

The following benefits of our combined biological approach to bioremediation include:

- A technology based upon natural systems.
- Native species may be used.
- Minimal handling and low maintenance.
- Visible improvement to your site.
- Non toxic byproducts-no waste stream
- Mobile and flexible, no structures, no minimum batch size.
- Economical Effective across a wide variety of contaminants and environments.
- Approved through US Navy's NFESC BAA program and entered into DENIX, book 23 (Defense Environmental Network and Information Exchange).

Mycoremediation of Petroleum Hydrocarbons- Project Results

GASCO REFINERY- Portland LNG Site Northwest natural Gas

The GASCO Refinery site is part of the Willamette River Superfund Site in Portland Oregon. It closed it's doors in 1965 after decades of operation producing an array of refined petroleum products. Our project was designed as a one time demonstration of fungal remediation on a variety of specific petroleum contaminants. It involved treatment of a 20 yard volume of soil which was extremely saturated with water and held within a large covered rolloff container measuring 8ft x 30 ft. approximately. The demonstration occurred from late fall through late spring in Portland Ore. The weather was cool to frozen through much of the winter.

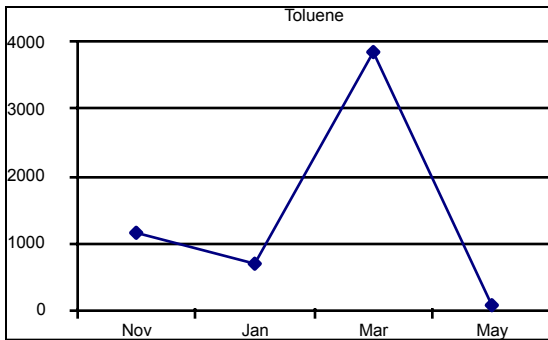
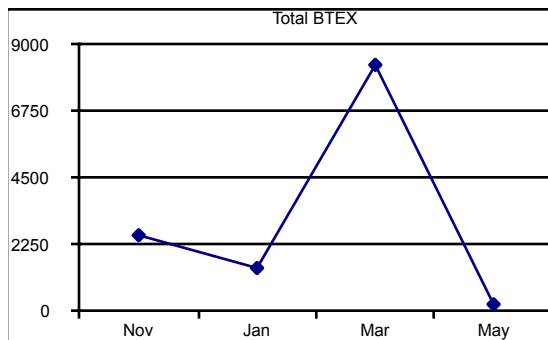
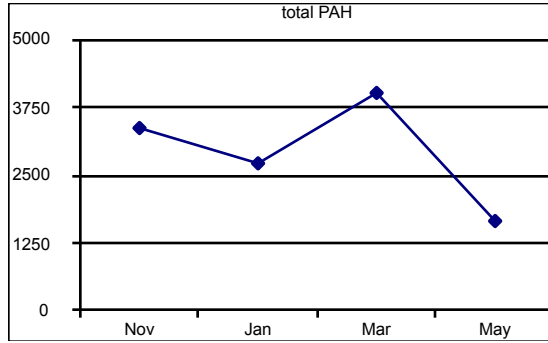
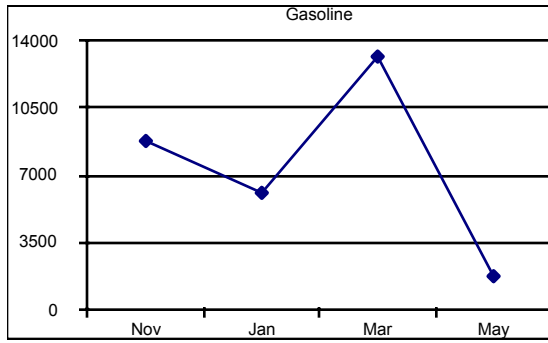
MYCOREMEDIATION OF OIL BYPRODUCTS - FIELD STUDY



Project Setup –
Sediment is contaminated with benzene, toluene, ethylbenzene, and xylene (BTEX), PAHs, phenols, and cyanide



Project at 8 Weeks –
Mycelia are producing fruiting bodies (mushrooms) and at project termination have reduced contaminant concentrations (see table)



GASCO Refinery Results (above)



Chevron Bulk Storage Facility, Ilwaco WA

A bulk Storage Facility operated for many years on property at the Port of Ilwaco supplying fuel to the boat harbor at the mouth of the Columbia River. The facility closed, the tanks were removed and the property was sold to a private entity. The soil at the location is mostly sand and subject to effects of groundwater fluctuations and tidal influence. The fungal strain used in this cleanup was a salt tolerant petroleum degrader.

The project start date was in the beginning of May. In October of the same year when the treatment pile was tested the results were non detects.

Given the optimal growing conditions at this site the breakdown of diesel range hydrocarbons was very rapid and complete.

Ilwaco Starting Values and Results

Starting Date:

5/30/08 SP-1 4870 ppm DX

5/30/08 SP-2 228 ppm DX

Finish Date:

10/23/08 SPE <50 ppm DX

10/23/08 SPW <50 ppm DX

