

## DOCKETED

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<b>Project Title:</b>	Panoche Energy Center
<b>TN #:</b>	203333
<b>Document Title:</b>	Wastewater Tanks PTA - Answers to Water Quality Staff Questions.
<b>Description:</b>	N/A
<b>Filer:</b>	Dale Rundquist
<b>Organization:</b>	CEC/Dale Rundquist
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## Rundquist, Dale@Energy

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**From:** Amanda Johnson [amanda.johnson@sageenvironmental.com]  
**Sent:** Monday, November 03, 2014 11:23 AM  
**To:** Rundquist, Dale@Energy  
**Cc:** Maggie Fitzgerald; Marshall, Paul@Energy; dburkard@ppmsllc.com; Amanda Johnson; Fearney, Kelly (kelly.fearney@amec.com); Borrego, Ron <Ron.Borrego@amec.com> (Ron.Borrego@amec.com)  
**Subject:** RE: Soil and Water Staff Questions

Hello Dale,

Here are some brief answers to Staff's questions from your 10/28/2014 email:

1. **How it Functions:** The Evoqua (formerly Siemens) treatment system includes a softening process, microfiltration (MF), and reverse osmosis (RO). Blowdown from the cooling tower is sent to the treatment system. Chemicals are added to precipitate target constituents such as hardness and silica. Suspended solids and these precipitates filtered out by the MF units. Filtrate from the MF units are sent to the RO units where dissolved solids are removed. The RO filtrate, also called permeate or product water, is recycled to the cooling tower. Reject, a byproduct of the RO units, also called brine, is disposed of in the existing deep injection wells. Wastes from the MF units (filtered suspended solids and precipitates) are concentrated as a sludge and then sent to a filter press to produce a cake sludge with 20%-40% solids content.
2. **How it is different from a ZLD:** ZLD refers to zero liquid discharge. The proposed Evoqua treatment equipment is not a ZLD system. The Evoqua system removes TDS from cooling tower blowdown and returns the treated water to the cooling tower. Solids from the treatment system waste brine are dewatered and hauled to a local permitted landfill, and the liquid waste contain the remaining TDS is pumped to four on-site injection wells. While the proposed system does not achieve zero liquid discharge, the proposed system reduces pumping of source water from groundwater and reduces pumping of wastewater to deep injection wells.

The proposed system produces 25% liquid waste. A ZLD system at the Panoche facility would require additional equipment such as additional RO equipment, an evaporator, and a crystallizer. These components are very energy intensive and are not appropriate for operation in a cyclic nature like at a peaking power plant.

3. **What volume of waste it will generate:** The proposed Evoqua treatment system is estimated to produce 25% reject. That means for every 100 gpm treated, 75 gpm is produced as permeate and recycled to the cooling tower, and 25 gpm is reject and disposed of as wastewater to the injection wells. For Panoche, the Evoqua system is design for approximately 388 gpm feed to the treatment system. The reject wastewater is then 97 gpm, plus small wastes from other processes, resulting in a wastewater estimate of 120 gpm to the deep injection wells. The filter cake sludge is less than 1 gpm and is estimated to fill 1 to 2 roll-off containers per week.
4. **What type of waste it will generate:** A water sample from Panoche was sent to Evoqua for bench scale testing. This testing produced a representative filter cake material, which was then characterized by a laboratory in California. The cake was determined to be non-hazardous according to both State of California and Federal Regulations.

5. Where will the filter cake be disposed of: The results of the filter cake sludge characterization were sent to Justin Raymond, the Operations Manager for Red Rock, the entity managing the Fairmead Landfill for Madera County. Mr. Raymond confirmed that sludge of this character would be accepted by the Fairmead Landfill as a non-hazardous waste.

Please let us know if you have any additional questions.

Best regards,

**Amanda Johnson** Power & Energy

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**From:** Rundquist, Dale@Energy [<mailto:Dale.Rundquist@energy.ca.gov>]

**Sent:** Tuesday, October 28, 2014 12:08 PM

**To:** Amanda Johnson

**Cc:** Maggie Fitzgerald; Marshall, Paul@Energy

**Subject:** Soil and Water Staff Questions

Hi Amanda,

Soil and Water Staff has questions about the Wastewater Tanks Petition to Amend.

Please provide more information on the Evoqua water treatment system.

Staff needs to know:

1. How it functions;
2. How it is different from a ZLD;
3. What volume of waste it will generate; and
4. What type of waste it will generate.

The flow diagram shows one truckload per week of filter cake.

Staff needs a preliminary idea of the waste characterization and where it will be disposed.

Thank you,  
Dale R.

**Dale Rundquist**

Compliance Project Manager



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