

# ***Petromax***



## **Transportation Case Study**

### **Location:**

Major Los Angeles Refinery

### **The Problem:**

Economically remove and dispose of 3,500 bbls of Crude Oil Tank Bottom Sludge with minimum environmental impact and the least possible disruption of refinery operations. At the time of this project, the refinery's Coker Unit was not available due to an ongoing modification of its quench water feed system.

For this client, the Petromax Process had been previously used to efficiently condition sludge for injection into their coke drum via the quench water feed system. Therefore, they were aware of the advantages of using the Petromax process but transporting Conditioned sludge over that great of a distance had never before been attempted.

### **The Solution:**

Because their Coker was not available, the next most economical disposal method available for this client was to transport the crude sludge via vacuum trucks 400 miles away to a sister refinery with a Coker Unit.

In order for that to occur, the sludge had to be Petromax Conditioned to maintain a pumpable, suspended, non-tacky slurry while being transported and injected into the Coker.

### **Additional Issues:**

- At the sister refinery the sludge was to be off loaded into 500 barrel portable holding tanks where it must stay in suspension throughout the Coker injection process.
- The designated Fluid Coker was located approximately ½ mile from the staged holding tanks.
- The stored sludge had to be pumped from the holding tanks to the Coker via 2" lines. .

### **Work-scope highlights:**

- The Petromax Fluidization and Conditioning process added only 16% to the waste stream, as compared to 200 to 300 per cent added by traditional removal methods.

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- Two vacuum trucks were used to remove the conditioned sludge (using 4" vacuum hoses) into conveniently staged 500 bbls holding tanks. This enabled the transporting vacuum trucks to haul sludge 24/7 without work stoppage on the tank.
- The job initially required fresh air due to high benzene levels. Fresh air was no longer required after day 4 of the 10-day process.
- Vacuum truck exhausting (while pulling sludge) did not require air filter drum canisters (no LEL or benzene levels were detected).
- Vacuum trucks with sleeper cabs were used to transport 41 loads of crude sludge. Each load carried approximately 100 bbls in order to stay within roadway weight restrictions specified by the DOT.
- The long-haul vacuum trucks loaded 100 bbls from the staged 500 bbl tanks in approximately 15 minutes.
- Full off-loading at the destination refinery was accomplished in about 20 minutes (head pressure accounted for), without any washouts. The crude sludge did not stick to the interior of the hoses, nor the inside of vacuum trucks or holding tanks. The transport trucks were able to leave the refinery immediately after off-loading.
- Final rinsing produced a 100% oil free tank interior, which originally had been coated a light beige color, and now looked as if it had been freshly painted. The tank was to be switched over to a diesel tank and had to be perfectly clean.
- Inspection Department and Operations personnel said they had never seen a crude tank, after cleaning, to be that spotless. They said it was impossible to tell it had contained crude.
- The tank rinsing process had totally washed out the vacuum trucks at the same time. The staged temporary holding tanks washed out easier and cleaner than the refinery's Operations and Maintenance personnel had ever witnessed before.

## **Bottom line result:**

- Compared to previous disposal costs, our client saved at least \$362,000 without considering ancillary handling and time savings.
- The tank was put back into service sooner than if traditional methods were used and this savings was not cost-quantified.
- The waste became a saleable product; waste handling was significantly reduced, and safety (employee exposure to risk) was greatly enhanced in the process.

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