Reclaimed Water Technical Advisory Panel Meeting
June 26, 2008
9:00 am – 3:30 pm

Welcome and Introductions 1
Task #1 - Review recommendations from RAC 1
Task #3 - Small group presentations 4
Task #5 - Small group presentations 6
Task #6 - Develop questions and tasks for July meeting 9
Wrap-Up and Action Items 9
Meeting Attendees 10

Welcome and Introductions

Angie Thomson welcomed everyone and introductions were made. Angie reviewed the agenda.

Jim McCauley, Washington State Department of Ecology (Ecology), said the meeting agenda is ambitious and asked everyone to remain flexible, try accomplish as much as possible, but recognize that everything might not be addressed. Kathy Cupps, Ecology, reminded the panel of the timeline to complete recommendations for the rule by October.

Task #1 - Review recommendations from RAC

Jim said the Rule Advisory Committee (RAC) met twice since the last Technical Advisory Panel (TAP) meeting. The RAC had a lot of comments on the pathogen topic but only a little feedback on the irrigation topic.

Pathogen Discussion

Jim reviewed the recommendations from the RAC on the TAP's proposed pathogen standards:

1. RAC did not support the color system suggested for categories of water. They felt the categories as described may be confusing to the public and similar to the class system currently in use but repackaged as colors.
2. The RAC thought the class system used now would be preferable. However, other states are considering "non-human" and "human contact" categories. Kathy suggested waiting to determine what to call the categories until the TAP decides on an approach.
3. The RAC did not think that "potable", "human contact", and "non-human contact" were enough categories and debated whether to lump or split categories.

4. The RAC thought more classes were needed to accomplish the quality necessary for use on crops.
5. The RAC questioned whether removal of all pathogens is feasible. One of the RAC members was of the opinion that the majority of treatment systems approved under California Title 22 did not use five log removal.
6. The RAC had concerns about the 10 micron particle removal requirement for tertiary treatment, suggesting that it may depend on the secondary process that precedes it. They suggested looking at the end water quality and further suggested 10 micron removal regardless of influent water quality.
7. The RAC suggested a two-step process for corrective action that includes a trigger point and an absolute level for compliance.
8. The RAC thought the limits TAP suggested for biological oxygen demand (BOD) / total suspended solids (TSS) would be difficult for existing plants to meet. Jim said he reviewed some monthly reports and agrees there would be plants that would have a hard time meeting the levels proposed by the TAP. This brings up a question of whether these facilities should be required to upgrade, or if the water quality is appropriate for the designated use. The RAC also had a concern about whether BOD/TSS are appropriate as final indicators for pathogens.
9. In general, the RAC would prefer a focus on the end product and suitability for the use instead of treatment techniques and surrogates. The RAC thought that viruses and protozoa are difficult and expensive to measure.
10. The appropriateness of particle counters for a reclaimed water system was discussed as well. They are becoming more popular with drinking water utilities and may have application for reclaimed water monitoring.
11. The RAC discussed whether advanced oxidation processes (AOP) or reverse osmosis (RO) and a secondary disinfection step similar to the California rule are the best treatment for indirect potable reuse.

Questions/Comments:

- Bill Persich said the old reclaimed water standards used a color coding system that might be confused with the TAP's suggested color system. Bill supported the RAC's suggestion to not use colors to define categories.
- Paul Schuler asked if the TAP is required to reply to all of the RAC's comments. Angie said any recommendations the TAP makes will need to be adopted by the RAC, so the TAP should take the time to address their concerns. Kathy added that the TAP should take the RAC's comments and concerns seriously and make sure they are addressed within this group.
- Bill asked what processes would have difficulty meeting the 10 micron particle requirement. Bill thought that sand filtration and membranes would easily meet it. Frank Loge said a number of the filtration systems in place today produce effluent

greater than 10 microns (such as disk, membrane, and sand filters). Frank said this could be due to technical issues.

- Craig Riley commented that advanced oxidation processes (AOP) are most often applied out of a concern for micro constituents and not pathogens. Angie suggested saying that this concern will be addressed during later discussions on micro constituents.

Irrigation Discussion

Jim reviewed the recommendations from the RAC on the TAP's preliminary irrigation recommendations:

1. The RAC wanted this group to consider the relationship between reclaimed water and the use of pesticides, fertilizers or other chemical applications.
2. The RAC commented that salts could be an issue. The National Resource Conservation Service (NRCS) has an irrigation guide.
3. Irrigation needs to be specific to crops and should have flexibility in permitting.
4. Reclaimed water should be marketed as a new water supply for irrigation.
5. The RAC asked the TAP to consider stock watering.
6. The RAC asked that storage impoundments with irrigation water, issues with algal growth and odor be considered.
7. The RAC also asked the TAP to consider frost control for irrigation on fruit trees.

Questions/Comments:

- Paul asked if the TAP is focused on technical standards or distribution of water. Kathy said the TAP should be focused on technical issues. Craig said management issues like frost control should also be considered. Kathy thought the water quality issues should be addressed first and the best management practices will come later.
- Ken Butti asked if the TAP is considering changing the practice of designating an agronomic rate. Kathy said the rule will point to a reference for calculating the correct agronomic rate, but will not identify each crop's agronomic rate. Ron Brown explained that this issue was brought up during the last TAP meeting and it was decided that designating an agronomic rate would increase the scope of work too much; the TAP decided it was better to focus on the end user.
- Bill asked if there is any information on maximum loads that could be used as a guide. Kathy said there are and the group can discuss this when the TAP breaks into small groups.
- Angie reviewed some additional recommendations from her notes at the RAC meeting. These included considering permit requirements for biological oxygen demand (BOD), nitrogen standards, and not excluding hydraulic loading.

Task #2 - Small group discussions

Angie asked the panel to split into small groups to discuss how the TAP would like to respond to the RAC's concerns regarding the pathogen and irrigation topics.

Task #3 - Small group presentations

Irrigation Discussion

Angie reviewed the small group's responses to the RAC's comments and questions regarding irrigation (numbered responses below do not necessarily coincide with RAC comments).

1. Make sure guidance documents do not conflict with each other (Food and Agriculture Organization (FAO) table 29 & Environmental Protection Agency (EPA) table 27).
2. Salinity limit should copy standards from FAO or Takashi Asano.
3. Limit chlorine to less than or equal to 1 mg/L of total chlorine to protect plants.
4. Nitrogen concentrations should be greater than or equal to 10 mg/L unless Ecology approves a variation.
5. Stock water standards should be based on the Department of Agriculture requirements.
6. Algal growth was determined to be a management issue. The quality of the water will depend on the customer or application you have for the use of the water. Guidance is needed so users know if they need additional treatment to ensure against litigation protection.
7. Frost control should be treated the same as food crops that are eaten raw (Direct Human Contact).

Questions/Comments:

- Paul asked if the chlorine or nitrogen limits would go in guidance or rule. Kathy said any limits would go in rule, and the rest would go in guidance. Paul was concerned that the limits would be set at a level that would produce designer water for a particular user.
- Angie said the irrigation group felt that no more discussion is needed on this topic. The panel should begin writing language for the rule; a preliminary draft rule language will be brought to the panel at the next meeting.

Pathogen Discussion

Paul reviewed the small group's responses to the RAC's concerns about the pathogen recommendations (these responses corresponded to the numbered items presented above).

1. Not a technical issue. This can be resolved in later discussions, perhaps by the RAC.

2. Not a technical issue. This can be resolved in later discussions, perhaps by the RAC.
3. The three main categories proposed will include sub-categories as necessary and appropriate for the end uses specified. Walt Jakubowski commented that the term "non-human" is not accurate because there will be some restricted human contact. The TAP clarified that the proposed name for this category is actually "Limited/Restricted Human Contact".
4. Sub-categories will be used to cover crop uses, and the class (level of treatment) will vary by use.
5. The TAP is proposing an 11-log removal requirement across whole treatment process or 5 log removal after secondary treatment for all 3 pathogen groups. A recent Water Environment Research Foundation (WERF) study has some guidance that could be used to support these numbers. Walt thought that these removal requirements are feasible but numbers need to be defended through more research. Jim said more work is needed on this subject and the panel needs to assign this work to someone to resolve before the next meeting.
6. The TAP decided to withdraw any recommendation for a 10 micron or similar particle size as a compliance value.
7. The TAP agreed with two-level compliance tool. This is an enforcement issue; the panel thought that no corrective action levels should be included in the rule, but could be included in guidance. Additional work will be assigned to develop these values.
8. The BOD/TSS levels proposed are set for reclaimed water that will be used as a potable water source only. The BOD/TSS levels for reclaimed water: are 10 and 5 mg/L for potable uses.
9. No practical methods exist for measuring all pathogens (bacteria, viruses, & protozoa). The TAP suggested the use of indicators for performance testing. The TAP suggested to continue use of the current parameters (turbidity & total coliform) with a possibility for adding other indicators if research supports this. Additional work will be assigned to identify potential indicator organisms.
10. Since there is not sufficient data to set particle limits, particle counters should not be used for monitoring. However, there may be reference in guidance to the application of particle counters as a process control tool.
11. The TAP thought the use of any Advanced Oxidation Process is not a pathogen issue and could be addressed during later discussions.

The pathogen group still needs to:

- Determine exact numbers for log removal requirements if this concept is retained
- Agree on corrective action levels
- Determine appropriate indicator organisms for each class, either existing or new
- Discuss direct potable reuse and aquifer residence time issues
- Discuss reliability issues

Questions/Comments:

- Bill said particle counters are becoming more common place and could become an accepted tool down the road. Ken thought this could be put in guidance. Craig said the TAP is not discouraging the use of particle counters, but is just saying the technology is not there yet for compliance monitoring applications.
- Kathy said Jim McCauley and Craig Riley should work together to determine how to address these issues, wrap them up, and draft some language for the rule. Angie said both the irrigation and pathogens topics should come back to the TAP in draft rule language at the next meeting.

Task #4 - Small group discussions

During the lunch break Angie asked the group for their preferences regarding topics and which workgroup they wanted to participate with. It was decided that one group would start creating preliminary recommendations for groundwater recharge criteria, and; the second group would develop recommendations for urban non-irrigation uses (including industrial uses).

Task #5 - Small group presentations

Groundwater Discussion

Jim said the group reviewed how the "groundwater criteria" is defined in the current statute and from there had a broad discussion on drinking water standards vs. groundwater standards. Jim said the group did not get to any final conclusions about groundwater standards, but looked at what treatment levels would be appropriate. The group thought that surface percolation and vadose zone recharge should be considered the same in any standard. Bill added that the mechanisms for treatment are similar for surface percolation and vadose zone recharge so separating them would not accomplish much.

- Kathy asked if the vadose zone might be considered an injection well. Jim said they did not get that far in the small group discussion. Kathy said DOH Shellfish and Water Protection has said there is a difference in human health protection required in subsurface and surface and the TAP might need to consider a lesser standard for subsurface discharge. Craig thought this issue could be addressed with DOH separately.

Jim said the group reviewed the current standards and made some preliminary changes and recommendations. For treatment mechanisms the group decided that there should be a minimum treatment of filtration and disinfection with a maximum total coliform level of 2.2. The group also thought that total nitrogen should be less than or equal to 10 mg/L unless there was a compelling reason to reduce it due to health or environmental factors.

- Kathy asked if the group discussed antidegradation. Craig said the group did not address it because the statute says reclaimed water is not inconsistent with the antidegradation standards. Kathy said that Ecology has the authority to change this to consider antidegradation. Kathy said there have been discussions between the agencies on groundwater standards and the state should be moving toward a single state groundwater standard instead of creating different groundwater standards in different agencies.
- Ginny Stern said the group worked from the assumption that the statute says drinking water quality standards should be used for groundwater recharge. Kathy thought there should be further discussions about the possibility of changing that assumption. Craig thought that going back and re-evaluating the definitions would kill any potential surface percolation projects. Ginny said the group discussed the need to define the State Advisory Levels (SAL) for water quality. She said the conditions and process needs to be defined for how that would be managed. DOH has decided to set MCL standards which get rid of the SALs. It requires a review process and sets a standard to update without changing the statute. Kathy said Ecology groundwater standards already have a clause regarding the overriding consideration of the public interest and should be able to make this change, where appropriate, and be consistent with the groundwater standards. Kathy said the RAC has expressed support for using the state groundwater standards (WAC 173-200 as long as they are not less stringent than the drinking water standards).

Jim said the group felt that significant industrial user pre-treatment standards were being addressed elsewhere and felt it did not need to be addressed in the groundwater recharge portion of the rule. The group also thought that reliability and redundancy issues would be addressed through a different section of the rule, and CT would be addressed in pathogen standards so it did not need to be included in this section.

The group advised rewording the rule for planning documents to read: “Planning documents shall describe the intended use and status of the reclaimed water”. This revision excludes the water rights language and removes the language on abandonment. The purveyor needs to decide when water used as recharge will be either recovered or surrendered to the state. Finally, the group wanted to make sure the language in the rule is consistent with the 90.46.120 language in the statute referencing Aquifer Storage and Recovery (ASR) (RCW 90.03.370).

Jim said the bullet under existing standards says a project will evaluate “treatment, reliability, reclaimed water quality & quantity, use or potential use, O & M, soil characteristics, hydrogeology, residence time prior to withdrawal, and distance from the recharge point to point of withdrawal” The group supported this statement but thought it was a general statement that could be said in the beginning of the rule and would not need to be included specifically under the section on groundwater recharge.

Jim said the group got stuck discussing surface percolation issues related to permits required in the handout. Kathy explained that the items in the handout were not created just for the TAP, but as a broad educational tool for general audiences.

Angie asked what the path forward is for coming up with a recommendation on groundwater. Craig said this group will need information from the pathogen group on residence time requirements to resolve some of the issues they began to address today. Angie asked if the group could summarize their discussion in draft recommendation language to work from next time. Ginny said it is important to provide a caveat that says this is based on not changing the current standards for groundwater recharge with reclaimed water which is essentially the drinking water standards. Jim said there are two paths to take, and the group has not decided which one to go down. Jim suggested presenting this to the RAC as one possible path. Kathy suggested next time having the small group discuss the other path.

Urban Non-Irrigation Uses

Ken said his group discussed whether or not the rule or guidance should include water quality criteria for industrial uses. He said they debated whether the health-based standards apply and are adequate for any type of industrial use. One issue brought up was whether Ecology needs to come up with different standards for all uses. Kathy discussed an example where a wastewater plant has no discharge other than reclaimed water for industrial use. The group discussed what water quality standards would apply in this case. Ken said a task came out of this discussion to research standards for industrial uses and include those in a guidance document. Items like color, TSS, and pH were some parameters the group discussed. The group is considering using a range to ensure to industries that the water is meeting a certain minimum quality. The group also discussed including language in the end user agreement so the user knows it is suitable for use. One example was a liability case in Florida where a cooling tower industry was using reclaimed water and had a problem with biomass growth. The case is still in the courts and the litigation went on for 12 years. Ken said the group thought that guidance should be used to address these things. Kathy added that best management practices could also be used to make sure it is being addressed.

Ken said most treatment plants have water quality criteria that govern what they discharge. Where there is no receiving water it becomes ambiguous what level of water quality should be associated with the use. Ken said Craig brought this up at a previous meeting as an issue when a city brings in a business that has high levels of pollutants in its discharge. Kathy said this is an issue with the viability of the product, which is based on water quality. Ken said he is supportive of an end user agreement to help industries understand they are getting water that meets a published standard. If a user needs higher treatment they should be responsible for any further treatment. Craig said he would like to bring in an expert to address attorney general guidance on consumer protection for this topic. Craig said he would try to get someone for the next TAP meeting.

- Bill asked why you couldn't negotiate a particular treatment cost with one user. Ken said this would be fine in the case that you had a responsible supplier that understands the nuances, but often utilities do not have that understanding. Boiler feed water is another example: a user called to find out if Class C could be used as boiler feed and nobody knew the answer. Kathy said the TAP needs to define "adequate and reliable treatment" for the use so there are no misunderstandings about the purity of the water. Kathy suggested including some ranges or critical parameters to define this. Bill suggested saying which classes are suitable for what uses, and subsequent users should research whether further treatment is required. Kathy said the group needs to establish water quality standards for reclaimed water.

Angie suggested a next step for this topic is to look for sources to outline what some of those uses are.

Task #6 - Develop questions and tasks for July meeting

Angie distributed the TAP work plan now formatted in the form of a checklist. She said the TAP will briefly revisit pathogens and irrigation topics during the next meeting. The groups today started the discussions on groundwater recharge and vadose zone but did not talk about ASR and direct aquifer injection. The TAP did not get to preliminary recommendations for the topics today so those will be revisited in July.

Angie asked if the small group discussion format is working. TAP members generally supported this approach to dealing with the topics. Ginny suggested including some other people in the discussions about changing the statute.

Angie said they would plan to allow some time in the morning next time to talk about groundwater and urban non-irrigation uses and in the afternoon would address the ASR and direct injection topics. Jim suggested pushing the discussion on wetlands to August and not introducing a new topic at the next meeting; panel members supported Jim's suggestion.

Wrap-Up and Action Items

Walt discussed a couple projects recently completed that may support the TAP's work. Walt said WERF recently came up with a tool that can be used on a PC which is designed for use by utilities and regulators to compare risks from different scenarios for reclaimed water. WERF has made this tool available on disks if anyone would like to try it out. Walt left copies of the tool with Jim, he also left a copy of the Water Reuse report that this tool was based on. This tool will be posted to the SharePoint site.

Angie said the next TAP meeting is scheduled for Wednesday July 16th. Kathy did not think the group would be ready by then and suggested moving the meeting to the

Thursday after the Wednesday RAC meeting (July 24th). Kathy said they would send out an e-mail announcing the new meeting date.

Meeting Attendees

Department of Ecology
Katharine Cupps, Agency Lead
Angie Thomson, Facilitator
Emily Neff, Note Taker

Committee Members and Alternates	**Guests**
Bill Persich, BC	Ken Butti, LOTT Alliance
Bill Backous, CH2M Hill	Walt Jakubowski, consultant
Craig Riley, DOH	Ginny Stern, DOH
Paul Schuler, PHCWA	
Ron Brown, HDR	
Ecology Staff	
Jim McCauley, Department of Ecology	