

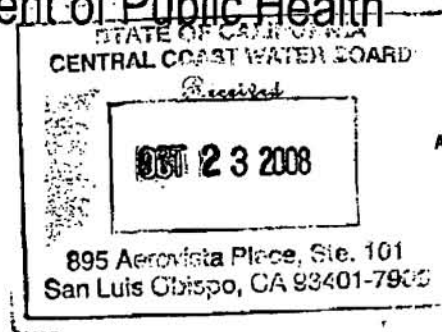


MARK B HORTON, MD, MSPH  
Director

State of California—Health and Human Services Agency  
California Department of Public Health



ARNOLD SCHWARZENEGGER  
Governor



October 17, 2008

Mr. Burton Chadwick  
Central Coast Regional Water Quality Control Board  
895 Aerovista Place, Suite 101  
San Luis Obispo, CA 93401-5411

Dear Mr. Chadwick:

**CITY OF HOLLISTER DRAFT MASTER RECLAMATION REQUIREMENTS, ORDER NO. R3-2008-0069  
Recycled Water System No. 3590004**

The California Department of Public Health, Drinking Water Field Operations Branch (Department) has reviewed the Draft Master Reclamation Requirements, Order No. R3-2008-0069 (MRR) for the City of Hollister, (City) Domestic Water Recycling Facility. The Department's comments and recommendations, as a result of the review, are presented below. They are provided to the Regional Water Quality Control Board (Board) in accordance with the Department's responsibility as an advisory agency on the matter of recycled water projects under Section 13523 of the California Water Code.

The City of Hollister proposed to upgrade the Domestic Wastewater Treatment Plant (DWTP) from a 2.69 million gallons per day (MGD) facultative and oxidation pond disposal system to a 5.0 MGD immersed membrane bioreactor (MBR) with a 4.0 MGD tertiary recycled water treatment train. The tertiary recycled water treatment train utilizes a Zenon Zeeweed 500d ultrafiltration membrane filtration process, coupled to a liquid sodium hypochlorite chlorination disinfection process to achieve turbidity and bacteriological standards for disinfected tertiary recycled water. The MBR process consists of four 1.25 MGD biological trains (5 MGD total) which includes an anoxic zone for denitrification, an aeration zone for soluble BOD reduction and nitrification, a post-anoxic zone for further denitrification and four 1.0 MGD ultrafiltration membrane trains (4.0 MGD total) for solids removal. The design will accommodate an additional 1.0 MGD ultrafiltration membrane train to increase the recycled water treatment process from 4.0 to 5.0 MGD.

The Department's comments will follow the layout of the MRR.

**A. Prohibitions**

Item 5 notes that the "Hourly flow rates through the DWTP treatment system surpassing the capacity of the chlorine contact basin or online membrane train is prohibited." However, in

Section B, Specifications, Item 1 specifies that the monthly average influent wastewater flow shall not exceed 4.0 MGD. The Department recommends that both be changed to "daily average" to be consistent with performance monitoring frequency requirements and the *City of Hollister Title 22 Engineers Report for Production, Distribution and Use of Recycled Water, April 2008 (Engineer's Report)*.

Item 10 specifies that a reduced pressure principle backflow prevention devices must be provided at all premises where recycled water is used and there is no interconnection with the potable water system. This prohibition is consistent with Cross Connection Control regulations found in Title 17, CCR. However, the footnote (2) for Item 10 states that, "This requirement does not apply to individual residences using recycled water for landscape irrigation..." The reader may interpret this to mean that backflow prevention is not necessary at individual residences. To clarify, Title 17, CCR requires that, as a minimum, a double check backflow prevention device be used at these sites or the implementation of a Department-approved alternative backflow protection plan. The Department recommends that the footnote be revised to clarify this regulatory requirement.

## **B. Specifications**

### **Flow and General Limitations**

The Department finds that the Zenon Zeeweed 500d ultrafiltration technology is an acceptable filtration technology to produce tertiary effluent for the intended beneficial uses. The Department recommends that Section B, Specifications, Flow and General Limitations, be revised to specify that the proposed recycled water treatment train is considered equivalent to tertiary treatment, per Title 22 requirements, when the Zenon Zeeweed 500d membranes are used in accordance with the manufacturer's specifications and the DWTP's Operations Plan. Also, the Department recommends that the MRR specify that when the plant capacity is increased to 5.0 MGD that only the Zenon Zeeweed 500d membranes be installed and used.

To clarify an operational issue, by letter dated July 3, 2008 from the Department to the Board, the Department noted that the Zenon ultrafiltration process should contain equipment that is capable of conducting air pressure hold tests on the membrane modules to confirm the integrity of the membrane barrier should a single fiber be broken. After further review of the treatment technology, the Department has determined that the membrane integrity test should not be a requirement for the Zenon Zeeweed 500d ultrafiltration technology and that complying with turbidity performance standards are sufficient to determine filtration effectiveness.

### **Disinfected Tertiary Recycled Water Limitations**

Item 8 states that, "The turbidity of the disinfected tertiary recycled water shall not exceed any of the following:

- a. An average of 0.2 nephelometric turbidity units (NTU) within a 24-hour period;
- b. 0.2 NTU more than 5 percent of the time within a 24-hour period; and
- c. 0.5 NTU at any time."

The Department recommends that this be revised to be consistent with Section 60301.320 (b), CCR. Only Items 8(b and c) are found in regulation. Item 8(a) should be deleted. In addition, turbidity is measured immediately after the filtration process. So, Item 8 should be revised to, "The filtered wastewater shall not exceed..."

The DWTP will utilize a Zenon Zeeweed 500d ultrafiltration technology and chlorination disinfection to achieve turbidity and bacteriological standards for disinfected tertiary recycled water. Coagulation is not provided and is not required as part of the treatment process. The Department recommends deleting the footnote (4) because the coagulation requirements do not apply to treatment at the DWTP.

Item 9(c) specifies that the total coliform concentrations for disinfected tertiary recycled water must be less than an MPN of 240 per 100 mL at all times. To be consistent with regulations (Section 60301.230(b), CCR), the Department recommends that this item be revised to state: "No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters."

The Department recommends that a new item is added to clarify the compliance monitoring requirements for Items 8 (turbidity) and 9 (coliform) as required in Section 60321, Title 22, CCR. The following is suggested:

"Disinfected tertiary recycled water must be sampled at least once daily for total coliform bacteria. The samples must be taken from the disinfected effluent and must be analyzed by an approved laboratory. Further, the water must be continuously sampled for turbidity using a continuous turbidity meter and recorder following filtration. Compliance with the daily average operating filter effluent turbidity must be determined by averaging the levels of recorded turbidity taken at four-hour intervals over a 24-hour period. Compliance with turbidity pursuant to Section 60301.320 (b)(1), CCR [or new Disinfected Tertiary Recycled Water Limitations, Item 8(a)] must be determined using the levels of recorded turbidity taken at intervals of no more than 1.2-hours over a 24-hour period. Should the continuous turbidity meter and recorder fail, grab sampling at minimum frequency of 1.2-hours may be substituted for a period of up to 24-hours. The results of the daily average turbidity determinations must be reported quarterly to the Board."

Section 2.5.3.1 of the Engineers Report proposed that the filtered effluent will be equally split between the two chlorine contact basins. Another word, the two chlorine contact basins will be operated in a parallel formation, not in series. In a July 22, 2008 email from Mr. Stephen Ferry of HydroScience Engineers, Inc. (the City's engineering consultant) to the Department, it was proposed that the two chlorine contact basins will be operated in series, instead of parallel, to maximize chlorine contact time and minimize chlorine usage. The Department recommends that this treatment configuration be specified in the MRR and chlorine contact basins operated at all times to meet the performance requirement established in Item 10.

In addition, to clarify the compliance monitoring frequency for Item 10, the Department recommends the following is added to Item 10: "Compliance with CT requirements should be determined at least daily."

### **C. Supplier and Distributor Requirements**

Item 1 specifies that the City must submit to, and obtain approval from, the Department and the Board the plan for the recycled water distribution system from the DWTP to the use areas prior to initial delivery of recycled water. The plan should show the final and as-built drawings and maps of the locations of the potable water, sewer, and recycled water pipelines. The Department recommends that this requirement be revised to indicate that the proposed plans must be submitted to, and approved by, the Department and Board prior to construction. And, after construction, as-built drawings must be prepared and kept on file by the City.

Also, Item 1 specifies that the design drawings "...should indicate adequate separation between the recycled water and potable domestic water lines..." The Department recommends that this is revised to include the regulatory requirements for pipe separation specified in the California Waterworks Standards (CWS). Section 64572(c and d), CWS requires that the potable pipeline be 4 feet horizontally from, and one foot vertically above, any parallel pipeline conveying disinfected tertiary recycled water. If crossing a pipeline conveying disinfected recycled water, a potable water main must be constructed no less than 45-degrees to and at least one foot above that pipeline.

Item 3 referenced the Department's *Guidelines for Use of Reclaimed Wastewater for Irrigation and Impoundment* and *Guidelines for Worker Protection at Reclamation Use Areas*. These guides were developed before the adoption of the current Title 22 requirements and, as such, are no longer enforced. The Department recommends that these two documents be deleted from this Item.

Item 6 states that, "Delivery of recycled water shall cease during any period the DWTP fails to produce disinfected tertiary recycled water meeting CCR Title 22 criteria." The Department recommends that the criteria for diversion of recycled water should be more specifically established. Our recommendation is, "...meeting performance criteria specified in Permit Specifications Items 8, 9, and 10."

Item 7 states that, "All recycled effluent storage reservoirs and use areas with public access shall post (in English and Spanish) signage to warn the public recycled wastewater is being stored or used." Title 22 defines "landscape impoundment", "restricted recreational impoundment", and "nonrestricted recreational impoundment". For clarity and to be consistent with regulatory definitions, the Department recommends that the term "storage reservoirs" is revised to "impoundments". Also, the Department recommends that "with public access" is deleted. Even restricted access use sites should be properly marked for worker protection.

Item 8 notes that, "Recycled water systems shall be properly labeled and regularly inspected to ensure proper operation, absence of leaks, and absence of illegal connections." For clarity, the Department recommends that "Recycled water systems" is changed to "Recycled water use areas".

#### **D. User Requirements**

Item 1 states that, "The application of disinfected tertiary recycled water is limited to the following areas pursuant to Title 22, Division 4, Chapter 3, Section 60304 of the California Code of Regulations:

- a) Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop,
- b) Parks and playgrounds,
- c) School yards,
- d) Residential landscaping,
- e) Unrestricted access golf courses, and
- f) Any other irrigation use not specified in Section 60304 (Title 22) and not prohibited by other sections of the California Code of Regulations, or within these requirements."

Title 22 has established other safe uses of disinfected tertiary recycled water. The Department recommends that Item 1 is revised to:

"The application of disinfected tertiary recycled water is limited to the following areas pursuant to Title 22, Division 4, Chapter 3, of the California Code of Regulations:

Surface irrigation:

- a) Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop,
- b) Parks and playgrounds,
- c) School yards,
- d) Residential landscaping,
- e) Unrestricted access golf courses,
- f) Cemeteries,
- g) Freeway landscaping
- h) Ornamental nursery stock, Christmas tree farms and sod farms,
- i) Fodder, fiber and pasture for animals producing milk for human consumption,
- j) Orchards and vineyards, and
- k) Seed crops not eaten by humans.

Other uses:

- a) Impoundments,
- b) Industrial or commercial cooling or air conditioning that involves the use of a cooling tower, evaporative condenser, spraying or any mechanism that may create a mist,
- c) Industrial boiler feed,
- d) Flushing toilets and urinals,
- e) Priming drain traps,
- f) Industrial process water,
- g) Structural and nonstructural fire fighting,
- h) Mixing concrete,
- i) Decorative fountains,
- j) Commercial laundries,
- k) Construction water for backfill consolidation, soil compaction, mixing concrete and dust control at construction sites,
- l) Commercial car washes, including hand washes if the recycled water is not heated, where the general public is excluded from the washing process, and
- m) Cleaning roads, sidewalks and outdoor work areas."

The Department recommends that Item 2 is revised to: "The Supplier and Distributor shall not add additional use areas or users other than those specified in User Requirements, Item 1 unless the proposed use is submitted to, and approved by, the Department and Board."

Item 12 references CCR Title 18, Section 7605, in establishing testing of backflow prevention devices. The Department recommends that this reference is revised to Title 17.

The Department recommends that a new Item, or Section, be added that addresses the requirements for a dual-plumbed use site. The Department suggests that the following is added to the MRR:

"Requirements for Dual-Plumbed Recycled Water System

1. The potable water supply shall not be used as a backup or supplemental source of water for a dual-plumbed recycled water system unless the connection between the two systems is protected by an air gap separation which complies with the requirements of Section 7602 (a) and 7603 (a) of Title 17, California Code of Regulations, and that such connection has been approved by CDPH.
2. The Distributor shall not deliver recycled water to a facility using a dual-plumbed system unless the report required pursuant to Section 13522.5 of the California Water Code, and which meets the requirements set forth in requirement 3, below, of this Order, has been submitted and approved by CDPH. The Regional Board shall be furnished with a copy of the CDPH approval together with the aforementioned report within 30 days following the approval.
3. The report pursuant to Section 13522.5 of the California Water Code shall contain the following information for dual-plumbed systems, in addition to the information required by Section 60323 of Title 22, California Code of Regulations (Engineering Report):
  - a. A detailed description of the intended use site identifying the following:
    - i. The number, location, and type of facilities within the use area proposing to use dual-plumbed systems;
    - ii. The average number of persons estimated to be served by each facility on a daily basis;
    - iii. The specific boundaries of the proposed use site including a map showing the location of each facility to be served;
    - iv. The person or persons responsible for operation of the dual-plumbed system at each facility; and
    - v. The specific use to be made of the recycled water at each facility.
  - b. Plans and specifications describing the following:
    - i. Proposed piping system to be used;
    - ii. Pipe locations of both the recycled and potable systems;
    - iii. Type and location of the outlets and plumbing fixtures that will be accessible to the public; and
    - iv. The methods and devices to be used to prevent backflow of recycled water into the public water system.
  - c. The methods to be used by the Producer to assure that the installation and operation of the dual-plumbed system will not result in cross connections between the recycled water piping system and the potable water piping system. These shall include a description of pressure, dye or other test methods to be used to test the system every four years.
4. Prior to the initial operation of the dual-plumbed recycled water system and annually thereafter, the dual-plumbed system within each facility and use site shall be inspected for possible cross connections with the potable water system. The recycled water system shall also be tested for possible cross connections at least once every four years. The testing shall be conducted in accordance with the method described in requirement 3(c), above, of this Order. The inspections and the testing shall be performed by a cross connection control specialist certified by the California-Nevada section of the American Water Works

Association or an organization with equivalent certification requirements. A written report documenting the result of the inspection and testing for the prior year shall be submitted to CDPH within 30 days following completion of the inspection or testing.

5. The Producer shall notify CDPH of any incidence of backflow from the dual-plumbed recycled water system into the potable water system within 24 hours of discovery of the incident."

### **Design Requirements**

The footnote (22) for Item 15 referenced an August 2005, RMC, Engineering Report for Production, Distribution, and use of Recycled Water, Appendix E-Las Palmas Ranch Cross Connection Control Plan. The Department is uncertain how this reference document applies to or relates to the Cross Connection Control Program for the City of Hollister. The Department believes this may be a transcription error. If the City of Hollister is adopting the Las Palmas Ranch Cross Connection Control Plan, a copy of the Plan should be submitted to the Department for review and approval.

### **Individual Recycled Water Use Permits**

Item 33 states that Recycled Water Use permits shall require Users to have these (copy of the Recycled Water Use Permit and the Order) "...available at all times for inspection by Water Board staff, the Distributor, or State/County Health Officers." The Department recommends that the last sentence is revised to "...for inspection by Water Board staff, the Distributor, County Health Officer or CDPH."

### **E. Provisions**

Item 3 requires the City to conduct a tracer study under four different flow rates to determine the respective modal contact times for the chlorine contact basins when they are operated simultaneously in parallel. As mentioned above, under Disinfected Tertiary Recycled Water Limitations, the engineering consultant clarified that the two chlorine contact basins will be operated in series instead of parallel to maximize chlorine contact time and minimize chlorine usage. Therefore, the tracer study must be conducted while the two chlorine contact basins are operated in series. A final report on the tracer study should be submitted to the Department and Board for review and approval prior to start up.

The Department recommends that an additional provision is added to require an operations plan for the DWTP, be submitted to the Board and Department for review and approval prior to start up. Also, the April 2008 Engineers Report noted that the DWTP has a SCADA system that enables full monitoring and control of the plant. The SCADA system, which has battery power back-up, will provide the annunciation of the alarms, that is, the alarms will sound for the following events:

- o The loss of normal power
- o Failure of biological treatment process
- o Failure of disinfection process
- o Failure of a filtration process

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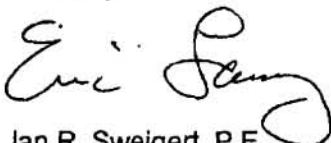
The Department recommends that a list of process control alarm set points should be included within the Operations Plan. The Plan should also include the procedures, frequencies and the agency and/or contractor responsible for testing the alarms for proper operation. If automatic shutdown features are provided to the treatment process, the shutdown features must also be tested. A detailed discussion of the follow up actions required, if the alarms were to sound, need to be included within the plan.

Furthermore, a discussion regarding compliance determination should be incorporated into the Operations Plan. Finally, Section 2.8 of the April 2008 Engineers Report noted that turbidity meters and chlorine analyzers are checked daily and calibrated as needed. The online analyzers should be checked and calibrated in accordance with the manufacturer's specifications. Checks and calibration procedures need to be included within the Operations Plan.

The Department recommends an additional provision to ensure that the City's potable water supply is properly protected from recycled water use sites' cross connections by performing a site test by a qualified individual. The Department recommends the following: "Prior to use of the recycled water supply on site, the City should ensure that the use area is inspected and tested for possible cross connections with the potable water system. The inspections and testing should be performed by a cross connection control specialist certified by the California-Nevada section of the American Water Works Association or an organization with equivalent certification requirements. A written report documenting the result of the inspection or testing for the prior year should be submitted to the Department and Board within 30 days following completion of the inspection or testing."

Should you have any questions regarding this letter, please contact Ms. Van Tsang at (510) 620-3602.

Sincerely,

  
for

Jan R. Sweigert, P.E.  
District Engineer  
Monterey District Office  
Drinking Water Field Operations Branch



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cc: Ms. Cecile DeMartini  
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