

Former Industrial Site, Glasgow

Client



Environmental Consultants



Site Overview

The site is situated in Rutherglen, Glasgow and occupies an area of approximately 50m by 50m. Historically the site has been used for various industrial purposes.

The site is bounded to the south and west by residential properties and to the north and east by industrial units. A culverted burn is located directly adjacent to the western boundary of the site.

The site prior to remediation is shown in Figure 1 below.

Figure 1 - Site Prior to Remediation



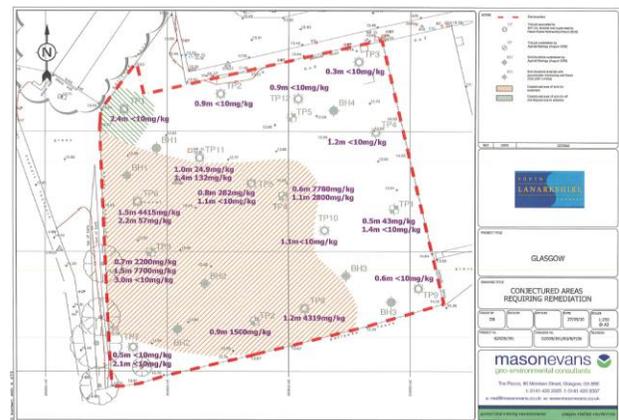
The site geology comprised of made ground ranging from 0.9m to 2.9mbgl overlying clays

and silt between 2.9 to 3.2m bgl overlying silt down to a depth of 4.3mbgl. Bedrock was identified to be present beneath the silt.

Groundwater was identified in the made ground layer and was perceived to be either perched or migrating from the site in the direction of the culverted burn.

The site investigations identified the presence of hydrocarbon and metal contamination within the made ground and the clayey / silty natural deposits – the prime contamination source was located in the western area of the site. The conjectured area of contamination as determined by Mason Evans Partnership [MEP] is shown in Figure 2 below. The prime contaminants of concern were identified as total petroleum hydrocarbons [TPH].

Figure 2 – Plan Showing Conjectured Area of Contamination



Remediation Objectives

The proposed remediation strategy was developed by MEP and approved by South Lanarkshire Council [SLC]. The proposed strategy provided the necessary protection for human health and for the water environment.

Human health protection would be provided by the provision of buildings and hard-standing /

car parking areas across the site which would act as an effective pathway break.

The identified water environment receptors comprised of the underlying groundwater and offsite receptors – the burn to the west of the site was considered to be a receptor on the assumption that the culvert may not effectively isolate the burn from the risk of pollution. The water environment would be protected by the remediation of the contaminated soils and associated groundwaters by E-Clay Stabilisation – the objective was to reduce leachabilities of the prime contaminants of concern to acceptable levels.

Remediation target criteria [RTC] were developed for the site – leachate target values of 500ug/L for TPH were considered to be acceptable taking into account the identified presence of residual contamination around the site boundaries. Treatability trials were undertaken to confirm compliance with the RTC.

Methodology

Envirotreat produced a Site-Specific Working Plan [SSWP] for SEPA approval prior to undertaking the proposed remediation works – the SSWP included conditions for reuse on-site following successful validation. SEPA approved the SSWP enabling the remediation works to commence – the remediation process was regulated by SEPA under the auspices of Envirotreat's Mobile Plant Licence authorised by SEPA.

The remediation works were undertaken by Envirotreat. The initial treatment volume was estimated to be 2,000m³.

The contaminated area previously identified by MEP (as shown in Figure 1 above) was excavated, the sides and bases of all

excavations were validated by MEP to confirm that all contaminated soils had been fully excavated in accordance with the remediation criteria.

All excavated soils were stockpiled pending remediation by *ex-situ* E-Clay Stabilisation. Considerable volumes of contaminated groundwater were encountered during the excavation works – the groundwater was collected and utilised in the treatment process (as a source of water for the on-site E-Clay production process).

The *ex-situ* treatment process involved the mixing of contaminated soil with required volumes of E-Clay in slurry form and cementitious additives in dry form. The soils were processed in 10m³ batches in a mixing bin as shown in Figure 3 below.

Figure 3 – Mixing Contaminated Soils with Treatment Reagents



The treated soils were stockpiled and allowed to fully cure. Validation samples were submitted to accredited laboratories for leachate analysis to confirm compliance with the designated RTC. All TPH leachate results were <10ug/l demonstrating full compliance with the 500ug/l target value.

The treated material was reused on-site in accordance with SEPA's "Land Remediation

and Waste Management Guidelines”, Section 4 “On-Site Treatment and Subsequent Use”.

It was agreed that the suitability of the treated material for reuse on site would be confirmed by compliance with risk based derived leachate target values.

The treated materials were seen as a necessary part of the works - the material would replace the potential requirement to import virgin fill (to return the site to pre-remediation formation levels).

The material was identified as having a specific purpose with any deficit of material resulting in the necessity to import fill.

The remediation works were completed within the agreed timeframe of six weeks.

Conclusions

The results were acceptable to MEP / SEPA / SLC and demonstrated that the remediation strategy had been successfully implemented. The prime driver for the remedial works was the protection of the water environment (groundwaters and the adjacent burn) from the potential risk of contamination. The remediation works also enabled the site to be developed by the discharge of relevant planning conditions.