim, if you have any questions or need additional information, please feel free to contact the undersigned at extension 2801.

Yours very truly,

Stephen R. Maguin



Raymond Tremblay
Section Head
Monitoring Section

RT:lmb
Attachment

cc: Roberta Larson, WateReuse Association California Section

[3] State Board Order 2006-0001 for the Alamitos Barrier Project.

Attachment – Detailed Comments on Water Recycling Policy

Irrigation Projects and Salts

Issues Presented:

- What should the State Water Board do to protect groundwater basins in the state from the accumulation of salt, including nitrate?
- To protect groundwater basins from the accumulation of salt, should the concentration of salt in recycled water used for irrigation be limited? If so, what procedures should be used to establish the limitations?

Comments:

The Districts have grouped these two questions together because the answers and options for each are interrelated. The Districts believe that the State Water Board does not need to devise a new complex regulatory scheme for protection of groundwater basins in relation to the use of recycled water. As a general principle, the Water Recycling Policy should acknowledge that minor and incidental groundwater recharge[1] from landscape irrigation projects, designed to apply water at agronomic rates, will not significantly contribute to the accumulation of any constituent in the groundwater. Large-scale agricultural irrigation projects designed to apply water at agronomic rates, combined with appropriate crop management practices, may contribute to the accumulation of constituents in the soil column and/or groundwater; therefore, case-by-case evaluations may be required for these types of reuse projects.

From a planning perspective, the Districts recognize that regional water boards are faced with the quandary of balancing salt and nitrogen management while encouraging water recycling. The Districts believe this can best be resolved by including both long-term and short-term approaches in the Water Recycling Policy as presented below.

Long-term Goal – Adopt Basin Management Plans (BMPs). As a long-term goal, adequate resources need to be provided to support Basin planning in each region (review of basin plan, evaluation of compliance with water quality objectives, resources to update basin plan as needed). For salts and nitrogen, one specific activity should be the development of BMPs, similar to the plan developed for the Santa Ana Region, with the participation of key stakeholders. The outcome of that effort has helped promote reuse in the area and protect surface water and groundwater. However, this was not a trivial effort, and required significant resources and time to complete.

In 1995, under the auspices of the Santa Ana Watershed Project Authority (SAWPA), a Total Inorganic Nitrogen (TIN)/Total Dissolved Solids (TDS) Task Force was formed to provide funding, oversight, supervision, and approval of a study to evaluate the impact of nitrogen and TDS on water resources in the Santa Ana River Watershed. The Task Force was comprised of 22 water supply and wastewater agencies throughout the region. The multi-year, multi-million dollar (approximately $3.5 million) study was coordinated by SAWPA, and investigated questions related to nitrogen and TDS management in the watershed from all sources, not just wastewater treatment agencies. The study also addressed, groundwater sub-basin water quality objectives, sub-basin boundaries, and regulatory approaches to wastewater reclamation and recharge.

The genesis of this effort was concerns over groundwater quality objectives for TDS and nitrate-nitrogen and the Santa Ana Regional Water Board's Nitrogen/TDS Management Plan that was established to satisfy the 1994 amendments to the Santa Ana Basin plan. A principal underlying concern was that the 1994 updates to the Santa Ana Basin plan resulted in inappropriate constraints on recycling opportunities. Since reuse of recycled water was a critical component of many agencies' plans to meeting

[1] Also known as "return flows"

rapidly increasing water demands in the region, the Santa Ana Regional Water Board agreed to review the objectives. As a result of the Task Force study, in January 2004, the Santa Ana Regional Water Board amended the Basin plan to incorporate new revised boundaries for groundwater sub-basins (called management zones), new nitrate and TDS objectives for the management zones, and TDS management strategies applicable to surface water and groundwater.[2]

Appropriate beneficial use protection/maximum benefit demonstrations were made by a number of agencies to justify alternative "maximum benefit" water quality objectives for a number of individual groundwater management zones. These "maximum benefit" proposals entailed commitments by the agencies to implement specific projects and programs.[3] To address circumstances that might impede or preclude these commitments, the Basin plan amendment included both the "anti-degradation" and "maximum benefit" objectives for the groundwater management zones. The "anti-degradation" objectives are more stringent than the "maximum benefit objectives."[4] As long as these agencies' commitments are met, then the agencies have demonstrated maximum benefit, and the "maximum benefit" objectives included in the 2004 Basin plan apply for regulatory purposes. However, if the regional water board finds that these commitments are not being met and that "maximum benefit" is not demonstrated, then the "anti-degradation" objectives for the waters will apply.

Similar stakeholder efforts could be done for other regions of the state; however, these efforts require a vested interest/commitment from the stakeholders and will take time and resources, which necessitates the need for shorter term approaches in the Water Recycling Policy to allow recycling to proceed in the absence of BMPs.

Short-term Goal: Adopt Technical Approaches in the Water Recycling Policy to Assess Degradation and Assimilative Capacity Allocation. In the short-term, there are approaches that can be used to evaluate salt loadings and allocate assimilative capacity, for both large (i.e. more than 20 acres per site) landscape irrigation projects and agricultural irrigation. The 2005 Recycling Document included a well thought out process for evaluating whether salt loadings will cause or contribute to exceedances of water quality objectives in groundwater, and a process to determine whether assimilative is available, how to allocate it if available, and how to proceed with recycling assimilative capacity is not available. This approach is presented below. The Districts recommend that this approach be incorporated into the Water Recycling Policy along with a provision that allows for mixing and dilution of recycled water in groundwater to clarify statutory authority.[5]

The general framework proposed is as follows:

- If recycled water meets the water quality objectives for the underlying groundwater basin or is higher in quality than alternative water sources (e.g., local groundwater, imported water), then there should be no additional limitations or regulations applied.[6]

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[2] Resolution No. R8-2004-001; this was approved by the State Water Board on September 30, 2004, and the Office of Administrative Law on December 23, 2004.

[3] Water and recycled water purveyors and other parties in the watershed have implemented, and propose to implement, facilities and programs designed to address salt problems in the groundwater of the region, including the construction of brine lines and groundwater desalters, implementation of programs to enhance the recharge of high quality storm water and imported water, where available, and re-injection of recycled water to maintain salt water intrusion barriers in coastal areas.

[4] For example, for the Beaumont groundwater management zone, the maximum benefit objective for TDS is 330 mg/L compared to the anti-degradation objective of 230 mg/L; similarly the maximum benefit objective for nitrate-nitrogen is 5 mg/L compared to the anti-degradation objective of 1.5 mg/L.

[5] With regard to allowing mixing zones in groundwater, we believe this authority is vested in California Water Code Section 13263 (b), which states: "A regional board, in prescribing requirements, need not authorize the utilization of the full waste assimilation capacities of the receiving waters." As such, since the California Water Code consents to some assimilative capacity allowance, this would argue that the Legislature therefore also provided for mixing zone allowances in groundwater.

[6] This condition is probably not applicable for large scale agricultural irrigation, where the focus should be on percolate quality and impacts to groundwater necessitating mass balance evaluations.

- If recycled water does not meet the water quality objectives and the proposed irrigation project represents a threat to significantly degrade or impair groundwater quality, then assimilative capacity should be evaluated.
- Based on this assessment, a three-step test for determining assimilative capacity should be conducted and assessments made regarding allocations.
- If no assimilative capacity is available, then permit limits can be established to allow recycling to proceed in a feasible manner.

The analysis of whether assimilative capacity is available consists of a three-test process:

The ***first test*** is to examine the existing water quality of wells near the reuse area. If the water from these wells has concentrations of salts that exceed the water quality objective, no assimilative capacity exists at the reuse site. Options for permitting projects in this situation are discussed later.

If assimilative capacity is currently available, then a ***second test*** using a basin or sub-basin-wide salt balance would be applied to predict if assimilative capacity would continue to be available over a long term. To make this assessment, a number of factors should be considered. Different methods can be used for conducting salt balance analyses. The form of the analysis should be based on the parameters of the particular basin, as well as the amount of information that is available for performing the analysis. The analysis may range from a simple approach to one with substantial detail. In either case, an intuitive approach to the method of analysis and evaluation of the results is required to ensure that they provide an appropriate level of assurance in the evaluation of a project. This is necessary to ensure that the burden of conducting the evaluation is reasonable and doable. Examples were provided in the 2005 Recycling Document and have been provided in Exhibit 1 attached hereto.

The ***third test*** is to evaluate if the discharge could affect any local existing water supply wells or wells that may be reasonably constructed in the future. Some regions are highly urbanized or have adjudicated basins. These regions may have a small number of wells located far from the reuse site and no potential for construction of additional wells. In these regions, the percolate from the reuse area can be assumed to be well mixed with other groundwater recharges at the well sites and no additional analysis may be necessary. In other regions, a supply well may be located near a reuse site or there may be a reasonable potential that a supply well will be constructed near the reuse site. Additional hydrogeologic analysis and/or groundwater monitoring of the well may be necessary to demonstrate that the reuse will not impair the quality of the water in these present or future wells.

If the analyses show that assimilative capacity is available, then the water recycling project may proceed. If recycled water limitations for salts are established for the project, they should be based on the salinity that would reasonably be obtained using best practicable treatment and control. Nevertheless, any recycled water limitation for salt content should be no more stringent than the alternative fresh water supply salt content.[7]

However, if a water quality objective in a basin plan impedes the use of recycled water, a basin plan can be amended to raise the objective to a level that is still protective of designated beneficial uses or, if a potential use for a water body is de-designated, a level that is protective of existing beneficial uses.

This option for review of water quality objectives and uses is referenced in Resolution No. 77-1, which is a general statement of State Water Board policy, and thus carries the same force and effect as Resolution No. 68-16. Among the most critical implications of Resolution No. 77-1 is that basin plan objectives adopted prior to 1977 may need to be updated to comply with these resolutions and Action Plan for Water Reclamation in California.

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[7] State Board Order WQ 80-7

"Since only recently has the State Board developed a specific Policy and Action Plan for Water in California (now proposed) to implement the statutory mandate of Water Code Sections 13500, et seq., during the basin planning process completed in 1975, the Regional water boards may not have considered the relative costs and benefits, economic, environmental and social, which might be associated with the use of reclaimed water in their basins. To the extent that these issues did not formerly receive consideration, it may be appropriate for the Regional water boards to re-examine the beneficial uses and water quality objectives identified in their basin plan on a case-by-case basis as reclamation projects are proposed. Further, the reclamation policy should be taken into account during the updating of the basin plan."[8]

As noted at the March 20th Workshop, basin plan have used various means of establishing the original groundwater objectives and uses, not always taking into consideration relevant data or attainability, and these objectives and uses rarely are reviewed. In some cases, the objectives are set at concentrations lower than necessary to reasonably protect the existing and potential beneficial uses. Thus, basin plan amendments may, in some cases, be appropriate for certain constituents, such as TDS. As water supplies become increasingly scarce, regional water boards may need to reevaluate objectives to facilitate additional water recycling. These analyses must carefully consider the environmental and economic impacts that would result from changing the water quality objective.[9]

Irrigation Projects and Nitrogen

Issue Presented:

- To limit the discharge of nitrate to groundwater, should the State Water Board require recycled water users to prepare nutrient management plans?

Comments:

Nitrogen in recycled water is a potential water quality concern. This nitrogen is typically present as nitrate or in ammonia and organic forms which are usually converted to nitrate by natural mineralization and nitrification processes in the soil. Although considered a valuable nutrient, its over-application can cause nitrate to leach through the soil and contaminate groundwater. To limit the leaching of nitrate into groundwater, the Water Recycling Policy should not require the development of user nutrient management plants, but rather, specify that reclamation requirements should require that recycled water in combination with fertilizers and soil amendments be applied at an agronomic rate.

Nutrient management plans should be prepared on a watershed basis, involving all stakeholders, not just recycled water users. If someone irrigates with potable water and uses fertilizer, they would not be required to develop these kinds of plans, yet they could be contributing more nitrogen to a watershed than a recycled water project. The Districts are concerned that if only recycled water users were required to implement nutrient management plans, this might be a significant disincentive to use recycled water, depending on the amount of information that would have to be collected and submitted by users, when the users would not be required to take such action if they used potable water and fertilizer.

If a recycled water use site is over or adjacent to an area with a sensitive municipal or domestic water supply, some additional analysis may be needed to evaluate potential nitrate contamination of the supply. But the issue for these situations is the appropriateness of the land use, since if recycled water is not used, the farm, golf course, or other facility would then use potable water and apply nitrogen containing fertilizers.

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[8] Water Board General Counsel Memorandum dated December 29, 1976, pg. 8.

[9] Any such amendments must be consistent with Water Code section 13241 and the Anti-degradation Policy.

Irrigation Projects and Salts

Issue Presented:

- Should groundwater monitoring be required for recycled water irrigation projects?

Comments:

With regard to groundwater monitoring, the Districts believe that the Water Recycling Policy should make distinctions between landscape irrigation projects and large agricultural irrigation projects. For landscape irrigations projects, groundwater monitoring is not necessary. These projects are designed to minimize incidental percolation and runoff. Requiring groundwater monitoring, particularly when it involves construction of new monitoring wells, will render many potential and existing projects uneconomical particularly for smaller communities with limited budgets and resources. Landscape irrigation projects are typically the simplest type of recycled water use and must remain so in order to meet the state's water recycling goals. Landscape irrigation consisting of small sites scattered throughout a community do not represent a significant threat to groundwater. For larger landscape irrigation projects, a mass balance approach to evaluate assimilative capacity may be necessary. Such a mass balance approach should be sufficient to ensure that beneficial uses of groundwater are protected while not being overly burdensome for landscape irrigation project proponents. In some selected cases, in particular where the recycled water quality exceeds the water quality objective and there is no assimilative capacity, limited and/or, focused groundwater monitoring may be required.

To illustrate the potential impacts of the imposition of wide-scale groundwater monitoring requirements, one can look at the Los Angeles region. If groundwater monitoring was required for all non-potable reuse projects in this area, it would mean that programs would have to be established for some 1,000 landscape irrigation sites scattered throughout the Los Angles Regional Board's jurisdiction. It is conceivable that dozens or even hundreds of monitoring wells would be required to be constructed in order to monitor groundwater for the effects of extremely small amounts of recycled water possibly passing through the root zone. Such wells can cost up to a hundred thousand dollars each to construct, and a large amount of resources would have to be expended to sample and analyze the groundwater for no apparent environmental benefit.

For large agricultural reuse projects, combinations of crop management and groundwater monitoring are probably warranted to ensure protection of groundwater and the specific monitoring requirements should be developed based on site-specific conditions.

The Water Recycling Policy should also address unnecessary requirements that have been applied by regional water boards for recycling monitoring programs. This concern is based on a number of unreasonable requirements that have been imposed for irrigation projects and, if precedent setting, would be a deterrent for other projects. The types of unnecessary requirements include: vadose zone sampling and soil moisture sensors below 15 feet (it is difficult to collect large samples using lysimeters and many lysimeters can be problematic in terms of deployment and use); daily inspection reports of reuse sites; documentation on worker safety, food storage, personal protective equipment, tool handling for water that meets California Department of Health Services (DHS) requirements; groundwater monitoring for pollutants that mimic the monitoring requirements imposed for groundwater recharge projects in scope including COCs; and chemical use reporting for herbicides and pesticides. The requests to perform this monitoring are not accompanied by an analysis or written explanation with respect to the burden of the monitoring and reporting requirements, or whether a reasonable relationship exists between the need for the requested sampling, analysis and reports and the benefits to be obtained as required by Water Code Sections 13225(c) and 13267(b). Examples of where this has occurred include the Waste Discharge and Water Recycling Requirements for the Lancaster Water Reclamation Plant; and Waste Discharge Requirements and Water Recycling Requirements for Title 22 Recycled Water Projects for the Donald C. Tillman Water Reclamation Plant and Los Angeles - Glendale Water Reclamation Plant, City of Los Angeles.

Other Irrigation Issues

The Districts have identified two additional issues the Districts would like to see addressed in the Water Recycling Policy: 1) defining agronomic rate; and 2) clarification of responsibilities in determining recycled water quality.

Agronomic Rate. The Water Recycling Policy needs to define agronomic rate so that recycled water proponents and regional water boards can make project and permitting decisions on the same basis. At present there are multiple interpretations of what agronomic rate means, which is compounded by the regional water boards' reluctance to use information from the 1984 State Water Board Irrigation Guidance Manual that contains information regarding agronomic rates for water and nitrogen.[10] The Manual is used by water recyclers to calculate nitrogen loadings; however some regional water boards have questioned the validity of these calculations. This occurred to the Districts for a project being reviewed by the Lahontan Regional Water Board for nitrogen loadings. If this information is outdated or no longer applicable, it should be updated; however, if it still applicable, then regional water boards should accept calculations derived based on the Manual.

Irrigation Water Quality. Regional water boards are responsible for ensuring that recycled water does not negatively affect beneficial uses of receiving waters. Regional water boards are not, however, responsible for ensuring that the recycled water use does not cause damage to the crops being irrigated with the recycled water, or other operational issues. This responsibility should be specified in contracts between the recycled water supplier and the user. This delineation in responsibility should be clarified in the Water Recycling Policy.

Groundwater Recharge/Reuse Projects

Issue Presented:

- What requirements should be placed on groundwater recharge reuse projects to protect the public from toxic constituents?

Comments:

Per the general comments in the cover letter, this issue is not unique to recycling, but is an issue for drinking water in general. However, due to the debate by regional water boards over their respective interpretations of the Anti-degradation Policy, it would be beneficial if the Water Recycling Policy addressed this issue in the context of the Order issued by the State Water Board with regard to the Alamitos Barrier project.[11] Also per the general comments, this issue is being addressed by DHS in establishing conditions for groundwater recharge projects that rely on a multiple barrier approach for dealing with toxic chemicals. State Water Board staff and other stakeholders are currently participating in a Working Group to review and develop revisions to the latest draft of the regulations, dated January 2007, including how best to protect the public from toxic constituents.

This debate has arisen in part because some regional water boards have taken an extreme interpretation of the Anti-degradation Policy to not allow any changes in water quality above "natural" or "background" concentrations as result of a water recycling project, even though with the change, the receiving groundwater will continue to meet or exceed (e.g., be of better quality than) State water quality and health standards. In other cases, some regional water boards have also taken the approach that recharge projects can proceed only if existing and future monitoring results in "non-detect" findings for priority pollutants and COCs, or can only be allowed at levels where there is no risk created by the presence of the chemical as a result of a recharge project, including the application of DHS Notification

[10] Irrigation with Reclaimed Municipal Wastewater: A Guidance Manual, SWRCB Report Number 84-1 wr., July 1984.
[11] State Board Order 2006-0001 for the Alamitos Barrier Project.

Levels.[12] The inclusion of Notification Level-based limits in permits has also been justified by one regional water board through the application of a Basin plan's narrative objectives.[13]

We recommend that to address this issue, the Water Recycling Policy should:

- Define a "no-significant threat" threshold for potable reuse projects that can be established above the *de minimis* or negligible risk of 10^{-6} up to 10^{-4} to be consistent with drinking water programs;
- Require permit limits and monitoring programs for protection of public health to be based on recommendations provided by DHS (this, for example, would exclude using DHS Notification Levels as limits in permits); and
- Address points of compliance for potable reuse projects that authorizes the application of attenuation, dilution and mixing, where appropriate.

The Districts believe these provisions are consistent with existing law and statutory intent, basin plan flexibility, State Water Board Orders, and the need to promote water recycling as summarized below.

Health and Safety Code Section 116551 provides that DHS may issue a permit to a public water system for the use of a reservoir as a source of supply that is directly augmented with recycled water if the recycled water meets or exceeds all applicable primary and secondary drinking water standards and poses no *significant* threat to public health. A fair interpretation of the term "significant threat" for water recycling projects would thus appear to encompass a range of risk above the *de minimis* or negligible 10^{-6}-based limits up to and including drinking water MCLs where necessary to render a recycling project feasible. Potable water may be chlorinated and legally served to the public at the drinking water MCL, which may correspond to a one in 10^{-4} cancer risk.

The Districts believe that the Basin plan provide flexibility in the interpretation of narrative objectives, and that the application of a10^{-6} *de minimis* cancer risk estimate or no risk, while perhaps appropriate at cleanup or waste disposal sites, is not necessary for recycled water projects, and will discourage their development. This is because the cost of advanced treatment to meet the *de minimis* risk level may severely increase the cost of producing recycled water, and thus, limit its use.

Last year, the State Water Board issued a precedential Order for the Alamitos Barrier indirect potable reuse project.[14] The Order concluded that based ". . . on the policies favoring reclamation and reuse of water, it was inappropriate for the Los Angeles Water Board to include DHS' notification levels as effluent limitations in the water reclamation and waste discharge requirements for the Alamitos Barrier Recycled Water Project."[15] The Order also included important findings that are applicable to the Water Recycling Policy for both injection and surface spreading groundwater projects:

- Recycled water limitations can be based on criteria that have not been adopted as water quality standards, so long as appropriate findings are made.

- Since the sanctions for violation of limitations are significant, the additional potential liability for violating overly stringent limitations can appropriately be considered in weighing the policy issues.

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[12] Notification Levels (Health & Safety Code Section 116455) are health-based advisory levels established by DHS for chemicals in drinking water that lack maximum contaminant levels. When chemicals are found at concentrations greater than their notification levels, certain requirements and recommendations apply.

[13] Los Angeles Basin plan: "Ground waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use."

[14] State Board Order 2006-0001 for the Alamitos Barrier Project.

[15] Id., page 7.

- Notification Levels are likely to change over time; such a "moving target" poses practical problems if used as an effluent limitation.

- Regional Water Boards should follow DHS recommendations on the appropriate use of its Notification Levels; DHS has not recommended the use of Notification Levels for limitations in permits issued for indirect potable reuse projects.

- Concerning the healthfulness of the injected water, it is subject to extensive treatment, blended with imported water, and must, of course, meet all drinking water requirements prior to being pumped up and served to customers.

With regard to establishing points of compliance with water quality objectives, the Water Recycling Policy should allow for the demonstration to be made at a specified distance from the discharge, thereby allowing for attenuation and dilution to be considered.[16] This approach takes into consideration the physical and chemical treatment that can occur during soil aquifer treatment or in an aquifer for both spreading and injection projects.[17] The analysis should also allow for mixing within the groundwater aquifer if it is consistent with the public interest, best practicable treatment and control is employed, and it does not unreasonably threaten present and anticipated beneficial uses. Mixing within groundwater aquifers is different than mixing in a river. While river flow is turbulent and relatively rapid, groundwater flow is generally laminar and substantially slower. Generally, for surface spreading recharge projects, recycled water applied at a groundwater recharge site flows down through the vadose zone to the groundwater table. As the recycled water moves away from the point of recharge, it slowly mixes with the groundwater. Mixing of recycled water with groundwater occurs due to mechanical dispersion and molecular diffusion. Each groundwater recharge project should be evaluated on a case-by-case basis since there is a great deal of variability in groundwater flow and mixing rates between different sites, and this can be demonstrated by the modeling required by DHS for preparation of Engineering Reports for groundwater recharge projects.

Consistent with the Alamitos Barrier Order, the Water Recycling Policy should define a more active role between regional water boards and DHS in how permit limits and monitoring programs are established for potable reuse projects. It should specifically require regional water boards to base permit limits for groundwater recharge projects and their monitoring and reporting programs for protection of public health associated with drinking water on recommendations provided by DHS rather than relying on "consultations" as required under the Water Code (but not defined therein) or on the general principles and program provisions and commitments as laid out under the existing *Memorandum of Understanding between DHS and the State Water Board on the Use of Reclaimed Water,* which do not adequately address situations where DHS recommendations are disregarded by regional water boards. This approach would ensure that appropriate health-based limits and monitoring requirements based on DHS recommendations are directly included in permits.

Impoundments

Issue Presented:

- What requirements should be placed on impoundments to prevent them from degrading underlying groundwater?

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[16] State Board Order WQ 81-5 at pp. 6-7, State Board Order WQ 73-4 at p.7.

[17] Fox, P., *et al.* (2001) *An Investigation of Soil Aquifer Treatment for Sustainable Water Reuse.* AWWA Research Foundation and American Water Works Association, Denver, CO.; Fox, P., et al. (2006) *Advances in Soil Aquifer Treatment for Sustainable Reuse.* AWWA Research, Denver, CO.

Comments:

Impoundments vary in their size and porosity and hence, their effects on groundwater quality vary. The Districts do not believe that "one-size fits all" requirements are appropriate for recycled water impoundments. The Districts recommend that the Water Recycling Policy should:

- Clarify that when the recycled water stored in an impoundment meets groundwater quality objectives, no additional regulation is necessary.

- Clarify that the mass balance/assimilative capacity process previously discussed can be applied to impoundments, if necessary.

- Clarify that when local soils conditions (i.e., tight clays) provide a barrier between the stored recycled water and groundwater, no additional regulation is necessary.

- Establish a permeability standard of 1×10^{-6} centimeters/second (a standard that can be achieved with engineered clay liners or natural soils) is the appropriate maximum standard to apply to recycled water projects, if the recycled water quality and local soil conditions necessitate.

- Clarify that it is appropriate to allocate assimilative capacity, if it exists, to recycled water projects that include impoundments.

- Allow for the application of management measures to mitigate salt impacts such as those that can occur via evaporation, which can concentrate salts. Mitigation measures to prevent the concentration of salts in impoundments can include surface area minimization, flushing, and use of flow through systems.

The Districts also believe that the Water Recycling Policy should clarify that it is not necessary to issue separate waste discharge permits for impoundments that are part of water recycling projects. Some regional water boards consider the incidental recharge from recycled water project storage ponds to be a "waste" rather than the use of "recycled water," and issue separate permits for the ponds (see Exhibit 2 – Lahontan Regional Water Board response to comments on Order No. R6V-2006-(Proposed) (October 25, 2006), entitled *"Waste Discharge Requirements for Los Angeles County Sanitation District No. 14 Lancaster, Four New Storage Reservoirs."* For many recycled water projects, given the diurnal variations in recycled water treatment volumes and seasonal or daily use schedules, storage of water is a critical element to ensure that recycled water is available when needed for its intended use. The Districts do not believe it is necessary to separately permit impoundments since they are part of the recycling project.

Anti-Degradation Policy

Issue Presented:

- Should the State Water Board modify Resolution No. 68-16 (Anti-degradation Policy) to encourage water recycling or to clarify the language? Is so, what modifications should be made to the Policy?

Comments:

The Districts do not believe that it is necessary to modify the Anti-degradation Policy, and believe that developing the Water Recycling Policy is the best approach to clarify application of the existing Anti-degradation Policy to encourage water recycling.

Issue Presented:

- Should the Water Recycling Policy define what is "maximum benefit" to the people of the state and/or what is "best practical treatment or control" for water recycling projects?

Comments:

The Districts believe that the Water Recycling Policy should define "maximum benefit" and "best practical treatment or control" since there is currently no clear understanding of how these concepts are defined and can be applied by project sponsors and regulators in interpreting the Anti-degradation Policy for recycling projects. We also believe that the Water Recycling Policy should address the allocation of assimilative capacity for recycling projects.

Maximum Benefit. The Districts believe that recycled water is critical element of the State's water resources program and strategy to reduce greenhouse gas emissions to meet the goal of Assembly Bill 32. Thus, these overriding principles must be factored into the definition of maximum benefit. As an example, since the inception of our program in 1962, we have delivered over 2 million acre-feet of recycled water, have saved over 6 billion kilowatt-hours of energy and prevented emission of approximately 5 million tons of carbon dioxide, as compared with the delivery of the same amount of potable water.

The Districts recommend that the Water Recycling Policy should specify that when evaluating the maximum benefit to the people of the State, the benefit should be compared to the alternative of not approving the recycling project. For example, if a water recycling project is not approved, the alternative may be to discharge the treated water to the ocean. Consequently, fresh water supply would have to be used for irrigation instead of recycled water. There would be a monetary cost for using fresh water instead of recycled water. In addition, there would be an environmental cost to develop the fresh water supply, such as the construction of storage facilities or increasing diversions of fresh water supplies from the Sacramento/San Joaquin Delta and other surface waters or groundwater's where beneficial uses are impaired due to diversion-related reduced flows. In many cases, the additional water supply provided by a water recycling project will outweigh the likely minimal degradation in the groundwater supply. This would not be the case, however, if the degradation would impair applicable beneficial uses.

As part of the definition, the Water Recycling Policy should provide a series of questions that should be evaluated in determining whether a project provides a maximum benefit to the people of the State, including the following:

- Does the project provide a net environmental benefit? Although the project may cause some lowering of groundwater quality, it may provide offsetting environmental benefits. These may include providing habitat restoration, creating new environmental habitat, avoiding diversion of potable water, preventing seawater intrusion, minimizing overdraft of groundwater supplies, or augmenting groundwater supplies.

- Does the project reduce the emission of greenhouse gases?

- Does the project reduce energy demands?

- Does the project increase the fresh water supply? Projects that replace fresh water use with recycled water use, such the replacement of fresh water with recycled water for the irrigation of a golf course, augment the fresh water supply, which is a benefit.

- Does the project prevent the depletion of fresh water supply? Recycled water may be used to supply new water demands, such as irrigation at new parks or residential communities that would otherwise use fresh water.

A larger question that must be addressed in determining whether a project provides a maximum benefit to the people of the State occurs for water recycling projects that are proposed to irrigate sites that would not otherwise be developed. This was referred to as "disposal versus recycling" in the comments

at the March 20th Workshop. This issue has arisen most frequently in the context of agricultural reuse projects, particularly where discharge to local water bodies is not an option. We believe that this matter could be aided by including criteria in the Water Recycling Policy that helps make this delineation. Suggestions include the following:

- For projects which irrigate new agricultural sites that would not otherwise be developed, if the project produces a marketable crop, that would constitute recycling, and not disposal.
- For projects that displace potable water used at existing sites (or expanded sites), that would constitute recycling, and not disposal.
- If the water is being applied to abandoned farm land to control dust or prevent erosion that should be considered recycling, and not disposal.
- The application of the recycled water would however constitute disposal if the crop was not marketable or if the recycled water was not generally applied at agronomic rates.

This question could also possibly occur for situations where recycled water is used for environmental enhancement where there may not clear delineations in the minds of the regional water boards between recycling and disposal. Because these kinds of projects are utilizing a resource of the state and providing an enhancement, they should be considered recycling.

Best Practicable Treatment or Control. The Districts recommend that best practicable treatment or control (BPTC) be defined in the Water Recycling Policy as "the use of economically feasible treatment and control technologies that most effectively prevent the introduction of pollutants into waste streams or that provide the most amount of pollutant removal from them." Economically feasible should be interpreted in a general perspective, not from the perspective of a particular applicant, but from the perspective of what is feasible for the majority of facilities in the applicant's industry. This definition is consistent with the meaning of BPTC that has been discussed in State Water Board Orders.[18]

For irrigation projects, BPTC is generally considered to be oxidation, disinfection, application at rates that balance available nitrogen from all sources with agronomic nitrogen demand, and the implementation of source controls to effectively control salt loads from commercial and industrial facilities.

For groundwater recharge projects that use injection wells, BPTC is generally considered to be treatment by reverse osmosis, disinfection and the implementation of source controls. For groundwater recharge projects that use spreading basins, BPTC is generally considered to be oxidation, filtration, disinfection, and the implementation of source controls.

In developing the definition of BPTC, the Districts are very concerned that because of some overly conservative interpretations of the Anti-degradation Policy or basin plan narrative objectives, there is the real possibility that BPTC could be defined by some regional water boards for some recycling projects (including non-potable projects) as the application of end-of-pipe advanced treatment using membranes (e.g., microfiltration/reverse osmosis). The Districts strongly recommend that this not occur because of the potentially significant environmental impacts that are part of this technology, and that this be addressed in the Water Recycling Policy. These impacts include:

- Increased energy usage compared with normal wastewater treatment plant operations.
- Brine disposal, since approximately 15% of the quantity of wastewater treated using advanced treatment can be expected to end up as brine, which presents significant disposal issues and costs.
- Increased generation of hazardous waste depending on the brine disposal alternative selected.

[18] State Board Orders WQ 81-5, 82-5, and 90-6.

- Air emissions associated with energy usage to operate advanced treatment facilities or for trucks are used to transport brine.

Assimilative Capacity. The Districts recommend that the Water Recycling Policy include provisions directing regional water boards to give priority to the allocation of assimilative capacity to recycling projects to encourage and promote their implementation. When assessing permit limits for a recycling project, a regional board may consider the available assimilative capacity of the groundwater basin. However, pursuant to the California Water Code, the regional water board is not obligated to authorize the utilization of the assimilative capacity of the groundwater.[19] However, when this approach is taken, it can result in very stringent permit requirements, which could impact control measures needed for project approval, and thus discourage their implementation; or it can lead to situations where projects are not allowed to proceed as discussed by the City of Los Angeles at the March 20th Workshop. We believe based on the benefits that are realized by recycling projects, they should be given priority when allocating assimilative capacity.

However, this is not always the case, as evidenced by a recent permit issued by the Lahontan Regional Water Board, that gave priority in allocation of assimilative capacity to an unspecified future banking project using imported potable water over a recycled water project.[20] Finding 18 in the permit states:

> "The Water Board is aware of various projects being considered in the Antelope Valley for groundwater recharge or banking that will use imported water. These projects would supplement municipal drinking water supplies benefiting both the residents of the Antelope Valley and potentially a larger number of Californians. The groundwater basin in the Antelope Valley is a closed basin. Salts are a conservative constituent. Therefore, salts that are added to the groundwater basin will likely contribute to increases in groundwater TDS concentrations. The California Water Code Section 13263(b) indicates that the State Water Board "need not authorize the utilization of the full waste assimilation capacities of the receiving waters" when prescribing waste discharge requirements. The Water Board believes that it is appropriate to limit the additional salt loading to this groundwater basin by controllable sources to maintain as much assimilative capacity for groundwater recharge or banking projects which have a higher public benefit than wastewater discharges."[21]

A clear statement in the Water Recycling Policy on the priority of recycling projects in receiving assimilative capacity would eliminate these kinds of findings and determinations. Also, per our earlier comments, the Districts have provided some suggested approaches for evaluating and allocating assimilative capacity for recycling projects that should be included in the Water Recycling Policy.

Agency Coordination

Issue Presented:

- The Department of Health Services is developing regulations for groundwater recharge reuse projects. Should the State Water Board not address some issues related to groundwater recharge reuse projects, since they may be addressed by the Department of Health Services regulations?

Comments:

We believe that DHS is the appropriate agency to set requirements for recharge projects for the protection of public health. Therefore, we do not believe that the regional water boards should "second guess" DHS with regard to establishing limitations or monitoring requirements for human-health related

[19] California Water Code section 13263(b).
[20] Order R6-2006-0051.
[21] Id. Page 19.

constituents. With regard to working with DHS, we believe that the Water Recycling Policy should define more precisely the roles of regional water boards and DHS in how permit limits and monitoring programs are established for groundwater recharge projects and also non-potable reuse projects.

Based on permitting processes over the past several years, it is clear that the consultation process isn't working as well as it should. We offer two examples where this has been the case. The first is the WDRs/WRRs for the Alamitos Barrier Recycled Water Project issued by the Los Angeles Regional Water Board to the Water Replenishment District of Southern California.[22] The Regional Water Board included DHS Notification Levels in the permit, contrary to recommendations provided by DHS not to do so. At the September 1, 2005 hearing on the permit, DHS representative Gary Yamamoto stated that DHS itself does not use Notification Levels as regulatory enforcement limits, and is "not in favor of [setting] them as limits."[23] Rather, Mr. Yamamoto stated, DHS supports "monitoring" with respect to Notification Levels.[24] The Regional Water Board chose to ignore the expertise of DHS with regard to protection of drinking water supplies and substituted its own judgment. This decision was reversed by State Water Board Order 2006-0001 for the Alamitos Barrier Project, which determined that it was inappropriate for the permits to have Notification Level-based limits, and included the finding that regional water boards should follow DHS recommendations on the appropriate use of its Notification Levels.

The second example are the WDRs and WRRs issued by the Los Angeles Regional Water Board to the City of Los Angeles for the Donald C. Tillman and Los Angeles Glendale Water Reclamation Plants. In reviewing and preparing comments on the various versions of draft permits, the Districts believed that many of the provisions in the permits related to use area requirements, and permit limits and monitoring had no regulatory basis and went beyond DHS requirements. In our formal written comments, the Districts provided the following with regard to DHS consultation:

> "Finding 10 finding states that: 'Pursuant to California Water Code Section 13523, the Regional Board has consulted with the DHS regarding the proposed recycling project and has incorporated their recommendations in this Order.' Based on information provided by the Regional Board, it is unclear if a consultation occurred with DHS regarding these Tentative WRRs or the previous versions of the permits since by all indications the permit language was based on a 2002 permit (which in part was based on a 1999 letter). It is our understanding that as part of a consultation, DHS only looks at permits to determine compliance with applicable laws and Title 22, and does not necessarily evaluate or undertake to approve additional requirements outside the scope of these legal restrictions. It is the Regional Board's obligation to conduct such a consultation pursuant to California Water Code section 13523. If a consultation with DHS occurred for these Tentative Permits, the Regional Board should provide more detailed information on what the consultation entailed, including the names of all of the staff from DHS and the Regional Board who participated, when the consultation occurred, what was specifically discussed/reviewed, any notes or summaries of the consultation, and if any of the determinations, approvals, or recommendations were made in writing. Furthermore, the Districts request that the Regional Board have further consultation with DHS on several provisions of the Tentative WRRs (Items II.3, VI.3, VI.4 and MRP Item II.5). We additionally request that the revisions suggested by the Districts for these provisions be discussed with DHS to determine if they provide an acceptable substitute to language in the current version of the Tentative WRRs."

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[22] Order No. R4-200500061.
[23] See Excerpt of Regional Board's September 1, 2005 hearing, p. 91, lines 17-20.
[24] Ibid.

In the January 2, 2007 response to comments, the Regional Water Board provided the following information regarding the "consultation":

> "Regional Board staff disagree. On highly technical indirect potable use WRRs, the Regional Board staff and DHS had numerous meetings and consultations. On straightforward WRRs, such as irrigation reuse, Regional Board staff conduct informal consultation by email, or simply alert one another by the sending of the draft WDRs/WRRs. This approach is consistent with the 1995 "Department of Health Services and the State Water Resources Control Board on the Use of Reclaimed Water", which directs the Department to review and respond to proposed water recycling requirements within 30 days should the Department have comments or concerns.
> **Action:** No change is necessary."

These were complicated permits that included provisions that should have been reviewed with DHS as part of a formal or at least more deliberate consultation process. It was also our understanding based on correspondence with DHS and the Regional Board that the informal consultation did not occur for these permits, but was based on discussions with DHS several years earlier for a Master Reclamation Permit for another discharger.

For these reasons, we believe this issue of agency coordination should be addressed in the Water Recycling Policy.

Aquifer Storage and Recovery Projects

Issue Presented:

- Should the scope of the policy also cover aquifer storage and recovery projects?

Comments:

The Districts do not believe that the Water Recycling Policy should address aquifer storage and recovery (ASR) projects. While ASR projects using potable or raw water present some similar issues to groundwater recharge projects using recycled water, there are also significant differences. The existing permitting scheme for ASR projects is less clear, and the issues involve numerous additional stakeholders not all of whom are involved in water recycling. If the State Water Board believes it is important to provide guidance on ASR regulation and permitting, we recommend that this be done in a separate policy. The critical components of a Water Recycling Policy were identified by the Recycled Water Task Force in 2003, and the policy itself has been under discussion/development since 2004. The Districts are concerned that including ASR in the Water Recycling Policy will increase its complexity and controversy and lead to further delays in its release.

Other Issues Not Included in the Workshop Notice

Incidental Runoff of Recycled Water

While this issue was not specifically addressed in the Workshop notice, the Districts believe that the Water Recycling Policy must address reasonable regulation of incidental runoff of recycled water. We support the inclusion of the State Water Board's February 24, 2004 Memorandum regarding Incidental Runoff of Recycled Water within the Water Recycling Policy. As an alternative, we would also support a clear statement in the Water Recycling Policy that any potential impacts from incidental runoff of recycled water, like all other urban runoff, are adequately mitigated by compliance with the local or general MS4 permits. No additional regulation within individual permits for water recycling projects is necessary.

There is an additional concern that the Districts believe could benefit by some direction from the Water Recycling Policy; namely, overly burdensome reporting requirements for incidental runoff by

regional water boards. The example the Districts would like to provide is comments submitted on the Draft Environmental Impact Report (DEIR) by the Los Angeles Regional Water Board on the Castaic Lake Water Agency's (CLWA's) Recycled Water Master Plan. In a letter from the Regional Board dated February 2, 2007, CLWA was told that:

> "The DEIR should include a detailed impact analysis of salt loading to the Santa Clara River by surface runoff from the use of recycled water. Currently, wastewater treatment does not routinely include the removal of salts; therefore, recycled water generally contains high amounts of salts. When recycled water is applied to land for irrigation purposes, water will be transpired into the air while salts will stay in the surface soil. Salts accumulated in surface soil can be transported to the Santa Clara River by stormwater runoff or incidental runoff, which poses water quality problems. The DEIR states that release of enriched salts from soils will be diluted to the extent that the impacts to receiving water bodies would be less significant; however, no detailed impact analysis and no mitigation measures were provide. Please provide detailed quantitative analyses and mitigation to address these foreseeable impacts."[25]

The Districts believe that this type of requirement ignores the general understanding of *de minimis* impacts from "incidental" runoff from recycled water use and goes beyond what should reasonably be considered as part of environmental documentation required for a project or master plan. However, this example does illustrate that without direction in the Water Recycling Policy, the regional water boards may impose unnecessarily burdensome demands for project implementation beginning at the CEQA step.

MCL-based Limits and Averaging Periods for Non-Potable Recycling Projects

Many permits issued to non-potable reuse projects contain limitations based on MCLs. In some cases, these may be daily maximum or monthly limits, or narrative limits whereby the recycled water shall not contain constituents in concentrations exceeding drinking water standards. The latter requirement can be interpreted to mean an instantaneous or single sample exceedance in recycled water is a violation.

The Districts do not support the *de facto* application of primary and secondary MCLs as limits (especially as instantaneous or single sample requirements) in non-potable water recycling permits, and believe this position is supported by DHS. On June 25, 2002, the Districts met with representatives from DHS and the Los Angeles Regional Water Board during which this particular issue was raised with both regulatory agencies. During the June 25th meeting, DHS stated that these requirements were unnecessary for non-potable projects and should be removed. In response, the Regional Board indicated the limits could not be removed due to backsliding requirements. However, this justification is unfounded, since anti-backsliding applies only to National Pollutant Discharge Elimination System (NPDES) permits.[26]

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[25] Letter to Jeff Ford, CLWA dated February 2, 2007 from Samuel Unger, Los Angeles Regional Board entitled "Comments on Draft Environmental Impact Report for the Castic Lake Water Agency Recycled Water Master Plan Sch No. 2005041138."

[26] Section 402(o) of the Clean Water Act (CWA) sets forth the general rule prohibiting backsliding from effluent limitations contained in previously issued NPDES permits that were based on Best Professional Judgment (BPJ) under CWA section 402(a)(1)(B), or on water quality under CWA sections 301(b)(1)(C), 303(d), or 303(e). The main thrust of section 402(o) is to bar EPA from allowing permit holders to "backslide" or weaken BPJ-based limits or water quality based effluent limits contained in an NPDES permit except under certain circumstances. Thus, permits issued with these types of limitations may not be reissued, renewed, or modified to contain less stringent effluent limitations than the previous permit unless the proposed new limitations comply with the antidegradation rule contained in section 303(d)(4), or the permit falls into one of the statutory exceptions to this ban on backsliding. Id.; sections 1342(o)(1), (o)(2). EPA guidance states that sections 402(o)(2) and 303(d)(4) of the CWA "constitute independent exceptions to the prohibition against relaxation of permit limits. If either is met, relaxation is permissible." U.S. EPA, Technical Support Document for Water Quality-based Toxics Control at 113 (1991). Thus, according to EPA, dischargers must only meet the requirements of one of these statutory provisions in order to relax their permit limits. See U.S. EPA Region IX Memorandum, Antibacksliding--Effect on Water Quality-Based Effluent Limitations 1 (Aug. 8, 1994); see also American Iron and Steel Institute v. EPA, 115 F.3d 979, 993 citing 58 Fed. Reg. 20837 (D.C.Cir. 1997)("section 402(o) allows relaxation of water quality-based limits if the requirements of either section 402(o)(2) or section 303(d)(4) are met.").

MCLs, as set forth in Title 22 of the California Code of Regulations, were intended only to apply to drinking water treatment facilities at the tap or point-of-use, not as permit specifications for non-potable reuse projects.[27] The use of Title 22-based requirements in non-potable reuse permits is also inconsistent with how DHS uses and enforces MCLs. For primary MCLs (with the exception of nitrate and nitrite), for drinking water systems monitoring quarterly, compliance is determined by a running annual average.[28] If any one sample causes the annual average to exceed the MCL, the system is out of compliance immediately. For systems monitoring annually or less frequently, compliance is determined based on the initial sample or the average of the initial and confirmation samples, if a confirmation sample is collected. For nitrate and nitrite, any samples above the MCL are reported to DHS and follow-up sampling is performed.[29] Secondary MCLs are set for constituents that may adversely affect the taste, odor, or appearance of drinking water, and are directly related to consumer "acceptance" or "dissatisfaction" with the drinking water provided through a community water system.[30] If a secondary MCL for a constituent contained in Table 64449-A is exceeded in drinking water, an investigation by DHS and a study by the water supplier is required to determine actual consumer acceptance or dissatisfaction with the drinking water that does not meet the particular MCL.[31] In addition, DHS is permitted to *waive* the requirement to meet secondary MCLs based upon consumer acceptance or economic considerations.[32]

If MCL limits are to be included in non-potable reuse permits, there needs to be a deliberative process similar to the NPDES reasonable potential analysis for determining which chemical to establish limits for. The regional water boards must also consider site-specific factors such as attenuation from surface water to groundwater, the quantity of surface water reaching the ground water aquifer, and the dilution provided by the groundwater aquifer when calculating requirements.[33] In addition, the typical convention used to establish the averaging periods for the limits should be reconsidered. The averaging periods for the limits are typically monthly averages and daily maximums, which bear no relation to the exposure used to derive the drinking water MCLs (e.g., chronic exposure, drinking 2 liters of water per day for 70 years). Thus, if needed, MCL-based limits should use running annual averaging periods to protect beneficial uses. The compliance point for these limits should also take into consideration attenuation and dilution and mixing zones.[34] In addition, if secondary MCL-based permits are needed, the compliance determination should follow that used for drinking water. For color in particular, we recommend that no limits for color be included in permits. This parameter has no impact on irrigation and groundwater recharge recycled water use applications, and, in fact, has been excluded from the draft DHS groundwater regulations.

Interpretation of DHS Secondary MCLs

For protection of municipal and domestic uses from offensive tastes and odors, the basin plan either specify or reference DHS's secondary MCLs.[35] For TDS, specific conductance, chloride and sulfate, the regulations express limits as Consumer Acceptance Contaminant Level Ranges. The ranges

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[27] *See* 22 C.C.R. §64431 and §64444.
[28] See §64432 and §64445.1.
[29] See 22 C.C.R. §64432.1.
[30] *See* 22 C.C.R. §64449(a).
[31] *See* 22 C.C.R. §64449(d).
[32] *See* 22 C.C.R. §64449 (e)(1) and (2).
[33] *See* State Board Order No. 2003-0013.
[34] With regard to allowing mixing zones in groundwater, we believe this authority is vested in Water Code Section 13263 (b), which states: "A regional board, in prescribing requirements, need not authorize the utilization of the full waste assimilation capacities of the receiving waters." As such, since the Water Code consents to some assimilative capacity allowance, this would argue that the Legislature therefore also provided for mixing zone allowances in groundwater. Also, with regard to attenuation see State Board Order WQ 81-5 at pp. 6-7, State Board Order WQ 73-4 at p.7.
[35] Title 22, Article 16, section 64449, Secondary Drinking Water Standards, Secondary Maximum Contaminant Levels and Compliance.

are titled "recommended levels", "upper levels", and "short-term levels." In its regulations, DHS states that being under the recommended contaminant level is desirable for a higher degree of consumer acceptance, and that concentrations ranging from the recommended to the upper contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable waters. Constituent concentrations ranging between the upper and short-term contaminant levels are acceptable only for existing systems on a temporary basis. DHS, however, may approve them for new services if progress is being made to improve mineral quality or for other compelling reasons approved by DHS. For TDS, the recommended level is 500 mg/L, the upper level is 1,000 mg/L, and the short-term level is 1,500 mg/L.

We believe that the Water Recycling Policy should clarify that when establishing recycled water permit requirements for TDS in recycled water and receiving waters, it is acceptable to be within the "recommended to upper level ranges", and certainly in cases where the alternative supply (either surface or groundwater) is within the same span.

California Environmental Quality Act (CEQA) Application to Recycling Permits

The Districts recommend that the Water Recycling Policy clarify CEQA application for the issuance of Master Reclamation Permits (Master Permits); specifically, to clarify that the issuance of Master Permits are exempt from CEQA. The Districts are basing this recommendation on the wide variation in how CEQA is interpreted and applied by the different regional water boards. In some cases, regional water boards include findings in Master Permits that the project has complied with CEQA and to do so they mandate CEQA documentation for all reuse sites must be provided to the regional water board before the permit is issued (Lancaster Water Reclamation Plant Master Permit) in other cases the Master Permits have no such findings and note that issuance of the permit is categorically exempt from CEQA (San Francisco General Order). It is the Districts' understanding that the issuance of Master Permits is exempt from CEQA based on Sections 15307, 15308 and 15300.2 of Chapter 3, Title 14 of the California Code of Regulations (i). Pursuant to Section 15307, the exemption is allowed if the proposed uses of recycled water will maintain and enhance natural resources by preserving potable water. The exemption provided in Section 15308 also applies since regional water boards are state regulatory agencies and the procedure for the issuance of Master Permits is authorized under Water Code Section 13523.1. That section establishes six different types of procedural and substantive requirements intended to assure protection of the environment, including compliance with uniform statewide reclamation criteria established pursuant to Water Code Section 13521 and monitoring and reporting by the permittee.

Recycled Water is not a Waste

We recommend that the Water Recycling Policy acknowledge that recycled water is not a waste, and that it be called recycled water in permits and not effluent or wastewater. It is also appropriate for the Water Recycling Policy to acknowledge that because neither the use or storage of recycled water, nor any incidental groundwater recharge associated with the storage, constitutes the discharge of "waste," it is appropriate for regional water boards to issue WRRs for recycling projects pursuant to, and in accordance with, California Water Code Section 13523, not Waste Discharge Requirements (WDRs) pursuant to Water Code Section 13263. The California Water Code defines "recycled water" as "water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource." California Water Code §13050(n); *see also* California Water Code §13575(a)(3). In many cases, the recycled water is the *result* of the treatment of "waste", and the water is suitable for a direct beneficial use or a controlled use that would not otherwise occur. For many recycled water projects, given the diurnal variations in recycled water treatment volumes and seasonal or daily use schedules, storage of water is a critical element to ensure that recycled water is available when needed for its intended use. Thus, the storage of "recycled water" and any incidental groundwater recharge associated with the storage reservoirs, should not constitute the discharge of "waste" as that term is defined in Water Code Section 13050(m), and WDRs are inapplicable.

Exhibit 1
***Excerpts From:* State Water Resources Control Board Guidance**
For Implementing State Statutes, Regulations, and Policies
For Recycled Water Projects, November 2005

Appendix A

Example of a Salt Balance for an Irrigated Field

To estimate the concentration of salts in the percolate from an irrigated field, a water balance and a salt balance may be prepared. For this example water balance, the inputs to the water balance are the applied irrigation water and precipitation. The outputs are evapotranspiration, runoff, moisture in grass clippings, and percolation. The amount of percolation to groundwater, therefore, is the applied irrigation water plus precipitation minus evapotranspiration, runoff, and moisture in grass clippings. These amounts were estimated primarily by using local meteorological data.

For the salt balance, the inputs are salts in irrigation water, salts in precipitation, and salts in fertilizers applied to the field. The outputs are salts in runoff, salts in grass clippings removed from the field, salts lost through denitrification, and salts in the percolate. The amount of salt in the percolate, therefore, is the salt in irrigation water, plus the salt in the fertilizers minus the salts in runoff, salts in grass clippings, and salts lost through denitrification.

Once the water and salt balances were completed, the concentration of salt in the percolate was calculated. It is the mass of salt in the percolate divided by its volume. The following table shows the example salt balance.

Water Balance (100 Acre Irrigation site)							
Input	**Feet**	**MG/yr**	**Output**	**Feet**	**MG/yr**		**Mg/yr**
Rain	1.50	48.9	Evapotranspiration	4.00	130.3		
Recycled Water	4.00	130.3	Runoff (20% of rain)		9.8		
			Clippings		0.3		
Total	5.50	179.2			140.4	Percolation (Water)	**38.8**

Salt Balance (100 acre irrigation site)							
Inputs	**mg/l**	**lbs/yr**	**Losses**	**mg/l**	**lbs/yr**		**lbs/yr**
Rain	5	2,038.06	Denitrification		7,000.0		
Recycled Water	650	706,527.17	Clippings		24,000.0		
Fertilizer		24,000.00	Runoff	200	12,676.8		
Total		732,565.23			43,676.8	Percola-tion (Salt)	**688,889**

For this example, the percolate concentration is:

688,889 lbs/(38.8 million gallons * 8.34 lbs/gallon) = 2,128 mg/l

The concentration of dissolved solid in the recycled water was 650 mg/l.

Appendix B

Examples of Basin-wide Mass Balance Analyses for Irrigation Projects

In the example shown in Table 1, the flow-weighted average inflow total dissolved solids (TDS) concentration is 588 mg/L with and without the project, because the recycled water project supplies only 500 acre-feet per year out of a total inflow of 120,000 acre-feet per year (AFY).

Table 1
Hydrologic and Salt Inflow Summary for the Chino Basin North
Without and With Recycled Water
Year 2001

Inflow Component	With No Recycled Water Recharge				With Recycled Water Recharge			
		TDS				TDS		
	Volume (afy)	Conc. (mg/L)	Mass (tons)	% of Inflow	Volume (afy)	Conc. (mg/L)	Mass (tons)	% of Inflow
Deep Percolation of Precipitation	57,421	100	7,812	8%	57,421	100	7,812	8%
Deep Percolation of Applied Water from Dairies and Agriculture	6,763	3,546	32,630	34%	6,763	3,546	32,630	34%
Deep Percolation of Applied Water from All Other Sources	27,245	1,264	46,839	49%	27,245	1,264	46,839	49%
Santa Ana River Stormflow Recharge	5,600	100	762	1%	5,600	100	762	1%
Imported Water Replenishment	6,500	290	2,565	3%	6,500	290	2,565	3%
Recycled Water Replenishment	0	487	0	0%	500	487	331	0%
Subsurface Inflow	16,410	240	5,358	5%	16,410	240	5,358	6%
Subtotal	119,939	588	95,966	100%	120,439	588	96,297	

Note: afy = acre-feet per year
Reference: Excerpt from table in letter dated April 19, 2002 from Chino Basin Watermaster to Executive Officer, Santa Ana Regional Water Quality Control Board

In the Table 1 example, it was assumed that, over the long-term, water inflow to the basin will generally match water outflow. Over a period of decades or longer, if water inflow does not generally match outflow, either overdraft or overfilling will occur. Neither overdraft nor overfilling is sustainable on a long-term basis. In any particular year, water inflow may exceed outflow, but over the long term, they will generally balance. For basins or sub-areas where inflow generally equals outflow, the primary value that needs to be determined and used in the salt impact evaluation is the average flow-weighted inflow concentration. If the average flow-weighted inflow concentration is less than the water quality objective, this provides evidence that the basin or sub-area will comply with the water quality objective.

If groundwater flows out of the basin or sub-area to downstream areas, the analysis should demonstrate that outflow to downstream areas will not negatively impact beneficial uses or cause exceedances of water quality objectives in downstream areas.

This approach does not account for the TDS of water produced or pumped from a groundwater basin that may be used within the basin. In some cases, an evaluation will need to account for recirculation of salt within a basin.

Depending upon local conditions, alternative approaches may be used to assess potential salt impacts. The approach presented in Table 1 is not the only acceptable approach. For example, an alternative approach is to calculate the flow-weighted average concentration based on available information regarding inflows to a basin. Table 2 shows an example of an approach used to evaluate recycled water use in the San Fernando Basin (SFB).

The purpose of the SFB analysis was to assess the effects of replacing 10,000 AFY of imported water used for irrigation with 10,000 AFY of recycled water. The SFB is an adjudicated basin operated so that, over time, the water recharging the basin balances the water leaving the basin. In addition, recirculation of water in the basin is minimal. For the SFB, the amount of water estimated to reach groundwater from delivered imported water sources, water spread in spreading grounds, and rainfall are reported on a regular basis.

Under average management of the SFB, 300,000 AFY of imported water is delivered to the SFB for all uses including inside uses (industrial, commercial, and domestic) and outside uses (public, commercial, and residential irrigation). Of this water, approximately 63,000 AFY recharges groundwater after being used primarily for irrigation. For the recycled water analysis, the recharge by imported water was reduced to 53,000 AFY, and the difference was replaced with 10,000 AFY of recycled water.

.The imported water delivered to the San Fernando Valley (referred to as "delivered return water") is a blend of water from the Los Angeles Aqueduct and the Metropolitan Water District (MWD). For this analysis, a typical blend of 50% LA Aqueduct water and 50% MWD water was assumed. Data for chloride and TDS concentrations in water imported from October 1, 1990 through September 30, 2002 was reviewed. The average chloride concentration for water purchased from MWD was 68.7 mg/l. For water from the Los Angeles Aqueduct, the average chloride concentration was 26.5 mg/l. For TDS, the average concentrations were 341.4 mg/l for MWD water and 195.5 mg/l for Los Angeles Aqueduct water. A blend of 50 percent MWD and 50 percent Los Angeles Aqueduct water results in an average imported water chloride concentration of 48 mg/l and an average TDS concentration of 268 mg/l.

Table 2
San Fernando Basin Salt Loading Calculation

SALT LOADING CALCULATION UNDER Current Conditions

Sources of recharge	Quantity (annual average) AFY	Concentration			Recharge concentration contribution	
		Chloride mg/L	TDS mg/L		Chloride mg/L	TDS mg/L
Recycled Water	0	190	605		0.00	0.00
Return Water, LA and Burbank (residential use, golf course irrigation, etc.)	63,000	48	268		28.66	160.04
Spreading Grounds	26,000	6.2	150		1.53	36.97
Rainfall on Valley Floor	12,500	6.2	150		0.73	17.77
Hill and Mountains	4,000	9.8	269		0.37	10.20
Total Recharge	**105,500**				**31**	**225**

Salt Loading Calculation with 10,000 AFY Recycled Water

Sources of recharge	Quantity (annual average) AFY	Concentration			Recharge Concentration Contribution	
		Chloride mg/l	TDS mg/l		Chloride mg/l	TDS mg/l
Recycled Water	10,000	190	605		18.01	57.35
Return Water, LA and Burbank (residential use, golf course irrigation, etc.)	53,000	48	268		24.11	134.64
Spreading Grounds	26,000	6.2	150		1.53	36.97
Rainfall on Valley Floor	12,500	6.2	150		0.73	17.77
Hill and Mountains	4,000	9.8	269		0.37	10.20
Total Recharge	**105,500**				**45**	**257**

The SFB salt loading calculations show that, under average conditions, the concentration of chloride in the total recharge is 31 mg/l, and for TDS it is 225 mg/l. When 10,000 AFY of imported water is replaced with 10,000 AFY of recycled water, the average concentration of chloride in the total recharge increases to 45 mg/l, and the average concentration of TDS increases to 257 mg/l. These calculations show that, over a long term, recycled water use will not cause chloride and TDS concentrations in the SFB to exceed basin plan objectives.

Because of limited available data, the calculations do not consider some factors that may affect the concentrations of chloride and TDS in the total recharge. Factors that could increase the concentrations in both analyses include the effects of evapotranspiration and the use of fertilizers. One factor that could decrease the concentrations of salt in both analyses include the limited recharge and percolation that could occur as a result of clay underlying areas of the basin, which prevents infiltrate from reaching the groundwater.

Exhibit 2
Lahontan Regional Board Response to Comments
Order No. R6V-2006-(Proposed) (October 25, 2006)
Waste Discharge Requirements for Los Angeles County Sanitation District No. 14 Lancaster, Four New Storage Reservoirs.

The District's general comment no. 2 contends the proposed reservoirs do not involve a waste discharge. Board staff disagrees. The leakage from the proposed reservoirs is tertiary-treated wastewater that is not being recycled. It is therefore a waste discharge. Since it is a waste discharge and could adversely affected water quality, it must be regulated as such to protect water quality.

Issuance of WDRs instead of WRRs is appropriate. Although the proposed reservoirs are to store tertiary treated wastewater that will ultimately be put to reuse fo irrigation of fodder crops, the leakage from the ponds is not a recognized and permitted reuse of treated wastewater and is therefore a discharge of waste to the groundwater and is appropriately regulated by WDRs. The Water Board is proposing to include receiving groundwater limits in the WDRs that minimize water quality degradation while balancing this limited degradation against economic and social factors to protect Agricultural and Municipal beneficial uses.