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Delivering land you can develop

# CASE STUDY

## Supplementary SI, In-Situ E-Clay Stabilisation & Watching Brief

**Former Car Showroom Site, Bromsgrove**

**Client**

bdht

**Developer**

HARPER
Est. 1898
*Build with Confidence*

**Demolition Contractor (our client)**

DES

**Remediation Contractor**

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### Site Background & History

The site comprised an irregular parcel of land approximately 40 m x 45 m and is located approximately 0.5 miles north from the centre of Bromsgrove.

Historically, the site had seen use as a petrol filling station and latterly as a Vauxhall vehicle sales dealership which had two main buildings located in the southern portion of the site. The main showroom building occupied the south eastern corner with maintenance and servicing building located in the south western corner of the site.

Residential properties form the southern and western boundaries with All Saints Road and Birmingham Road forming the northern and eastern boundaries.

Following demolition of the buildings the site is to be redeveloped for the construction of 19 one bedroomed apartments with associated parking and landscaped areas for Bromsgrove District Housing Trust.

Figure 1 – Operational Site

### Initial Site Investigation

Initial Phase 1 and Phase 2 Site Investigations carried out by ASL confirmed the presence of underground storage tanks (USTs) and significant petroleum hydrocarbon contamination in both soil and groundwater on the site. The locations of the USTs are shown in figure 2 below

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Figure 2 – UST Locations

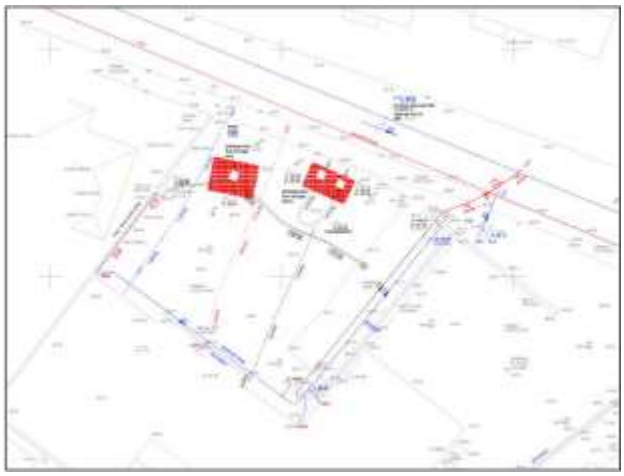

Figure 3 – ETL Trial Pit Locations

ASL concluded from their initial investigations that there were risks to both human health and controlled waters which could be addressed through a robust remediation strategy. Feedback from the regulatory bodies (Worcester Regulatory Services – WRS) requested a supplementary site investigation to be carried out post demolition to fully characterise the site and determine the potential contamination sources present on the site, which would allow the discharge of the relevant planning conditions for the development.

Figure 4 – ETL Trial Pit

**Supplementary Site Investigation**

Demolition Environmental Services (DES) Limited engaged Envirotreat to undertake a required supplementary site investigation. This was undertaken prior to demolition works being undertaken within the existing building structures. The works comprised the excavation of 5 trial pits, collection of soil samples and revision of the contaminated land risk assessment. The locations of the trial pits are shown in figure 3 below

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A total of nine soils samples were collected and submitted for relevant analysis. The findings confirmed previous investigations i.e. significant hydrocarbon contamination (ETL TP5) in addition visible asbestos containing materials (ACMs) were observed during the excavation of ETL TP4, asbestos fibres were also confirmed in the analysis of this sample.

Figure 5 – Visible Asbestos (ETL TP4)

A general site walkover was also undertaken, and all the finding entered into a Factual Report.

Envirotreat submitted a revised contaminated land risk assessment and Remediation Strategy to WRS for subsequent approval.

**Remediation Strategy**

- DES employed Envirotreat to deliver the following remediation strategy.
- Watching Brief throughout archaeological investigations and post remediation enabling works.
- Delineation and confirmation of asbestos removal.
- Delineation and verification of UST emptying and removal.
- In-situ E-Clay stabilisation of circa 450 m3 of hydrocarbon contaminated soils.
- Validation and Verification Report.

**Site Remediation Works:**

Watching Brief During Archaeological Investigations

Envirotreat provided a watching brief during the required archaeological investigations to ensure the technicians did not encounter any unexpected contamination, e.g. asbestos or free phase hydrocarbons. No contamination was encountered during this archaeological investigation.

Figure 6 – Archaeological Investigations

Verification of Asbestos Removal

ACMs identified and confirmed within ETL TP4 (during the supplementary site investigation) works were removed by DES during the demolition and disposed of at a suitably licensed facility.

Envirotreat delineated the area around ETL TP4 to confirm the absence of visible ACMs and collected verification samples to confirm the absence of asbestos fibres within this area.

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Figure 7 – Delineation around ETL TP4

Verification of UST Removal

The USTs were emptied, and the contents taken off site for disposal. Once empty, the tanks were carefully exposed to allow safe and efficient removal. Envirotreat collected soil samples from below and around the tank area for analysis to determine the extent of any lateral or vertical migration of hydrocarbon contamination. The results confirmed that contaminated soils were confined to the tank area only.

Figure 8 – Exposed USTs

In-Situ E-Clay Stabilisation

The delineated treatment area was gridded, and each section treated in-situ with the E-Clay slurry, purpose designed to target the hydrocarbon contamination and ensure complete immobilisation of mobile contaminants.

Each grid section was treated in turn, the process was repeated for each grid section with representative samples collected from each section for Validation and Verification purposes.

Figure 9 – In-Situ E-Clay Stabilisation

Figure 10 – In-Situ E-Clay Stabilisation

## Validation

Validation and verification samples were collected from each completed treated section and submitted to an accredited laboratory for leaching as per the EA approved BS 12457-2 methodology and hydrocarbon analysis of the leachates. The results of the analysis confirm that the concentrations of hydrocarbons were below the target criteria agreed in the Remediation Strategy.

## Conclusions

Envirotreat has successfully demonstrated through a comprehensive Validation Report that the remediation objectives for the site have been achieved. The watching brief and remediation works had been successfully implemented in accordance with the agreed Remediation Strategy.

Figure 11 – Ongoing Development