

The project was a RCRA removal of oily sediment and debris from drainage canals at a refinery in northern California. Oil waste had been dumped into the canals dating back to the refinery's origins in the early 1900s, and accumulation of contaminated sediment and sludge was substantial. The canals, one running east-west and the other north-south, totaled 3,200 LF, ranging in width from 25 feet to 50 feet and in depth from 2 feet to 14 feet. The canals were directly adjacent to several active process units making access very limited.

Terra crews began work on the east-west canal, which was shallower and ran along a surge pond. Great care had to be taken excavating the canal to prevent an unstable wall that ran between the canal and surge pond from collapsing. Terra operators used an excavator and backhoe, transferring sludge from the canal directly to a vessel where it was prepared with a drying agent to meet DOT requirements. A mister with an odor suppressant was utilized throughout the excavation process. Once the sediment had been prepared for transportation, it was loaded into zipper bags and placed in roll-off boxes. The boxes were then transported to a rail yard where they were loaded into gondola cars, also lined with zipper bags, and shipped to a F037 landfill.

Terra crews then addressed the north-south canal, which presented more challenges. It was a wider and deeper canal that ran through the refinery with the potential for underwater hazards including utilities and other structures. Because the excavation would now take place under water, Terra employed its own patented Sed-Vac® system (U.S. Patent No. 7,526,884) to extract sediment. Sed-Vac is based on vacuuming technology and was designed specifically for removal of river and lake sediment. This method drastically reduced the potential for odor impact at the adjacent operating units, and also allowed for compliance with strict air emission regulations enforced by the State of California. The system operated at an efficient rate of 350 gallons per minute with vacuumed material averaging from 40 percent to 55 percent solids, an optimal blend of water and slurry. Once vacuumed, sludge was centrifuged, separating oil, water and solids. The oil was returned to the refinery as a recyclable product, and the water was filtered and discharged into the plant's wastewater system.

As an additional environmental precaution, exhaust from the vacuum was piped to a thermal oxidizer, so all VOCs and other gasses were burned off at a 96 percent to 99 percent efficiency rate before released into the atmosphere.

Once the canals were excavated, they were backfilled with several feet of stone, covered with a geo-textile layer followed by general fill, a clay cap, and a second geo-textile layer. Approximately 28,000 CY of impacted material were removed during the course of the project.

