

## CASE STUDY # 036

# IN-SITU EXTRACTION AND BIOTREATMENT OF SPILLED FUEL OIL AT EARLY WARNING STATION

### **SUBJECT:**

In-situ Bioremediation of Spilled Fuel Oil

**PRODUCT APPLIED:** Submerged, fixed-film bioreactor  
MICROCAT-XR Hydrocarbon-degrading bacteria and nutrients

### **PROCEDURES & OBJECTIVES:**

Corroded subterranean fuel oil transfer lines had resulted in a significant fuel oil loss from a boiler building into subsurface shale strata. Original construction of the radar station had involved excavation and leveling of shale strata (immediately subsurface) on a site sloping steeply to the ocean with backfilling of shale. Backfilled pits had been covered with concrete slabs upon which had been placed the boiler building, fuel oil storage and other utility equipment for the radar station as a whole. Oozing black oil downgrade (toward the ocean) of the installation had indicated the presence of leaking underground oil transfer lines. These lines were replaced. Subsequent work indicated that the backfilled shale pits beneath the concrete slabs contained significant quantities of spilled oil which was periodically pushed out, especially after heavy rainfall quite common in the area. This leakage had caused some embarrassment in this ecologically- sensitive area.

### **PROGRAM:**

A leaching system was developed for spraying and injecting water to force oil out of the shale pit beneath a concrete slab without excavation of the site. Downgrade, the oil-water mixture was captured, treated using submerged, fixed-film biotreatment reactors and reinjected. The reactors were started up and maintained using naturally-occurring, non-indigenous, preselected microbes adapted to the constituents of fuel oil. Proprietary nutrients were added to enhance microbial growth and removal rates. This was accomplished in-situ without major dislocations to the sensitive site ecology.

### **RESULTS:**

Total petroleum hydrocarbons (TPH) concentrations in the system effluent fluctuated initially during the fuel oil extraction process and declined to closure limits as recoverable fuel oils diminished (Figure 1).

### **CONCLUSIONS:**

A significant cost savings over alternate physical disposal and/or chemical destruction methods was realized.



# IN-SITU BIOTREATMENT OF FUEL OIL AT RADAR EARLY WARNING STATION

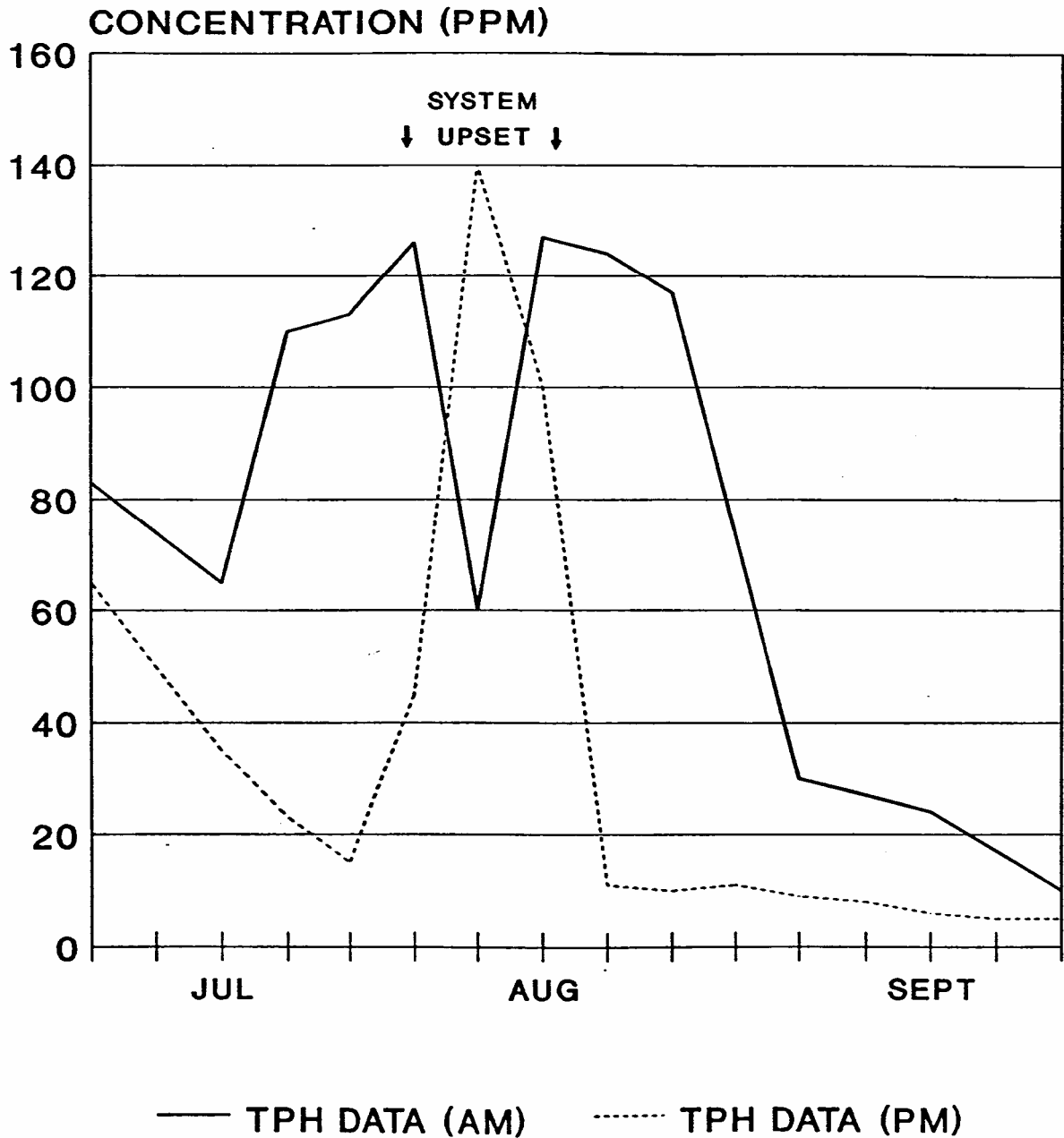


FIGURE 1