

**NEWCLYN
WOODCLYN**

OIL CONTAMINATION TREATMENT

EXPERIENCE

CONTAMINATION OF HIGHLY CONTAMINATED SOIL

PROJECT | Two pools of highly contaminated soil ~30.000 tones.



PROJECT GOALS

- 1 In the oil refinery area, for many years, as no economically viable way to handle the oil-contaminated soil was accumulated in pools. **2 large pools** were accumulated containing approximately **30 thousand tons** of contaminated soil.
- 2 Oil concentration in the soil $\leq 1\%$

THE SOLUTION

Biodegradation by specially selected microorganisms has been shown as a major method of handling contaminated soil.

Special soil regeneration sites were installed in the plant territory. Soil from the pools was excavated and brought to these sites. Initial soil contamination at the start of treatment was **150 to 200 g/kg**. The treatment sites were limited in size, with the capacity of **10,000 tonnes at a time**. Thus, only after the soil had been cleaned up to the required concentration, additional quantities could be dispensed and started, which resulted in a long project period of **36 months**.

TRIALS WITH VILNIUS UNIVERSITY LIFE SCIENCE CENTRE BIOSCIENCE INSTITUTE

PROJECT | Experimental cleaning of oil products polluted soil.



A Starting TPH concentration C_{10-40}
40.000 mg/kg
 C_{10-28} - 40 %
 C_{28-40} - 60%

B Starting TPH concentration C_{10-40}
102.000 mg/kg
 C_{10-28} - 40 %
 C_{28-40} - 60%

PROJECT GOALS

- 1 Examine NEWCLYN bioproduct with **2 different levels** of contaminated soil.

RESULTS

75 DAYS OF TRIALS

	Concentrations of petroleum products, mg/kg					
	A			B		
	Starting	Final	Reduction	Starting	Final	Reduction
C₁₀₋₁₂	438	55	87%	1 830	402	78%
C₁₂₋₁₆	1 420	289	80%	7 520	2 550	66%
C₁₆₋₃₅	30 500	6 990	77%	82 800	38 000	54%
C₃₅₋₄₀	7 680	1 750	77%	10 300	3 840	63%
C₁₀₋₄₀	40 000	9 080	77%	102 000	44 800	56%

TREATMENT OF CREOSOTE IMPREGNATED WOOD

PROJECT | Decrease the concentrations of PAH (polycyclic aromatic hydrocarbons).



PROJECT GOALS

- 1 To find the way of application microorganisms to **decrease the concentrations of PAH**.

SUMMARY OF THE PROJECT

~100 units (10 tonnes) of old wooden railway sleepers were crushed and treated with microorganism which are using **PAH** as a source of food and **decompose them into H₂O and CO₂**.

TARGET

sum of **PAH16 ≤ 100 mg/kg**

RESULTS

60 DAYS OF TRIALS

PAH	Concentrations µg/kg		%
naphthalene	72 000	6 610	-90,8
acenaphthene	44 900	5 000	-88,9
fluorene	28 100	4 220	-85,0
phenanthrene	96 300	8 080	-91,6
anthracene	27 600	4 020	-85,4
fluoranthene	78 100	16 200	-79,3
pyrene	36 800	11 200	-69,6
benz[a]anthracene	18 800	5 630	-70,1
chrysene	12 600	5 510	-56,3
benzo[b]fluoranthene	4 590	2 530	-44,9
benzo[k]fluoranthene	2 590	1 110	-57,1
benzo[a]pyrene	3 810	2 590	-32,0
dibenz[a,h]anthracene	389	309	-20,6
benzo[g,h,i]perylene	1 180	1 560	32,2
indeno[1,2,3-c,d]pyrene	653	486	-25,6
SUM:	428 412	75 055	-82,5

NEWCLYN FIELD TRIAL IN POLAND

PROJECT | Experimental cleaning of oil products polluted soil.



PROJECT GOALS

- 1 Examine **NEWCLYN** bioproduct with contaminated soil.

SUMMARY OF THE PROJECT

1 tone of contaminated soil with oil products.

TARGET

100 ppm

RESULTS

8 WEEKS OF TRIALS

C12-C35 contents (ppm)		
Data	Control	Test
2019 September 25	710	710
2019 October 11	1000	780
2019 November 18	730	100

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