

Project Profile

Penrice Soda Soil Bioremediation



Client	Penrice Soda
Location	Osborne, South Australia
Duration	N/A
Contract	Excavation, Backfill & Bioremediation of Petroleum Hydrocarbon Impacted Soils
Cost	\$1.5 Million

Project Overview

Soil bioremediation of site contaminated by 500,000 litre oil spill.

Penrice have been occupying their Osborne site for the last 80 years, undertaking a wide range of activities involved in the processing of soda ash and sodium bicarbonate.

McMahon Services was engaged to bioremediate soils within the area of a former above ground storage tank for fuel oil and existing underground storage tanks. The bulk of the contamination resulted from a 500,000 litre fuel oil spill that occurred on the site in the 1970's.

Excavated contaminated material was treated in a series of purpose built biopiles. These biopiles were made up of the following constituents:

The biopile design focussed on a negative forced aeration system. This approach ensures that odours and potentially environmentally sensitive receptors were not negatively impacted. The contaminated soil was utilised with a number of amendments to ensure the prevailing environmental conditions were conducive to optimised metabolic activity. This included adding in green waste to increase porosity for efficient out flow adding in a range of nutrients specially designed for microbial

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growth. The enhanced bioremediation system was then ready for construction.

The construction process included series of leachate and condensate collection lines were installed on top of an on-site welded HDPE liner. These pipes were reticulated to a series of manifolds, then further reticulated to a purpose-built carbon filtered air extraction and filtering system.

The vacuum system comprises a 3,000 litre pressure vessel acting as a moisture trap, a 3,000 litre capacity carbon filter and a purpose built roots vacuum blower. The entire vacuum pump system was installed on a skid-mounted platform for easy maneuverability on-site. The contaminated soil was mixed on a purpose made mixing pad to form the biopile. Once the biopile was constructed to sufficient capacity, a series of water dripper lines were installed and the HDPE cover installed and welded in place, providing an air tight envelope.

The project team successfully managed several challenges, including:

- › Undertaking well point dewatering for excavation of contaminated material
- › Monitoring of dewatering water to ensure only 'clean' water was removed, without effecting the contaminated plume of underground water
- › Working within a fully operational site
- › In-house design and construction of the unique vacuum system
- › Sourcing quality materials in the quantities required

