Value Proposition

Blackwall Process has adapted proven technology into its Patent Pending SWORD package. The SWORD is a low-profile, flexible bolt-on to existing tank batteries that increases the available skim oil for recovery pre-injection. CAPEX-free as a rental unit, the SWORD is designed to meet Class I Division I hazardous electrical areas, corrosive environments, and will operate continuously, regardless of facility activities.

Current Technique for Separation

Currently, Salt Water Disposal Facilities utilize a battery of tanks and a gun barrel to provide oil separation. Gun barrels are sized for maximized retention time based on flow rate, API° of crude oil and water. Oily water comes into tank with oil separating and rising while the heavier water stays below the oil layer. The oil “pad” grows as more oil pops to top increasing enough to get to the skim or weir nozzle. Oil will then skim collecting in the oil skim tanks with water exiting to the clean tanks/injection tanks.

The current separation method utilizing a gun barrel has benefits and inefficiencies.

- Pros
  - Cleaner oil
    - Free oil separates and rises easily
    - Dirtier oil/water/solids stay in solution
  - Cleaner water
    - Less oil flowing downstream
    - Solids drop out to bottom of tank
  - Best of what residence time can provide
    - Time in the tank allows for natural separation
  - Skim capability
    - The more oil that makes its way to the gun barrel has a chance to be skimmed vs other tanks in facility.

- Cons
  - Not capturing all oil
    - Some oil too small to rise or inhibited
  - Atmospheric tanks allow oil to attach to solids
    - Iron and other naturally occurring solids will pop out of solution and attract oil and other solids
  - Residence time is not always a benefit
    - Time for solids to precipitate, grow, and trap oil
    - Solids will be carried with water downstream to “clean tanks” and can cause fouling of critical equipment and injection formation.
SWORD Salt Water Disposal Pilot Tests

The SWORD has been tested at two facilities in West Texas over the last few months with facility characteristics and results of the testing listed below.

West Texas Facility #1

Facility Characteristics
- 5,000 Barrels of Water per Day (BWPD)
  - 100% pipeline water from one operator
- 600 samples taken
  - Inlet to facility (pipeline)
  - Transfer to Gun Barrel
  - 1st clean (injection) tank
  - Injection pump
- 1 week with skid off, 2 weeks with skid on
- KPIs
  - Low, mean, and high concentrations of oil in water at each sample point
  - Lower concentration at clean tank and injection pump AFTER skid on.
  - Increase oil in skim tank and/ or oil pad in Gun Barrel

Results
- Removal Efficiency increased from 53% to 85% after 1 week period of running
  - Removal efficiency will increase as residual oil in downstream tanks becomes more diluted and less oil is passed downstream of the Gun barrel
- Oil level in skim tank increased by 68 barrels in 10 days
  - The facility had not skimmed any oil previously during our tests, so there was no benchmark for oil recovery
- Oil pad in Gun barrel grew by 1.5 ft. over 1 week.
West Texas Facility #2

Facility Characteristics
- 4,000 BWPD
  - 100% water from Trucks
- Sampling Inconclusive
  - Each truck comes from a different site, operator, phase of production, etc.
- 1 week with skid off, 2 weeks with skid on
  - Just finished 2nd week of "On" testing
- KPIs
  - Oil increase only based on skim oil sales for previous 12 months.

Results
- In previous 12 months, facility processed average of 4,600 BWPD
- Average skim oil sales were 380 Barrels/ month
- In last two weeks, facility has processed 2,000 Barrels of water, and sold 570 barrels of oil.