

Slops Treatment



Engineering solutions to eliminate waste



Due to a combination of new legislative imperatives, enhanced ethical awareness and a growing trend towards best practice, the global oil and gas industry is increasingly pursuing more sustainable and efficient methods of handling and treating drilling wastes from onshore and offshore operations.

We have redefined what is possible, providing tailored solutions to fit project-specific requirements, successfully overcoming perceived limitations.

TWMA's specialist solutions provide a range of innovative methods for the efficient collection, transfer, treatment and reduction of drill cuttings, slops, sludges and associated materials onshore, allowing operators to honour both ambitious operational targets and environmental responsibilities.

Working with operators across the globe, our in-house engineering team ensures all equipment and processes comply with the highest HSEQ standards, providing tailored solutions for any location and maintaining optimum production, improving safety and minimising environmental impact.

Understanding and defining “slops”



TWMA slops treatment plants are individually designed to treat slops waste generated by the oil and gas industry, from drilling or production slops to downstream refinery slops.

The term “slops” is widely used in the oil and gas industry.

Frequently asked questions for TWMA include;

- Can TWMA supply a slops plant?
- How much slops can you treat per hour?
- What size is your slops plant?
- How clean will the water be?
- How many people does it take to operate a slops plant?

In reality, there are many variables affecting the answers due to the varying nature of the material's make-up and constituents. These relate to the origin of the slops, and sometimes the variations in the operation generating the slops. Slops emanate from drilling and production facilities, oil refineries, drilling fluid plants, crude oil storage pits, and legacy storage lagoons.

To understand a slops nature to determine treatment, TWMA must first understand some fundamental details about the slops.

To begin with, the constituent materials must be generically categorised according to the main component types:

- Organic material content, types and volume % or weight %
 - > Oil or other organic materials
- Inorganic material content, types and volume % or weight %
 - > Water
 - > Soluble salts
 - > Inert solids
 - > Other inorganic materials content

The types and relationships of these components provide initial guidance to treatment approach.

3 elements

Oil content



- Is the oil a base oil, a hydraulic oil, a fuel oil, a crude oil, a bitumen/tar oil
- Is it part of an oil based emulsion like a drilling fluid, is it mineral, synthetic or an ester based oil

Water content



- Is the water sea water, fresh water, brine waters, bilge water, well bore clean up water
- What chemicals and/or additives are known to have been added or could have contaminated the water

Solids content



- Are the solids likely to contain metal particles like swarf
- Is it tank bottom/bilge sands
- Is it Barite from mud washings
- Is it rock from drill cuttings and how big are those particles likely to be, stones, hard hats, boots, bolts/nuts/washers, tools, grinding discs or welding rods

In simple terms, oil and gas industry slops are waste materials containing 90% or more liquids, and from 1-10% solids. For illustration purposes:

- A material with less than 5% solids and less than 5% oil with no noxious contaminants might be classified as slops and treated to recover these basic constituents through simple mechanical and/or chemical processes
- A material for treatment with 20% oil from oil base drilling fluid contamination and with no noxious contaminants might be classified as waste drilling fluid, or drilling fluid cuttings and not 'slops' and may require thermal or chemical separation
- A material for treatment with 15% solids would require screening and/or thermal or chemical processing to remove solids and would not be classified as slops



Slops treatment plant selection

The main factors affecting the selection of slops treatment plant type and size are the relevant regulations in respect of use or disposal of the recovered/treated components, the quantity and rate of slops to be treated, and the available space for the slops treatment plant to operate. In some cases other factors, such as crew size and requirements and other operations ongoing at the plant site, can influence plant type and size.

- **Regulations** Offshore regulations often allow discharge disposal of recovered water with oil content below 30mg/l; onshore regulations are more varied. Offshore discharge disposal limits are generally not heavily influenced by factors such as soluble salts or suspended solids contents, oxygen demand, or pH, whereas onshore disposal limits usually have stricter and more specifically defined criteria for disposal
- **Volume** The rate at which slops are received and processing is required will influence the plant type/design. Well planned, sufficient storage prior to processing can help decouple plant treatment rates from rates at which slops are produced
- **Available space** Offshore facilities can have little space allocatable to slops storage and/or treatment, land facilities may have more space, but also have more movement of various service providers mobile equipment on and off location

Slops treatment plants



Slops treatment process

The treatment process begins with the transfer of slops to the plant, either directly from the area of generation or from receiving and holding tanks at the treatment plant.

Step 1

- Large particles, foreign objects, and debris are removed by screening baskets or grids, if required
- Fine screen shakers may be employed to remove solids down to >70 microns

Step 2

- Liquids and solids are separated by coagulation and flocculation, if required
- Slops liquids and solids are separated by two-phase or three-phase decanting centrifuges

Step 3

- Separated and recovered slops liquids can be polished clean of fine solids by disk stacked separators and/or filtration devices
- Oil recovered from the plant is acceptable as a low grade fuel, or, if sourced from oil base drilling fluid, may be reused for drilling fluid
- Water recovered from the plant will be suitable for discharge or disposal. Further treatments, if required, can be by membrane systems, or by more complex bio-treatment units to reduce oxygen demand levels

Step 4

- At site, plant or field measurements and analyses of process outputs check products to ensure compliance with project regulations and expectations
- Plant or field measurements and analyses include oil in water, oil on solids, pH, salinity, oxygen demand, and others
- Depending on location and requirements, analyses are carried out at site by plant operators and/or off site by external accredited laboratories

Complete solutions give complete results

TWMA offers something that its competitors simply cannot – with over a decade of experience in waste management, processing and reduction, our knowledge of the field is unrivalled. Drawing on first-hand insight and understanding, we push the limits of engineering and procedural knowledge. Plus our technology is designed and manufactured in-house, so quality is guaranteed.

We adhere to the philosophy that all accidents are preventable, and continually pursue ways to further reduce risk and safeguard all involved in our operations.

Our complete reporting regime and exacting environmental standards have earned the trust of the global oil and gas industry, with TWMA providing consultancy solutions in respect to global and regional environmental issues and regulation.

UK – Head office

T: +44 1224 222520

TWMA Ltd
Aberdeen

Norway

T: +47 5163 0835

TWMA Norge AS
Sandnes

Egypt

T: +202 2358 7084

TWMA Egypt
Cairo

UAE

T: +971 (0)2 495 70 29

TWMA Middle East Ltd
Abu Dhabi

USA

T: +183 2300 4200

TWMA Inc
Houston

sales@twma.co.uk
twma.co.uk



This product is printed on 100% recycled paper
produced from post-consumer waste paper