

CASE STUDY

Cost effective Olefins Wastewater solution meets RCER discharge requirements and eliminates haul off

Customer: SABIC Affiliate

Location: Jubail Industrial City, KSA

Process: Olefins Plant – Waste Water



APPLICATION:

Treatment of Olefins Wastewater from Saturator Blowdown and oily sewers, tower bottoms and upstream process upsets

OBJECTIVES OF THE TREATMENT

- Enable the customer to meet the RCER 2010 discharge requirements for oil and benzene
- Handle Olefins upset conditions treatment by vacuum truck
- Undertake treatment of this water without prior analysis of its characteristics
- Eliminate the large number of vacuum trucks which queued outside the plant

KEY METRICS

Inlet conc. (ppm)	Average	Upset Conditions
Oil & Grease	143	440,000
Benzene	15	22,000

- Target effluent concentrations:
 - Oil and Grease: 120 ppm
 - Benzene: 0.056 ppm

FLOW RATE: 100 m³/hr

CONTACT / REFERENCE: Upon request

MYCELX DELIVERED:

Customer's discharge consistently met RCER standards for 2.7 yrs

440,000m³ of saturator blowdown wastewater treated

53,000m³ of highly contaminated water from upstream upsets treated

75% cost savings vs. haul off

Achieved without any additional capex



CHALLENGE

An olefins petrochemical facility in Saudi Arabia generated a wastewater stream from saturator blowdown operations that were heavily contaminated with oil and benzene. This wastewater stream needed to be treated in order for the customer to comply with RCER 2010 discharge requirements for oil and benzene. Final discharge requirements under RCER 2010 are stringent, requiring effluent concentrations to be no more than 120ppm oil and 0.05ppm benzene. Treatment of this wastewater had to be undertaken by a system that could continuously remove hydrocarbons and benzene in the presence of a wide range of emulsifying chemicals and water soluble organics.

After installation and commissioning of the MYCELX system in February 2013, the customer's requirements expanded to include the treatment of heavily contaminated water which was trucked in from oily sewers, tower bottoms and upstream process upset conditions within the olefins plant. This water needed to be treated in batches, each of which would contain different characteristics that could not be analyzed ahead of time to determine treatment approach. The MYCELX system was robust enough to handle the treatment of these unique and high contaminated water sources without further capital cost to the customer and at a price that remained significantly cheaper than the cost of using a third party to haul off the water for off-site treatment and disposal.

SOLUTION

MYCELX designed, engineered and delivered a multi-stage treatment solution using our patented technologies for an optimized solution.

The primary **MYCELX Advanced Coalescer** system removed bulk oil and recovered high purity slop oil and settled out large solids.

The **MYCELX Polisher system** removed any remaining free oils as well as dispersed oil, emulsified oil and fine solids. The Polisher also extended the life of the final stage of the treatment process – a non-regenerable media bed.

The **MYCELX media depth bed** acted as the tertiary stage, reducing levels of BTEX and soluble oils.

Analysis of effluent water samples for key performance parameters was used to generate regular reports for the client. **Water characterization and engineering expertise** allowed MYCELX to handle any unexpectedly high inlet concentrations as well as the significantly varied composition of water trucked in from oily sewers, tower bottoms and upstream process upset conditions.

MYCELX was able to handle the heavily contaminated water by concentrating the oil and benzene contaminants, reducing waste volumes and **eliminating the need for expensive third party haul-off**. This capability and approach resulted in dramatic cost savings for the plant.

IMPACT

The MYCELX oil and benzene removal system ran continuously to significantly reduce contamination and manage intermittent upset conditions.

- **Continuous Operation for 2.7 years** despite periodic upstream upset and turnaround conditions
- **RCER 2010 requirements met:**
MYCELX's consistent performance enabled the customer to meet RCER discharge requirements despite high and variable contamination
- **Average inlet concentrations:**
 - Oil and Grease: 142.5 ppm
 - Benzene: 14.7 ppm
- **Upset conditions:**
 - Oil & Grease: 439,788 ppm
 - Benzene: 22,030 ppm
- **Large volumes treated without additional capex:**
 - 440,000m³ of saturator blowdown wastewater treated through October 2015
 - 53,000m³ of highly contaminated water treated from vacuum trucks through October 2015
- **Significant opex cost savings:**
 - Up to 75% cost savings vs traditional haul-off disposal
- **Eliminated the need for vacuum trucks**
 - >20,000 expensive vacuum truck journeys