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WRF CONCENTRATE DISPOSAL AD HOC COMMITTEE

DATE: November 8, 2023

TO: Cambria Community Services District Resources and Infrastructure Committee

FROM: Jim Webb
Steve Siebuhr
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SUBJECT: Cambria Community Services District WRF Concentrate Disposal Options Update

INTRODUCTION

The WRF Concentrate Disposal Ad-Hoc Committee is tasked with researching brine waste disposal alternatives, including zero liquid discharge, with utilities engineer Dienzo. On July 5, 2023, The WRF Concentrate Disposal Ad-Hoc Committee reviewed potential brine waste disposal options with District Utilities Manager Ray Dienzo. All options were considered without any intent to make recommendations.

The Committee noted during the meeting that while the Water Reclamation Facility (WRF) concentrate is often referred to as a brine, it has lower salinity than seawater. There is no agreed-upon level of Total Dissolved Solids (TDS) that defines a brine. To avoid confusion with brines that have TDS levels higher than seawater, these notes will use the word concentrate rather than brine.

CONCENTRATE DISPOSAL OPTIONS

OPTIONS DISCUSSED WITH DISTRICT STAFF

Concentrate disposal options that the committee discussed with Mr. Dienzo on included the following:

1. **Trucking Concentrate to an Approved Facility**

   This option entails temporarily storing the concentrate onsite, then transporting it by truck to an approved facility such as the South San Luis Obispo County Sanitation District (SSLOCSD) in Oceano. This is currently the default disposal option.

Pros: - No special permitting required
- No new facilities required

Cons: - Expensive
- Significant carbon emissions from the estimated 2 to 4 daily trucks

2. Reducing Concentrate Volume with Zero Liquid Discharge (ZLD)

This option reduces the amount of concentrate that must be disposed of by removing most or all of the liquid from the concentrate. The semi-solid concentrate would be trucked to an approved disposal site. CCSD is currently investigating one potential ZLD technology.

Pros: - Reduces the amount of waste that must be transported by truck compared to the default trucking option
- Likely less expensive than the default trucking option

Cons: - The technology is untested, but a pilot test is planned
- Cost of the ZLD plant is unknown
- The cost of disposal is uncertain, and will depend on the concentrations of constituents in the concentrate

3. Disposing Through the Existing San Simeon CSD Outfall

This option requires CCSD enter into an agreement with San Simeon CSD to dispose of concentrate through SSCSD's existing outfall. The outfall has unused capacity that could accept some concentrate.

Pros: - The outfall infrastructure and permit already exist.

Cons: - Concentrate would currently need to be trucked to San Simeon. Rough estimates for pipes to San Simeon are approximately $2 Million/mile
- San Simeon CSD has historically not shown interest in this option
- California Coastal Commission has indicated it would like San Simeon CSD to abandon the existing outfall, and may not favor additional users of the outfall
- Some residents of San Simeon would like to move their existing plant and outfall

4. **Disposing in Coordination with a New San Simeon Treatment Plant Located in or Near San Simeon Creek Valley**

   This option relies on San Simeon CSD moving its treatment plant to a new location relatively near CCSD's San Simeon Creek facilities. CCSD could enter into an agreement with San Simeon CSD to dispose of concentrate in San Simeon CSD's new wastewater disposal system. This agreement could be part of a land lease, land sale, funding agreement, or other contractual mechanism.

   Pros: - Eliminates the need for trucking or piping concentrate
   - Could be relatively inexpensive
   - Permitting covered as part of the new treatment plant
   - In accordance with California Coastal Commission and San Simeon community's desire to move the San Simeon CSD treatment plant

   Cons: - San Simeon CSD currently has no plans to move its treatment plant

5. **Disposing as Part of a Regional Wastewater Treatment System**

   This option is similar to option 4. However, instead of San Simeon CSD moving its treatment plant to a new location, San Simeon CSD and CCSD would jointly build and operate a regional treatment plant.

   Pros: - Eliminates the need for trucking or piping concentrate
   - In accordance with California Coastal Commission and San Simeon community's desire to move the San Simeon CSD treatment plant

   Cons: - San Simeon CSD has historically shown little interest in a regional treatment plant.

6. **Improve the Existing Discharge System in Coordination with Cambria WWTP Expansion**

   This option relies on CCSD expanding its existing treatment plant. As part of the treatment plant expansion, CCSD could design and permit a new wastewater discharge system. Part of this system could accept concentrate discharge

   Pros: - Eliminates the need for trucking or piping concentrate
   - Does not rely on San Simeon CSD plans

   Cons: - CCSD currently has no plans to move expand its treatment plant

7. **Disposing Through Subsurface Discharge Originating from the Flag Lot**

   This option uses CCSD's existing pipe infrastructure at the Flag Lot, with any needed improvements, to discharge concentrate. Rather than an open ocean discharge, the concentrate would be discharged beneath the ocean floor.

   The committee noted that the Sand City brackish water desalination plant is permitted to dispose of its concentrate in the Monterey Bay Marine Sanctuary through a subsurface horizontal well beneath the surf zone. The Sand City permit could provide some guidance on how such a disposal could be permitted. However, the committee noted that the source water for the Sand City plant does not contain municipal waste constituents that are likely found in the WRF concentrate. These constituents may prevent permitting this disposal option.

   Pros: - CCSD has existing, permitted facilities in the Flag Lot
   - Eliminates the need for trucking or piping concentrate

   Cons: - Existing pipe condition is unknown
   - Permitting is required by many agencies, and may be difficult
   - Community environmental concerns may prevent this option

OPTIONS NOT DISCUSSED WITH DISTRICT STAFF

Two brine waste disposal options were not discussed with Mr. Dienzo but could be viable options for brine waste disposal.

8. **Deep Well Injection**

   This option injects concentrate into deep geologic strata. This is similar to how oil-field brines are disposed. The geologic strata used for injection are far below any water supply wells or areas of environmental concern.

   Limited geologic data may be available from the California Department of Conservation, Geologic Energy Management Division (GEM). The GEM online well finder shows two deep exploratory oil wells in San Simeon. Both exploratory holes were drilled in 1952. Neither well produced oil, and both holes were abandoned the same year. One hole was drilled to a depth of 641 feet, and the other hole was drilled to a depth of 1,620 feet.

   Pros: - Eliminates the need for trucking or piping concentrate
   - Eliminates environmental impacts from disposal

Cons: - Unknown if an adequate geologic stratum exists locally at depth
- Permitting requirements are unknown
- RWQCB has previously stated their opposition to this option
- Injection wells are expensive (millions of dollars)

9. Evaporation Ponds

An evaporation pond was included in the original WRF system design. The evaporation pond was built, but the Regional Water Quality Control Board issued a cease and desist order after a flood event highlighted a flaw with the original engineering firm's design. The District cannot currently use the existing pond for its intended purpose. The technology, however, might still be a viable alternative for brine disposal.

Pros: - Eliminates the need for trucking or piping concentrate
- Relatively low environmental impacts from disposal

Cons: - Subject to flooding
- Potential community concerns after previous pond experiences
- The Coastal Commission has requested the existing Evaporation Pond be removed as part of the CDP mitigation effort.