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CASE STUDY

Soil Remediation & Recycling

Ford Engine Plant, Bridgend

Client

Environmental Consultant

ARCADIS

Remediation & Recycling Contractors

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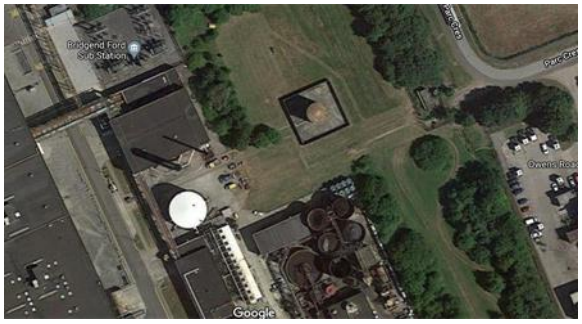
THE HUB™ THE TREATMENT HUB

Site Background & History

The site forms part of the Ford Engine Plant located in Bridgend, South Wales. The engine plant was constructed in the 1960's but was scheduled for closure in September 2020. The plant is now closed and the required decommissioning works are well underway.

A concrete slabbed area on the site had historically housed an above ground fuel storage tank. A considerable volume of fuel had leaked into the surrounding soils from a buried supply line – this pipeline traversed the adjacent grassed area. This area of site is shown in Figure 1 below.

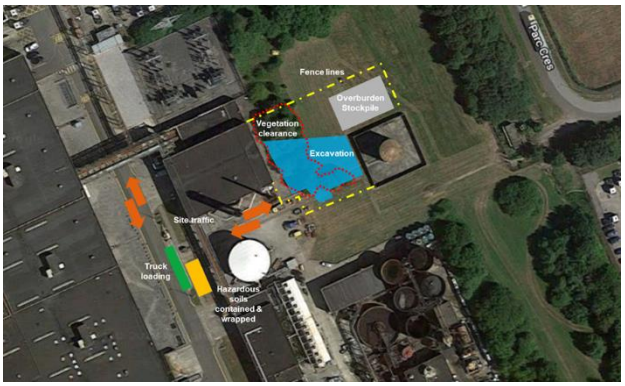
Figure 1 – Affected Area of the Site



Site Investigation

Arcadis carried out site investigation works in this area during 2019. These investigations confirmed the presence of hydrocarbon contamination within the soils at a depth of approximately 1m below ground level [bgl]. Concentrations were assessed against the relevant screening values and the impacted area was delineated to confirm the area requiring remediation. The hydrocarbon impacted area is shown in Figure 2 below.

Figure 2 – Hydrocarbon Impacted Area



Arcadis proposed the following remediation strategy based on the findings of the investigation (these works were approved by Ford):

- Excavation and screening of the upper 1.00m – 1.25m of material (850m^3 of overburden) which would then be set aside on-site
- Excavation of the contaminated soils over the next 0.5m (350m^3) and removal from site for off-site treatment and recycling
- Treatment of open excavation with Oxygen Release Compound [ORC] to degrade residual hydrocarbon contamination
- Import of recycled Type 1 backfill - certified clean (350m^3)
- Installation of a low permeability clay barrier at the boundary with the boilerhouse
- Reinstatement of the excavation with backfill and overburden and re-seeding of the grass

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Arcadis engaged Envirotreat (in conjunction with The Treatment Hub) to carry out the designated remediation works. These works were carried out in 2020 and are summarised below:

Excavation of Overburden

The area required for remediation was set out by Arcadis and appropriately marked up prior to any excavation works.

The upper 1m to 1.25 m of overburden was excavated and stockpiled adjacent to the work area for subsequent reuse following completion of the remediation work. These works are shown in Figures 3 and 4 below.

Figure 3 – Excavation of Overburden

Figure 4 – Stockpiled Overburden Material

Excavation of Hydrocarbon Impacted Soil

Following the excavation of the overburden material, the underlying hydrocarbon impacted soils were excavated and stockpiled on the concrete slab prior to offsite disposal and recycling at The Treatment Hub. Representative samples were collected from the stockpile for laboratory analysis. The results were assessed in accordance with the requirements of WM3 prior to disposal.

The excavation and stockpiling of the hydrocarbon impacted soils is shown in Figures 5 and 6 below.

Figure 5 – Excavation of Hydrocarbon Impacted Soils

Figure 6 – Contaminated Soil Stockpile

Groundwater was confirmed at a depth of approximately 1.2 m bgl. Groundwater entering open excavations was pumped to the Ford effluent treatment plant via a 'Siltbuster' to remove any free product and solids – this ensured full compliance with Ford's discharge consents. The groundwater and the Siltbuster are shown in Figure 7 below.

Figure 7 – Groundwater and Siltbuster

Application of Oxygen Release Compound [ORC]

It was decided to add an oxygen release compound (ORC) to the open excavation – this was to ensure that any residual hydrocarbon contamination would be effectively degraded over time. The ORC additive was designed to gradually dissolve in the groundwater resulting in the slow release of oxygen (enhancing the natural degradation of hydrocarbons).

The excavated area with ORC added is shown in Figure 8 below.

Figure 8 – ORC Application

Disposal of Contaminated Soils

The hydrocarbon impacted soils were loaded onto 8 wheeled wagons for transport to The Treatment Hub for processing and subsequent recycling.

The wagons brought in the recycled Type 1 which was unloaded prior to loading with soil (on a 'back to back' basis) – this provided the optimum programme for the client, minimised the overall carbon footprint of the project and ensured the impacts of site traffic on the local area were mitigated.

The offsite disposal operations are shown in Figures 9 and 10 below.

Figure 9 – Off Site Disposal

Figure 10 – Off Site Disposal

Reinstatement with Recycled Type 1

The excavated areas were reinstated to existing levels with recycled Type 1 material. An excavator was used to cast the Type 1 - it was then tracked in by the excavator to the required level.

Figure 11 – Reinstatement with Type 1

Reinstatement of Overburden

The overburden material was reinstated once the Type 1 fill had been suitably tracked in. The reinstated area was reseeded with standard grass seed upon completion of the works.

Figure 12 – Reinstatement of Overburden

Validation

All excavations were validated by Arcadis prior to reinstatement.

Conclusions

Envirotreat successfully completed the designated remediation works at the Ford Bridgend Site in full accordance with the Arcadis scope of works and the stringent Health and Safety requirements of Ford.

The excavated soils were fully recycled following processing at The Treatment Hub in Swansea in accordance with the Welsh Government's Towards Zero Waste Strategy.