

## Bioremediation of #2 Fuel Oil



### Massachusetts Residential Property

A release of #2 fuel oil was identified underneath the basement floor of a residential property in Massachusetts. The release came from a leaking above-ground storage tank located next to the foundation. A site investigation found that TPH (total petroleum hydrocarbons) levels were as high as 4,500 ppm in the soil under the basement floor.

Cost estimates to remove the foundation and basement floor, as well as the contaminated soil, ranged from \$150,000 to \$200,000. The owner selected bioremediation as an alternative solution for elimination of the fuel oil contamination. A series of six-inch diameter holes were drilled through the basement floor, and M-1000H, OSNF #1 nutrients, and water were metered into the holes to assure thorough penetration and proper soil saturation. Moisture and nutrient levels were monitored and maintained. After five months, the TPH levels were reduced to less than 500 ppm, except in one small area where hard pan soil lenses prevented proper saturation. The concrete floor was removed in this area, the soil was broken up, and the area was treated with bacteria and nutrients.

The contaminant levels in the problem area immediately started to drop following treatment, and by the end of seven months, that area also showed TPH values well below the target 500 ppm. The next month, confirmation testing was done to show that all areas complied with state clean-up standards. The total cost to remediate the site was less than \$25,000.

### TPH RESULTS OF SOIL CONTAMINATED WITH NO. 2 FUEL OIL

DATE	SAMPLING LOCATIONS					
	S-1	S-2	S-3	S-4	S-5	S-6
06/13/94	4,000	NC	2,600	NC	4,000	13
01/27/95	BBP	BBP	BBP	BBP	BBP	BBP
03/12/95	1,632	2,378	387	717	1,028	ND
04/06/90	1,632	1,270	240	800	249	5.7
07/25/95	349	NC	NC	NC	NC	NC
10/05/95	230	590	NC	NC	470	370

**BBP** = began bioremediation program, **ND** = not detected, **NC** = soil sample not collected

1) All soil samples collected after the bioremediation program began (01/27/95) were tested for total petroleum hydrocarbons (TPH) using EPA method D-3328 (GC-FID). All reported concentrations shown above are in parts per million (ppm).

2) Only one soil sample, collected on 07/25/95 at the S-1 location, was tested for TPH to give a general indication of the bioremediation progress. The sample collected was taken after the soil (from existing grade to two feet below) under the concrete floor was roto-tilled.

3) Soil samples collected on 10/05/95 are the results of the final testing program to determine if the average concentration of the remediated soil is below the Method GW-1/S-1 of 500 ppm for TPH.

*Information courtesy CJH Environmental, Inc., Stoughton, MA*

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