Seneca Resources Company, LLC

Basin Plan Amendment

Proposal to De-Designate MUN and AGR Beneficial Uses from the Lower Tulare and Upper Etchegoin Aquifers in the Southern Lost Hills Oilfield
Agenda

• Objectives for this meeting
• Regulatory Basis for Proposed De-Designation
• Lost Hills Oil Field Introduction
• Seneca Operations
• De-designation Area Definition
• Geologic and Hydrogeologic Framework
• Impacts Analysis
• Close - Discussion
Objectives

• Seek CV-SALTS technical feedback on beneficial use de-designation request. Specifically:
  • Facilitate CV-SALTS technical feedback on Seneca Resources request to de-designate beneficial uses.
  • Expedite the formal process to obtain Basin Plan amendment to protect Seneca from undue liability.
Regulatory Basis

• Seneca has all necessary approvals and is in full compliance with all requirements to reinject produced water from its oilfield operations into two aquifers with TDS levels greater than 10,000 mg/L

• Nevertheless, Seneca is facing undue liability under Prop. 65 because of MUN designation

• De-designation will allow continued lawful re-injection into non-USDW aquifers, minimizing potential salt load by minimizing surface discharges

• No impact to municipal, domestic, or agricultural water supply

• Protective of the environment
Lost Hills Oil Field

- West Kern County
- West Side of the San Joaquin Valley
- South of Tulare Lake Bed
Seneca Resources operates four produced water disposal wells in the southern part of the oil field under DOGGR-issued UIC permits.

The wells inject water into the Lower Tulare and Upper Etchegoin Formations.

These aquifers are classified Non-USDW under SDWA because of TDS levels greater than 10,000 mg/l.

Aquifers are confined-from overlying waters.

The Basin Plan currently applies a blanket MUN designation beneficial use for these aquifers, because they are not specifically listed as exempt.

Water from these aquifers is not being used for any other use.

It is not economically or technically viable to use groundwater from these deeper formations for MUN or AGR purposes.

Seneca Proposes to amend the Basin Plan so that these aquifers are exempt from MUN and AGR beneficial uses.
Proposed De-designation Area

- Lower Tulare and Upper Etchegoin Aquifers
- Area Beneath Six Sections
- But not subsurface area above these aquifers
- Within Lost Hills admin. Boundary
Figure 5: Type log, Stratigraphic Column and Formation Production

General Stratigraphy, Lost Hills Oil Field

Figure source: Lost Hills Tulare Aquifer Exemption Application
Adapted From California Oil & Gas Fields, Volume 1, DOGGR 1973
Figure 9
Tulare Type Log
Lost Hills Oilfield

Figure 10
Mid-Tulare Shale Isochore Map

Lost Hills Field Admin Boundary
PLSS Sections

Isochore Thickness Contour Color Fill

Tulare Formation Stratigraphy and Thickness
Lateral Containment

- Modeled 100-year injection program using MODFLOW

- Area impacted by 100-Year injection program, including buffer, remains within the De-designation Area.

- De-designation Area contained in Lost Hills administrative boundary
Vertical Containment

- Pressure measurements during injection test
- Water quality difference (sample and resistivity)
100-Year injection plumes remain confined beneath the Mid-Tulare Shale.

Proposed De-designation Area does not extend above Mid-Tulare Shale to Surface.

Upper Tulare retains MUN and AGR designation.

Figure 23. Geologic Cross-Section B-B’ showing 100-Year Injection Plume, Buffer Zone and Aquifer De-Designation Area, Lost Hills Oilfield.
• Lower Tulare is well below screening of Ag wells in the Basin.
• Lower Tulare water quality remains poor beneath the Basin.
• Nearest MUN well > 9 miles east of De-Designation Area.

• In Semitropic Oil Field
Close

Discussion and Questions