



Klamath Energy, LLC
An Avangrid Renewables Company

4940 Highway 97 South
Klamath Falls, Oregon 97603
Telephone (541) 883-3118
Facsimile (541) 883-3154

May 17, 2019

Mr. Duane Kilsdonk
Oregon Department of Energy
625 Marion St.
Salem, OR 97301-3737



Subject: Amendment Determination Request to install and use chlorine dioxide disinfectant system in cooling water at Klamath Cogeneration Project.

Dear Mr. Kilsdonk,

In accordance with OAR 345-027-0057, Klamath Energy LLC submits this Amendment Determination Request for a potential change to more efficiently disinfect cooling water used at the Klamath Cogeneration Project (KCP). KCP operates the facility pursuant to the Fifth Restated and Amended Site Certificate for the Klamath Cogeneration Project Dated January 25, 2013.

Background:

The KCP receives secondary effluent from the Spring Street Wastewater Treatment Plant ("SSWTP") and uses this effluent for cooling. The effluent water is pretreated at SSWTP with a chlorine-based disinfectant called sodium hypochlorite (NaOCl), which is also known as *bleach*, to prevent biological growth. Klamath Energy uses the same chemical (sodium hypochlorite) to disinfect and prevent biological growth in the cooling tower and cooling system. Klamath energy feeds sodium hypochlorite into the cooling water system to maintain a small amount of free chlorine in the pipeline as it is returned to the SSWTP for final treatment. From a chemistry perspective, free chlorine is effective at preventing biological growth because it breaks down the enzymes in the bacteria. When enzymes do not function properly, a cell or bacterium will die. Chlorine is the main component when it comes to disinfecting the water. There is no site certificate condition related to chemical use for the cooling water supply; however, use of sodium hypochlorite (bleach) solution is described in the Application for Site Certificate (ASC). Exhibit B of the ASC on page B-7 states: "An injection system using acid, sodium hypochlorite

Klamath Energy, LLC
4940 Hwy 97 S, Klamath Falls, OR 97603
Telephone 541-883-3118, Fax 541-883-3154
www.avangrid.com, dennis.winn@avangrid.com

(bleach), and corrosion inhibitor will be used to control biological growth corrosion, and foaming in the circulating cooling water system. Secondary containment will be provided to prevent the spread of accidental chemical spills.”

Proposed Change:

Klamath Energy is considering supplementing its chlorine-based disinfectant practice using a chlorine dioxide system. The chlorine dioxide system mixes a sodium-chlorate (NaClO_3) solution with sulfuric acid (which is already used for pH control) and is significantly more effective at disinfecting the effluent than the sodium hypochlorite (bleach), even though it is still a chlorine-based disinfectant. Chlorine dioxide systems are common at water-treatment facilities in the United States to treat drinking water and it should be noted that SSWTP is also interested in changing to a similar system for its treatment facility. Advantages of a chlorine dioxide system include:

- A significant reduction of bulk sodium hypochlorite deliveries to Klamath Energy and injection into the cooling water.
- pH independence – chlorine dioxide efficiency is effective over a much wider range of pH (approximately 3.5 – 11).
- Chlorine dioxide is more selective as an oxidizer which minimizes corrosion.
- Chlorine dioxide is more soluble in water so the chlorine will remain in the system longer.
- Chlorine dioxide has superb biofilm control properties.
- Chlorine dioxide is highly efficient in disinfecting the effluent water.

One final point is that SSWTP is the entity who issued the Industrial Wastewater Discharge Permit (“IWDP”) for the KCP facility and is the local enforcement agency (LEA) for this permit. SSWTP supports the change as demonstrated in the attached letter.

Certificate Holder Evaluation and Conclusion:

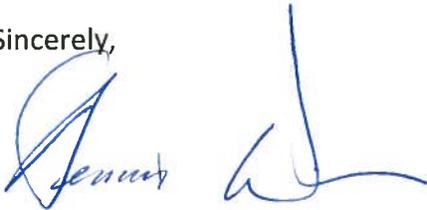
The proposed supplemental disinfectant chemical does not impact KCP’s ability to comply with any condition in the Fifth Restated and Amended Site Certificate for the KCP nor does it require any change to the Industrial Wastewater Discharge Permit (IWDP). A chlorine dioxide cooling water disinfectant system is substantially similar to the treatment system described in the ASC, because it uses the same base chemical (chlorine), and will use a similar system for injection into the cooling system that is currently used. Additionally, the system will be automatic just as the current system is which prevents chemical exposure to personnel.

No changes are being proposed to the acid or corrosion inhibitor systems or the secondary containments. Klamath Energy believes that because the substance we are proposing for disinfecting does not change from chlorine based chemical, that an amendment to the site certificate is not required. In fact, the volume of chlorine based materials in use would be significantly reduced. Its use could not result in any significant adverse impact that the Council has not already addressed, impair the certificate holder’s ability to comply with a site certificate condition or require a new condition or change to an existing condition in the site certificate.

In conclusion, Klamath Energy proposes to significantly improve the efficiency of the disinfectant system used at the KCP. It is anticipated that this optionality can result in an 85% - 90% reduction in chlorine based disinfectant usage which reduces sodium loading and employee exposure with chemicals during delivery. Also this change will improve Klamath Energy's ability to comply with the facility IWDP resulting from another efficient disinfecting approach and the LEA (SSWTP) is supportive of the proposed option. (See attached letter from SSWTP to Klamath Energy) During the planning phase of this change, Klamath Energy analyzed the requirements in the site certificate for KCP and when a site certificate amendment is required as described in Oregon Administrative Rule (OAR) 345-027-0050. After this analysis, we have concluded that supplementing the effluent water disinfectant does not require an amendment to the site certificate prior to implementing this change. Klamath Energy respectfully requests that Oregon Department of Energy review this proposed change and provide concurrence with its conclusions.

Should you have any questions or concerns regarding this change, please feel free to let me know. We look forward to your reply.

Sincerely,



Dennis Winn
Managing Director – Klamath Energy

Cc: Bruce Willard, Klamath Energy Operations & Engineering Manager
Enc. Chlorine dioxide IWDP 12-02-20113



CITY OF KLAMATH FALLS, OREGON

500 KLAMATH AVENUE – P.O. BOX 237
KLAMATH FALLS, OREGON 97601



April 16, 2019

Dennis Winn, Managing Director – Klamath Energy LLC

4940 Hwy 97 S – Klamath Falls – OR-97601

RECEIVED
4/16/19 AEW

Subject: Use of chlorine dioxide as a disinfectant in the cooling water Permit no. IWDP -12 -02-2013

Dear Mr. Winn,

With regards to your request to use chlorine dioxide as a disinfectant. The City of Klamath Falls is aware of the approval from the Oregon Department of Environmental Quality (DEQ) to “move ahead “ with the change in the water reuse plan to allow the use of chlorine dioxide as a disinfectant.

I have spoken with Mark Willrett and Arjen De Hoop and they along with myself see no reason not to give the City’s approval within our scope of the water reuse plan.

Recycled Water Use is regulated by DEQ under Oregon Administrative Rules (OAR) Chapter 340, Division 55, which prescribes methods, procedures, restrictions, treatment, and monitoring requirements for the beneficial use of reclaimed water. Our (the City’s) approval is limited to agreeing that if the Oregon DEQ has approved of the use of chlorine dioxide as a disinfectant and as long as you have sodium hypochlorite as a back up disinfectant, and there is no negative noticeable difference in the blow down effluent returned to our facility we approve of this change in disinfectant. Our approval is also based on the following conditions:

- All Conditions (section 3.0), Other Issues (section 4.0) listed in the Recycled Water Use Plan (RWUP) must continue to remain in compliance.
- Any future changes (including returning to sodium hypochlorite) must be communicated to our Pre-Treatment Administrator.
- Continued compliance with Industrial Waste Discharge Permit # IWDP-12-02-2013.

We look forward to seeing this new disinfection system start up and would like help to make it a success. We are also very interested in seeing if it can scale up and work for our facility.

Sincerely

Ray Busch, Water Recovery Division Manager

Cc: Mark Willrett, Director of Public Works

Cc: Arjen DeHoop, Pre-Treatment Administrator