

WATER RECLAMATION FACILITY

Technology and Operations Expertise Optimize Water Reclamation Facility



WATER

Scope

A Southern California refinery recovers more than 10,000 barrels of heavy oil each day. Steam flooding has been used continuously since the 1960s to soften the oil and enhance its recoverability. The extraction process results in produced water that rises to the surface, requiring treatment and disposal. The refinery worked with water treatment technology experts and water treatment operations specialists at Veolia to provide a solution with a guarantee of performance to enable enhanced oil production.

This refinery features the first-ever installation of OPUS® (Optimized Pretreatment and Unique Separation) technology. Developed by Veolia Solutions & Technologies, OPUS has proven to be a reliable and robust process for successfully treating produced water for surface discharge. The system is managed by Veolia and includes supervision of operations that extends the system's performance guarantee through the life of the 11-year operating contract ensuring system optimization.



Responsibility

Veolia assures that the process reliably treats the water to meet California's stringent effluent discharge requirements.

Sustainability

Veolia enables the plant's entire water cycle to be managed in a truly sustainable way.

Challenge

The process of extracting oil from the ground generates a volume of water that can range from 10 to 20 times the oil production rate. Historically, a portion of this water had been recycled and softened to provide water for steam generation, with the remainder going to local EPA class II injection wells for disposal. However, the injection zone capacity is limited and that had constrained full field development. New water reclamation technology was commissioned that has enabled the expansion of steam-enhanced production into idled, previously developed portions of its oil field. This project is the first produced water desalination facility in the world to use OPUS technology, a multiple-treatment process that removes contaminants sufficiently to meet the requirements for discharge. The treated water is released through shallow wetlands into aquifer recharge basins that replenish water resources.

The technology and services provided by Veolia enables the plant's entire water cycle to be managed in a truly sustainable way, while simultaneously expanding oil production capacity. Since 2008, the water treatment facility has been operated by Veolia, a leading water services provider in North America, under contract with the refinery.

Solution

Veolia provides daily operations and oversees the facility to optimize the field.

Four key areas of service include:

- Daily plant management and handling of 50,000 barrels of water involving a chain of treatment processes. The treated water is discharged to post-treatment constructed wetlands that drain into aquifer recharge basins.
- Engineering support both onsite and offsite for improved operations. As an example, the devastation

caused by hurricanes in 2008 and 2005 resulted in a shortage of hydrochloric acid used in the regeneration process of the water softeners that are part of the OPUS technology. Veolia developed a different concentration of the formula to maintain ongoing operation of the facility and to reduce its reliance on hydrochloric acid while maintaining operational efficiency.

- Independent pilot studies at the plant and in the laboratory are conducted regularly with the

refinery engineers to identify new ways to optimize plant operations, prevent failure and continue to implement sustainable processes while maintaining oil production capacity.

- Troubleshooting as required, available onsite 24/7, to maintain operational efficiency.



OPUS®

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Result

Engineering and operational services provided by Veolia allows the refinery to focus on its core operations of oil production.

- The services provided by Veolia, and the use of OPUS technology, enabled the refinery to expand its area of steam-enhanced production into an idled, previously developed portion of its production field.
- Historically, water not recycled for steam generation was sent to local EPA class II injection wells for disposal; however the injection zone capacity is limited and that had constrained full field development. Use of Veolia's proven technologies and expert services provided a sustainable solution for the refinery to increase oil production.

- Onsite Veolia technicians and engineers assure that the facility and processes achieve the refinery's stringent removal requirements of < 0.64 ppm for boron and a 92% reduction in total dissolved solids. In addition, Veolia assures that the process reliably treats the water to meet California's stringent effluent discharge requirements.
- Operation of the facility by Veolia effectively extends the system performance guarantee for the life of the operating contract and ensures continual system optimization.

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