Contaminated Land
Air Quality
Environmental Audit

SMITH GRANT Environmental Consultancy LLP

Partnership No: OC 300776

Heyford Park

Dorchester Living: Phase 10 East

Remediation Earthworks Completion Report

For Urban Regen Ltd. & Dorchester Living

May 2023

Report Ref: R1742-R24-v2

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1. Introduction

1.1. Dorchester Living (DL) has submitted an application for Reserved Matters Approval (ref: 22/02255/REM) for redevelopment of an area of land referred to as Phase 10 within the former RAF/USAF Upper Heyford Airbase off Camp Road. It is understood that the application, which falls under the overarching Planning Permission for the wider site (ref: 18/00825/HYBRID), is currently under consultation by Cherwell District Council (CDC). DL intend to redevelop the site to 148 residential dwellings with associated infrastructure and areas of landscaping and public open space (POS).

1.2. Urban Regen Ltd. (URL) was instructed by DL to carry out demolition, remediation and preparatory earthworks across Phase 10 to allow construction works to commence. URL duly instructed Smith Grant LLP (SGP) to carry out the verification works and produce the earthworks completion reporting.

1.3. Planning Permission 18/00825/HYBRID contains the following Conditions relating to contaminated land:

32	*No operational development hereby approved shall commence in a phase of development until a remediation strategy to address the risks associated with contamination of that phase has been submitted to, and approved in writing by, the Local Planning Authority. This strategy shall include the following components:*
i.	*A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site [Condition (1) relates to the "application for approval of all the reserved matters" which has been undertaken for Phase 10 as discussed in Section 1.1];*
ii.	*The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken;*
iii.	*A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.* *Any changes to these components require the express written consent from the Local Planning Authority. The scheme shall be implemented as approved.* *Reason: This former RAF base is located over the White Limestone (Great Oolite) that is classified as a Principal Aquifer. Due to the potential for disturbance of historic contamination to impact on groundwater quality, this Principal Aquifer needs to be protected during development of this site.*
33.	*Prior to any operational development within a phase or sub-phase being occupied a verification report demonstrating the completion of works set out in the approved remediation strategy approved under Condition 32 and the effectiveness of the remediation shall be submitted to, and approved in writing, by the local planning authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met.*

	Reason: This site is located over a Principal Aquifer (Great Oolite White Limestone) and there is the potential for contamination to be present in the soils from previous use of this site as an RAF Air Base. Demolition and construction might result in disturbance of petroleum hydrocarbons that could impact on the groundwater quality of the Principal Aquifer.

1.4. An initial site investigation report was produced by Hydrock for Phase 10 and other development areas within the wider site in February 2017 (ref. HPW-HYD-MS-ZZ-RP-G-0001). This was supplemented by further site investigation works carried out within Phase 10 by Jomas Engineering Environmental (JEE) as reported in their Geo-Environmental & Geotechnical Assessment (Ground Investigation) Report (ref: P4280J2513/SC; 18th August 2022).

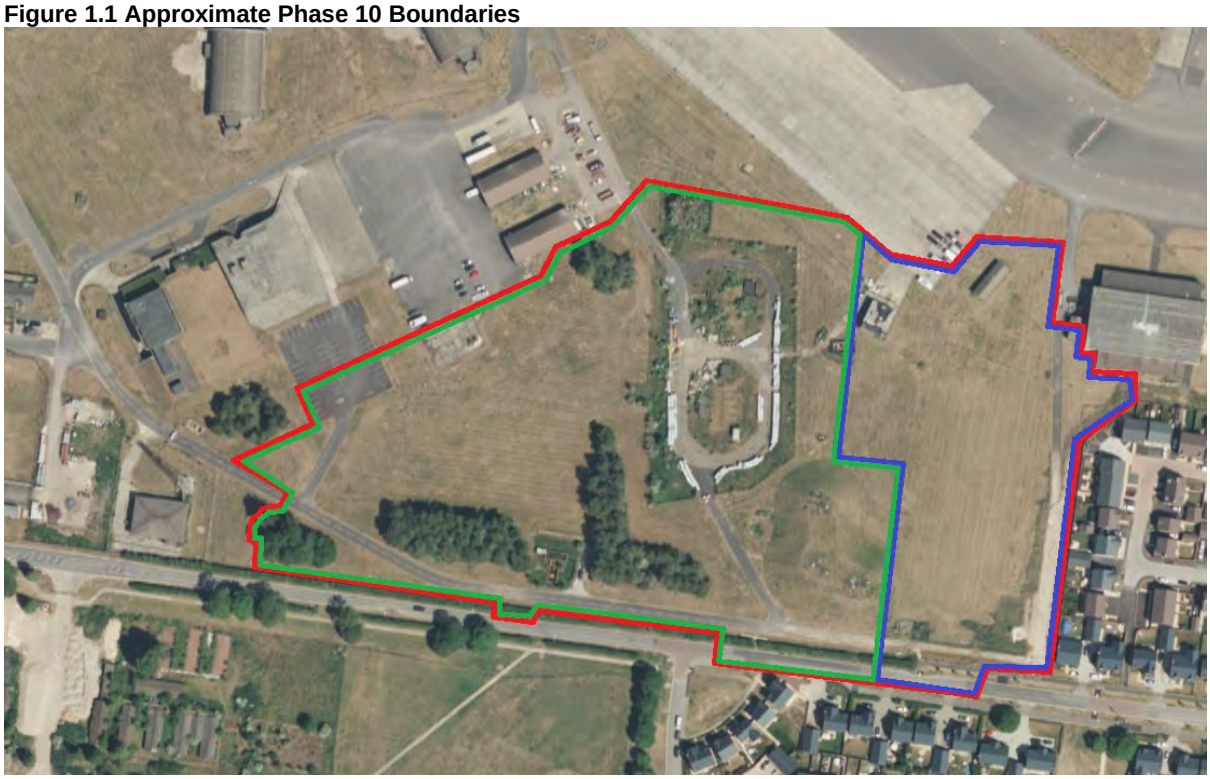
1.5. A Remediation Statement which covers Phase 10 was prepared by Hydrock (ref. HPW-HYD-PX-REM-RP-GE-P1-S2, April 2017), however it was decided that a revised Strategy was required to align the remedial and verification works to the SGP Remediation Strategy which was produced to cover the neighbouring NSA area (R1742-R01-v1; May 2014) under Planning Consent 10/1642/OUT for consistency and to take into account the supplementary investigation works completed by JEE in 2022. SGP therefore produced a revised Remediation Strategy for Phase 10 (ref: R1742d-R04-v1; September 2022).

1.6. It is understood that the supplementary JEE Ground Investigation Report and the revised SGP Remediation Strategy for Phase 10 were both submitted to CDC under discharge of condition application 22/03017/DISC. Following a review of these reports, CDC confirmed approval of both documents and recommended partial discharge of Condition 32 ('partial' as it relates to Phase 10 of the development only).

1.7. The preparatory earthworks in the eastern section of Phase 10 have now been completed and this verification report is intended to assist in the discharge of Condition 33 for this part of the site, although some aspects can only be completed by the developers. This is to allow early handover of this sub-phase for construction works to commence whilst remediation earthworks continue within the wider Phase 10 development area (see drawing D01 and Figure 1.1 for development boundaries). Separate Remediation Earthworks Completion Reports for the remainder of the Phase 10 area not covered by this report will be produced in due course (current proposals are for two further phased reports covering the western end of the site and then the remaining central area).

1.8. A development layout has been provided by DL (ref. 0521-PH10-102) which shows that Phase 10 is to comprise a variety of detached, semi-detached and terraced housing with private gardens, areas of POS, and associated infrastructure. Several attenuation ponds are also indicated on the site and a children's play area is proposed in the centre-southeast.

Figure 1.1 Approximate Phase 10 Boundaries



Red – Phase 10 Site Boundary
Blue – Area covered by this report (ref. R1742-R24)
Green – Wider Phase 10 Development Area (Remediation Earthworks Ongoing)

1.9. SGP has inspected the URL preparatory earthworks carried out in the eastern part of Phase 10, collected samples of the recovered topsoil and the formation soils, and undertaken a vapour intrusion risk assessment via the installation of vapour monitoring probes. This report describes the works carried out, drawing conclusions and making recommendations concerning the further works required by DL in order to fully discharge Planning Condition 33 for this part of the site.

2. Remediation Strategy

2.1. Site Characterisation *(Entire site – not restricted to Phase 10 East)*

Development History

2.1.1. The Phase 10 area was occupied by agricultural farmland during the time of the earliest available mapping (1875-1880) until 1916-1918 when the Upper Heyford airbase was constructed which was used by the Royal Flying Corps (later merging with the Royal Naval Air Service in 1918 to become the Royal Air Force (RAF)). The United States Air Force (USAF) then took over the site in 1950 until its eventual closure in 1994.

2.1.2. There is limited historical mapping covering the site due to national security reasons therefore some uncertainties remain regarding its development; however, OS mapping from 1974-75 shows the presence of tanks in the south referred to as above ground storage tanks (ASTs) by JEE in their site investigation reporting. Mapping from 2002 shows the presence of raised mounds on the site associated with the Petroleum Oil Lubricant (POL) system – a network of tanks and pipes which transported aviation fuel around the wider airbase – although it is considered that these features were present from a much earlier date but were omitted from OS mapping for security reasons. The mounds are referred to as 'POL2' comprising a collection of 12 tanks in the centre / centre-north of the site and 'POL21' consisting of a cluster of 3 tanks in the centre-southeast (these are both located outside of the Phase 10 East area).

2.1.3. The POL pipeline entered the site from the south before forming a "T-junction" in the southwest in the location of the ASTs described by JEE, although Vertase who carried out the POL decommissioning works referred to this feature as a 'Valve-Pit' (both terms are used throughout this report for clarity). From the "T-junction", one line extends westwards exiting the western site boundary with the other traversing eastwards to POL2 and POL21 before continuing off-site to the north and northeast. The site underwent little change after its closure with both the POL tanks and pipeline remaining onsite, although these were decommissioned by Vertase as described in the SGP Remediation Strategy.

Intrusive Investigation Works

2.1.4. The only significant indicator of contamination reported during the initial intrusive site investigation carried out by Hydrock was a "slight hydrocarbon odour and sheen observed within groundwater ingress" into trial pit TP109 in the far west of the site. During the 2022 JEE investigation more frequent contamination indicators were encountered as follows:

- JBH4 (southwest, near ASTs / Valve-Pit) – Black staining with hydrocarbon odour reported in cohesive deposits of weathered bedrock at 1.2-2.0m bgl;

- JTP10 (southwest, near ASTs / Valve-Pit) – Black staining with hydrocarbon odour reported in granular deposits of weathered bedrock at 1.5-1.7m bgl;
- JSTP1 (centre-northwest) – Black staining with slight hydrocarbon odour reported within the made ground at 1.4-1.5m bgl;
- JSTP2 (southwest, near ASTs / Valve-Pit) – Black staining with no odours within made ground at 0.9-1.1m bgl.

2.1.5. A log of a BGS trial pit historically excavated in the northeast corner of the site (TP7) was also reviewed which indicated the potential presence of an asbestos pipe at 0.8m bgl.

2.1.6. Made ground soils have been identified across the site which generally consisted of natural reworked soils with inclusions of brick and occasional asphalt fragments. No inclusions of ash, clinker or slag were reported and the descriptions of the made ground were typical to that within the wider Heyford Development site.

2.1.7. Soil testing has indicated the presence of low-level PAHs within the shallow made ground above residential screening criteria at locations across the site (Hydrock entry TP128 and JEE entries JWS1, JBH2, JBH3 and JTP8). No discussion was made on the probable source of the PAHs but it is most likely to be attributed to the minor inclusions of asphalt which were recorded within some of the investigation entries.

2.1.8. Minor exceedances of the aromatic C16-C21 and C21-C35 hydrocarbon fractions were recorded in 2 locations: JBH3 (0.25m bgl), located in the centre-northwest of the site, and JBH4 (1.5m bgl) located in the southwest near the ASTs / Valve-Pit. No obvious source of the contamination was identified, however JEE concluded this was most likely attributable to the presence of asphalt fragments.

2.1.9. The detection of asbestos was limited to a single incidence of loose fibres of chrysotile and amosite within the made ground in entry JTP8 (0.5m bgl) located in the far west of the site, however quantification analysis confirmed only trace levels with a fibre mass below detection limits (<0.001%).

2.1.10. In all instances concentrations of heavy metals, VOCs and PCBs were below their respective generic assessment criteria (GAC) with VOCs and PCBs all reported below analytical detection limits.

2.1.11. A large number of entries were made in the vicinity of the POL tanks and pipeline with no impacted soils encountered; however, it was acknowledged that 1) due to the extent of the mounds overlying the tanks impacted soils could be present directly around these, and 2) locally impacted soils around the decommissioned fuel lines could still exist.

Groundwater Monitoring

2.1.12. Hydrock carried out a single round of groundwater monitoring on the six boreholes they installed across the site. Minor exceedances were detected for the heavy metals copper, manganese, nickel and zinc and elevated hydrocarbons were recorded in five of the six wells. One entry (BH12) also recorded the presence of VOCs, however these all consisted of individual hydrocarbon compounds which were present at low concentrations.

2.1.13. During the JEE supplementary investigation works, two rounds of monitoring were carried out on the eleven newly installed boreholes as well as on the six existing Hydrock wells. Consistent with the Hydrock results, minor exceedances for heavy metals were reported (copper, lead and nickel) with exceedances for total cyanide also reported in four of the entries. Further assessment undertaken by JEE however concluded there was no risk from either the heavy metal or cyanide groundwater concentrations.

2.1.14. Elevated hydrocarbons above WHO drinking water guideline values were also recorded in three of the boreholes sampled by JEE, whereas VOCs were reported below detection limits in all instances. The exceedances were generally minor with JEE concluding that these were highly localised and that there was no evidence of offsite migration. This was consistent with Hydrock's assessment which concluded that the groundwater contamination recorded on Phase 10 does not represent a significant risk of pollution to the groundwater beneath the site, although it was also recommended that existing fuel stores (tanks / pipelines) and impacted soils should be removed.

Ground Gas

2.1.15. No significant sources of hazardous ground gas have been identified on the site or surrounding area with no significant depths of made ground soils encountered during the investigations.

2.1.16. A total of six ground gas monitoring rounds were carried out by Hydrock and JEE during which marginally elevated methane (max. 1.7%) and carbon dioxide (max. 9.3%) concentrations were recorded; however, given that there were no significantly elevated flows JEE concluded that the site should be classified as CIRIA Characteristic Situation 1 (no gas protection measures required).

2.1.17. JEE also carried out screening of the well headspaces with a PID to detect the presence of VOCs which recorded some elevated readings above 50ppm at locations across the site (max. 565ppm). JEE also compared the groundwater hydrocarbon concentrations to SoBRA GAC_{gwvap} to assess the risk from vapour generation / migration into future dwellings from this source with one exceedance reported for Aliphatic C10-C12 hydrocarbons (JBH6). JEE concluded that a localised vapour intrusion risk could be present in the vicinity of JBH6 possibly necessitating the installation of protection measures, however the assessment

largely focussed on vapour risks from groundwater concentrations and did not take into account the elevated PID readings recorded within the boreholes.

2.2. Expected Contamination

2.2.1. Identified known or potential contamination sources determined from the historical uses of the site and the site investigations were determined to be:

- Decommissioned fuel tanks and pipework associated with POL2 and POL21 where there is the potential for residual hydrocarbon impacted soils associated with historic leaks and spills;
- Decommissioned POL pipeline which crosses the site from west to north-east where there is potential for residual hydrocarbon impacted soils associated with historic leaks and spills;
- ASTs / Valve-Pit located in the southwest where elevated TPHCWG hydrocarbons / indicators of hydrocarbon contamination have been reported within nearby soils (JBH4, JSTP2 & JTP10);
- Other areas where indicators of hydrocarbon contamination have been reported in the soils in the centre-northwest (JSTP1) and far west (TP109) of the site;
- Possible asbestos pipe in the northeast (BGS TP7);
- Occasional PAH exceedances (site-wide) and trace asbestos fibre (west - JTP8) within the made ground soils;
- Potential vapour migration risk from areas of former fuel storage / transmission where leaks / spills may have occurred (general) and from localised impacted groundwater (centre-east - JBH6).

2.2.2. Natural background contamination may be present in the bedrock and soils. The site lies within, or adjacent to, the "ironstone domain" as described in DEFRA Technical Guidance Sheet TGS01 "Arsenic", July 2012, and within 1km of mapped outcrops of ironstones within the Jurassic sedimentary rocks. Within the ironstone domain, the normal background concentration (NBC) of arsenic is reported to be 220 mg/kg; the NBC is defined as the upper 95% confidence limit of the 95th percentile of topsoil concentrations. This value substantially exceeds the criteria for garden soils (Remediation Strategy, Table 3.3).

2.3. Remediation Objectives and Approach

2.3.1. The key contamination remediation objectives are to:

- create a significant betterment of the groundwater environment thereby protecting groundwater quality at and beyond the site boundary;
- remove / remediate significant pollution sources such as hydrocarbon hotspots, if present, that pose a risk to man and the environment, to the extent feasible;

- break significant or potentially significant future pollutant linkages resulting from the change of land use, in particular related to shallow garden soils and human exposure;
- respond appropriately to contingencies, in particularly the discovery of previously undisclosed contamination;
- remove development constraints and prepare the site physically to enable residential development with associated infrastructure;
- manage all emissions to air and water to protect surface waters, groundwater and the atmosphere during the remediation works;
- provide appropriate additional protection measures, where necessary, to be implemented during construction – including building gas barriers, water mains protection, and garden / open space soil quality and thickness.

2.3.2. Dedicated inspections by an Environmental Consultant were recommended in the areas where visual / olfactory fuel contamination indicators were reported (TP109, JBH4, JTP10, JSTP1 and JSTP2) with samples of the potentially impacted materials to be collected for an appropriate suite of analysis, if encountered. Full time attendance was also recommended during the break-out and removal of the base of the POL tanks and the AST / Valve-Pit due to the potential for fuel contamination in these areas. The pipeline will be subject to removal, although full time attendance by a consultant is not considered necessary unless contamination indicators are encountered (in which case verification sampling would be required as described below following the removal of any impacted material).

2.3.3. Where identified, it was specified that hydrocarbon contaminated soils would be chased out up to either site boundaries, retained buildings, services or intact bedrock as determined through use of a PID and visual inspection. Impacted soils would then be removed to a secure stockpile on an impermeable membrane liner or suitable impermeable paved surface pending treatment or offsite removal. It was then recommended that the sidewalls and bases of the excavations should be sampled to verify that the contamination has been removed to acceptable concentrations or to the extents feasible (there was no requirement to sample intact bedrock). Verification sampling of the POL tank excavation extents was determined to be required whether hydrocarbon contamination indicators were encountered or not.

2.3.4. A dedicated inspection by an Environmental Consultant was also recommended within the area of the suspected asbestos containing material (ACM) pipeline (BGS TP7) with samples of the underlying soils collected for an appropriate analysis suite (i.e., asbestos identification) following removal of the pipeline. Soils with asbestos fibre at quantifiable amounts (>0.001%) would be excluded from use in soil cover systems and placed at depths over 1m below ground level, subject to suitability. This provision did not apply to hazardous levels of unbonded asbestos (>0.1%) which would require offsite disposal.

2.3.5. General inspections of the ground conditions by operatives and supervisors were recommended during site turnover and construction excavations and removal of the POL pipeline. Attendance by an Environmental Consultant was only considered necessary if contamination indicators were encountered and, if confirmed, such areas would be treated as a contamination hotspot requiring full time Consultant attendance.

2.3.6. The general requirements for garden and landscaped soils taken from the Remediation Strategy are as follows:

- provision of 600mm clean soil cover within garden areas / 300mm in soft landscaping where the underlying soils contain one or more concentrations of substances in excess of contamination targets set out in Table 3.3 of the Strategy;
- site won materials to be used as garden / landscaping soils must be suitable for use, validated, and comply with contamination targets set out in the Remediation Strategy at a rate of 1 sample per 500m^3;
- imported soils used for cover purposes to comply with contamination targets set out in the approved Remediation Strategy at a rate of 1 sample per 250m^3 with a minimum of 3 samples per source;
- in areas where natural uncontaminated soils are present following the site re-grade, clean topsoil may be required as a growing medium but there will be no requirement for a full 600mm of placed soil cover.

2.3.7. It is confirmed that Phase 10 may be generally classed as “Green” under the NHBC classification scheme with no special measures required to address risks posed by ground gas. However, due to the recognised potential for hydrocarbon contamination on the site relating to the POL tanks and pipeline, a post-remediation vapour monitoring programme was recommended to assess the intrusion risk of volatile hydrocarbons into future built development / inhalation by site users. Dependant on the findings of the assessment, precautionary VOC protection measures may be required in dwellings.

2.4. Phase-specific Strategy (Phase 10 East)

2.4.1. It was concluded that the Phase 10 East area posed a localised risk of contamination associated with an area of made ground containing slightly elevated PAHs (JWS1, 0.1m), likely the result of the recorded presence of asphalt within the entry, as well as potential asbestos fibre contamination associated with the suspected ACM pipeline identified in the northeast of the site (BGS TP7). Additionally, a potential hydrocarbon vapour risk was identified in the vicinity of borehole JBH6 due to the presence of elevated C10-C12 aliphatic hydrocarbons in the groundwater exceeding SoBRA GAC_{gwvap} criteria. It was also recognised that there was potential around the area of the decommissioned pipeline for localised impacted soils associated with historical leaks, although no evidence has been reported to date to confirm this.

2.4.2. The site-wide strategy of ensuring clean cover soils to 600mm depth (subject to formation testing) is considered to be an appropriate approach. No requirement for the remediation of hydrocarbon impacted soils was identified following removal of the decommissioned POL pipeline as well as the absence of any hydrocarbon hotspots on this sub-phase of the development. A post-remediation vapour assessment programme was, however, recommended given the potential for hydrocarbon contamination within the wider site and to further assess the potential risk identified by JEE around entry JBH6.

3. Description of Works

3.1. General Approach

3.1.1. Preparatory works within the Phase 10 East site included:

- asbestos survey and strip of onsite buildings and structures;
- demolition of all above ground structures;
- soft strip and vegetation clearance;
- segregation of waste materials for recovery / disposal (i.e. metal and timber);
- recovery of topsoil.

3.1.2. Remediation earthworks within the Phase 10 East site included:

- Grubbing out of relict ground floor slabs, foundations and roadways;
- Removal of decommissioned POL pipeline;
- Removal of relict ACM pipeline;
- Dedicated inspection / sampling of soils underlying the ACM pipeline identified in the northeast.

3.1.3. The main remediation and site preparatory works within the Phase 10 East part of the site was carried out in October 2022 with removal of the ACM pipeline carried out by a specialist contractor on 18.01.2023.

3.1.4. The existing buildings were demolished following an asbestos survey and removal was carried out by a specialist sub-contractor (Elite) prior to the main earthworks mobilisation. Copies of the asbestos survey reports and removal of ACM certificates are retained by URL and are available on request.

3.1.5. Relict structures including basal slabs, foundations and redundant infrastructure were excavated and recoverable materials such as concrete, brick and masonry were segregated into a stockpile within the wider site for processing at later date. Ultimately this will be crushed to produce aggregate for use by the developer as construction platforms / sub-base under building footprints and roads. Scrap metal and any timbers were sent off-site for recycling.

3.1.6. At the time of completion of the Phase 10 East earthworks, approximately 5,151m^3 of topsoil had been recovered from the wider Phase 10 site which had been placed into three separate stockpiles (‘TS-SP1’ to ‘TS-SP3’). Shallow natural deposits of sandy silty clay with frequent gravel / cobbles of limestone and/or weathered limestone bedrock within a clayey soil matrix were present within the top 400mm of soils following removal of buildings, slabs, topsoil and made ground in the Phase 10 East area. Formation testing has been undertaken across the eastern part of the site as per the Remediation Strategy to establish the suitability of the shallow soils for retention within garden areas.

3.1.7. It was acknowledged that localised areas of impacted soils could be present along the pipeline and that the remediation contractor should remain vigilant during its removal and notify SGP of any contamination indicators, if encountered. The pipework has now been removed from the Phase 10 East area and URL has confirmed that no contamination indicators were encountered.

3.2 Validation of Formation Level Strata

3.2.1 It is a requirement under the Remediation Strategy that a 600mm cover of clean soils is to be placed over made ground in garden areas; however, due to the requirement to trim development areas below existing ground levels, made ground was absent due to the shallowness of the natural strata. This meant that a 400mm depth of natural soil could form part of the full 600mm of garden soil cover after placement of 200mm of garden topsoil.

3.2.2 In-situ sampling of the formation level strata was carried out by sampling the upper 400mm at a test frequency of 1 sample per 500m^3, the residual 400mm depth equating to 1 sample per 1,250m^2 plan area of development. Fourteen in-situ samples were collected from the exposed formation level with depth validation photos showing the 0-400mm soil profile. Samples were analysed for a suite of contaminants as specified with the Remediation Strategy. Discussion of the results is included in Section 4.5.

3.3 Post-remediation Vapour Monitoring

3.3.1 Following completion of the Phase 10 East remediation earthworks, SGP undertook a vapour monitoring programme which involved the installation of vapour monitoring probes / passive diffusion tubes which, after a period of 3 weeks, were collected and submitted for laboratory analysis. Upon receipt of the laboratory results a vapour intrusion risk assessment was then undertaken. Details are provided in Section 5.

3.4 Site Waste Management

3.4.1 Waste materials removed from the Phase 10 East area included timber, scrap metal and ACM. Wood and metal were carefully segregated and sent off-site to be recycled and ACMs were stripped from the buildings prior to demolition by an appropriately qualified sub-contractor and disposed of at an appropriate waste accepting facility. URL maintain copies of all waste transfer documentation which can be provided on request.

3.5 Constraints and Limitations

3.5.1 No significant constraints or limitations were encountered during the Phase 10 East remediation earthworks.

3.6 Unforeseen Contamination

3.6.1 No areas of unforeseen contamination were encountered during the Phase 10 East remediation earthworks.

4. Inspections and Testing

4.1. SGP attended site on 2 occasions during the main remediation earthworks in the east of Phase 10 with a visit carried out following completion of these works. SGP then returned to site on four separate occasions to install vapour monitoring probes / diffusion tubes across the Phase 10 East area, collect the diffusion tubes after a 3-week installation period, collect topsoil samples recovered from the wider site (TS-SP3), and to collect soil samples from along the base of the removed ACM pipeline. The dates and activities carried out in Phase 10 East during SGP attendance are cross-referenced in the table below to the site inspection photographic record (Appendix A), formation soils photographic record (Appendix B), and the attached laboratory analysis certificates (Appendix C).

Table 4.1 SGP Inspection Summary

Date	Description of Site Works	SGP Activities	Record
18.10.22	Vegetation / topsoil strip (northwest corner)	Site walkover / topsoil sampling (TS-SP1 & TS-SP2)	Appendix A – Photos 1-6 Appendix C – 22-40689
25.10.22	Breakout / removal of relict POL pipeline	Site walkover / formation sampling	Appendix A - Photos 7-14 Appendix B - Photos 1-14 Appendix C – 22-41389
09.11.22	None –works complete	Site walkover / additional topsoil sampling (TS-SP2)	Appendix A - Photos 14-17 Appendix C – 22-43692
17.11.22	None	Installation of vapour monitoring probes / diffusion tubes	Appendix A – Photo 18
01.12.22	None	Topsoil sampling (TS-SP3)	Appendix A – Photo 19 Appendix C – 22-46599
08.12.22	None	Collection of vapour diffusion tubes	Appendix C – Q09891R
19.01.22	Removal of ACM pipeline (undertaken the previous day with the excavation left open to allow soil sampling)	Collection of samples of retained soils below removed ACM pipeline	Appendix A – Photos 20-22 Appendix C – 23-01971

4.3 Phase 10 Topsoil (TS-SP1 & TS-SP2)

4.3.1 During the initial topsoil strip, approximately 4,456m^3 of topsoil was recovered from across Phase 10 which was placed into two stockpiles (referred to as TS-SP1 (2,950m^3) and TS-SP2 (1,506m^3)). SGP attended site on 18.10.22 and initially collected 6 samples of the topsoil stockpiled within the wider site to the northwest (TS-SP1) and 4 samples of the topsoil stockpiled offsite to the north (TS-SP2), satisfying the prescribed sampling frequency of 1 per 500m^3 for site-won topsoil. Due to a single minor exceedance for dibenzo(ah)anthracene in stockpile 'TS-SP2', a further 5 samples were collected from this material for PAH analysis only. Full copies of the results are provided in Appendix C (ref. 22-40689 & 22-43692) and are summarised below with comparison to the residential soils criteria as outlined in Table 3.3 of the Remediation Strategy.

Table 4.2 Summary of Ph10 Topsoil (TS-SP1 & TS-SP2)

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Garden Cover System Screening criteria (mg/kg unless stated)	Exceedances
SOM (%)	10	4.8-7.5	-	-
pH (units)	10	7.7-7.8	-	-
asbestos fibre (%)	10	NAD	<0.001%	None
arsenic	10	7.6-13	37 (S4UL)	None
cadmium	10	0.12-0.73	11 (S4UL)	None
chromium	10	11-21	910 (S4UL)	None
chromium IV	10	<0.5	6 (S4UL)	None
copper	10	6.3-9.3	2400 (S4UL)	None
lead	10	12-65	200 (C4SL)	None
mercury	10	<0.05	1.2 (S4UL)	None
nickel	10	8.2-14	180 (S4UL)	None
vanadium	10	21-37	410 (S4UL)	None
zinc	10	31-86	3700 (S4UL)	None
naphthalene	15	<0.1	2.3 (S4UL)	None
acenaphthylene	15	<0.1	170 (S4UL)	None
acenaphthene	15	<0.1	210 (S4UL)	None
fluorene	15	<0.1	170 (S4UL)	None
phenanthrene	15	<0.1-0.85	95(S4UL)	None
anthracene	15	<0.1-0.24	280 (S4UL)	None
fluoranthene	15	<0.1-2.3	2400 (S4UL)	None
pyrene	15	<0.1-2.3	620 (S4UL)	None
benzo(a)anthracene	15	<0.1-0.81	7.2 (S4UL)	None
chrysene	15	<0.1-1.1	15 (S4UL)	None
benzo(b)fluoranthene	15	<0.1-1.7	2.6 (S4UL)	None
benzo(k)fluoranthene	15	<0.1-0.77	77 (S4UL)	None
benzo(a)pyrene	15	<0.1-1.4	2.2 (S4UL)	None
indeno(123cd)pyrene	15	<0.1-0.87	27 (S4UL)	None
dibenzo(ah)anthracene	15	<0.1-0.41	0.24(S4UL)	**1): TS2-S2**
benzo(ghi)perylene	15	<0.1-1.0	320 (S4UL)	None
aliphatic C5-C6	10	<1	42 (S4UL)	None
aliphatic C6-C8	10	<1	100 (S4UL)	None
aliphatic C8-C10	10	<1	27 (S4UL)	None
aliphatic C10-C12	10	<1	130 (S4UL)	None
aliphatic C12-C16	10	<1	1100 (S4UL)	None
aliphatic C16-C21	10	<1	65,000 (S4UL)	None
aliphatic C21-C35	10	<1	65,5000 (S4UL)	None
aromatic C5-C7	10	<1	70 (S4UL)	None
aromatic C7-C8	10	<1	130 (S4UL)	None
aromatic C8-C10	10	<1	34 (S4UL)	None
aromatic C10-C12	10	<1	74 (S4UL)	None
aromatic C12-C16	10	<1	140 (S4UL)	None
aromatic C16-C21	10	<1	260 (S4UL)	None
aromatic C21-C35	10	<1	1100 (S4UL)	None
benzene	10	<0.001	0.08 (S4UL)	None
toluene	10	<0.001	130 (S4UL)	None

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Garden Cover System Screening criteria (mg/kg unless stated)	Exceedances
ethylbenzene	10	<0.001	47 (S4UL)	None
o-xylene	10	<0.001	60 (S4UL)	None
m/p-xylene	10	<0.001	56 (S4UL)	None

4.3.2 A single minor dibenzo(ah)anthracene exceedance was reported within sample TS2-S2 with a concentration of 0.41 mg/kg when compared to the residential soils criteria of 0.24 mg/kg; however, given the SOM content of the sample (7.5%), the criterion for 6% SOM is deemed more appropriate raising the screening value to 0.3mg/kg which is still exceeded.

4.3.3 To determine the source of the exceedance a PAH cross plot was undertaken (Appendix D: PH10-TS2-S2), however this proved to be indeterminant indicating either a coal tar / or pyrolytic (coal) origin. Five further samples were then collected from stockpile 'TS-SP2' around the area of the initial exceedance with samples submitted for PAH analysis only, no further exceedances were reported. The minor dibenzo(ah)anthracene exceedance is therefore not considered representative of the material as a whole and shouldn't preclude its reuse as topsoil within gardens and/or landscaped areas within the development.

4.3.4 No exceedances were reported for any of the other determinants tested for.

4.4 Phase 10 Topsoil (TS-SP3)

4.4.1 An additional circa. 715m^3 of topsoil was recovered from the wider Phase 10 site in the vicinity of the POL2 tanks (the results have been included in this report for completeness) which was placed into a stockpile in the centre-northwest of the site referred to as 'TS-SP3'. SGP attended site on 01.12.22 and collected 3 samples of this material, satisfying the prescribed sampling frequency of 1 per 500m^3 for site-won topsoil. Full copies of the results are provided in Appendix C (ref. 22-46599) and are summarised below with comparison to the residential soils criteria as outlined in Table 3.3 of the Remediation Strategy. Due to the detection of several PAH exceedances, the results have also been compared to Public Open Space Park (POS_{park}) criteria (at 2.5% SOM to reflect the reported organic content of the soil) to determine its suitability for use within the proposed POS areas on the site.

Table 4.3 Summary of Ph10 Topsoil (TS-SP3)

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Garden Cover System		POS_{park} (2.5% SOM)	
			Screening criteria (mg/kg unless stated)	Exceedances	Screening criteria (mg/kg unless stated)	Exceedances
SOM (%)	3	5.2-6.3	-	-	-	-
pH (units)	3	7.9-8.1	-	-	-	-
asbestos fibre (%)	3	NAD	<0.001%	None	<0.001%	None
arsenic	3	12-20	37 (S4UL)	None	170 (S4UL)	None
cadmium	3	0.41-0.94	11 (S4UL)	None	532 (S4UL)	None

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Garden Cover System		POS_{park} (2.5% SOM)	
			Screening criteria (mg/kg unless stated)	Exceedances	Screening criteria (mg/kg unless stated)	Exceedances
chromium	3	17-25	910 (S4UL)	None	33,000 (S4UL)	None
chromium IV	3	<0.5	6 (S4UL)	None	220 (S4UL)	None
copper	3	18-180	2400 (S4UL)	None	44,000 (S4UL)	None
lead	3	26-40	200 (C4SL)	None	1,300 (C4SL)	None
mercury	3	<0.05-0.08	1.2 (S4UL)	None	30 (S4UL)	None
nickel	3	14-23	180 (S4UL)	None	800 (S4UL)	None
vanadium	3	32-46	410 (S4UL)	None	5,000 (S4UL)	None
zinc	3	99-180	3700 (S4UL)	None	170,000 (S4UL)	None
naphthalene	3	<0.1-0.38	2.3 (S4UL)	None	1,900 (S4UL)	None
acenaphthylene	3	<0.1-0.29	170 (S4UL)	None	30,000 (S4UL)	None
acenaphthene	3	<0.1-2.3	210 (S4UL)	None	30,000 (S4UL)	None
fluorene	3	<0.1-1.9	170 (S4UL)	None	20,000 (S4UL)	None
phenanthrene	3	0.32-21	95(S4UL)	None	6,200 (S4UL)	None
anthracene	3	0.14-5.9	280 (S4UL)	None	150,000 (S4UL)	None
fluoranthene	3	1.0-24	2400 (S4UL)	None	6,300 (S4UL)	None
pyrene	3	1.1-23	620 (S4UL)	None	15,000 (S4UL)	None
benzo(a)anthracene	3	0.4-8.8	7.2 (S4UL)	**1)** TSSP3-ES2	56 (S4UL)	None
chrysene	3	1.0-10	15 (S4UL)	None	110 (S4UL)	None
benzo(b)fluoranthene	3	0.93-10	2.6 (S4UL)	**1)** TSSP3-ES2	10 (S4UL)	None
benzo(k)fluoranthene	3	0.32-4.1	77 (S4UL)	None	410 (S4UL)	None
benzo(a)pyrene	3	0.76-8.6	2.2 (S4UL)	**1)** TSSP3-ES2	12 (S4UL)	None
indeno(123cd)pyrene	3	<0.1-5.3	27 (S4UL)	None	170 (S4UL)	None
dibenzo(ah)anthracene	3	<0.1-1.4	0.24(S4UL)	**1)** TSSP3-ES2	1.3 (S4UL)	**1)** TSSP3-ES2
benzo(ghi)perylene	3	<0.1-4.4	320 (S4UL)	None	1,500 (S4UL)	None
aliphatic C5-C6	3	<1	42 (S4UL)	None	130,000 (S4UL)	None
aliphatic C6-C8	3	<1	100 (S4UL)	None	220,000 (S4UL)	None
aliphatic C8-C10	3	<1	27 (S4UL)	None	18,000 (S4UL)	None
aliphatic C10-C12	3	<1	130 (S4UL)	None	23,000 (S4UL)	None
aliphatic C12-C16	3	<1	1100 (S4UL)	None	25,000 (S4UL)	None
aliphatic C16-C21	3	<1	65,000 (S4UL)	None	480,000 (S4UL)	None
aliphatic C21-C35	3	<1	65,5000 (S4UL)	None	480,000 (S4UL)	None
aromatic C5-C7	3	<1	70 (S4UL)	None	84,000 (S4UL)	None
aromatic C7-C8	3	<1	130 (S4UL)	None	95,000 (S4UL)	None
aromatic C8-C10	3	<1	34 (S4UL)	None	8,500 (S4UL)	None
aromatic C10-C12	3	<1	74 (S4UL)	None	9,700 (S4UL)	None
aromatic C12-C16	3	<1	140 (S4UL)	None	10,000 (S4UL)	None
aromatic C16-C21	3	<1-3.6	260 (S4UL)	None	7,700 (S4UL)	None
aromatic C21-C35	3	<1	1100 (S4UL)	None	7,800 (S4UL)	None
benzene	3	<0.001	0.08 (S4UL)	None	100 (S4UL)	None
toluene	3	<0.001	130 (S4UL)	None	95,000 (S4UL)	None
ethylbenzene	3	<0.001	47 (S4UL)	None	22,000 (S4UL)	None
o-xylene	3	<0.001	60 (S4UL)	None	24,000 (S4UL)	None
m/p-xylene	3	<0.001	56 (S4UL)	None	23,000 (S4UL)	None

4.4.2 When compared against the adopted residential screening criteria, several PAH exceedances (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene & dibenzo(ah)anthracene) were reported within sample 'Ph10-TSSP3-ES2' indicating that this material is not suitable for reuse in gardens within the development.

4.4.3 As large areas of public open space are proposed within Phase 10, comparison of the results to POS_{park} (2.5% SOM) criteria (defined as an area of open space provided for recreational use) was carried out and a single minor exceedance of the PAH dibenzo(ah)anthracene was still reported at 1.4mg/kg when compared to the screening criteria of 1.3mg/kg. To determine the source of the exceedance a PAH cross plot was undertaken (Appendix D: Ph10-TSSP-ES3) which indicates a pyrolytic (coal) origin. Given that the exceedance is very minor and that the probable source is coal which has a low bioavailability due to the sequestration of PAHs within a carbon or vitrified matrix, it is considered that this material is suitable for reuse within the POS areas of the development.

4.5 Validation of Formation Soils

4.5.1 Sampling and analysis were carried out to determine the suitability of the formation level soils for retention within the top 600mm of gardens / 300mm of landscaped soils within the development. Development levels for the site are yet to be confirmed by the developer; however, in-situ sampling of the formation level will determine whether a reduced 200mm topsoil cover can be placed within gardens / landscaped areas providing the underlying natural strata is chemically suitable for retention.

4.5.2 In-situ sampling of subsoils was carried out through the excavation and sampling of the top 400mm of natural subsoil with a total of 14 samples collected. Assuming an approximate area of 16,600m^2, the volume of validated soils is effectively 6,640m^3 and the test rate is equivalent to 1 sample per 474m^2, achieving the specified rate of 1 sample per 500m^3.

4.5.3 Sampled soils generally consisted of a natural, slightly sandy, silty clay with frequent coarse limestone gravel / cobbles and occasional roots near the surface. No anthropogenic inclusions such as ash, clinker or slag were observed during either sampling or the walkover inspections.

4.5.4 A photographic record confirming the depth and soil profile at each test location is provided within Appendix B and the relevant laboratory test certificate (lab ref. 22-41389) is provided in Appendix C. All sample locations are indicated on Drawing D01.

4.5.5 The results are summarised in the table below and are compared to the adopted assessment criteria for garden cover soils.

Table 4.3 Analysis of Formation Soils

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
SOM (%)	14	1.0-5.3	-	None
pH (units)	14	8.4-8.8	-	None
asbestos fibre (%)	14	NAD	<0.001%	None
arsenic	14	6.8-18	37 (S4UL)	None
cadmium	14	<0.1-0.35	11 (S4UL)	None
chromium	14	9.5-28	910 (S4UL)	None
chromium IV	14	<0.5	6 (S4UL)	None
copper	14	4.3-14	2400 (S4UL)	None
lead	14	8.1-20	200 (C4SL)	None
mercury	14	<0.05-0.06	1.2 (S4UL)	None
nickel	14	7.6-24	180 (S4UL)	None
vanadium	14	19-47	410 (S4UL)	None
zinc	14	17-62	3700 (S4UL)	None
naphthalene	14	<0.1	2.3 (S4UL)	None
acenaphthylene	14	<0.1	170 (S4UL)	None
acenaphthene	14	<0.1	210 (S4UL)	None
fluorene	14	<0.1	170 (S4UL)	None
phenanthrene	14	<0.1-0.55	95(S4UL)	None
anthracene	14	<0.1-0.17	280 (S4UL)	None
fluoranthene	14	<0.1-1.2	2400 (S4UL)	None
pyrene	14	<0.1-1.3	620 (S4UL)	None
benzo(a)anthracene	14	<0.1-0.57	7.2 (S4UL)	None
chrysene	14	<0.1-1.0	15 (S4UL)	None
benzo(b)fluoranthene	14	<0.1-1.1	2.6 (S4UL)	None
benzo(k)fluoranthene	14	<0.1-0.61	77 (S4UL)	None
benzo(a)pyrene	14	<0.1-0.74	2.2 (S4UL)	None
indeno(123cd)pyrene	14	<0.1	27 (S4UL)	None
dibenzo(ah)anthracene	14	<0.1	0.24(S4UL)	None
benzo(ghi)perylene	14	<0.1	320 (S4UL)	None
aliphatic C5-C6	14	<1	42 (S4UL)	None
aliphatic C6-C8	14	<1	100 (S4UL)	None
aliphatic C8-C10	14	<1	27 (S4UL)	None
aliphatic C10-C12	14	<1	130 (S4UL)	None
aliphatic C12-C16	14	<1	1,100 (S4UL)	None
aliphatic C16-C21	14	<1	65,000 (S4UL)	None
aliphatic C21-C35	14	<1	65,000 (S4UL)	None
aromatic C5-C7	14	<1	70 (S4UL)	None
aromatic C7-C8	14	<1	130 (S4UL)	None
aromatic C8-C10	14	<1	34 (S4UL)	None
aromatic C10-C12	14	<1	74 (S4UL)	None
aromatic C12-C16	14	<1	140 (S4UL)	None
aromatic C16-C21	14	<1	260 (S4UL)	None
aromatic C21-C35	14	<1	1,100 (S4UL)	None
benzene	14	<0.001	0.08 (S4UL)	None

Contaminant	Samples	Range of Concentrations (mg/kg unless stated)	Residential Use	
			Screening criteria (mg/kg unless stated)	Exceedances
toluene	14	<0.001	130 (S4UL)	None
ethylbenzene	14	<0.001	47 (S4UL)	None
o-xylene	14	<0.001	60 (S4UL)	None
m/p-xylene	14	<0.001	56 (S4UL)	None

4.5.6 No exceedances were reported for any of the determinants tested for indicating that the formation soils are suitable for retention in gardens and/or landscaped areas.

4.6 ACM Pipeline Validation Sampling Results

4.6.1 Following removal of the ACM pipeline in the east of the site by specialist contractors Elite, the excavation trench (circa. 120m length) was left open to allow validation sampling of the soils that previously underlay the pipeline. SGP attended site on the 09th January 2023 to collect samples at approximate 10m intervals along the base of the trench as indicated on Drawing D03.

4.6.2 A total of twelve validation samples were collected from the excavation base (samples: ASBPL-SS1 to SS12) which were submitted to accredited laboratory Eurofins Chemtest Ltd. for asbestos identification analysis. The results of the validation testing are provided in Appendix C (lab ref. 23-01971) and are summarised in Table 4.4 below.

Table 4.4 ACM Pipeline Soil Validation results

Lab Ref	Sample	Asbestos Identification	Asbestos Concentration (%)	ACM Identification
23-01971	ASBPL-SS1	NAD	-	-
	ASBPL-SS2	NAD	-	-
	ASBPL-SS3	NAD	-	-
	ASBPL-SS4	NAD	-	-
	ASBPL-SS5	NAD	-	-
	ASBPL-SS6	NAD	-	-
	ASBPL-SS7	NAD	-	-
	ASBPL-SS8	NAD	-	-
	ASBPL-SS9	NAD	-	-
	ASBPL-SS10	NAD	-	-
	ASBPL-SS11	NAD	-	-
	ASBPL-SS12	NAD	-	-

NAD = No asbestos detected

4.6.3 No asbestos was detected in the samples collected from the excavation base indicating the absence of any residual ACM / asbestos fibres in the soils underlying the former pipeline.

5. Post-remediation Vapour Monitoring

5.1. Post-Remediation Vapour Monitoring

5.1.1. Due to the recognised potential for hydrocarbon contamination on the site relating to the POL tanks and pipeline, as well as the localised area of elevated groundwater hydrocarbon concentrations (JBH6), a post-remediation vapour monitoring programme was recommended to assess the intrusion risk of volatile hydrocarbons into future built development and the subsequent inhalation risk to future site users. Ultimately this is to determine whether precautionary VOC protection measures are required in future dwellings in this part of the site.

5.1.2. Installations for the monitoring of VOCs were constructed on 17.11.22 in accordance with British Standard BS8576:2013 (Section 10.2.3) and were located on an approximate 50m grid spacing across the site as indicated on Drawing D02. Given the general absence of specific contamination hotspots on the Phase 10 East area, the monitoring locations were selected to provide general coverage across the site. The only exception to this was entry JBH6 where elevated groundwater hydrocarbon concentrations were reported which couldn't be directly targeted due to the presence of stockpiles in this area following the remedial works; however, good coverage was achieved across the entirety of the Phase 10 East area therefore this is not considered to be a deficiency or limitation of the assessment.

5.1.3. Following installation of the probes, passive diffusion tubes (provided by Gradko International Ltd.) with appropriate adsorption media for volatile aliphatic and aromatic hydrocarbons (<C16 and BTEX) were secured to the probe caps and sealed with PTFE tape. The diffusion tubes were then left in-situ for a period specified by the laboratory (3 weeks) to allow sufficient adsorption of determinants and achieve a suitable limit of detection (LOD) for comparison with assessment criteria.

5.1.4. A travel blank (to check for cross-contamination which remained sealed) and an external tube to provide background concentrations located along the eastern site boundary were also used during the monitoring period.

5.1.5. Diffusion tubes were left in-situ for a period of 3 weeks before collection on 08.12.22 and were couriered to Gradko International Ltd. for analysis (lab ref. Q09891R).

5.2. Derivation of Inhalation Assessment Criteria

5.2.1. To determine whether concentrations of the contaminants of concern were present at levels which may pose a risk to human health, derivation of assessment criteria was carried out.

5.2.2. The methodology for deriving assessment screening criteria for health impacts from VOCs at the receptor is set out in Appendix 9 of the VOC handbook[1]. Tolerable Daily Soil Intake

[1] CIRIA C682: The VOCs Handbook: Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination 2009

values or Index Doses (for non-carcinogens and carcinogens respectively) are multiplied by the body weight (13.3 kg) and divided by the inhalation rate (8.8 m^3/day) of a child receptor as defined in the most recent published UK guidance (DEFRA C4SL). Most of the substances under consideration have toxicological inhalation data published in the "LQM/CIEH S4ULs for Human Health Risk Assessment" (S4UL) - *Copyright Land Quality Management Limited reproduced with Permission* or CL:AIRE "Soil Generic Assessment Criteria for Human Health Risk Assessment".

5.2.3. The assessment criteria are inherently conservative as they assume long-term, constant exposure of residents over 24 hr periods, 365 days a year and a continuous source which does not diminish over time. However, for the most vulnerable receptors (infants and small children), significant amounts of time spent within dwellings may be anticipated.

5.2.4. The exception for this is benzene for which a UK Air Quality Standard (AQS) is available (5 µg/m^3).

5.2.5. TDIs and / or IDs used in the determination of inhalation assessment criteria are summarised in the table below:

Table 5.1. Derived Inhalation Assessment Criteria

Contaminant	Index Dose/Tolerable Daily Intake (µg/kg.bw.day^{-1})	Assessment Criteria (µg.m^3)
Benzene	1.4 (S4UL)	5 (AQS)
Toluene	1400 (S4UL)	2,115.91
Ethylbenzene	74.3 (S4UL)	112.29
m/p-xylene	60 (S4UL)	90.68
o-xylene	60 (S4UL)	90.68
Aliphatic Hydrocarbons (C5-C6)	5000 (S4UL)	7,556.82
Aliphatic Hydrocarbons (C6-C8)	5000 (S4UL)	7,556.82
Aliphatic Hydrocarbons (C8-C10)	290 (S4UL)	438.3
Aliphatic Hydrocarbons (C10-C12)	290 (S4UL)	438.3
Aliphatic Hydrocarbons (C12-C16)	290 (S4UL)	438.3
Aromatic Hydrocarbons (C5-C7)*	Benzene	Benzene
Aromatic Hydrocarbons (C7-C8)*	Toluene	Toluene
Aromatic Hydrocarbons (C8-C10)	60 (S4UL)	90.68
Aromatic Hydrocarbons (C10-C12)	60 (S4UL)	90.68
Aromatic Hydrocarbons (C12-C16)	60 (S4UL)	90.68

**Aromatic C5-C7 and C7-C8 correspond to benzene and toluene. As BTEX analysis has been undertaken repetition of these results in the aromatic fraction have not been reported.*

5.3. Vapour Risk Assessment

5.3.1. Comparison of soil-vapour concentrations determined through diffusion tube monitoring are compared to the derived inhalation assessment criteria in the table below. The Gradko laboratory report is provided in Appendix C.

Table 5.2. Derivation of Assessment Criteria and Comparison to Soil-Vapour Concentrations

Contaminant	Assessment Criteria (µg/m³)	Soil-Vapour Range of concentrations (µg/m³)	Exceedances
Benzene	5	<0.7	None
Toluene	2,115.91	<0.6-0.9	None
Ethylbenzene	112.29	<0.5	None
m/p-xylene	90.68	<0.5	None
o-xylene	90.68	<0.5	None
Aliphatic Hydrocarbons (EC5-6)	7,556.82	<0.3	None
Aliphatic Hydrocarbons (EC6-8)	7,556.82	<0.7	None
Aliphatic Hydrocarbons (EC8-10)	438.3	<1.3-3.7	None
Aliphatic Hydrocarbons (EC10-12)	438.3	ND-4.9	None
Aliphatic Hydrocarbons (EC12-16)	438.3	<2.7-3.2	None
Aromatic Hydrocarbons (EC5-7)	As Benzene	As Benzene	None
Aromatic Hydrocarbons (EC7-8)	As Toluene	As Toluene	None
Aromatic Hydrocarbons (EC8-10)	90.68	<1.8-2.6	None
Aromatic Hydrocarbons (EC10-12)	90.68	<2-3.1	None
Aromatic Hydrocarbons (EC12-16)	90.68	ND	None

ND = None detected

5.3.2. No exceedances of the derived assessment criteria were reported for any of the BTEX compounds or the aliphatic / aromatic hydrocarbon fractions.

6. Conclusions & Recommendations

6.1. Conclusions

6.1.1. SGP considers that the remedial works within the Phase 10 East area have been completed in accordance with the Remediation Strategy.

6.1.2. Further investigation of the soils underlying the suspected ACM pipeline has been carried out via the collection of 12 samples at approximate 10m intervals at the base of the former pipeline. No asbestos has been detected in any of the validation samples tested for asbestos identification indicating the absence of any residual ACM / fibres in the soils in this area.

6.1.3. Approximately 5,171m^3 of topsoil has been recovered from the entirety of the Phase 10 site which, at the time of testing, was separated into three stockpiles – 'TS-SP1', 'TS-SP2' & 'TS-SP3'– which had volumes of 2,950m^3, 1,506m^3 and 715m^3, respectively. No exceedances were detected within the six samples collected from 'TS-SP1', however a minor exceedance of the PAH dibenzo(ah)anthracene was recorded in one out of the four samples collected from 'TS-SP2' and several PAH exceedances were detected in 'TS-SP3'. Five further samples were therefore collected from stockpile 'TS-SP2' for PAH analysis within which no further exceedances were reported. The minor exceedance is therefore not considered to be representative of the material or preclude reuse of the topsoil within the development in either gardens or landscaped areas. The PAH exceedances detected in 'TS-SP3' are considered to preclude reuse of this material within gardens but further assessment has indicated that the material is suitable for use within the proposed POS areas on the site. Sampling frequencies of 1 per 492m^3 (TS-SP1), 1 per 377m^3 (TS-SP2) and 1 per 238m^3 have been achieved thereby satisfying the 1 per 500m^3 frequency specified in the Remediation Strategy.

6.1.4. Formation testing of the top 400mm of site soils has been completed within the Phase 10 East area with a total of 14 samples collected achieving an effective sampling frequency across the site of 1 sample per 474m^2, satisfying the sampling rate of 1 sample per 500m^3. No exceedances were detected confirming that the formation soils are suitable for retention in future gardens and landscaped areas. Additionally, the shallow strata of PAH impacted made ground in the northwest of the site (JWS1) was removed during the site regrade with only natural soils remaining at the formation surface across the whole of the Phase 10 East area.

6.1.5. Demolition arisings / hardstanding has been recovered during the Phase 10 East remediation earthworks which is to be crushed for reuse as aggregate across the site within plot / road footprints. This material is currently stockpiled within the wider Phase 10 development area and following crushing will require testing for asbestos identification (and quantification, if detected), the results of which will be detailed in the subsequent Completion Reporting for the wider Phase 10 development area.

6.1.6. Vapour monitoring was undertaken to assess whether residual contamination associated with the decommissioned POL tanks / pipeline, as well as hydrocarbon impacted groundwater in the vicinity of JBH6, presented a possible vapour intrusion risk into future built development. No exceedances of derived inhalation criteria were reported concluding that there is no risk to future occupants from hydrocarbon vapours.

6.1.7. A risk assessment with regards to water pipelines may be required by the utility provider. This should be undertaken utilising the information provided within this report and supplemented as appropriate by other reporting pertaining to the site.

6.1.8. No specific testing has been undertaken for potentially aggressive conditions to concrete. Reference should be made to the preceding site investigation reports.

6.1.9. URL has confirmed that the onsite boreholes have been decommissioned via infilling with hydrated bentonite pellets in accordance with the appropriate Environment Agency Guidance[2] as per the requirements of the Remediation Strategy.

6.2. Recommendations

6.2.1. To secure completion of remediation in the Phase 10 East area in accordance with the Remediation Strategy and the recommendations made within this report (subject to Local Authority Approval), the developer is required to complete the following actions:

- placement of clean topsoil to a nominal depth of 200mm within all gardens / landscaped areas within the Phase 10 East area (corresponds to Plots 90-138);
- it is considered that the tested site-won topsoil from stockpiles ‘TS-SP1’ and ‘TS-SP2’ are suitable for use as cover soils within gardens and/or landscaped areas;
- the topsoil in stockpile ‘TS-SP3’ is considered unsuitable for reuse as garden soils but is suitable for use within less sensitive areas such as the areas of POS within the development;
- any other site-won materials to be used within the top 600mm of gardens / 300mm of landscaped areas must be demonstrably suitable for use and comply with the contamination targets set out in Table 3.3 with sampling carried out at a rate of 1 sample per 500m^3;
- imported soils used for cover purposes are to comply with the contamination targets set out in Table 3.3 of the Remediation Strategy with sampling to be carried out at a rate of 1 sample per 250m^3 (minimum 3 samples per single source);

[2] Environment Agency. Decommissioning redundant boreholes and wells (1996)

- any recycled aggregate to be used within the development as road base / development platforms for plots (imported or site-recovered) to be sampled for asbestos identification at a sampling frequency of 1 sample per 500m^3 – if concentrations exceed the quantification threshold (0.001%) then further assessment will be required to determine its suitability (the testing results of the site-recovered aggregate to be detailed in the subsequent Phase 10 Completion Reporting).

6.2.2. With the adoption of the above normal practices for Brownfield development, and on the information available to it, SGP concludes that the preparatory remedial works have been completed in accordance with the agreed strategy. In the event that any previously undisclosed contamination or suspect materials are identified then this should be assessed by an appropriately qualified and experienced person.

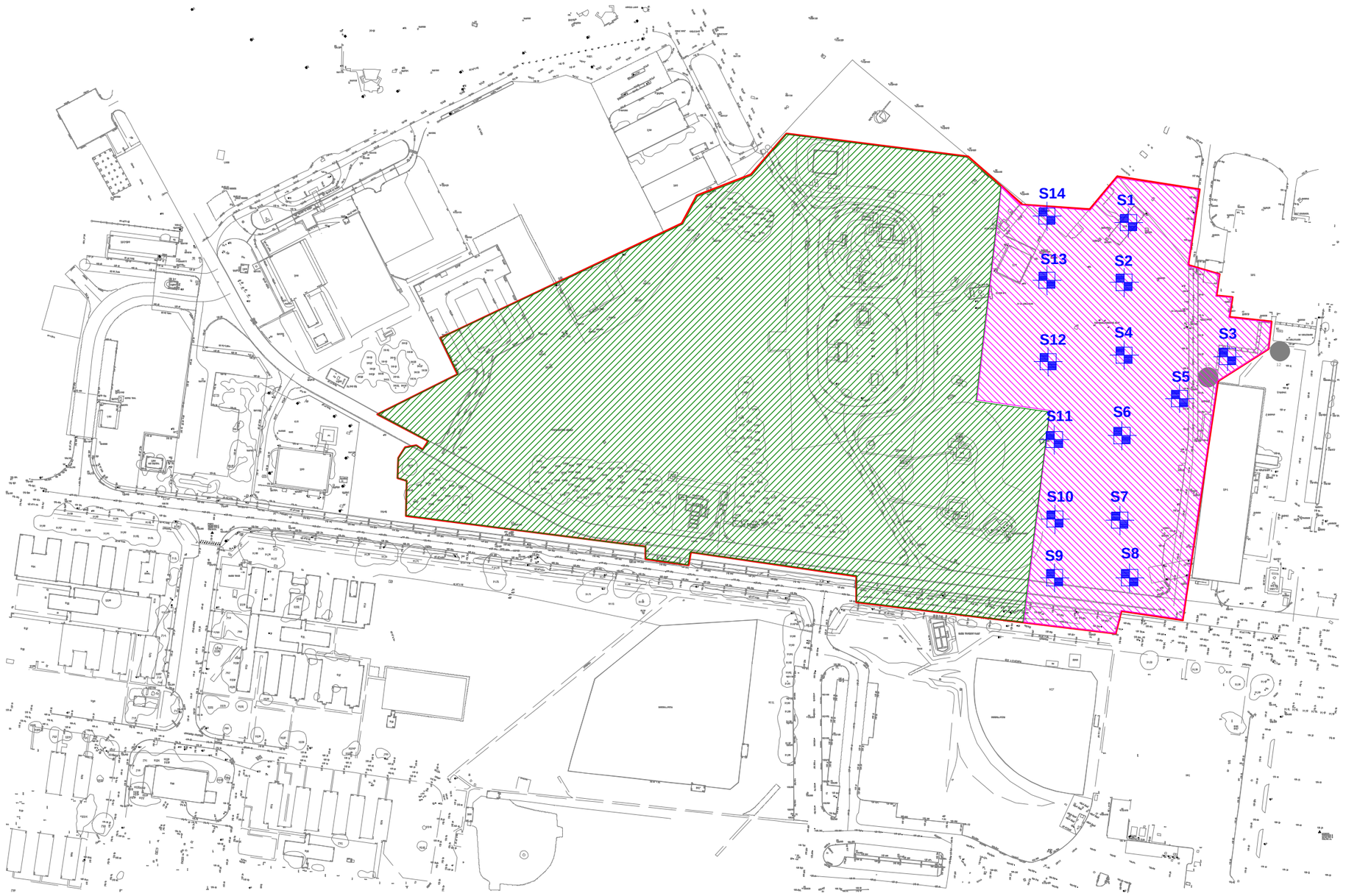
6.3. Limitations

6.3.1. SGP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines and responses by the statutory and regulatory authorities.

6.3.2. This report has been prepared by Smith Grant LLP, for the sole and exclusive use of Urban Regen Ltd. and Dorchester Living, and the benefit of this report may not be assigned to any third party without the prior agreement in writing of Smith Grant LLP.

6.3.3. Reasonable skill, care and diligence have been exercised within the timescale and budget available, and in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in undertaking the assessment and preparing this report, it is possible that other ground conditions and contamination as yet undetected may exist. Reliance on the findings of this report must therefore be limited accordingly. Such reliance must be based on the whole report and not on extracts which may lead to incomplete or incorrect conclusions when taken out of context. This report reviews and relies upon site investigations largely conducted by others. If errors or omissions in previous work have been noted then these have been duly noted, however SGP accepts no responsibility for advice given on the basis of incorrect factual information provided to it.

DRAWINGS



Phase 10 Boundary

Phase 10 East (Early Handover Area)

Wider Phase 10 Development Area

Formation Sample Locations

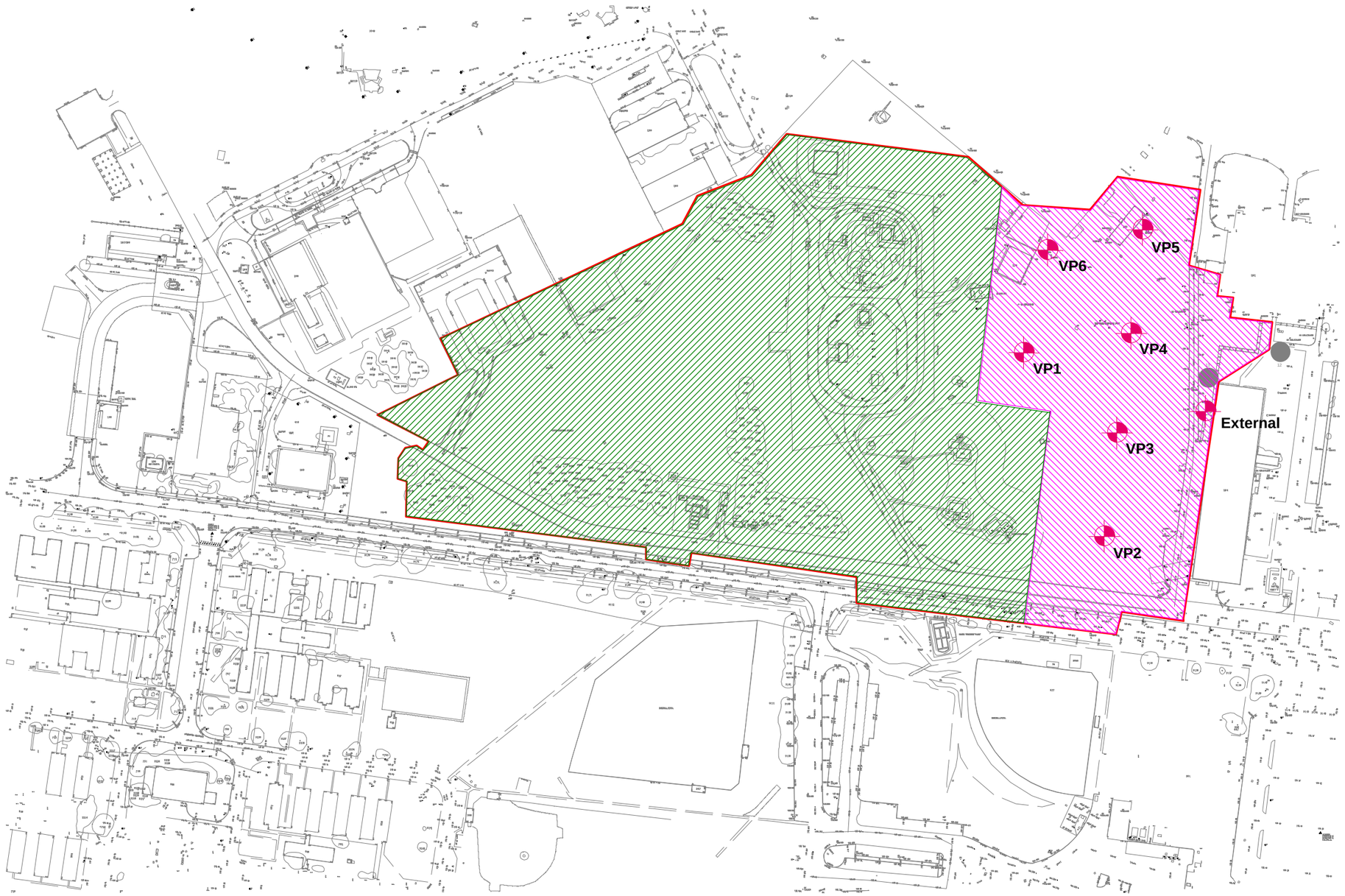
SMITH GRANT Environmental Consultancy LLP

Smith Grant LLP
Station House, Station Road
Ruabon, Wrexham LL14 6DL

Tel: 01978 822367
Fax: 01978 8247182

www.smithgrant.co.uk
email: consult@smithgrant.co.uk

Project: Heyford Park: Dorchester Phase 10 (East)	
Drawing: Site Boundary and Formation Sampling Locations	
Drawn: SM	Checked: DW
Date: 22.12.22	Scale: 1:2,000 @ A3
Job No: R1742b-R24	Drg No: D01



Phase 10 Boundary

Phase 10 East (Early Handover Area)

Wider Phase 10 Development Area

Vapour Probe / External Tube Locations

SMITH GRANT Environmental Consultancy LLP

Smith Grant LLP
Station House, Station Road
Ruabon, Wrexham LL14 6DL

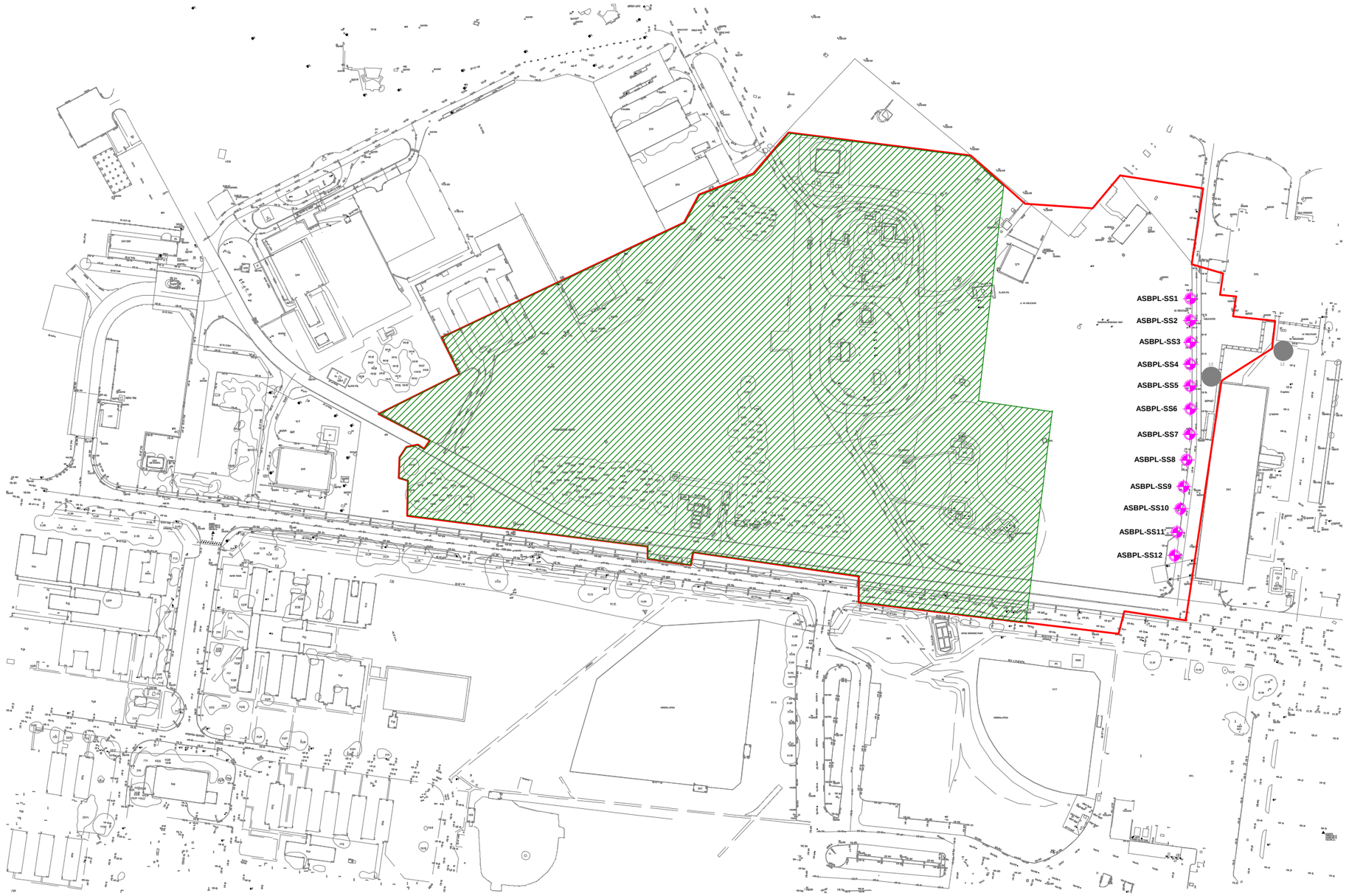
Tel: 01978 822367
Fax: 01978 8247182

www.smithgrant.co.uk
email: consult@smithgrant.co.uk

Project:
Heyford Park: Dorchester Phase 10 (East)

Drawing:
Vapour Probe Locations

Drawn: SM	Checked: DW
Date: 22.12.22	Scale: 1:2,000 @ A3
Job No: R1742b-R24	Drg No: D02



Phase 10 Boundary

Wider Phase 10 Development Area

ACM Pipeline Validation Sample Locations

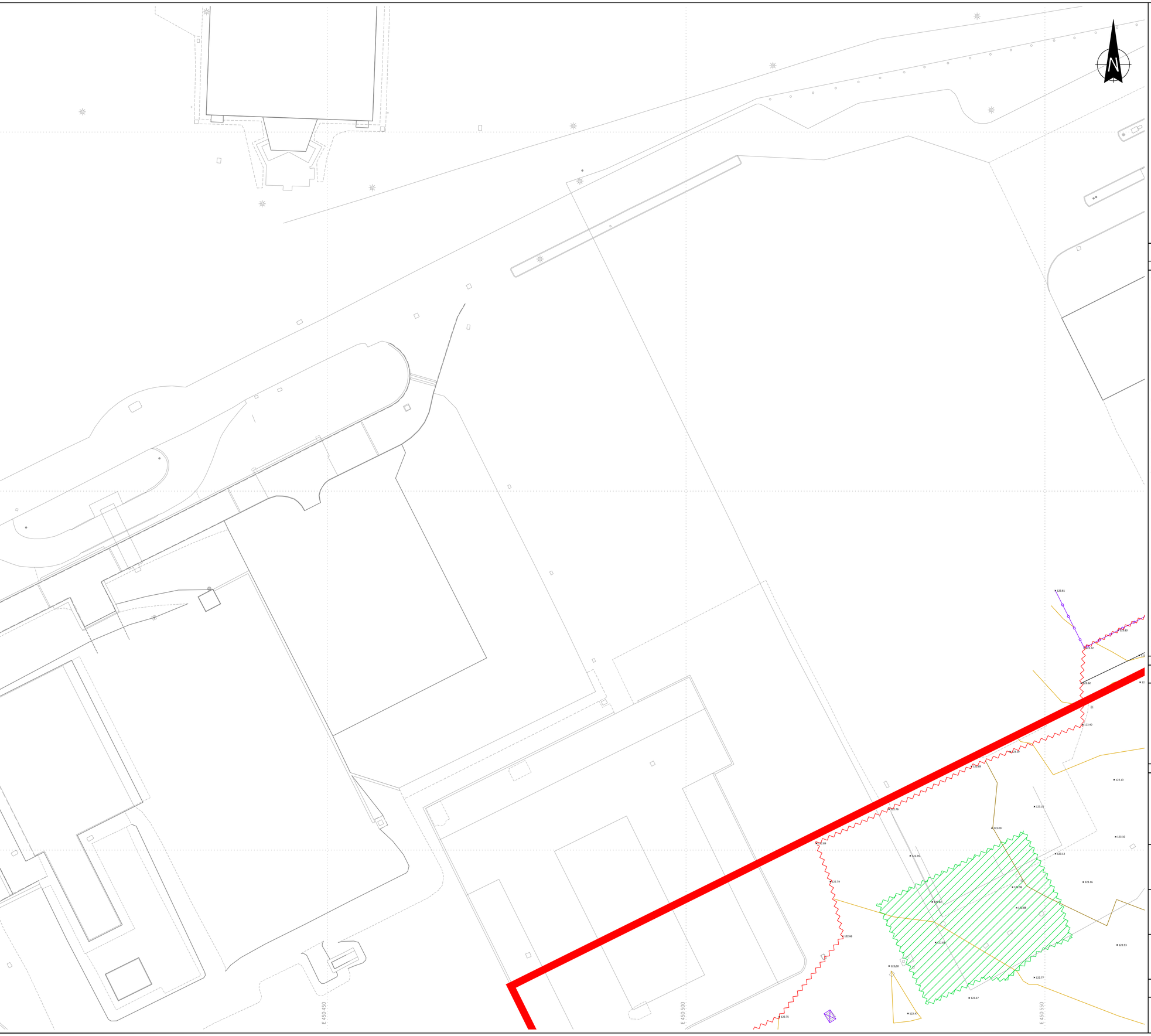
SMITH GRANT Environmental Consultancy LLP

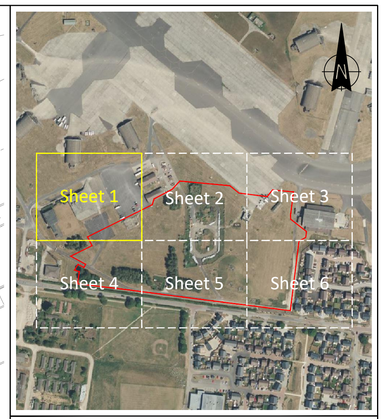
Smith Grant LLP
Station House, Station Road
Ruabon, Wrexham LL14 6DL

Tel: 01978 822367
Fax: 01978 8247182

www.smithgrant.co.uk
email: consult@smithgrant.co.uk

Project: Heyford Park: Dorchester Phase 10 (East)	
Drawing: ACM Pipeline Validation Sample Locations	
Drawn: SM	Checked: DW
Date: 10.05.23	Scale: 1:2,000 @ A3
Job No: R1742b	Drg No: D03





Sheet Plan Scale 1:5000

Notes:

Site boundary	
Phase boundary	
Approximate extent of remediation works	
Contour (0.25m interval)	
Spot level	×120.12
Bottom/top of bank	
Fenceline	
Historic building footprints (see note 2)	
Tank excavation (see note 4)	
Contamination excavation (see notes 6, 7, and 8)	
Buried asbestos impacted soils >2m bgl (see note 6)	
Manhole (see note 10)	
Stockpile (extents)	
Services - Telecommunications	

Notes

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2. Made ground associated with the removal of the historic building foundations extends to approximately 0.5-1.5m below remediated ground levels.
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7. In-ground contamination excavations extend to circa 2.5m below remediated ground levels as detailed.
8. Fill materials used to make up any bulk deficit due to the contamination excavation was provided by the Client.
9. The central area of the site has been left low to a accommodate future development arisings (as instructed by the Client).
10. Live manholes and drainage infrastructure have been retained.

Survey Information:

Co-ord System:	Co-ord Type:	Primary Survey Control:	Secondary Survey Control:
OSGB36(15)	Grid	Leica SmartNet	Site

Rev	Date	Amendment	Drawn	Checked

Urban Regen
ESTABLISHED 2001

Client:
Dorchester Homes

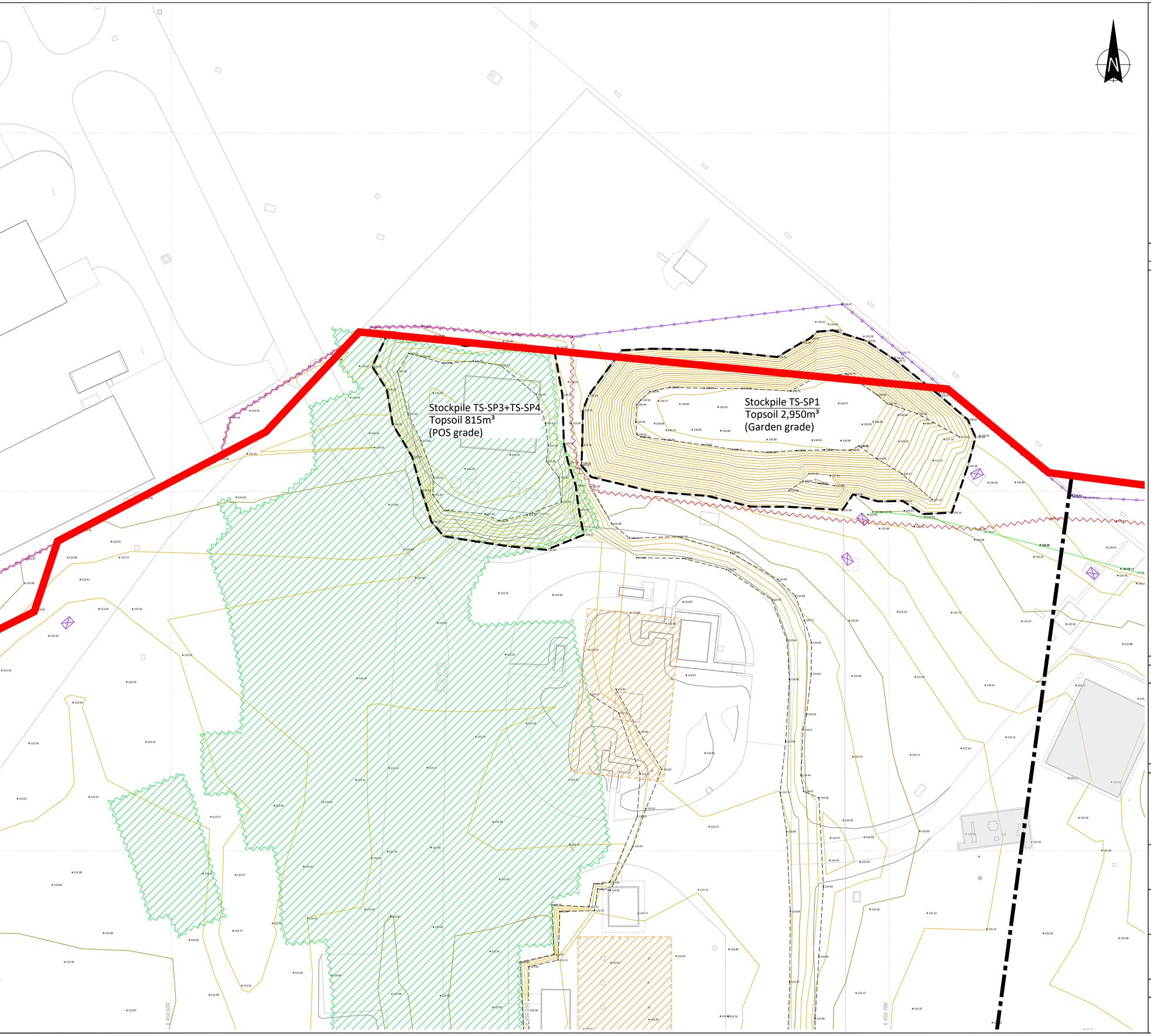
Project:
Upper Heyford (Phase 10)

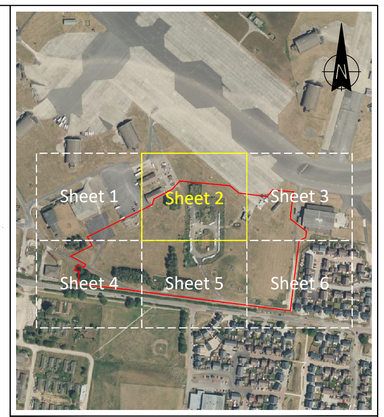
Title:
As built topographic survey and constraints (Sheet 1 of 6)

Scale:	First Issue:	Drawn:	Checked:
1:250 @A1	18th April 2023	D.J.Woodrow	B.Carter

Drawing No:
372-22-001-01

Revision:





Sheet Plan Scale 1:5000

Notes:

- Site boundary
- Phase boundary
- Approximate extent of remediation works
- Contour (0.25m interval)
- Spot level ×120.12
- Bottom/top of bank
- Fenceline
- Historic building footprints (see note 2)
- Tank excavation (see note 4)
- Contamination excavation (see notes 6, 7, and 8)
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- Manhole (see note 10)
- Stockpile (extents)
- Services - Telecommunications

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Survey Information:

Co-ord System:	Co-ord Type:	Primary Survey Control:	Secondary Survey Control:
OSGB36(15)	Grid	Leica SmartNet	Site

Rev	Date	Amendment	Drawn	Checked

Urban Regen
ESTABLISHED 2001

Client:
Dorchester Homes

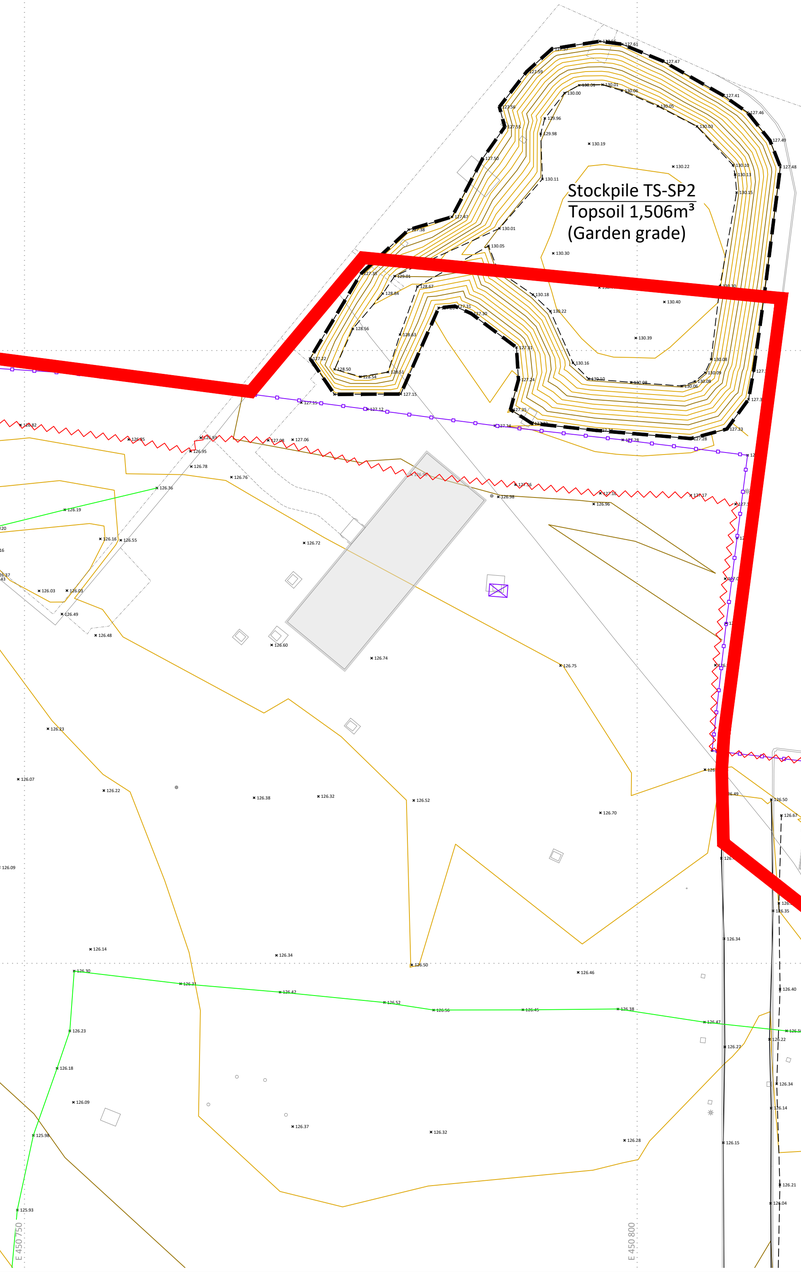
Project:
Upper Heyford (Phase 10)

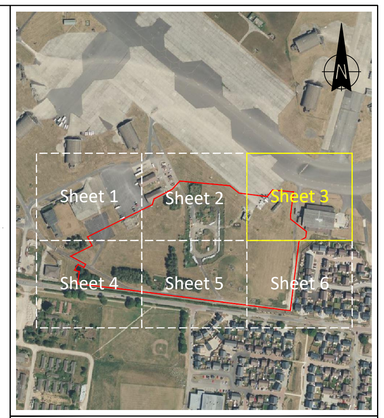
Title:
As built topographic survey and constraints (Sheet 2 of 6)

Scale:	First Issue:	Drawn:	Checked:
1:250 @A1	18th April 2023	D.J.Woodrow	B.Carter

Drawing No: 372-22-001-02

Revision:





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Site boundary
Phase boundary
Approximate extent of remediation works
Contour (0.25m interval)
Spot level ×120.12
Bottom/top of bank
Fenceline
Historic building footprints (see note 2)
Tank excavation (see note 4)
Contamination excavation (see notes 6, 7, and 8)
Buried asbestos impacted soils >2m bgl (see note 6)
Manhole (see note 10)
Stockpile (extents)
Services - Telecommunications

Notes

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Survey Information:

Co-ord System:	Co-ord Type:	Primary Survey Control:	Secondary Survey Control:
OSGB36(15)	Grid	Leica SmartNet	Site

Rev	Date	Amendment	Drawn	Checked

Urban Regen
ESTABLISHED 2001

Client:
Dorchester Homes

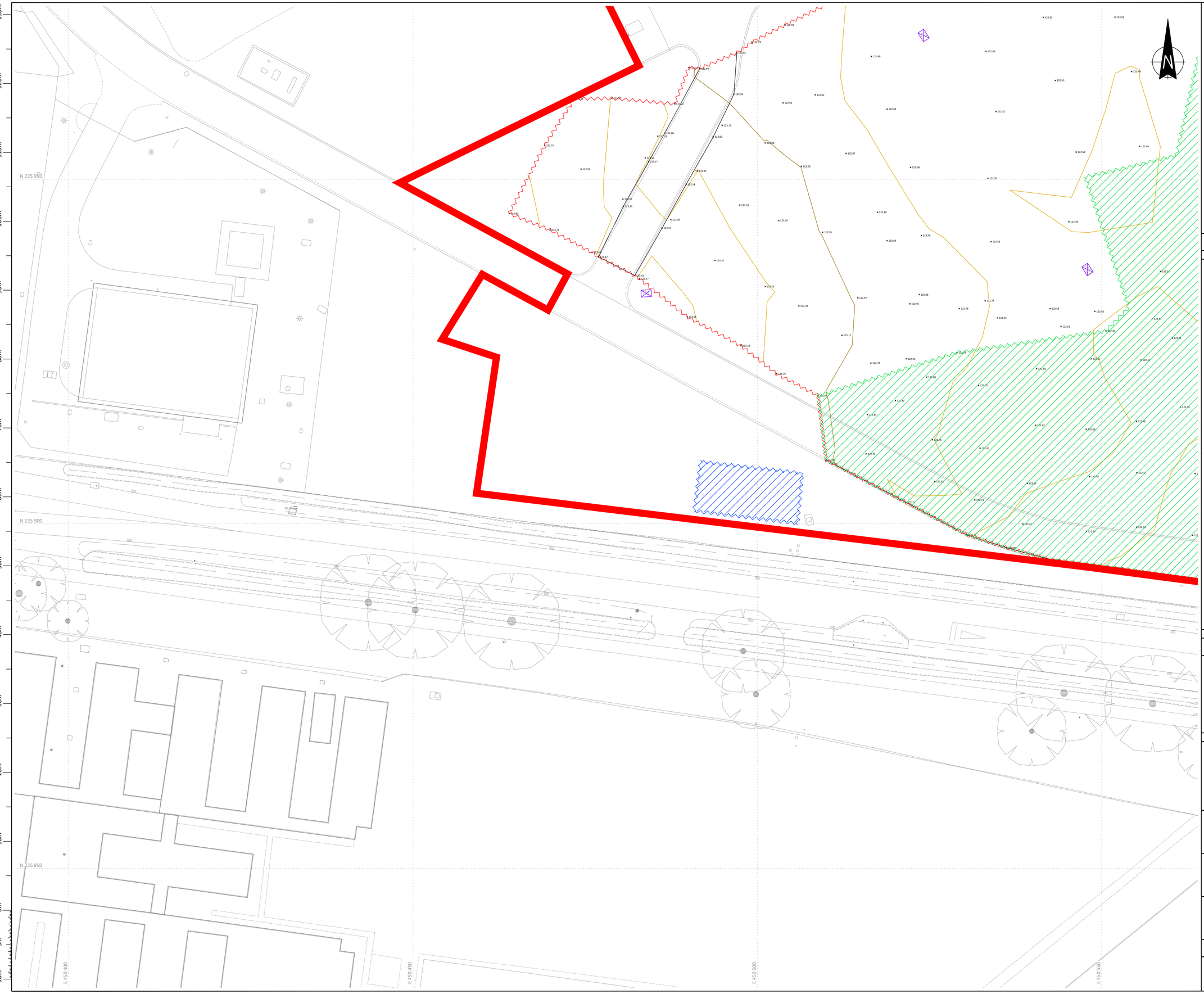
Project:
Upper Heyford (Phase 10)

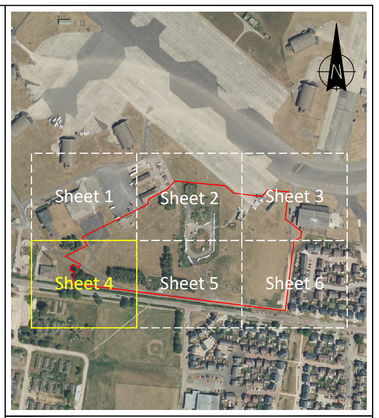
Title:
As built topographic survey and constraints (Sheet 3 of 6)

Scale:	First Issue:	Drawn:	Checked:
1:250 @A1	18th April 2023	D.J.Woodrow	B.Carter

Drawing No: 372-22-001-03

Revision:





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- Site boundary
- Phase boundary
- Approximate extent of remediation works
- Contour (0.25m interval)
- Spot level ×120.12
- Bottom/top of bank
- Fenceline
- Historic building footprints (see note 2)
- Tank excavation (see note 4)
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- Manhole (see note 10)
- Stockpile (extents)
- Services - Telecommunications

Notes:

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Survey Information:

Co-ord System:	Co-ord Type:	Primary Survey Control:	Secondary Survey Control:
OSGB36(15)	Grid	Leica SmartNet	Site

Rev	Date	Amendment	Drawn	Checked

Urban Regen
ESTABLISHED 2001

Client:
Dorchester Homes

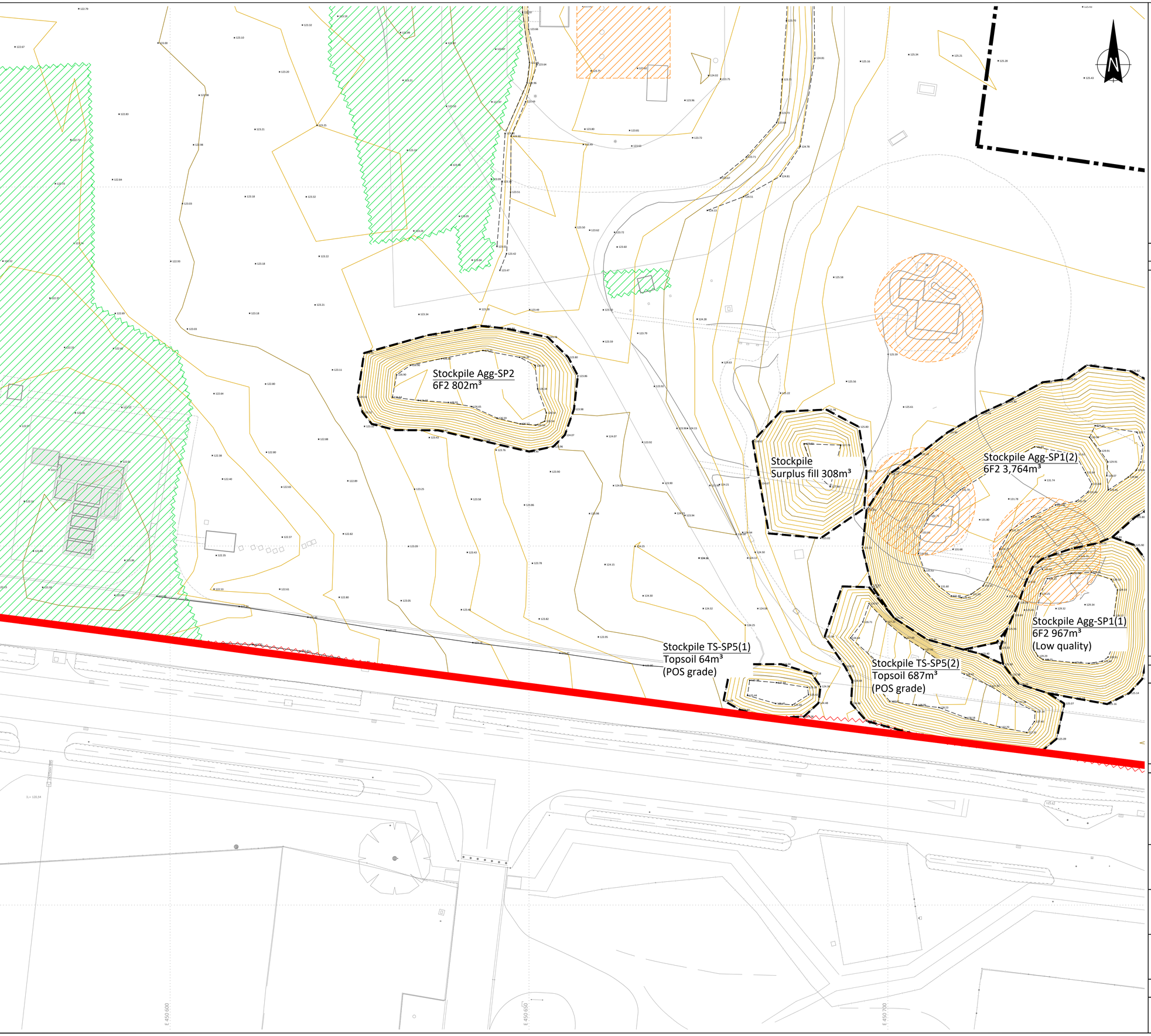
Project:
Upper Heyford (Phase 10)

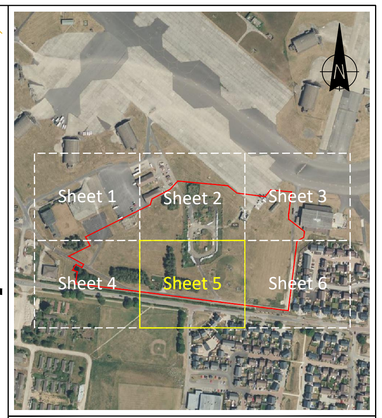
Title:
As built topographic survey and constraints (Sheet 4 of 6)

Scale:	First Issue:	Drawn:	Checked:
1:250 @A1	18th April 2023	D.J.Woodrow	B.Carter

Drawing No: 372-22-001-04

Revision:





Sheet Plan Scale 1:5000

- Site boundary
- Phase boundary
- Approximate extent of remediation works
- Contour (0.25m interval)
- Spot level ×120.12
- Bottom/top of bank
- Fenceline
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- Tank excavation (see note 4)
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- Manhole (see note 10)
- Stockpile (extents)
- Services - Telecommunications

Notes:

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OSGB36(15)	Grid	Leica SmartNet	Site

Rev	Date	Amendment	Drawn	Checked

Urban Regen
ESTABLISHED 2001

Client: Dorchester Homes

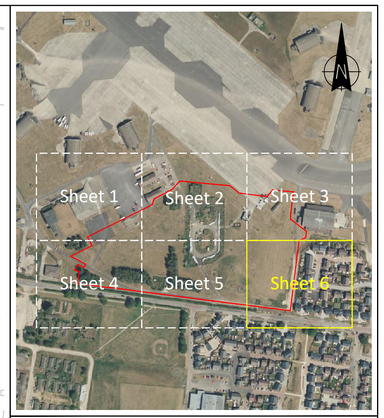
Project: Upper Heyford (Phase 10)

Title: As built topographic survey and constraints (Sheet 5 of 6)

Scale:	First Issue:	Drawn:	Checked:
1:250 @A1	18th April 2023	D.J.Woodrow	B.Carter

Drawing No: 372-22-001-05

Revision:



Sheet Plan Scale 1:5000

Notes:

Site boundary	
Phase boundary	
Approximate extent of remediation works	
Contour (0.25m interval)	
Spot level	×120.12
Bottom/top of bank	
Fenceline	
Historic building footprints (see note 2)	
Tank excavation (see note 4)	
Contamination excavation (see notes 6, 7, and 8)	
Buried asbestos impacted soils >2m bgl (see note 6)	
Manhole (see note 10)	
Stockpile (extents)	
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OSGB36(15)	Grid	Leica SmartNet	Site

Rev	Date	Amendment	Drawn	Checked

Urban Regen
ESTABLISHED 2001

Client:
Dorchester Homes

Project:
Upper Heyford (Phase 10)

Title:
As built topographic survey and constraints (Sheet 6 of 6)

Scale:	First Issue:	Drawn:	Checked:
1:250 @A1	18th April 2023	D.J.Woodrow	B.Carter

Drawing No: 372-22-001-06

Revision:

REVISION/S:

A. 2022-11-03. Planning Layout revised to comments received from the LPA and Client. PVA
B. 2022-11-30. Material of private drives revised. SO
C. 2022-12-14. Plots 9-20 Repositioned and Plots 50-53, 86-93 and 97-104 moved south. JB/DGK
D. 2023-01-09. Updated in response to LA comments. DJE

Housetypes	No. Of Storeys	No. Of Beds	No. Of Units
OPEN MARKET UNITS			
SP1-V2	2.5 Storey	4 Bed house	4
SP6	3 Storey	5 Bed house	7
TOTAL OPEN MARKET UNITS			11
PRS			
2B.T1	2 Storey	2 Bed house	30
3B.T1	2 Storey	3 Bed house	44
3B.T3	2 Storey	3 Bed house	16
4B.T1	2 Storey	4 Bed house	10
TOTAL PRS UNITS			100
AFFORDABLE HOUSING UNITS - SOCIAL RENTED			
1BF1	3 Storey	1 Bed flat	2
2B3P	3 Storey	2 Bed maisonettte	4
AF2	2 Storey	2 Bed house	7
AF3	2 Storey	3 Bed house	4
AF4	2 Storey	4 Bed house	1
TOTAL RENTED UNITS			18
AFFORDABLE HOUSING UNITS - INTERMEDIATE			
1BF2	3 Storey	1 Bed flat	3
2BF	3 Storey	2 Bed house	3
AF3	2 Storey	3 Bed house	3
TOTAL INTERMEDIATE UNITS			9
TOTAL AFFORDABLE UNITS			27
OVERALL TOTAL UNITS			138

HEYFORD PARK, UPPER HEYFORD

PLANNING LAYOUT

DATE : MARCH 2022
DRAWN : DJE
CHECKED : DRB

DRAWING TITLE : PLANNING LAYOUT
DRAWING NO : 0521-PH10-102

SCALE : 1:500 @ A0

The Distillery, The Old Brewery Office Park, 7 - 11 Lodway, Pill, Bristol BS20 0DH
T. 01275 813380 E:admin@focusdp.com
www.focusdp.com

APPENDIX A

Site Photographs

1.

18.10.22 – View southeast across central / southern parts of site; topsoil strip completed in these areas prior to arrival.

2.

18.10.22 – View northeast across central / north-eastern parts of site; topsoil strip completed in these areas prior to arrival.

3.

18.10.22 – View north across north / north-western part of site; stockpiles of site-recovered topsoil located offsite to north (TS-SP2) and northwest (TS-SP1) of site.

4.

18.10.22 – Final vegetation / topsoil strip being carried out in northwest corner of site.

5.

18.10.22 – Topsoil stockpile (TS-SP1) located offsite to northwest within wider Phase 10 development area.

6.

18.10.22 – Stockpiles of recovered hardstanding in northern part of site.

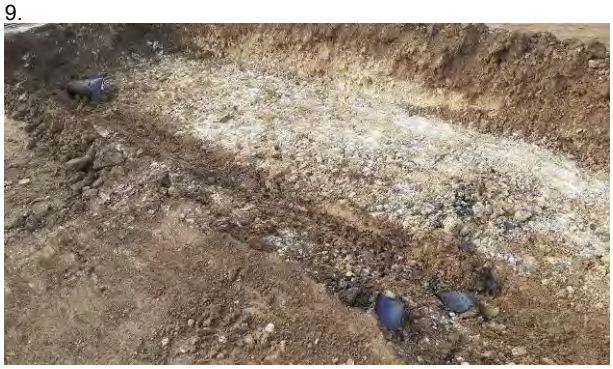
7.

25.10.22 – Exposure of relict POL pipeline crossing central / northern parts of site traversing from southwest to northeast.

8.

25.10.22 – Breakout of western section of relict POL pipeline.

9.



25.10.22 – No contamination indicators in soils underlying western section of relict POL pipeline (1/2).

10.

25.10.22 – No contamination indicators in soils underlying western section of relict POL pipeline (2/2).

11.

25.10.22 – Continued exposure of relict POL pipeline crossing central / northern parts of site.

12.

25.10.22 – Breakout of central / eastern sections of relict POL pipeline.

13.

25.10.22 – No contamination indicators in soils underlying central section of relict POL pipeline.

14.

25.10.22 – No contamination indicators in soils underlying eastern section of relict POL pipeline.

15.

09.11.22 – Earthworks complete: view southeast across south of site.

16.

09.11.22 – Earthworks complete: view east across centre of site.

17.

09.11.22 – Earthworks complete: view north across north of site; stockpiles of hardstanding previously located in north of site relocated to wider Phase 10 development area.

18.

17.11.22 – Example vapour probe / diffusion tube installation (VP1)

19.

01.12.22 – Topsoil stockpile (TS-SP3)

20.

19.01.22 – ACM pipeline excavation (south).

21.  19.01.22 – ACM pipeline excavation (centre).	22.  19.01.22 – ACM pipeline excavation (north).

APPENDIX B

Formation Validation Photographic Record

1.

25.10.22 – Formation Validation: S1

2.

25.10.22 – Formation Validation: S2

3.

25.10.22 – Formation Validation: S3

4.

25.10.22 – Formation Validation: S4

5.

25.10.22 – Formation Validation: S5

6.

25.10.22 – Formation Validation: S6

7.

25.10.22 – Formation Validation: S7

8.

25.10.22 – Formation Validation: S8

9.

25.10.22 – Formation Validation: S9

10.

25.10.22 – Formation Validation: S10

11.

25.10.22 – Formation Validation: S11

12.

25.10.22 – Formation Validation: S12

13.

25.10.22 – Formation Validation: S13

14.

25.10.22 – Formation Validation: S14

APPENDIX C

Laboratory Certificates

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	22-40689-1
Initial Date of Issue:	07-Nov-2022
Client	Smith Grant LLP
Client Address:	Bryn Estyn Business Centre Bryn Estyn Road Wrexham LL13 9TY
Contact(s):	Dan Wayland
Project	R17426 Heyford - PH10

Quotation No.:		**Date Received:**	24-Oct-2022
Order No.:		**Date Instructed:**	24-Oct-2022
No. of Samples:	10		
Turnaround (Wkdays):	5	**Results Due:**	28-Oct-2022
Date Approved:	07-Nov-2022		

Approved By:

[redacted]

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: R17426 Heyford - PH10

Client: Smith Grant LLP		**Chemtest Job No.:**			22-40689	22-40689	22-40689	22-40689	22-40689	22-40689	22-40689	22-40689	22-40689
Quotation No.:		**Chemtest Sample ID.:**			1531139	1531140	1531141	1531142	1531143	1531144	1531145	1531146	1531147
		Sample Location:			PH10-TS1-S1	PH10-TS1-S2	PH10-TS1-S3	PH10-TS1-S4	PH10-TS1-S5	PH10-TS1-S6	PH10-TS2-S1	PH10-TS2-S2	PH10-TS3-S3
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	12	14	14	16	14	14	8.7	11	11
pH	U	2010		4.0	7.7	7.8	7.7	7.8	7.8	7.7	7.7	7.7	7.7
Arsenic	U	2455	mg/kg	0.5	11	9.1	13	10	13	11	8.4	7.6	11
Cadmium	U	2455	mg/kg	0.10	0.13	0.12	0.17	0.12	0.16	0.15	0.21	0.73	0.18
Chromium	U	2455	mg/kg	0.5	15	14	18	15	21	16	11	11	16
Copper	U	2455	mg/kg	0.50	7.1	6.6	8.4	6.4	8.5	7.6	6.3	7.0	9.3
Mercury	U	2455	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	11	9.7	14	10	13	12	8.2	8.4	13
Lead	U	2455	mg/kg	0.50	14	12	16	13	17	15	15	19	65
Selenium	U	2455	mg/kg	0.25	0.50	0.42	0.61	0.46	0.63	0.53	0.45	0.39	0.72
Vanadium	U	2455	mg/kg	0.5	29	25	35	30	37	31	21	21	31
Zinc	U	2455	mg/kg	0.50	33	31	39	36	45	42	44	86	45
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	5.0	4.9	5.5	4.8	5.0	5.3	5.1	7.5	6.6
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: R17426 Heyford - PH10

Client: Smith Grant LLP			**Chemtest Job No.:**		22-40689	22-40689	22-40689	22-40689	22-40689	22-40689	22-40689	22-40689	22-40689
Quotation No.:			**Chemtest Sample ID.:**		1531139	1531140	1531141	1531142	1531143	1531144	1531145	1531146	1531147
			Sample Location:		PH10-TS1-S1	PH10-TS1-S2	PH10-TS1-S3	PH10-TS1-S4	PH10-TS1-S5	PH10-TS1-S6	PH10-TS2-S1	PH10-TS2-S2	PH10-TS3-S3
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Date Sampled:		18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022	18-Oct-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.85	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.24	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	0.26	0.55	< 0.10	0.19	0.58	0.32	1.1	2.3	0.19
Pyrene	U	2700	mg/kg	0.10	0.30	0.53	< 0.10	0.32	0.71	0.37	1.2	2.3	0.29
Benzo[a]anthracene	U	2700	mg/kg	0.10	0.39	0.43	< 0.10	0.40	0.41	< 0.10	0.73	0.81	< 0.10
Chrysene	U	2700	mg/kg	0.10	0.29	0.51	< 0.10	0.24	0.47	< 0.10	1.1	0.87	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	0.41	< 0.10	< 0.10	0.55	< 0.10	1.1	1.7	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	0.32	< 0.10	< 0.10	0.39	< 0.10	0.66	0.77	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	0.34	< 0.10	< 0.10	0.43	< 0.10	0.97	1.4	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.87	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.41	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.0	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	3.1	< 2.0	< 2.0	3.5	< 2.0	6.9	14	< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: R17426 Heyford - PH10

Client: Smith Grant LLP			**Chemtest Job No.:**		22-40689
Quotation No.:			**Chemtest Sample ID.:**		1531148
			Sample Location:		PH10-TS4-S4
			Sample Type:		SOIL
			Date Sampled:		18-Oct-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	11
pH	U	2010		4.0	7.7
Arsenic	U	2455	mg/kg	0.5	12
Cadmium	U	2455	mg/kg	0.10	0.18
Chromium	U	2455	mg/kg	0.5	13
Copper	U	2455	mg/kg	0.50	6.9
Mercury	U	2455	mg/kg	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	9.4
Lead	U	2455	mg/kg	0.50	16
Selenium	U	2455	mg/kg	0.25	0.50
Vanadium	U	2455	mg/kg	0.5	23
Zinc	U	2455	mg/kg	0.50	49
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	6.8
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10

Results - Soil

Project: R17426 Heyford - PH10

Client: Smith Grant LLP			**Chemtest Job No.:**		22-40689
Quotation No.:			**Chemtest Sample ID.:**		1531148
			Sample Location:		PH10-TS4-S4
			Sample Type:		SOIL
			Date Sampled:		18-Oct-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Phenanthrene	U	2700	mg/kg	0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	< 0.10
Pyrene	U	2700	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	22-41389-1		
Initial Date of Issue:	07-Nov-2022		
Client	Smith Grant LLP		
Client Address:	Bryn Estyn Business Centre Bryn Estyn Road Wrexham LL13 9TY		
Contact(s):	Scott Miller		
Project	R1742b Heyford (Dorchester)		
Quotation No.:	Q15-02887	**Date Received:**	28-Oct-2022
Order No.:		**Date Instructed:**	28-Oct-2022
No. of Samples:	18		
Turnaround (Wkdays):	5	**Results Due:**	03-Nov-2022
Date Approved:	07-Nov-2022		
Approved By:	[redacted]		
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: R1742b Heyford (Dorchester)

Client: Smith Grant LLP		**Chemtest Job No.:**			22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389
Quotation No.: Q15-02887		**Chemtest Sample ID.:**			1534351	1534352	1534353	1534354	1534355	1534356	1534357	1534358	1534359
		Sample Location:			PH10-S1	PH10-S2	PH10-S3	PH10-S4	PH10-S5	PH10-S6	PH10-S7	PH10-S8	PH10-S9
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	15	12	8.4	14	13	14	15	8.9
pH	U	2010		4.0	8.6	8.5	8.7	8.7	8.4	8.5	8.6	8.7	8.7
Arsenic	U	2455	mg/kg	0.5	7.1	8.5	10	11	18	10	8.6	11	8.0
Cadmium	U	2455	mg/kg	0.10	< 0.10	< 0.10	0.12	< 0.10	0.35	0.11	0.10	0.25	0.10
Chromium	U	2455	mg/kg	0.5	11	11	16	16	28	15	12	17	12
Copper	U	2455	mg/kg	0.50	5.4	5.7	7.3	7.5	14	8.1	6.5	9.8	5.6
Mercury	U	2455	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	8.5	9.2	13	15	24	13	9.9	14	9.7
Lead	U	2455	mg/kg	0.50	10	11	14	9.6	20	16	11	18	9.5
Selenium	U	2455	mg/kg	0.25	0.31	0.32	0.43	0.39	0.92	0.45	0.38	0.63	0.49
Vanadium	U	2455	mg/kg	0.5	19	21	28	28	47	29	23	32	23
Zinc	U	2455	mg/kg	0.50	31	27	30	30	62	34	27	34	22
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	5.3	3.0	2.8	1.0	2.2	2.9	3.3	1.7	2.0
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: R1742b Heyford (Dorchester)

Client: Smith Grant LLP			**Chemtest Job No.:**		22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389
Quotation No.: Q15-02887			**Chemtest Sample ID.:**		1534351	1534352	1534353	1534354	1534355	1534356	1534357	1534358	1534359
			Sample Location:		PH10-S1	PH10-S2	PH10-S3	PH10-S4	PH10-S5	PH10-S6	PH10-S7	PH10-S8	PH10-S9
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Date Sampled:		25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	0.55	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	0.17	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	1.2	0.92	0.33	< 0.10	0.44	< 0.10	0.35	< 0.10	< 0.10
Pyrene	U	2700	mg/kg	0.10	1.3	1.1	0.38	< 0.10	0.49	< 0.10	0.48	< 0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	0.57	0.34	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	1.0	0.61	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	1.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	0.61	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	0.74	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	7.2	3.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: R1742b Heyford (Dorchester)

Client: Smith Grant LLP		**Chemtest Job No.:**			22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389
Quotation No.: Q15-02887		**Chemtest Sample ID.:**			1534360	1534361	1534362	1534363	1534364	1534365	1534366	1534367	1534368
		Sample Location:			PH10-S10	PH10-S11	PH10-S12	PH10-S13	PH10-S14	PH9-Agg-4-S1	PH9-Agg-4-S2	PH9-DH-Agg-S1	PH9-DH-Agg-S2
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	8.4	11	9.5	12	12				
pH	U	2010		4.0	8.8	8.8	8.7	8.8	8.8				
Arsenic	U	2455	mg/kg	0.5	14	12	13	6.8	9.0				
Cadmium	U	2455	mg/kg	0.10	0.11	< 0.10	0.11	< 0.10	0.16				
Chromium	U	2455	mg/kg	0.5	18	14	16	9.5	11				
Copper	U	2455	mg/kg	0.50	8.1	6.8	7.2	4.3	5.7				
Mercury	U	2455	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05				
Nickel	U	2455	mg/kg	0.50	14	12	13	7.6	9.3				
Lead	U	2455	mg/kg	0.50	13	8.1	11	8.6	13				
Selenium	U	2455	mg/kg	0.25	0.61	0.46	0.48	0.31	0.38				
Vanadium	U	2455	mg/kg	0.5	38	30	31	19	20				
Zinc	U	2455	mg/kg	0.50	31	24	27	17	23				
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50				
Organic Matter	U	2625	%	0.40	2.1	1.6	3.0	2.2	1.9				
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0				
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0				
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10				
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				

Results - Soil

Project: R1742b Heyford (Dorchester)

Client: Smith Grant LLP		Chemtest Job No.:			22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389	22-41389
Quotation No.: Q15-02887		Chemtest Sample ID.:			1534360	1534361	1534362	1534363	1534364	1534365	1534366	1534367	1534368
		Sample Location:			PH10-S10	PH10-S11	PH10-S12	PH10-S13	PH10-S14	PH9-Agg-4-S1	PH9-Agg-4-S2	PH9-DH-Agg-S1	PH9-DH-Agg-S2
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022	25-Oct-2022
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.40	0.40				
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.50	0.50				
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.29				
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.51				
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10				
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0				
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	22-43692-1
Initial Date of Issue:	12-Dec-2022
Client	Smith Grant LLP
Client Address:	Bryn Estyn Business Centre Bryn Estyn Road Wrexham LL13 9TY
Contact(s):	Dan Wayland
Project	R1742b Heyford Park - Phase 10

Quotation No.:		**Date Received:**	14-Nov-2022
Order No.:		**Date Instructed:**	14-Nov-2022
No. of Samples:	9		
Turnaround (Wkdays):	10	**Results Due:**	25-Nov-2022
Date Approved:	12-Dec-2022		

Approved By:

[redacted]

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: R1742b Heyford Park - Phase 10

Client: Smith Grant LLP		Chemtest Job No.:			22-43692	22-43692	22-43692	22-43692	22-43692	22-43692	22-43692	22-43692	22-43692
Quotation No.:		Chemtest Sample ID.:			1544902	1544903	1544904	1544905	1544906	1544907	1544908	1544909	1544910
		Sample Location:			POL21-Soil-S1	POL21-Soil-S2	POL21-Soil-S3	POL21-Soil-S4	PH10-TS-SP2-S5	PH10-TS-SP2-S6	PH10-TS-SP2-S7	PH10-TS-SP2-S8	PH10-TS-SP2-S9
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022
		Asbestos Lab:			IN-TRAN-D								
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Moisture	N	2030	%	0.020	11	13	13	12	19	20	20	21	21
Aliphatic VPH >C5-C6	U	2780	µg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05					
Aliphatic VPH >C6-C7	U	2780	µg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05					
Aliphatic VPH >C7-C8	U	2780	µg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05					
Aliphatic VPH >C8-C10	U	2780	µg/kg	0.05	< 0.05	< 0.05	0.43	0.16					
Total Aliphatic VPH >C5-C10	U	2780	µg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25					
Aromatic VPH >C5-C7	U	2780	µg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05					
Aromatic VPH >C7-C8	U	2780	µg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05					
Aromatic VPH >C8-C10	U	2780	µg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05					
Total Aromatic VPH >C5-C10	U	2780	µg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25					
Total VPH >C5-C10	U	2780	µg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50					
Aliphatic EPH >C10-C12	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0					
Aliphatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0					
Aliphatic EPH >C16-C21	U	2690	mg/kg	2.00	< 2.0	2.9	< 2.0	< 2.0					
Aliphatic EPH >C21-C35	U	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0	< 3.0					
Aliphatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0					
Total Aliphatic EPH >C10-C35	U	2690	mg/kg	5.00	< 5.0	8.0	6.7	< 5.0					
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0					
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0					
Aromatic EPH >C16-C21	N	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	2.7					
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0					
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0					
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0	< 5.0					
Total EPH >C10-C35	U	2690	mg/kg	10.00	< 10	< 10	< 10	< 10					
Naphthalene	U	2700	mg/kg	0.10					< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10					< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10					< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10					< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10					< 0.10	0.26	0.23	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10					< 0.10	0.15	0.14	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10					0.48	1.2	0.72	0.60	0.34
Pyrene	U	2700	mg/kg	0.10					0.58	1.1	0.80	0.66	0.44
Benzo[a]anthracene	U	2700	mg/kg	0.10					0.22	0.68	0.34	0.25	0.14
Chrysene	U	2700	mg/kg	0.10					0.40	0.91	0.61	0.47	0.40
Benzo[b]fluoranthene	U	2700	mg/kg	0.10					0.37	0.94	0.65	0.51	0.48
Benzo[k]fluoranthene	U	2700	mg/kg	0.10					0.14	0.35	0.28	0.20	0.17
Benzo[a]pyrene	U	2700	mg/kg	0.10					0.54	1.1	0.78	0.63	0.26
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10					< 0.10	0.55	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10					< 0.10	0.23	< 0.10	< 0.10	< 0.10

Results - Soil

Project: R1742b Heyford Park - Phase 10

Client: Smith Grant LLP		**Chemtest Job No.:**			22-43692	22-43692	22-43692	22-43692	22-43692	22-43692	22-43692	22-43692	22-43692
Quotation No.:		**Chemtest Sample ID.:**			1544902	1544903	1544904	1544905	1544906	1544907	1544908	1544909	1544910
		Sample Location:			POL21-Soil-S1	POL21-Soil-S2	POL21-Soil-S3	POL21-Soil-S4	PH10-TS-SP2-S5	PH10-TS-SP2-S6	PH10-TS-SP2-S7	PH10-TS-SP2-S8	PH10-TS-SP2-S9
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022
		Asbestos Lab:			IN-TRAN-D								
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10					< 0.10	0.51	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0					2.7	8.0	4.6	3.3	2.2
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0					
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0					
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0					
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0					
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0					

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C44 Aromatics: >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21–C35, >C35– C44	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10 Aromatics: >C5–C6, >C6–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection

Report Information

Key

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SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Amended Report

Report No.:	22-46599-2		
Initial Date of Issue:	19-Jan-2023	**Date of Re-Issue:**	20-Jan-2023
Client	Smith Grant LLP		
Client Address:	Bryn Estyn Business Centre Bryn Estyn Road Wrexham LL13 9TY		
Contact(s):	Scott Miller		
Project	R1742b Heyford (Dorchester URL)		
Quotation No.:	Q15-02887	**Date Received:**	05-Dec-2022
Order No.:		**Date Instructed:**	05-Dec-2022
No. of Samples:	10		
Turnaround (Wkdays):	10	**Results Due:**	16-Dec-2022
Date Approved:	20-Jan-2023		
Approved By:	[redacted]		
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP		Chemtest Job No.:			22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599
Quotation No.: Q15-02887		Chemtest Sample ID.:			1558208	1558209	1558210	1558211	1558212	1558213	1558214	1558215	1558216
		Sample Location:			POL21b-V1	POL21b-V2	POL21b-V3	POL21b-V4	POL21b-V5	POL21b-V6	POL21b-V7	PH10-TSSP3-ES1	PH10-TSSP3-ES2
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0	0	0	0	0	0	0		
		Bottom Depth (m):			2.2	2.2	2.2	2.2	2.2	2.2	2.2		
		Date Sampled:			01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
		Asbestos Lab:										DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A								-	-
Asbestos Identification	U	2192		N/A								No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	13	15	15	15	13	15	19	21
pH	U	2010		4.0								7.9	8.1
Arsenic	U	2455	mg/kg	0.5								20	12
Cadmium	U	2455	mg/kg	0.10								0.61	0.41
Chromium	U	2455	mg/kg	0.5								25	18
Copper	U	2455	mg/kg	0.50								39	18
Mercury	U	2455	mg/kg	0.05								0.06	0.08
Nickel	U	2455	mg/kg	0.50								23	14
Lead	U	2455	mg/kg	0.50								40	31
Selenium	U	2455	mg/kg	0.25								0.88	0.61
Vanadium	U	2455	mg/kg	0.5								46	32
Zinc	U	2455	mg/kg	0.50								180	150
Chromium (Hexavalent)	N	2490	mg/kg	0.50								< 0.50	< 0.50
Aliphatic VPH >C5-C6	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aliphatic VPH >C6-C7	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aliphatic VPH >C7-C8	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aliphatic VPH >C8-C10	N	2780	mg/kg	0.05	< 0.05	0.20	0.20	< 0.05	0.52	2.5	0.11		
Total Aliphatic VPH >C5-C10	N	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	0.52	2.5	< 0.25		
Aliphatic EPH >C10-C12	N	2690	mg/kg	2.00	< 2.0	< 2.0	290	< 2.0	9.7	11	7.0		
Aliphatic EPH >C12-C16	N	2690	mg/kg	1.00	< 1.0	< 1.0	98	2.4	8.7	6.9	3.8		
Aliphatic EPH >C16-C21	N	2690	mg/kg	2.00	2.0	< 2.0	5.7	< 2.0	6.8	2.2	5.6		
Aliphatic EPH >C21-C35	N	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	4.3		
Aliphatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Total Aliphatic EPH >C10-C35	N	2690	mg/kg	5.00	< 5.0	< 5.0	400	< 5.0	25	21	21		
Aromatic VPH >C5-C7	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aromatic VPH >C7-C8	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Aromatic VPH >C8-C10	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Total Aromatic VPH >C5-C10	N	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25		
Aromatic EPH >C10-C12	N	2690	mg/kg	1.00	< 1.0	< 1.0	50	< 1.0	< 1.0	< 1.0	< 1.0		
Aromatic EPH >C12-C16	N	2690	mg/kg	1.00	< 1.0	< 1.0	27	< 1.0	< 1.0	< 1.0	< 1.0		
Aromatic EPH >C16-C21	N	2690	mg/kg	2.00	2.3	2.4	2.2	2.6	3.0	3.2	3.5		
Aromatic EPH >C21-C35	N	2690	mg/kg	2.00	9.6	< 2.0	6.1	4.3	3.7	7.5	4.6		
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Total Aromatic EPH >C10-C35	N	2690	mg/kg	5.00	12	< 5.0	85	7.1	7.3	12	8.9		

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP			**Chemtest Job No.:**		22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599
Quotation No.: Q15-02887			**Chemtest Sample ID.:**		1558208	1558209	1558210	1558211	1558212	1558213	1558214	1558215	1558216
			Sample Location:		POL21b-V1	POL21b-V2	POL21b-V3	POL21b-V4	POL21b-V5	POL21b-V6	POL21b-V7	PH10-TSSP3-ES1	PH10-TSSP3-ES2
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0	0	0	0	0	0	0		
			Bottom Depth (m):		2.2	2.2	2.2	2.2	2.2	2.2	2.2		
			Date Sampled:		01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
			Asbestos Lab:									DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Total VPH >C5-C10	N	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.52	2.5	< 0.50		
Total EPH >C10-C35	N	2690	mg/kg	10.00	16	< 10	480	11	33	33	30		
Organic Matter	U	2625	%	0.40								5.2	5.9
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0								< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0								< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0								< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0								< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0								< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0								< 10	< 10
Naphthalene	U	2700	mg/kg	0.10								< 0.10	0.38
Acenaphthylene	U	2700	mg/kg	0.10								< 0.10	0.29
Acenaphthene	U	2700	mg/kg	0.10								< 0.10	2.3
Fluorene	U	2700	mg/kg	0.10								< 0.10	1.9
Phenanthrene	U	2700	mg/kg	0.10								0.32	21
Anthracene	U	2700	mg/kg	0.10								0.14	5.9
Fluoranthene	U	2700	mg/kg	0.10								1.0	24
Pyrene	U	2700	mg/kg	0.10								1.1	23
Benzo[a]anthracene	U	2700	mg/kg	0.10								0.40	8.8
Chrysene	U	2700	mg/kg	0.10								1.0	10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10								1.1	10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10								0.36	4.1
Benzo[a]pyrene	U	2700	mg/kg	0.10								0.90	8.6
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10								0.53	5.3
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10								0.12	1.4

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP		**Chemtest Job No.:**			22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599	22-46599
Quotation No.: Q15-02887		**Chemtest Sample ID.:**			1558208	1558209	1558210	1558211	1558212	1558213	1558214	1558215	1558216
		Sample Location:			POL21b-V1	POL21b-V2	POL21b-V3	POL21b-V4	POL21b-V5	POL21b-V6	POL21b-V7	PH10-TSSP3-ES1	PH10-TSSP3-ES2
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0	0	0	0	0	0	0		
		Bottom Depth (m):			2.2	2.2	2.2	2.2	2.2	2.2	2.2		
		Date Sampled:			01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
		Asbestos Lab:										DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10								0.69	4.4
Total Of 16 PAH's	U	2700	mg/kg	2.0								7.7	130
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP			**Chemtest Job No.:**		22-46599
Quotation No.: Q15-02887			**Chemtest Sample ID.:**		1558217
			Sample Location:		PH10-TSSP3-ES3
			Sample Type:		SOIL
			Top Depth (m):		
			Bottom Depth (m):		
			Date Sampled:		01-Dec-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	17
pH	U	2010		4.0	8.0
Arsenic	U	2455	mg/kg	0.5	15
Cadmium	U	2455	mg/kg	0.10	0.94
Chromium	U	2455	mg/kg	0.5	17
Copper	U	2455	mg/kg	0.50	180
Mercury	U	2455	mg/kg	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	19
Lead	U	2455	mg/kg	0.50	26
Selenium	U	2455	mg/kg	0.25	0.84
Vanadium	U	2455	mg/kg	0.5	33
Zinc	U	2455	mg/kg	0.50	99
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic VPH >C5-C6	N	2780	mg/kg	0.05	
Aliphatic VPH >C6-C7	N	2780	mg/kg	0.05	
Aliphatic VPH >C7-C8	N	2780	mg/kg	0.05	
Aliphatic VPH >C8-C10	N	2780	mg/kg	0.05	
Total Aliphatic VPH >C5-C10	N	2780	mg/kg	0.25	
Aliphatic EPH >C10-C12	N	2690	mg/kg	2.00	
Aliphatic EPH >C12-C16	N	2690	mg/kg	1.00	
Aliphatic EPH >C16-C21	N	2690	mg/kg	2.00	
Aliphatic EPH >C21-C35	N	2690	mg/kg	3.00	
Aliphatic EPH >C35-C40	N	2690	mg/kg	1.00	
Total Aliphatic EPH >C10-C35	N	2690	mg/kg	5.00	
Aromatic VPH >C5-C7	N	2780	mg/kg	0.05	
Aromatic VPH >C7-C8	N	2780	mg/kg	0.05	
Aromatic VPH >C8-C10	N	2780	mg/kg	0.05	
Total Aromatic VPH >C5-C10	N	2780	mg/kg	0.25	
Aromatic EPH >C10-C12	N	2690	mg/kg	1.00	
Aromatic EPH >C12-C16	N	2690	mg/kg	1.00	
Aromatic EPH >C16-C21	N	2690	mg/kg	2.00	
Aromatic EPH >C21-C35	N	2690	mg/kg	2.00	
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	
Total Aromatic EPH >C10-C35	N	2690	mg/kg	5.00	

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP			**Chemtest Job No.:**		22-46599
Quotation No.: Q15-02887			**Chemtest Sample ID.:**		1558217
			Sample Location:		PH10-TSSP3-ES3
			Sample Type:		SOIL
			Top Depth (m):		
			Bottom Depth (m):		
			Date Sampled:		01-Dec-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Total VPH >C5-C10	N	2780	mg/kg	0.50	
Total EPH >C10-C35	N	2690	mg/kg	10.00	
Organic Matter	U	2625	%	0.40	6.3
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	3.6
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	0.41
Anthracene	U	2700	mg/kg	0.10	0.16
Fluoranthene	U	2700	mg/kg	0.10	1.1
Pyrene	U	2700	mg/kg	0.10	1.2
Benzo[a]anthracene	U	2700	mg/kg	0.10	0.55
Chrysene	U	2700	mg/kg	0.10	1.2
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	0.93
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	0.32
Benzo[a]pyrene	U	2700	mg/kg	0.10	0.76
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP			**Chemtest Job No.:**		22-46599
Quotation No.: Q15-02887			**Chemtest Sample ID.:**		1558217
			Sample Location:		PH10-TSSP3-ES3
			Sample Type:		SOIL
			Top Depth (m):		
			Bottom Depth (m):		
			Date Sampled:		01-Dec-2022
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	6.6
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	23-01971-1
Initial Date of Issue:	31-Jan-2023
Client	Smith Grant LLP
Client Address:	Bryn Estyn Business Centre Bryn Estyn Road Wrexham LL13 9TY
Contact(s):	Scott Miller
Project	R1742b Heyford (Dorchester URL)
Quotation No.:	Q15-02887
Date Received:	23-Jan-2023
Order No.:	
Date Instructed:	23-Jan-2023
No. of Samples:	15
Turnaround (Wkdays):	5
Results Due:	27-Jan-2023
Date Approved:	31-Jan-2023
Approved By:	[redacted]
Details:	Stuart Henderson, Technical Manager

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP		**Chemtest Job No.:**			23-01971	23-01971	23-01971	23-01971	23-01971	23-01971	23-01971	23-01971	23-01971
Quotation No.: Q15-02887		**Chemtest Sample ID.:**			1577764	1577765	1577766	1577767	1577768	1577769	1577770	1577771	1577772
		Client Sample ID.:			ASBPL-SS1	ASBPL-SS2	ASBPL-SS3	ASBPL-SS4	ASBPL-SS5	ASBPL-SS6	ASBPL-SS7	ASBPL-SS8	ASBPL-SS9
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023
		Asbestos Lab:			NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020									
pH	U	2010		4.0									
Arsenic	U	2455	mg/kg	0.5									
Cadmium	U	2455	mg/kg	0.10									
Chromium	U	2455	mg/kg	0.5									
Copper	U	2455	mg/kg	0.50									
Mercury	U	2455	mg/kg	0.05									
Nickel	U	2455	mg/kg	0.50									
Lead	U	2455	mg/kg	0.50									
Selenium	U	2455	mg/kg	0.25									
Vanadium	U	2455	mg/kg	0.5									
Zinc	U	2455	mg/kg	0.50									
Chromium (Hexavalent)	N	2490	mg/kg	0.50									
Organic Matter	U	2625	%	0.40									
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0									
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0									
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0									
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0									
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0									
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0									
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0									
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0									
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0									
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0									
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0									
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0									
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0									
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0									
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0									
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0									
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0									
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0									
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0									
Naphthalene	U	2700	mg/kg	0.10									
Acenaphthylene	U	2700	mg/kg	0.10									
Acenaphthene	U	2700	mg/kg	0.10									
Fluorene	U	2700	mg/kg	0.10									

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP			**Chemtest Job No.:**		23-01971	23-01971	23-01971	23-01971	23-01971	23-01971	23-01971	23-01971	23-01971
Quotation No.: Q15-02887			**Chemtest Sample ID.:**		1577764	1577765	1577766	1577767	1577768	1577769	1577770	1577771	1577772
			Client Sample ID.:		ASBPL-SS1	ASBPL-SS2	ASBPL-SS3	ASBPL-SS4	ASBPL-SS5	ASBPL-SS6	ASBPL-SS7	ASBPL-SS8	ASBPL-SS9
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Date Sampled:		09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Phenanthrene	U	2700	mg/kg	0.10									
Anthracene	U	2700	mg/kg	0.10									
Fluoranthene	U	2700	mg/kg	0.10									
Pyrene	U	2700	mg/kg	0.10									
Benzo[a]anthracene	U	2700	mg/kg	0.10									
Chrysene	U	2700	mg/kg	0.10									
Benzo[b]fluoranthene	U	2700	mg/kg	0.10									
Benzo[k]fluoranthene	U	2700	mg/kg	0.10									
Benzo[a]pyrene	U	2700	mg/kg	0.10									
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10									
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10									
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10									
Total Of 16 PAH's	U	2700	mg/kg	2.0									
Benzene	U	2760	µg/kg	1.0									
Toluene	U	2760	µg/kg	1.0									
Ethylbenzene	U	2760	µg/kg	1.0									
m & p-Xylene	U	2760	µg/kg	1.0									
o-Xylene	U	2760	µg/kg	1.0									

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP		**Chemtest Job No.:**			23-01971	23-01971	23-01971	23-01971	23-01971	23-01971
Quotation No.: Q15-02887		**Chemtest Sample ID.:**			1577773	1577774	1577775	1577776	1577777	1577778
		Client Sample ID.:			ASBPL-SS10	ASBPL-SS11	ASBPL-SS12	JTP8-TS1	JTP8-TS2	JTP8-TS3
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:			09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023
		Asbestos Lab:			NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020				16	18	18
pH	U	2010		4.0				8.1	8.0	8.0
Arsenic	U	2455	mg/kg	0.5				16	18	14
Cadmium	U	2455	mg/kg	0.10				0.29	0.34	0.27
Chromium	U	2455	mg/kg	0.5				24	25	21
Copper	U	2455	mg/kg	0.50				15	17	13
Mercury	U	2455	mg/kg	0.05				0.05	< 0.05	< 0.05
Nickel	U	2455	mg/kg	0.50				19	20	16
Lead	U	2455	mg/kg	0.50				38	39	34
Selenium	U	2455	mg/kg	0.25				0.60	0.73	0.59
Vanadium	U	2455	mg/kg	0.5				46	46	40
Zinc	U	2455	mg/kg	0.50				60	63	52
Chromium (Hexavalent)	N	2490	mg/kg	0.50				< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40				6.2	5.1	5.9
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0				< 10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10

Results - Soil

Project: R1742b Heyford (Dorchester URL)

Client: Smith Grant LLP			**Chemtest Job No.:**		23-01971	23-01971	23-01971	23-01971	23-01971	23-01971
Quotation No.: Q15-02887			**Chemtest Sample ID.:**		1577773	1577774	1577775	1577776	1577777	1577778
			Client Sample ID.:		ASBPL-SS10	ASBPL-SS11	ASBPL-SS12	JTP8-TS1	JTP8-TS2	JTP8-TS3
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Date Sampled:		09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023	09-Jan-2023
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Phenanthrene	U	2700	mg/kg	0.10				2.8	1.5	0.64
Anthracene	U	2700	mg/kg	0.10				0.87	0.42	0.19
Fluoranthene	U	2700	mg/kg	0.10				7.6	3.5	2.2
Pyrene	U	2700	mg/kg	0.10				7.5	3.5	2.3
Benzo[a]anthracene	U	2700	mg/kg	0.10				3.5	1.5	1.2
Chrysene	U	2700	mg/kg	0.10				4.4	2.4	1.9
Benzo[b]fluoranthene	U	2700	mg/kg	0.10				4.7	2.9	2.2
Benzo[k]fluoranthene	U	2700	mg/kg	0.10				1.6	0.90	0.67
Benzo[a]pyrene	U	2700	mg/kg	0.10				3.3	2.0	1.4
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10				2.3	1.4	1.0
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10				0.56	0.39	0.23
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10				1.9	1.3	0.90
Total Of 16 PAH's	U	2700	mg/kg	2.0				41	22	15
Benzene	U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

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tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

2187

LABORATORY ANALYSIS REPORT

Report Number	**Q09891R**
Customer	**Smith Grant LLP**
	Bryn Estyn Business Centre (Suie 16)
	Wrehham
	LL13 9TY
Booking In Reference	**R2985**
Despatch Note Number	**97593**
Date Samples Received	**12/12/2022**
Diffusion Tube Type	**Tenax**
Job Reference	**R1742b**

Quantitative Analysis of BTEX
Identification and estimation of ng on tube in accordance with ISO16000-6

Tube Number	**GRA10600**
Gradko Lab Reference	**04Q1239**
Sample ID	**Blank**

BTEX	**ng on tube**
Benzene	<5
Toluene	<5
Ethylbenzene	<5
m/p-Xylene	<5
o-Xylene	<5

EC5-EC6 Aliphatic Hydrocarbons**	NIST Library Quality Match	**Estimated ng on tube**
Pentane, 2-methyl-	50	6
Pentane, 3-methyl-	86	<5
Hexane	53	<5

EC>6-EC8 Aliphatic Hydrocarbons**	NIST Library Quality Match	**Estimated ng on tube**
Cyclopentane, methyl-	72	<5
Pentane, 2,2-dimethyl-	78	<5

EC>8-EC10 Aliphatic Hydrocarbons**	NIST Library Quality Match	**Estimated ng on tube**
		<5

EC>10-EC12 Aliphatic Hydrocarbons**	NIST Library Quality Match	**Estimated ng on tube**
		<5

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	NIST Library Quality Match	Estimated ng on tube
EC>12-EC16 Aliphatic Hydrocarbons**		<5
EC>16-EC26 Aliphatic Hydrocarbons**		<5
EC5-EC7 Aromatic Hydrocarbons**		(Benzene)
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)
EC>8-EC10 Aromatic Hydrocarbons**		(Ethylbenzene) (m/p-Xylene) (o-Xylene)
EC>10-EC12 Aromatic Hydrocarbons**		<5
EC>12-EC16 Aromatic Hydrocarbons**		<5

Tube Number	**004239**
Gradko Lab Reference	**04Q1240**
Exposure Time (mins)*	**30380**
Sample ID	**External**

BTEX	**ng on tube**	**ppb in air***	**µgm^{-3}***
Benzene	6.2	0.3	0.9
Toluene	<5	<0.2	<0.6
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	<5	<0.1	<0.5
o-Xylene	<5	<0.1	<0.5

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1
EC>6-EC8 Aliphatic Hydrocarbons**		<5	<0.1

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	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
EC>8-EC10 Aliphatic Hydrocarbons**				
Decane	93	<5	<0.1	<0.5
Nonane	83	<5	<0.1	<0.4
EC>10-EC12 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Undecane	94	<5	<0.1	<0.5
Dodecane	95	<5	<0.1	<0.6
EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Tridecane	68	<5	<0.1	<0.6
Tetradecane	95	<5	<0.1	<0.7
EC>16-EC26 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
		<5	<0.1	
EC5-EC7 Aromatic Hydrocarbons**		(Benzene)		
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)		
EC>8-EC10 Aromatic Hydrocarbons**		(Ethylbenzene) (m/p-Xylene) (o-Xylene)		
EC>10-EC12 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
		<5	<0.1	
EC>12-EC16 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
		<5	<0.1	

Tube Number	**006071**
Gradko Lab Reference	**04Q1241**
Exposure Time (mins)*	**30404**
Sample ID	**VP1**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	<5	<0.2	<0.7
Toluene	<5	<0.2	<0.6
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	<5	<0.1	<0.5
o-Xylene	<5	<0.1	<0.5

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	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1	
EC>6-EC8 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Heptane	78	<5	<0.1	<0.3
Cyclohexane, 1,3-dimethyl-, cis-	59	<5	<0.1	<0.4
EC>8-EC10 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Decane	87	21	0.3	1.9
Cyclohexane, 1,3,5-trimethyl-	90	9	0.1	0.7
Octane, 2,6-dimethyl-	91	8	0.1	0.7
Heptane, 2,6-dimethyl-	64	<5	<0.1	<0.4
EC>10-EC12 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Dodecane	64	25	0.4	2.8
Undecane	95	14	0.2	1.5
Undecane, 2-methyl-	80	<5	<0.1	<0.6
EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Tridecane	90	<5	<0.1	<0.6
Pentadecane	86	<5	<0.1	<0.7
Tetradecane	95	<5	<0.1	<0.7
EC>16-EC26 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
		<5	<0.1	
EC5-EC7 Aromatic Hydrocarbons**		(Benzene)		
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)		
EC>8-EC10 Aromatic Hydrocarbons**		(Ethylbenzene) (m/p-Xylene) (o-Xylene)		

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EC>10-EC12 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Benzene, 1,2,4,5-tetramethyl-	38	7	0.1	0.6
Benzene, 1-methyl-3-(1-methylethyl)-	38	7	0.1	0.6
Benzene, 1,2,3,4-tetramethyl-	55	6	0.1	0.6
Benzene, 1-ethyl-2,3-dimethyl-	76	5	0.1	0.5
Benzene, 1,2,3,5-tetramethyl-	93	<5	<0.1	<0.4
Benzene, 1-ethyl-2,4-dimethyl-	38	<5	<0.1	<0.4

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>12-EC16 Aromatic Hydrocarbons**		<5	<0.1

Tube Number	**006020**
Gradko Lab Reference	**04Q1242**
Exposure Time (mins)*	**30403**
Sample ID	**VP2**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	<5	<0.2	<0.7
Toluene	<5	<0.2	<0.6
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	<5	<0.1	<0.5
o-Xylene	<5	<0.1	<0.5

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1

	NIST Library Quality Match	Estimated ng on tube	ppb in air*
EC>6-EC8 Aliphatic Hydrocarbons**		<5	<0.1

EC>8-EC10 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Decane	95	10	0.2	0.9

EC>10-EC12 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Undecane	97	10	0.2	1.0
Dodecane	93	8	0.1	0.9

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EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Tridecane	95	<5	<0.1	<0.6
Tetradecane	96	<5	<0.1	<0.7
Hexadecane	59	<5	<0.1	<0.7

EC>16-EC26 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*
		<5	<0.1

EC5-EC7 Aromatic Hydrocarbons**	(Benzene)

EC>7-EC8 Aromatic Hydrocarbons**	(Toluene)

EC>8-EC10 Aromatic Hydrocarbons**	(Ethylbenzene) (m/p-Xylene) (o-Xylene)

EC>10-EC12 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Benzene, 1,2,3-trimethyl-	76	<5	<0.1	<0.4
Benzene, 1,2,3,5-tetramethyl-	76	<5	<0.1	<0.4
Benzene, 1-ethyl-2,3-dimethyl-	90	<5	<0.1	<0.4
Benzene, 1,2,3,4-tetramethyl-	53	<5	<0.1	<0.4
Benzene, 1-ethyl-2,4-dimethyl-	50	<5	<0.1	<0.4

EC>12-EC16 Aromatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*
		<5	<0.1

Tube Number	**005091**
Gradko Lab Reference	**04Q1243**
Exposure Time (mins)*	**30401**
Sample ID	**VP3**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	<5	<0.2	<0.7
Toluene	7.2	0.2	0.9
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	<5	<0.1	<0.5
o-Xylene	<5	<0.1	<0.5

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	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
EC5-EC6 Aliphatic Hydrocarbons**				
Pentane, 3-methyl-	52	<5	<0.1	<0.3
EC>6-EC8 Aliphatic Hydrocarbons**				
Heptane	87	<5	<0.1	<0.3
EC>8-EC10 Aliphatic Hydrocarbons**				
Decane	96	11	0.2	1.0
EC>10-EC12 Aliphatic Hydrocarbons**				
Undecane	91	9	0.2	1.0
Dodecane	93	<5	<0.1	<0.6
EC>12-EC16 Aliphatic Hydrocarbons**				
Pentadecane	93	<5	<0.1	<0.7
Tetradecane	96	<5	<0.1	<0.7
Tridecane	94	<5	<0.1	<0.6
Hexadecane	87	<5	<0.1	<0.7
	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
EC>16-EC26 Aliphatic Hydrocarbons**		<5	<0.1	
EC5-EC7 Aromatic Hydrocarbons**		(Benzene)		
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)		
	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
EC>8-EC10 Aromatic Hydrocarbons**				
Styrene	94	<5	<0.1	<0.3
		(Ethylbenzene)		
		(m/p-Xylene)		
		(o-Xylene)		
	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
EC>10-EC12 Aromatic Hydrocarbons**				
Benzene, 1,2,3-trimethyl-	64	5	0.1	0.4
Benzene, 1,2,3,5-tetramethyl-	76	<5	<0.1	<0.4
Benzene, 1-ethyl-2,3-dimethyl-	80	<5	<0.1	<0.4
Benzene, 1,2,3,4-tetramethyl-	58	<5	<0.1	<0.4
Benzene, 1-ethyl-2,4-dimethyl-	64	<5	<0.1	<0.4

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	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
EC>12-EC16 Aromatic Hydrocarbons**		<5	<0.1	

Tube Number	**003696**
Gradko Lab Reference	**04Q1244**
Exposure Time (mins)*	**30404**
Sample ID	**VP4**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	<5	<0.2	<0.7
Toluene	<5	<0.2	<0.6
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	<5	<0.1	<0.5
o-Xylene	<5	<0.1	<0.5

	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1	

	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
EC>6-EC8 Aliphatic Hydrocarbons**		<5	<0.1	

EC>8-EC10 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Octane, 2,6-dimethyl-	64	<5	<0.1	<0.5
Octane, 4-methyl-	42	<5	<0.1	<0.4
Cyclohexane, ethyl-	64	<5	<0.1	<0.4

EC>10-EC12 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Undecane	81	5	0.1	0.5
Dodecane	95	5	0.1	0.6

EC>12-EC16 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Tetradecane	97	<5	<0.1	<0.7
Tridecane	95	<5	<0.1	<0.6
Hexadecane	97	<5	<0.1	<0.7

EC>16-EC26 Aliphatic Hydrocarbons**	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
Heptadecane	81	<5	<0.1	<0.8

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EC5-EC7 Aromatic Hydrocarbons**		(Benzene)		
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)		
	NIST Library			
EC>8-EC10 Aromatic Hydrocarbons**	Quality Match	**Estimated ng on tube**	**ppb in air***	**µgm^{-3}***
Benzene, 1,2,4-trimethyl-	97	9	0.2	0.7
Benzene, propyl-	64	<5	<0.1	<0.4
		(Ethylbenzene)		
		(m/p-Xylene)		
		(o-Xylene)		
	NIST Library			
EC>10-EC12 Aromatic Hydrocarbons**	Quality Match	**Estimated ng on tube**	**ppb in air***	**µgm^{-3}***
Benzene, 1,2,3-trimethyl-	81	7	0.1	0.5
Benzene, 1,2,3,5-tetramethyl-	60	<5	<0.1	<0.4
Benzene, 1-ethyl-2,3-dimethyl-	87	<5	<0.1	<0.4
Benzene, 1-ethyl-2,4-dimethyl-	80	<5	<0.1	<0.4
Benzene, 1-methyl-3-propyl-	38	<5	<0.1	<0.4
	NIST Library			
	Quality Match	**Estimated ng on tube**	**ppb in air***	
EC>12-EC16 Aromatic Hydrocarbons**		<5	<0.1	
Tube Number	**005995**			
Gradko Lab Reference	**04Q1245**			
Exposure Time (mins)*	**30398**			
Sample ID	**VP5**			
BTEX		**ng on tube**	**ppb in air***	**µgm^{-3}***
Benzene		<5	<0.2	<0.7
Toluene		<5	<0.2	<0.6
Ethylbenzene		<5	<0.1	<0.5
m/p-Xylene		<5	<0.1	<0.5
o-Xylene		<5	<0.1	<0.5
	NIST Library			
	Quality Match	**Estimated ng on tube**	**ppb in air***	
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1	
	NIST Library			
	Quality Match	**Estimated ng on tube**	**ppb in air***	
EC>6-EC8 Aliphatic Hydrocarbons**		<5	<0.1	

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	NIST Library Quality Match	Estimated ng on tube	ppb in air*	
EC>8-EC10 Aliphatic Hydrocarbons**		<5	<0.1	
EC>10-EC12 Aliphatic Hydrocarbons**		<5	<0.1	
EC>12-EC16 Aliphatic Hydrocarbons**		<5	<0.1	
Pentadecane	59	<5	<0.1	<0.7
Tetradecane	94	<5	<0.1	<0.7
EC>16-EC26 Aliphatic Hydrocarbons**		<5	<0.1	
EC5-EC7 Aromatic Hydrocarbons**		(Benzene)		
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)		
EC>8-EC10 Aromatic Hydrocarbons**		(Ethylbenzene) (m/p-Xylene) (o-Xylene)		
EC>10-EC12 Aromatic Hydrocarbons**		<5	<0.1	
EC>12-EC16 Aromatic Hydrocarbons**		<5	<0.1	

Tube Number	**005140**
Gradko Lab Reference	**04Q1246**
Exposure Time (mins)*	**30394**
Sample ID	**VP6**

BTEX	ng on tube	ppb in air*	µgm^{-3}*
Benzene	<5	<0.2	<0.7
Toluene	<5	<0.2	<0.6
Ethylbenzene	<5	<0.1	<0.5
m/p-Xylene	<5	<0.1	<0.5
o-Xylene	<5	<0.1	<0.5

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	NIST Library Quality Match	Estimated ng on tube	ppb in air*	µgm^{-3}*
EC5-EC6 Aliphatic Hydrocarbons**		<5	<0.1	
EC>6-EC8 Aliphatic Hydrocarbons**		<5	<0.1	
EC>8-EC10 Aliphatic Hydrocarbons**				
Decane	90	<5	<0.1	<0.5
EC>10-EC12 Aliphatic Hydrocarbons**				
Dodecane	96	5	0.1	0.6
Undecane	90	<5	<0.1	<0.5
EC>12-EC16 Aliphatic Hydrocarbons**				
Pentadecane	58	8	0.1	1.2
Tetradecane	95	<5	<0.1	<0.7
Tridecane	94	<5	<0.1	<0.6
Hexadecane	94	<5	<0.1	<0.7
EC>16-EC26 Aliphatic Hydrocarbons**				
Pentacosane	92	8	0.1	1.9
Heptadecane	93	<5	<0.1	<0.8
EC5-EC7 Aromatic Hydrocarbons**		(Benzene)		
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)		
EC>8-EC10 Aromatic Hydrocarbons**		(Ethylbenzene) (m/p-Xylene) (o-Xylene)		
EC>10-EC12 Aromatic Hydrocarbons**				
Benzene, 1,2,3,5-tetramethyl-	41	<5	<0.1	<0.4
EC>12-EC16 Aromatic Hydrocarbons**		<5	<0.1	

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Tube Number	**GRA05998**
Gradko Lab Reference	**13_230104_BLANKTXTA**
Sample ID	**Laboratory Blank**

BTEX	**ng on tube**
Benzene	<5
Toluene	<5
Ethylbenzene	<5
m/p-Xylene	<5
o-Xylene	<5

	NIST Library Quality Match	**Estimated ng on tube**
EC5-EC6 Aliphatic Hydrocarbons**		<5
EC>6-EC8 Aliphatic Hydrocarbons**		<5
EC>8-EC10 Aliphatic Hydrocarbons**		<5
EC>10-EC12 Aliphatic Hydrocarbons**		<5
EC>12-EC16 Aliphatic Hydrocarbons**		<5
EC>16-EC26 Aliphatic Hydrocarbons**		<5
EC5-EC7 Aromatic Hydrocarbons**		(Benzene)
EC>7-EC8 Aromatic Hydrocarbons**		(Toluene)
EC>8-EC10 Aromatic Hydrocarbons**		(Ethylbenzene) (m/p-Xylene) (o-Xylene)
EC>10-EC12 Aromatic Hydrocarbons**		(Naphthalene)

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	NIST Library Quality Match	Estimated ng on tube
EC>12-EC16 Aromatic Hydrocarbons**		<5

Uptake Rates:
Benzene 0.70 ng.ppm^{-1}.min^{-1}.
Toluene 1.03 ng.ppm^{-1}.min^{-1}.
Ethylbenzene 1.46 ng.ppm^{-1}.min^{-1}.
m/p Xylene 1.46 ng.ppm^{-1}.min^{-1}.
o-Xylene 1.46 ng.ppm^{-1}.min^{-1}.
All other compounds: 2.00 ng.ppm^{-1}.min^{-1}.

Results are not Blank corrected.
The laboratory blank is a system check and will not be from the same batch of tubes analysed.

Reporting Limit 5ng on tube
Results reported as <5ng on tube are below the reporting limit.
Estimated results reported as <5ng on tube are below the reporting limit for the non-specific standard toluene.

Uncertainty of Measurement

Benzene	±12%
Toluene	±10%
Ethylbenzene	±12%
m/p-Xylene	±11%
o-Xylene	±11%

The reported expanded uncertainty is based on a standard uncertainty multiplied by a factor of *k*=2, providing a level of confidence of approximately 95%. Uncertainty of measurement has not been applied to the reported results.

Estimated results as ng on tube are calculated by reference to toluene in accordance with ISO 16000-6

Compounds reported may not be the most abundant detected in these samples.
**The classification and grouping of TPH compounds to CWG guidelines is not covered by our UKAS accreditation.

Identification of compounds is carried out by comparison of the mass spectra to the NIST 17 mass spectral library. Compounds with a quality match below 85% are noted as a tentative identity and shown in italics. These compounds are outside of the scope of our UKAS accreditation.

Analysts Name	Mariella Angelova	**Date of Analysis**	04/01/2023
Report Checked By	Katya Paldamova	**Date of Report**	05/01/2023

Analysis has been carried out in accordance with in-house method GLM 13

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APPENDIX D

PAH Ratio Crossplot

Job name	Heyford: Dorchester Phase 10 (East)
Job no.	R1742b
Date:	22.12.22
Author:	SM
Laboratory:	Eurofins Chemtest
Lab. Reference:	22-40689

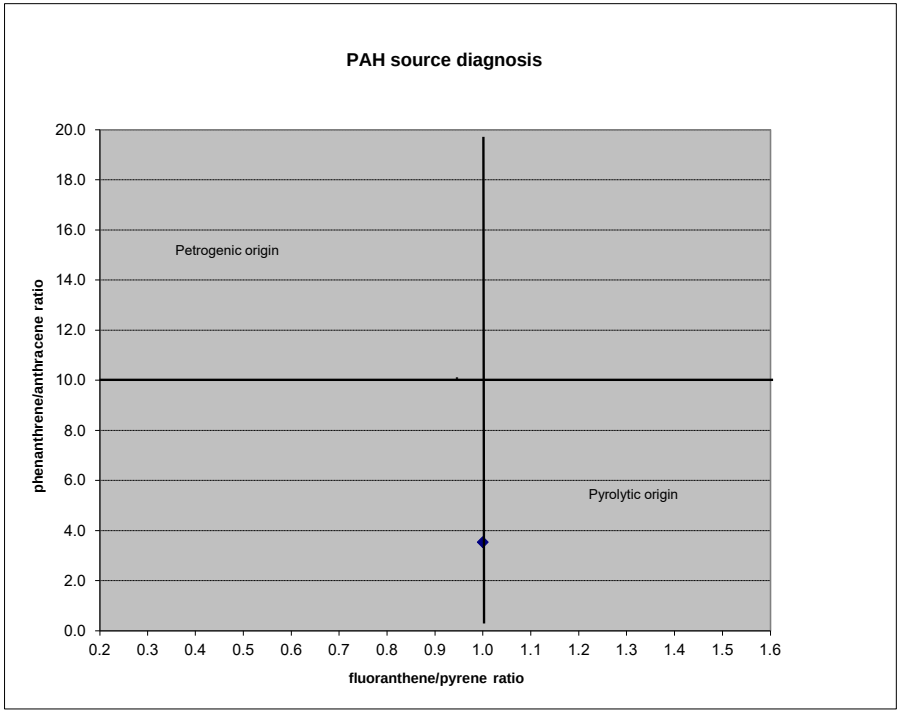
PAH concentrations

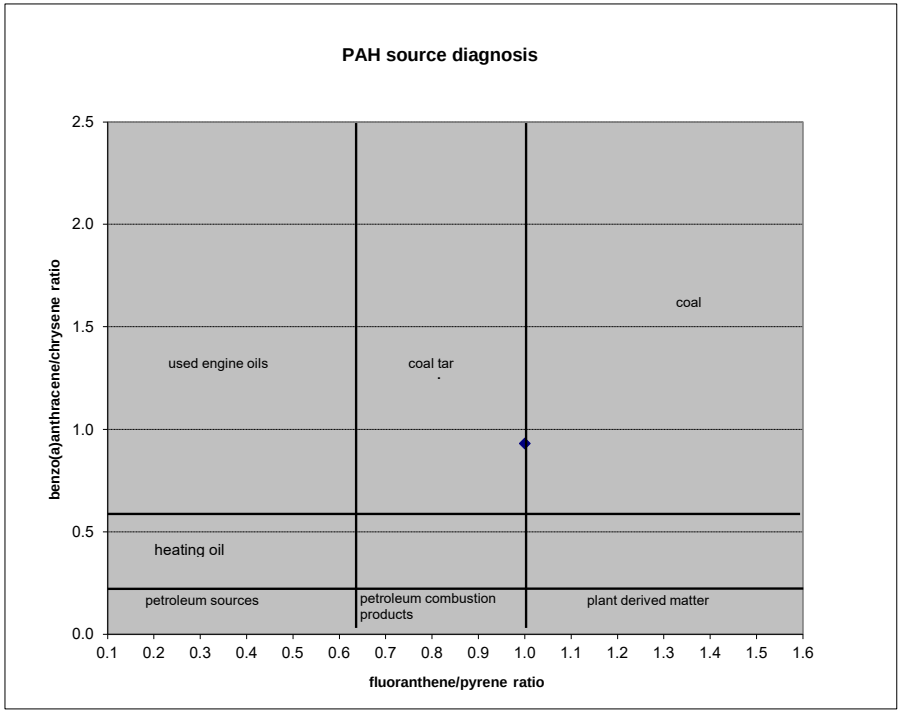
sample identity	PH10-TS2-S2
phenanthrene	0.9
anthracene	0.24
fluoranthene	2.3
pyrene	2.3
benz(a)anthracene	0.8
chrysene	0.9

PAH units	mg/kg

PAH ratios

phe/ant	3.542
flu/pyr	1.000
baa/chr	0.931





Job name	Heyford: Dorchester Phase 10 (East)
Job no.	R1742b
Date:	20.01.23
Author:	SM
Laboratory:	Eurofins Chemtest
Lab. Reference:	22-46599

PAH concentrations

sample identity	PH10-TSSP3-ES2
phenanthrene	21.0
anthracene	5.90
fluoranthene	24.0
pyrene	23.0
benz(a)anthracene	8.8
chrysene	10.0

PAH units	mg/kg

PAH ratios

phe/ant	3.559
flu/pyr	1.043
baa/chr	0.880