



CASE STUDY

Produced Water

CUSTOMER: Major Oil and Gas Company **LOCATION:** Gulf of Mexico

Application

Water Solubilized Organics (WSO) removal from produced water on Deepwater Floating Production Facility (FPF)

FLOW RATE: 66m3/hr (10,000bpd)

OBJECTIVE OF THE TREATMENT

Remove WSOs and discharge less than 15 ppm Total Petroleum Hydrocarbons (TPH) to enable overboard discharge within the National Pollutant Discharge Elimination System (NPDES) regulatory limits.

DATA Inlet:	TPH WSO	24 - 65, 35 avg. (ppm) EPA 413.2; 17 - 26, 21 avg. (ppm) Silica Gel
Outlet:	TPH WSO	0 - 30, 9 avg. (ppm) EPA 413.2; 0 – 24, 6 avg. (ppm) Silica Gel
Temperature:	140°F	
Pressure:	Operating Pressure 35 psi	



MYCELX polisher system deployed on board the platform. Red footing covers represent previous carbon bed vessel





Challenge

A major oil company producing 35k bpd and 160 MMCF/D experienced slight overages in discharges averages for compliance under the NPDES monthly discharge averages. The deepwater production region was beginning to show higher water cut and concentration of WSO compounds. Gas Chromatography/Mass Spectrometry (GC/MS) analysis showed a mixture of low molecular weight organic acids (C6-C10) and medium molecular weight naphthenic acids. Traditional treatment equipment was unable to reduce these, causing a water treatment process production bottleneck on the platform resulting in monetary loss. With a limited time frame and space available for equipment testing, concurrent production chemical testing was required in order to find a solution. In order for the platform to see their five year estimated production growth of 100k bpd come to fruition, a robust system was required to handle WSO presence and current and future flow rates.

SOLUTION

MYCELX deployed a temporary demo system at 10k bpd to treat one quarter of the platform flow. The system measured 8' x 4' x 8', weighing 2,200 pounds and consisted of a single train of MYCELX polishers and specially developed WSO media.

Three phases of testing determined the removal efficiency, specific capacity and operating feasibility. This included stationing two engineers at the site for six weeks to perform a data gathering campaign comprised of over 150 data points with backup analysis from EPA certified labs.

MYCELX provided a detailed report of contaminants detected, operating and capital cost of full-scale equipment and footprint required. As a result, the MYCELX polishing system for tertiary treatment was adopted; providing a smaller footprint than the previous carbon bed.

MYCELX systems are designed per ASME, NACE and ABSA requirements on the pressure vessels, instrumentation and skids.



IMPACT

- 73% removal efficiency of WSO demonstrated at one quarter of the full platform flow
- Removed over 20% TPH and 18% of WSO from the full stream by slip streaming 25% of the flow through the treatment process
- Linked high WSOs concentration fluctuations to loss in LDHI injection. This resulted in reformulation of LDHI; removing 40% of WSOs from water phase
- MYCELX polishing system for tertiary treatment was adopted providing a smaller footprint than the previous carbon bed



Inlet (left jar) and Outlet (right jar) of the MYCELX polishing system.

