



National Cleaner Production Center Foundation

Registered under Section 42 of the Companies Ordinance, 1984

Anaerobic/Aerobic Bioremediation for OMV using CPEM Technology (A Trial Run)

*in
Collaboration
with*

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Anaerobic Bioremediation

National Cleaner Production Center (NCPC) has successfully completed several projects for the treatment of waste sludge and remediation of oil spills. The anaerobic bioremediation method was selected due to cost effectiveness, efficiency and environmentally friendly mode. All these projects were performed with the help of indigenously adopted technology.

NCPC has offered bioremediation services to OMV on trial basis initially. OMV has sent 200 kg samples for Demo activity regarding Anaerobic Bioremediation. Samples were taken from three oilfields i.e.

1. Sawan-5 (50 kg)
2. Ex-waste pit (50 kg)
3. Kandanwari Plant (100 kg)

NCPC has remediated the sample with the help of CPEM technology.

Trail Run

Before trial run, samples were analyzed in the laboratory. The Total Petroleum Hydrocarbons (TPH) values of the samples before treatment were:

	Kandanwari Plant	Sawan-5	Ex-waste pit
TPH (mg/kg)	1675	795	1025

Before treatment, samples were mixed with each other and divided into two portions. Each portion was consisting of 100 kg.

Average TPH Value before Bioremediation

Sample Location	Sample Quantity (kg)	TPH value (mg/kg)	Total sample TPH	Avg. TPH value
Kandanwari Plant	100	1675	167500	1292
Sawan-5	50	795	39750	
Ex-waste pit	50	1025	51250	
Total Sample	200		258500	

Methodology

A pit was excavated for the remediation of OMV samples. The size of the pit was 6' x 3' x 1'. The trial sludge was placed in the pit in polythene sheets. The sludge was treated with the CPEM technology. The temperature was also measured on 3 days interval successfully.

EM INGREDIENTS COMPOSITION

Item	Description	Quantity
CPEM-1	Orange in Color	1.5L
CPEM-2	Red in Color	1.5L
CPEM-3	Brown in Color	1.5L
CPEM-4	Powder Grey	10gm
CPEN-1	Molasses	2.0L
CPEN-2	Bokashi+NPK	8.0Kg

Equal quantities of EM ingredients were added in both the samples. The main steps of the adopted procedure are shown below:

Procedure

- All the ingredients were added one by one to the samples while mixing thoroughly
- Pit was covered with polythene sheet to provide anaerobic environment
- Moisture content was noted to be about 30%.
- 12 L water +2.0 L Molasses was mixed homogenously.
- Then CPEM-1, 2,3 were mixed to make solution.
- Temp were noted after three days interval successively.

Temperature Monitoring

Date	Temp	Temp
14/03/2005	23	25
18/03/2005	18	19
24/03/2005	19	20
28/03/2005	22	24
01/04/2005	22	21
08/04/2005	29	28

Sample Analysis Results

Samples were taken from the heaps of trail 1 and trial II after 4-week intervals. The TPH value of the samples are shown in tables A & B

Table A (April 20, 2005)

Trial II		
TPH Value (mg/kg)	Humidity Content (% age)	Value Reduction (% age)
298	16.87	77

Table B (May 20, 2005)

Trial II		
TPH Value (mg/kg)	Humidity Content (% age)	Value Reduction (% age)
83.4	18.7	93.5

Results and Discussion

TPH Results Before Treatment (average)
 Results after 4 weeks
 Results after 8 weeks
 Note: Depending upon the Temperature

= 1292 mg/kg
 = 398 mg/kg (Reduction 77%)
 = 83 mg/kg (Reduction 94%)

