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SUB SURFACE CONSULTANTS
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS

Your ref: 16/00396/FUL

Our ref: DJ/6461F

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20th December 2018

Planning and Development
Rochdale Borough Council
Number One Riverside
Smith Street
Rochdale OL16 1XU

Dear Sirs,

RE: PROPOSALS FOR GROUNDWATER INVESTIGATION AT FORMER HARE HILL MILL, LITTLEBOROUGH.

We assume you have received copies of the following reports:

- Ground Investigation Report 6461 dated 6th February 2018
- Ground Investigation Addendum Report 6461A dated 17th April 2018
- Verification Report 6461B dated 5th December 2018
- Ground Investigation Report 6461C dated 23rd November 2018
- Gas Update Report 6461D dated 5th December 2018

We are undertaking site investigation work on behalf of Wiggett Construction Limited at the Former Hare Hill Site in Littleborough, Rochdale. In our initial investigation we have identified an elevated toluene concentration in the groundwater in the eastern extent of the site. The elevated concentration was found in BH7 the location of which is indicated on the attached Figure 1 and the suspected source is either spillage of toluene in the workshop previously occupying that part of the site or migrations of leaked toluene from a buried tank formerly located some 34m to the west of BH7 (as indicated on Figure 1). No elevated toluene was noted in the soil or groundwater in the previous borehole 6461_M5 taken out adjacent to the south east of the former tank. We understand from our Client's Engineer that on removal of the tank a substantial amount of material was excavated from the surrounding area and disposed of off site which may have remediated any soil source. We have undertaken sampling of the excavation faces and bases (as detailed in our Report No. 6461B) and no elevated hydrocarbons were found.

In order to assess the significance of the elevated toluene concentration in BH7 we intend to carry out the following further investigation and would welcome your comments on the proposals.

Directors: C.A. MARSDEN, B.Sc (Hons.) C. Eng., M.I.C.E. D.E. MARSDEN (Secretary)

We intend to take out a further five boreholes in the locations indicated on the attached Figure 1 in order to determine whether there is a source of toluene within the made ground derived from spillage outside of the former tank area. We will have an Engineer on site who will carry out PID headspace analyses on samples taken at 0.50m, 1.0m and then at intervals of 1.0m down to groundwater depths. In order to check if there is a significant soil source of toluene or other petroleum hydrocarbons we intend to undertake the following suite of analyses on the soil samples obtained from the boreholes:

- TPHCWG
- BTEX

The results of the PID readings will be used to target the soil testing. We will also undertake soil organic matter content analyses and take samples from cohesive strata to allow determination of the hydraulic conductivity if a Controlled Waters DQRA is ultimately required. In-situ tests can be carried out in the borehole standpipes at a later date to obtain hydraulic conductivity parameters for granular strata if required. In addition it is proposed to take out three hand dug pits in an area of ground formerly found to be contaminated with heavy carbon band hydrocarbons in the area of 6416C_TP14 and 6416C_TP15 in order to confirm that the contamination in this area was removed by the site strip.

Groundwater monitoring standpipes will be installed in all of the new boreholes. The boreholes have been positioned to determine whether a significant plume is present in the area of BH7 with BH105 intended to be a control and provide background hydrocarbon concentrations for the site. During the previous investigation no elevated hydrocarbons were found in the standpipes other than BH7. We intend to monitor and sample all available standpipes including 6461C_BH5, 6461C_BH6 and 6461C_BH7 from the previous investigation (6461C_BH2, 6461C_BH3 and 6461C_BH4 did not have installations and the 6461 mini boreholes and 6461C_BH1 are no longer intact). The wide spread of standpipes will allow for accurate determination of the groundwater gradient. After the results are in from the first monitoring and sampling visit we will re-assess the need to monitor and sample all standpipes. For the first two monitoring visits we will take samples for TPHCWG and BTEX analyses. If significant concentrations are found (when compared with WFD EQS and UK DWS) then on the third visit we will take samples for the following analyses:

- TPHCWG
- BTEX
- Iron (total and dissolved)
- Nitrate
- Sulphate
- Redox potential
- Conductivity

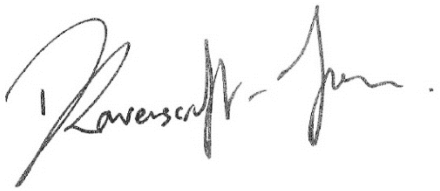
We also intend to monitor the standpipes for methane and to take PID readings. No free phase hydrocarbon product has been noted during previous monitoring visits, however if free product is noted or suspected then we will sample the free product and water separately. The BH7 standpipe was resampled for TPHCWG and BTEX analyses on Tuesday 11th December and we are awaiting the results.

On completion of the three months of monitoring, if the elevated toluene contamination is persistent a Controlled Waters DQRA will be carried out using the Environment Agency's Remedial Targets Methodology.

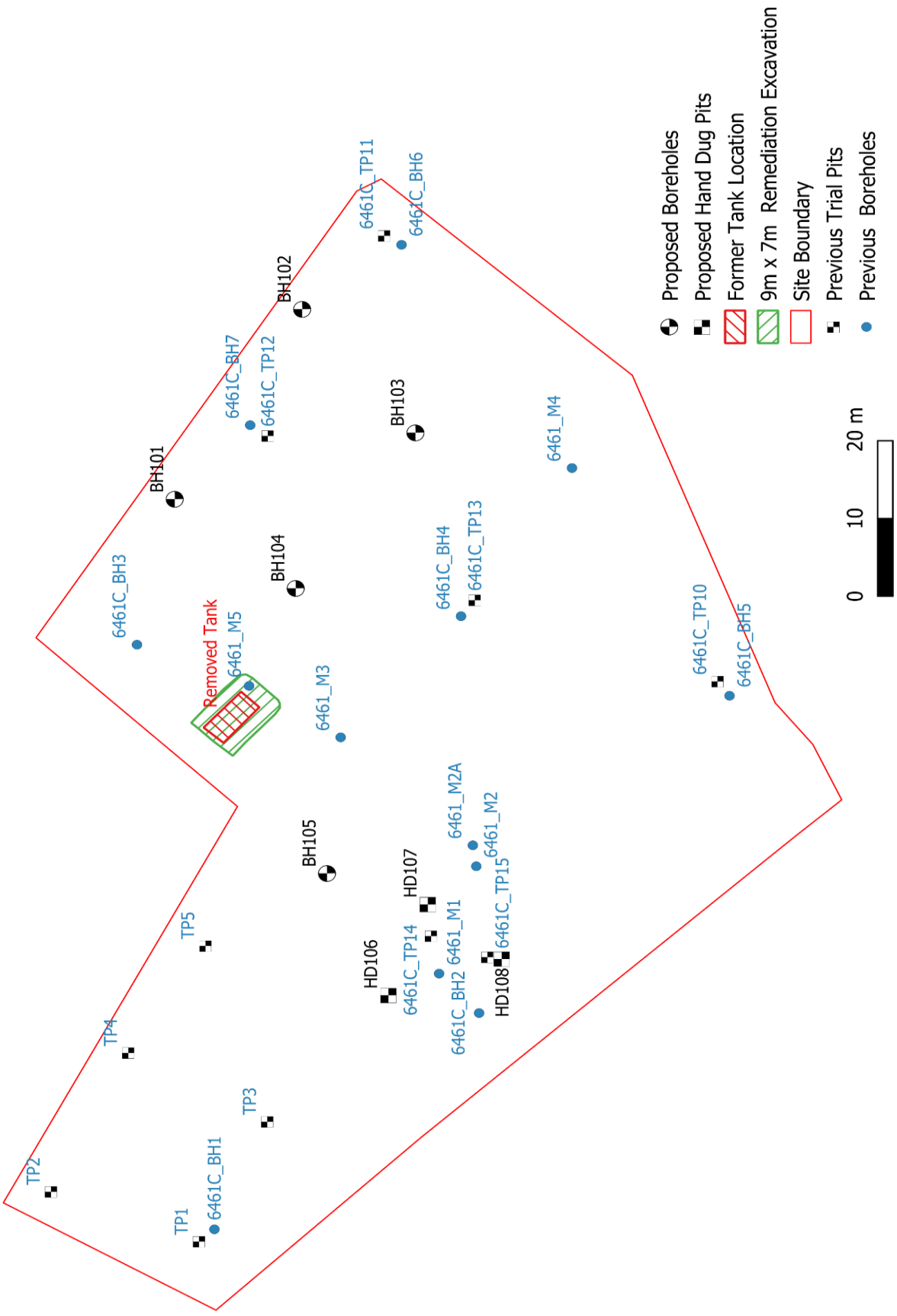
Our Client is keen to progress with the development and is proposing to commence with construction of Plots 1 to 7 in the north west of the site (indicated on Figure 2) while the groundwater investigation is being undertaken. In our opinion the proposed buildings will not significantly alter the groundwater regime on the site and as can be seen from Figure 2, the construction of Plots 1 to 7 will not interfere with the proposed or existing monitoring standpipes. Please can you confirm as a matter of urgency whether you would be happy for our Client to proceed on this basis as they are wishing to progress the development.

If you have any queries or require further assistance please do not hesitate to contact the undersigned or Miss Anna Marsden at our Preston office.

Yours faithfully,



David Ravenscroft-Jones BSc (Hons), MSc, Cert Nat Sci (Open), CEnv, MIEnvSc, MSEE,
Senior Geoenvironmental Engineer
For and on behalf of
Sub Surface Consultants Limited



SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907		Proposed and Previous Exploratory Hole Locations		
Site FORMER HARE HILL MILL, LITTLEBOROUGH, GREATER MANCHESTER	Date Drawn 20/12/2018	Date Checked	Orientation N	Job No. 6461F
Client WIGGETT CONSTURCTION LIMITED	Drawn By DJ	Checked By	Scale	Figure No. 1



SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Development With Proposed Exploratory Hole Overlay			
Site FORMER HARE HILL MILL, LITTLEBOROUGH, GREATER MANCHESTER	Date Drawn 20-Dec-18	Date Checked	Orientation N	Job No. 6461F
Client WIGGETT CONSTURCTION LIMITED	Drawn By DJ	Checked By	Scale –	Figure No. 2