ASSALA ENERGY

CASE STUDY: LANDFARMING

Assala's approach to restoring nature

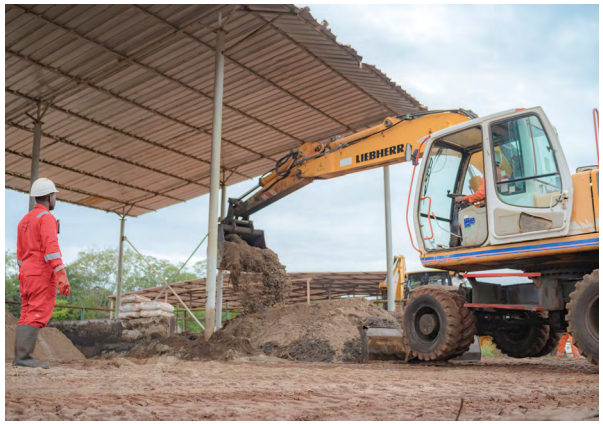
The process

Assala treats legacy sludge, oil residue and black spot areas through ex-situ landfarming, a technique used to treat soils contaminated with hydrocarbons.

The process reduces the hydrocarbon concentration through bioremediation, degrading harmful pollutants into nontoxic or less hazardous substances using enzymes and other microorganisms. The treated soil is also mixed for aeration, stimulating the added nutrients and encouraging hydrocarbon loss to the atmosphere[1].

Soil conditions are controlled to optimise the rate of contaminant degradation.

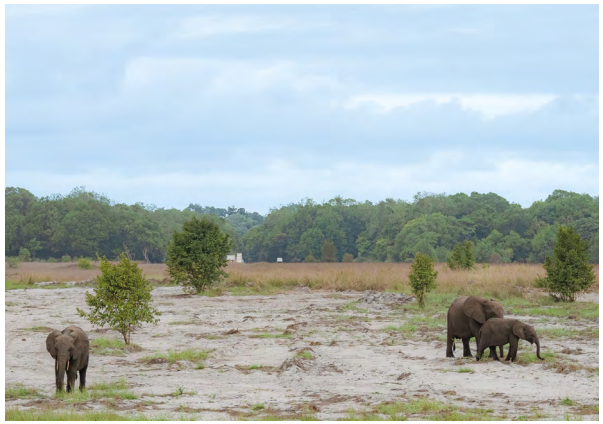
1 Contaminated soil is safely transported to our dedicated landfarming site at Gamba.



2 Nutrients are added and aerated to improve efficiency of treatment process.

3 Treated soil is moved to lined beds to allow continuous monitoring of hydrocarbon degradation and soil quality improvement.

4 Once treated to within internationally compliant levels, soil is used to backfill excavated land and is covered with an ecolayer to encourage regrowth.



5 Assala operates in harmony with nature.

1. https://www.sciencedirect.com/science/article/pii/S0048969717309099

The results

In December 2022, tests conducted by an external contractor demonstrated that Assala's landfarming process has been successful. Between May and December 2022, average hydrocarbon concentration in the soil had decreased from 78,000ppm to 3,000ppm, significantly below the threshold of 5,000ppm agreed with Gabon's Hydrocarbon Ministry's laboratory team (DGEL) at the beginning of the process. In early 2023, DGEL representatives also controlled and validated these results to ensure compliance with the agreed threshold.

Putting landfarming into practice: treating and remediating black spot areas

Since 2019, Assala has been working to remediate legacy black spots as part of a five-year plan.

Black spots are sites of contaminated soil resulting from oil and gas production activities. Created by practices that, today, are unacceptable in our industry, black spots within Assala's assets were inherited and contribute to legacy waste.

Following delays related to COVID-19, we have reached the third phase of our black spot remediation project. At the end of 2022, more than 10,800m³ of inherited contaminated land had been treated through landfarming, with the remaining 9,000m³ due to be remediated on schedule, and by the end of 2023. The next stage will be to backfill the excavated areas with clean, internationally compliant soil and allow nature to retake these areas.

Our journey

2019

Project initiated:
30 legacy black spots mapped

2020

COVID-19 logistical constraints delay project

Contractor identified to commence work in 2021

2021

Analysis conducted by specialist contractor which reduced 30 black spots to 7

2022

10,800m³ of inherited contaminated ground treated

Concentration of hydrocarbons in excavated soil reduced to 3,000ppm

2023

9,000m³ remediated

Areas backfilled with internationally compliant soil, treated through landfarming

Implementing solutions for the future

This technique allows us to eliminate legacy waste from our sites, as well as implement a solution for the future. In the event of a process safety event (PSE) leading to a spill, instead of storing contaminated soil, we can rehabilitate and return it to the environment.

Continuous monitoring of ground water sources is crucial to the efficient identification of newly contaminated areas. In the event of an LOPC or spill, our teams are prepared to respond and, where necessary, remove soil to be treated at our dedicated landfarming site.

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