



# Design and build of large in-situ groundwater treatment plant

Oil refinery, Saudi Arabia

**Industry:** Oil and gas  
**Location:** Saudi Arabia  
**Value:** €540k  
**Timeframe:** 9 months

## Challenge

McAuliffe and its Italian remediation partner, Geostream Group, were tasked with delivering a large in-situ groundwater treatment plant for an oil refinery in Saudi Arabia. This was to target significant dissolved phase hydrocarbon contamination and LNAPL in groundwater across the site, using circa 100 recovery/sparge well points.

Before installation could begin, the design team had to overcome various challenges:

- Adapting the ATEX-rated Pump & Treat technology for a desert environment
- Finding a way to supply the vast amount of air flow needed
- Meeting specific electrical requirements of both the refinery and Saudi Arabia

## Solution

We supplied two separate groundwater treatment areas with ATEX-rated equipment, including two custom-designed 20 m<sup>3</sup>/h, stainless steel oil and water separators, plus two 10m crude oil storage tanks.

The equipment has been adapted for the desert environment, including air conditioning, thermal insulation, custom-designed air filters, chimneys and ventilation

The on-site Pump & Treat system uses three 90kW rotary screw compressors to supply air to almost 100 submersible pneumatic pumps. Three extraction systems were installed – one standalone, another combined with an air sparging unit, and a third combined with a skimming unit.

Extracted air and condensation water are treated by activated carbon filtration; while the skimming unit extracts LNAPL using pneumatic active skimmers, and stores the product in a series of IBC tanks.

Working with no neutral electricity supply, we designed and built a control system, with a PLC, CPU and touch-screen, which manages 340 kW of nominal power. It uses software entirely designed by Geostream, in line with the client's safety requirements.

The main panel is linked via fibre optic to a local network of auxiliary panels for control of remote areas, including two ATEX-rated control boards.

## RESULTS

- Full design and build of Pump & Treat system – hardware and software
- Manufactured in GeoStream's Italian factory
- ATEX-rated to meet strict safety regulations
- Air supplied to 100 submersible pneumatic pumps