Petromax Technologies, Inc.

Sludge Conditioning - Cost Saving Opportunities

- Less sludge material going to the Coker through our waste minimization process (only 15% to 20% added to the waste stream). Coker Operations wants the least amount of sludge possible, preferably without added cutter stock (for operator safety reasons). Petromax solution is water-based and complements a quench water system. This will cut the conventional waste stream, conservatively**,** by one half.

- Once the sludge is conditioned & consolidated, fewer temporary storage tanks are required for staging the sludge prior to utilizing the quench cycle to inject to the Coker.

- The crude sludge remains easily pumpable through to final disposal, thus saving manpower and equipment charges to mobilize and de-mobilize each time sludge is taken to the MOSC tanks for injection into the Coker Unit. The suspended sludge can be transferred to the quench system 24/7 to easily meet any Operational needs. Conventional methods require a labor intensive process to meet unpredictable windows of opportunity for waste injection. Our Petromax process effectively eliminates this double work and is a significant savings to the client.

- The temporary holding tanks (fewer in number when using our process) are easier and faster to clean since the sludge remains suspended and pumpable. When using conventional cleaning methods, at each juncture the sludge settles and again becomes unpumpable, thus creating additional conventional costs.

- Fewer vacuum truck loads are required to complete sludge transfers.

- No troublesome vacuum truck washouts because the crude sludge passes easily through hoses as the trucks complete full discharges to the MOSC tanks. Transfers are completed swiftly and safely without problematic inline filter plugging. Trucks rinse without problems before leaving the refinery.

- Centrifuging or filter pressing as a means of minimizing waste going to the Coker Unit is eliminated. Additional costs of re-slurring dry cake with related manpower and equipment, plus vacuum truck usage is also eliminated.

- Refinery Operations personnel spend less time supervising cleaning contractors and the tank can be put back into service days sooner.

- There is no added waste water treatment cost associated with decanted waste water from conventional sludge transfer methods (from temporary storage tanks).

- The client does not have to circulate heavy “solids laden” tank sludge with added diluents/chemicals and therefore saves on the following:

    1. Cost of diluents/chemicals and related circulating equipment.
    2. Manpower required by both contractor and client operations.
    3. Less operational downtime is required as tank is placed back into service sooner by using Petromax conditioning process.

Special note: Utilizing the Petromax conditioning process means less sludge going to a centrifuge or filter press, should that option become necessary. Oil, water, and solids are already in suspension, therefore, dewatering 3-phase separation operations run more efficiently and faster without the use of polymers. The resulting dry cake is more oil and contaminant free because of our conditioning process. The cake is **significantly drier** with less weight since the resulting water matrix created by polymers is not an inherent part of the dewatering operation. Lab testing our conditioned sludge has resulted in cakes with 17% water in a filter test compared to the usual 30% to 40% after conventional dewatering of sludge using polymers.

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