

Client



Stagecoach

Environmental Consultant



deltasimons
Environment - Health & Safety - Sustainability

Remediation & Recycling Contractors



THE HUB™
THE TREATMENT HUB

Site Background & History

Stagecoach Porth Bus Depot comprises of a large industrial building used for bus maintenance with areas of hardstanding in the north and south. Afon Rhondda Fach is located adjacent to the western boundary of the depot and a bridge crosses the river in the south of the site. Afon Rhondda Fach is a major tributary to the River Rhondda which is located approximately 400 metres south of the site.

An accidental release of heating oil occurred in the west of the site immediately adjacent to the bank of the Afon Rhondda Fach in early 2019. The spillage incident was attributed to the overflowing of two internal heating oil / kerosene above ground bulk storage tanks (ASTs), situated in a single-storey part of the building adjacent to the Afon Rhondda Fach riverbank. The heating oil overtopped the ASTs and flowed onto the building's flat roof. The heating oil subsequently migrated down the vertical rainwater pipes and impacted the shallow soils at the base of the rainwater pipe outlet and then migrated through the shallow soils / surface drainage into the Afon Rhondda Fach.

The area impacted by the oil spillage is shown in Figure 1 below.

Figure 1 – Heating Oil Impacted Area



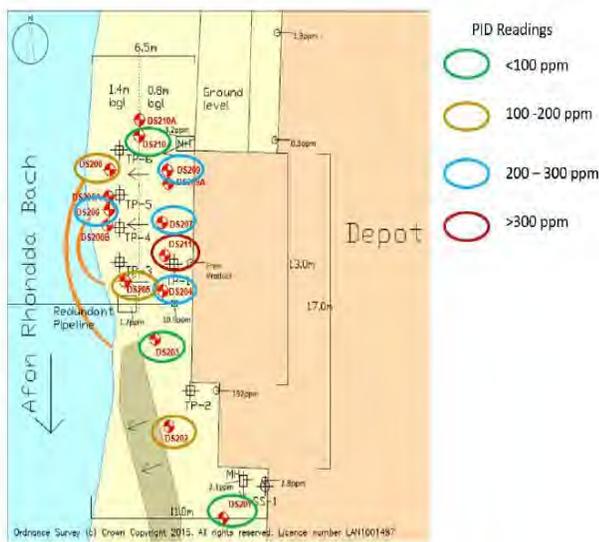
A local oil spill response contractor was engaged immediately following the incident to carry out the requisite triage and to protect the adjacent river from any ongoing contamination impact. A series of trial pits were also excavated to provide an understanding and extent of the impacted area and any impacts to the River.

The findings from the investigation support the theory that heating oil appears to have migrated down the surface water downpipes to impact the soils within the river bank. Heating oil has likely further migrated through the porous soils and potentially along a concrete slab structure in a rapid pathway to impact the river. The only discreet preferential pathway observed was the clay pipe outlet, present in the river bank, though the majority of kerosene entering the river was observed to emanate from the soils over a length of approximately 6 to 8 metres.

Site Investigation

Delta Simons subsequently carried out a more detailed investigation of the area through the installation of 10 no boreholes and 15 no hand dug trial pits. The locations of the exploratory boreholes are as shown in Figure 2 below.

Figure 2 – BH/TP Locations



Free phase product was identified in three of the boreholes and TPH concentrations were identified at concentrations between 5,000 and 11,000 mg/kg immediately adjacent to the AST storage building.

Based on the findings of the investigation, Delta Simons proposed the following remediation strategy:

- Removal of LNAPL from groundwater within the source area
- Removal of grossly impacted soils for off-site disposal
- Backfill excavated area with clean materials

Delta Simons agreed a soil remediation target concentration of 5,000 mg/kg with Natural Resources Wales [NRW] based on the following:

'Several soil samples have recorded TPH concentrations above saturation limits. Whilst it is possible to calculate theoretical soil saturation limits, in reality, due to co-solubility effects, these are not an appropriate indicator of the presence of LNAPL. In order to assess the presence of LNAPL, for petroleum hydrocarbons, an assessment criterion of 5,000 mg/kg has been applied based on professional experience.'

Site Remediation Works

Following the tender period, Envirotreat was awarded the contract for the remediation works. Envirotreat produced a Remediation Strategy & Method Statement summarising the site history and contamination issues, the approved remediation strategy & technical rationale, the necessary environmental protection measures required during the remediation works and the agreed validation protocols for the excavation and disposal element of the works.

The on-site remediation works comprised of the following:

- Removal of debris and general rubbish from the impacted area for offsite disposal
- Excavation of a number of slit trenches to facilitate the removal of any free phase product (LNAPL) encountered – it was anticipated that any significant volume of LNAPL would be pumped / skimmed to IBCs for appropriate offsite disposal
- Excavation of grossly impacted soils from the areas around DS205, DS206, DS207, DS209 and DS211 and transfer to roll on roll off skip for disposal / recycling at The Treatment Hub
- Reinstatement of excavated area with clean materials in accordance with the Specification for Highways Work Series 600 Earthworks Table 6/1.

Removal of Debris from the Work Area

The debris and general rubbish present within the work area as shown in Figure 3 below was removed and placed into a skip for subsequent disposal at a licensed waste facility.

Figure 3 – Debris / General Rubbish



Removal of LNAPL

Three slit trenches were excavated immediately adjacent to the AST building to enable the removal of any free phase product (LNAPL) present on the surface of the perched groundwater. Excavation of the trenches revealed only a very thin layer of product on the water surface. This is shown in Figure 4 below.

Figure 4 – Thin Layer of Free Product



A number of oil specific absorbent pads were used to absorb the LNAPL from the surface of the water as shown in Figure 5 below. These were later removed and bagged for disposal at a suitably licensed facility.

Figure 5 – Oil Absorbent Pads for LNAPL Removal

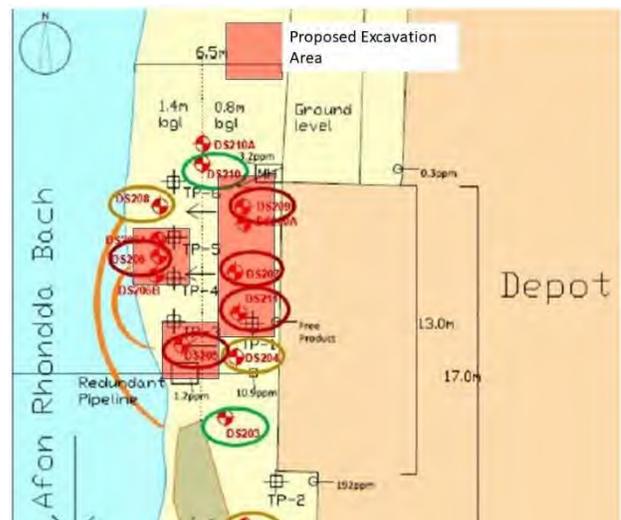


This element was validated once no visible free phase product was observed to be entering the open excavations.

Excavation of Grossly Impacted Soils

The grossly impacted soils were excavated as per the schematic plan shown in Figure 6 below.

Figure 6 – Location of Grossly Impacted Soils



The soils were excavated and placed into a skip for transport to The Treatment Hub for subsequent processing and recycling. The excavated soils are shown in Figure 7 below.

Figure 7 – Excavated Soils Prior to Disposal



The soils were excavated to the top of the underlying bedrock (circa 1.5 m) and validated by the collection of soil samples at regular intervals from each exposed side of the excavated area. The samples were analysed for TPH-CWG to confirm compliance with the agreed remediation criteria.

The fully excavated area is shown in Figure 8 below (the red flags are sample locations)

Figure 8 – Fully Excavated Area



Reinstatement with Clean Materials

Following successful validation of the excavation, the area was backfilled with clean materials.

The backfill material was placed into the excavated area in layers and tracked in using the excavator to the required level.

This is shown in Figures 9 and 10 below.

Figure 9 – Backfilling of the Excavation

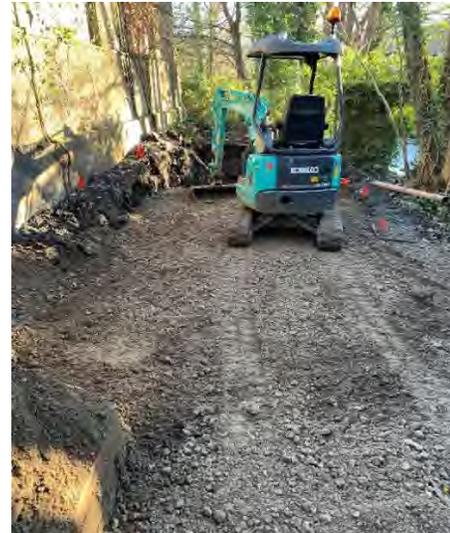


Figure 10 – Fully Reinstated Area



Validation

The works were undertaken in accordance with the approved Remediation Strategy and Method Statement.

The results have clearly demonstrated compliance with the agreed remediation target criteria.

Conclusions

Enviro-treat successfully demonstrated through a comprehensive Validation Report that the overall remediation strategy had been successfully implemented.

The prime drivers for the remediation works were the protection of human health and controlled waters, i.e. the adjacent Afon Rhondda Fach.

The works were carried out in the agreed timescales with the full support of Delta Simons who attended site throughout.

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