LOUISIANA REFINERY

Recycling process provides sustainable solution for a major Louisiana Refinery

"Veolia's oily residual management solution recovers around 2,600 barrels of oil a month and reduces the amount of hazardous waste that the refinery produces – a significant financial and environmental benefit."

– Harold Bolanos, Veolia North America project manager

Contract Facts

1992 - Ongoing
duration of project

Delisted haz. waste
thermal desorption

Key Figures

31,000 barrels
recovered annually

16 dedicated
employees

45,215 hours
worked safely

Scope

A unique oily residual management process is providing a sustainable solution for a major refinery in Louisiana. Veolia's two-stage operation recycles oil-bearing secondary materials, resulting in a delisted solids cake that can be disposed of in a local landfill as non-hazardous waste. The recycling process helps reduce environmental risk while recovering an estimated 31,000 barrels of oil per year.

Veolia's residual management solution at this refinery includes a three-phase centrifuge process and a thermal desorption system. Veolia processes more than 500,000 barrels of oil-bearing secondary material per year, helping reduce hazardous materials and returning thousands of barrels to the refining process.

Challenge

Every refinery generates oil-bearing secondary materials during day-to-day operations. If left unchecked, long-term accumulation will reduce site storage space and potentially interfere with normal vessel functioning. Consequently, refineries periodically remove these oil-bearing materials from the storage tanks. Unless the materials can be reused in the refining process, it must be disposed, generally as hazardous waste, which is expensive and impacts the environment. Materials that can be reused, however, do not become classified as waste.

Our customer's refinery, which is one of the largest in the United States, has been admitted to the U.S. EPA's National Environmental Performance Track Program and is a recipient of the Louisiana DEQ's prestigious Environmental Leadership Award. The company strives to use industry best practices to protect the environment, and partnered with Veolia on a sustainable solution for long-term oily residual management that includes a three-phase centrifuge and a thermal desorption system.

Solution

The recycling processes delivered by Veolia offers the client a sustainable solution for managing oil-bearing secondary material streams. By combining Veolia's patented three-phase centrifuge process with a thermal desorption unit, the refinery is recovering 31,000 gallons of oil from its residuals and significantly reducing the hazardous waste generated by the refinery.

The process solids that remain after Veolia's complete thermal desorption process meet or exceed U.S. EPA land disposal restriction (LDR) standards, and Veolia assisted the refinery with securing a conditional delisting authorization. Delisting is a regulatory authorization that allows specific wastes from a particular generating facility to be removed from the hazardous waste list and not be regulated as hazardous waste. Generators remain obligated under RCRA, however, to determine whether or not their waste remains non-hazardous based on the hazardous waste characteristics.

Under Veolia's solution, the refinery's oily waste material is transferred from the refinery's tanks, either via pipeline or vacuum trucks, to the Veolia processing unit. Upon arrival at the unit, the material is heated and conditioned to enhance phase separation in the centrifuges. Once conditioned, the material is introduced into a centrifuge, which separates the oil, water and solids. The recovered oil is returned to the client to use in the refining process; the water is returned to the client for reuse or further processing; and the solids are transferred to the thermal desorption system, which recovers additional oil for reuse and further reduces the water content of the solids.

Veolia's thermal desorption system consists of two units operating in series. A low temperature dryer (LTD) first heats the centrifuge cake to 350°F, removing all free water and 75% of the volatile hydrocarbons. The overall cake mass is reduced by approximately 65% as the water and hydrocarbons are vaporized.

From the LTD, the cake is discharged into another solids hopper that feeds the cake to two high temperature dryers (HTD) operating in parallel. These dryers heat the solids to 870°F, removing all of the remaining hydrocarbons from the solids.

The treated solids exit the system and are cooled to approximately 120°F in a water-cooled screw conveyor system. The vapors containing the desorbed organics exit the thermal processor and are treated to meet regulatory standards using a vapor recovery system. The condensed oily water is returned to the refinery along with the centrifuge oil and water phases. The remaining solids are analyzed against the requirements of the conditional delisting authorization. Upon confirmation of the results, the solids may be disposed as non-hazardous solid waste.

Sixteen employees operate and maintain the Veolia facility around the clock. The staff includes a project manager, two operators and maintenance and safety personnel. The operators are responsible for operating the equipment, monitoring the process, and recording the operating conditions and data. They also diagnose any operational problems and take corrective action to ensure optimal operation.

Results

The recycling process recovers an estimated 31,000 barrels of oil per year for the refinery, and allows the client to significantly reduce its hazardous waste disposal costs and liabilities.

Veolia's safety record at this customer site is excellent, with no lost time accidents since 2002. Awards include the Contractor Merit Award by the American Fuel Petrochemical Manufacturers working 45,215 hours with zero incidents for calendar years 2007-2009 and 2011. They also received the Contractor Safety Excellence Award from the Greater Baton Rouge Industry Alliance in 2011.

"We maintain excellent communication with the client, meeting weekly with refinery personnel and maintaining daily communication with the refinery's wastewater manager," says Bolanos. "The highly experienced staff understands the industrial streams that are recycled, process flows and how various challenges can impact operations. This in-depth experience with refinery processes has allowed Veolia to provide the best technology and service solutions to meet the client's complex water and oil-bearing material-related management challenges."

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