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Local Plans team
St Albans City & District Council
Civic Centre
St Peter's Street
St Albans
Hertfordshire, AL1 3JE

8 August 2025
My Ref: 23/315

Dear sir/madam,

RE: ST ALBANS LOCAL PLAN EXAMINATION 2025 – ADDITIONAL DOCUMENTS CONSULTATION
SADC/ED77 – FLOOD RISK ADDENDUM
SITE M20 – LAND AT LOWER LUTON ROAD, HARPENDEN

Thank you for the opportunity to comment on the additional documents published on 4 July 2025. I write in response to the Flood Risk Addendum, ref SADC/ED77, and specifically in relation to groundwater flooding.

As you are aware, DLA Town Planning acts for Jarvis Homes, who are the promoters of Land at Lower Luton Road – proposed housing allocation M20 in the submitted draft Local Plan. Jarvis Homes are working with the landowners to bring forward a residential development on the site and you may have seen the recent pre-application submission we made, seeking the Council's comments on our emerging layout.

Paragraph 3.3.2 of the Council's Strategic Flood Risk Assessment (SFRA) Level 1 addendum published in 2024 highlights that limited information is available on groundwater flooding. The lack of available data means that it is not possible to provide an equivalent level of analysis to that provided for river flooding, for example. While the Council's consultants have done their best to fill the void, Appendix B for the SFRA Level 1 Addendum highlights the caveats that come with their work:

> *"Due to the limitations of this dataset, it could not be used with confidence unless supported by more detailed local studies. The mapping provides an indication of where risk might be higher, but it would not be easy to defend sequential decisions based on the available mapping."* (SFRA Level 1 addendum, Appendix B).

This heightened level of uncertainty is important. It is not appropriate, at this stage, for the Local Plan to specify the impact that groundwater flooding might have on development capacity, given the paucity of information. The estimates of capacity given for each proposed allocation are "indicative", so sufficient flexibility exists to vary capacity at a later stage.

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We therefore object to the proposed reduction in capacity for site M20 from 25 to 12. The data does not support this reduction and is not sufficiently detailed to be reliable.

In contrast, Jarvis Homes are monitoring actual groundwater levels at the site through the installation of boreholes. The initial results are attached at Appendix A to this letter and are summarised by Infrastruct Consulting Civil Engineers. As can be seen, in July 2025 groundwater was encountered at just over 1m below ground level, which contrasts with the modelled results relied upon by the Council of 0 to 0.025m below ground level. We acknowledge these results are only a snapshot and Jarvis Homes will continue to monitor groundwater levels to establish any seasonal variations. However, at this stage, the evidence does not support the proposed reduction in development capacity.

A detailed Flood Risk Assessment will be required with any planning application and this would be the point at which the detailed impact of any groundwater flood risk will become clear. The capacity of the site can be established at that time.

The SFRA Level 2 Addendum sets out a number of potential mitigation measures that should be considered. These are listed below with some initial commentary:

- Raising finished floor levels – as set out in Appendix A, finished floor levels will be higher than surrounding levels.
- Avoiding basements – no basements are proposed or envisaged.
- Potential limitations in the use of infiltration may mean SuDS features need to be larger – Jarvis Homes control a larger area of land beyond the proposed allocation (as set out in our Regulation 19 representations). If groundwater levels mean larger SuDS features are necessary, these can be accommodated elsewhere on the site, outside of the development area.

The proposed policy for site M20 should remain as per the submitted draft Local Plan.

We look forward to discussing this site with the Inspectors at the forthcoming hearing session. If there are any questions in the meantime, please feel free to contact me.

Yours faithfully

[redacted]

Simon Andrews
Strategic Planning Manager

Appendix A – Infrastruct CS Ltd response and Geo-site Assessment (WDE Consulting)

Infrastruct CS Ltd

Consulting Civil Engineers

Infrastruct CS Ltd
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28th July 2025

REF: 6017-LUTO-ICS-CO-C-03.003A

Lower Luton Road, Harpenden AL5 5ES (M20 in Draft Local Plan)

This statement has been prepared by Infrastruct CS Ltd to assist the M20 Land Promoter with the assessment of flood risk from different sources, including fluvial, pluvial and groundwater.

In this capacity, we have already assessed the results of some preliminary intrusive ground investigation carried out by WDE Consulting in May 2025 (Report Ref: 21372R1), and that can be found in Appendix A of this document. In there, groundwater was encountered in three different locations at 1.1m below ground level, far from the 0.025mbgl that the JBA Consulting map indicates.

Further testing was carried out by Lucion Ground Engineering Ltd in July 2025, (Report Ref: 136262), in two locations. In WS01, water rose to 1.05mbgl, approximately at 83.35mAOD. In WS02, water remained at 4.20mbgl, approximately at 83.50mAOD.

Based on these findings we believe a scheme close to the one submitted as part of a recent pre-application (See attached in Appendix B) could be feasible from a flood risk and drainage perspective. Especially if 4 of 5 houses are removed to provide a large above ground SuDs feature, and all finished floor levels are at 85.00mAOD or higher.

Extensive earthworks are necessary to provide accessible gradients to all footpaths and roads, and to maintain or even increase the floodplain volumes to the south, giving further protection to adjoining/neighbouring land. Proposed finished floor levels for all units will be higher than the surrounding levels as well. If our current findings are proven to be consistent in the winter, a scheme of approximately 30 dwellings should be achievable, albeit this may reduce once further data is available.

Yours sincerely

[redacted]

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MEng CEng MICE
DIRECTOR

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[redacted]

A. J. GRIFFITHS
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Appendix A

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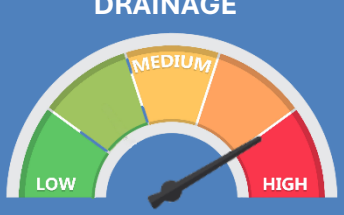
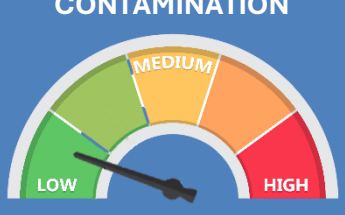
WDE consulting
GROUNDED SOLUTIONS

Geo-Site Assessment
Lower Luton Road
Harpenden
AL5 5AF

Client: Jarvis Strategic Land Ltd

Issue Date: May 2025
Report Ref: 21372R1 (Issue A)





Document verification schedule	
Project Name	Lower Luton Road, Harpenden, AL5 5AF
Document title	Geo-Site Assessment
Document ref	21372R1 (Issue A)
Date of Issue	May 2025
Comments	Issued to client

	Prepared by	Checked by	Quality Check	Approved by
Name	Charlotte Bird	Jason Fitzgerald	Corrienne Ainscough	Simon Ware
Position	Graduate Consultant	Principal Consultant	Business Manager	Managing Director
Date	May 2025	May 2025	May 2025	May 2025

WDE has prepared this report with reasonable skill, care and diligence in accordance with the current guidance and common practice at the time of issue. It represents a limited assessment which may fail to identify potential hazards outside the agreed areas that have been assessed. Groundwater levels are particularly susceptible to variations due to seasonal or other effects and hence any comments relating to groundwater are limited to the dates they were obtained. The subsurface geological profiles and other plots are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths sampled and tested. Interpretation of the results contained within this document are based on the proposed site usage and the findings may not be valid should the proposed land use and/or the regulatory regime/guidance change. The findings and opinions conveyed via this document are based on information obtained from a variety of sources as detailed within this report, which WDE Consulting Limited believes are reliable. Nevertheless, WDE Consulting Limited cannot and does not guarantee the authenticity or reliability of the information it has relied upon. In preparing this report, it has been assumed that all past and present occupants have provided all relevant and other information, especially relating to known or potential hazards.

WDE believes that providing information about limitations is essential to help the client identify and thereby manage their risks. These risks can be mitigated, but they cannot be eliminated, through additional assessments. WDE will on request, advise the client of the additional assessment opportunities available, their impact on risk, and their potential cost benefit. It should be noted that WDE does not provide legal advice, and the advice of lawyers may also be required.

The work is also subject to WDE Consulting's standard terms and conditions.

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Permeability Sheets

1.0 EXECUTIVE SUMMARY

Phase 1 Desk Study	Comments	Risk Rating
Site Setting	Open field used as a garden area and set within curtilage of residential dwelling Forge Cottages	Low
Published Geology and Hydrogeology	• Bedrock geology: Lewes Nodular Chalk Formation and Seaford Chalk Formation (Principal Aquifer, SPZ 3). • Superficial geology: Kesgrave Catchment and Alluvium (Secondary A aquifer)	Moderate
Hydrology/Flood Risk	• River Lea located adjacent S. • High risk of flooding. Flood Zone 2 & 3 • 1no potable abstraction 977m SW	High
Historical land use	Open field since 1879 until c1980 when Forge Cottages shown. Minor alterations until present day. Surface of Water 18th February 1922 on 1922 map.	Low
Landfill/Infilled land	• No landfill within 250m of site • Sand pit c1922 and c1948 onsite • Refuse heap c1922 and c1946 onsite • Gravel pit within 20m of site	Low/moderate
Radon	• Majority of site is within a low risk area (<1%) • NW corner within 3-5% risk area requiring basic protection	Low/moderate
Ground Cavities	• Moderate risk area • Solution pipe x 3 located 313m SW	Moderate
UXO	Moderate risk	Moderate
Phase 2 Intrusive	**Comments**	**Risk Rating**
Proven Ground Conditions	• Topsoil to ~0.20mbgl over gravelly Clay to 1.10mbgl.	
Groundwater/Drainage	• Groundwater encountered at 1.10m bgl. • BRE365 soakage value range of 1.07E-05 to 3.64E-06 m/sec (moderate/poor to poor) within the gravelly clay.	Moderate/High
Conclusions and Recommendations	• Low/moderate risk from contamination for potential future receptors • Report to be forwarded to planning • Preliminary UXO assessment to be undertaken • Radon report undertaken for northwest corner	

2.0 INTRODUCTION

WDE Consulting Limited (WDE) was appointed by Jarvis Strategic Land Ltd (the *client*) to conduct a Geo-Site Assessment at Lower Luton Road, Harpenden, AL5 5AF, What 3 Words ///point.blaze.spoon (Figure 1). The current site comprises an open field within the rear of Forge Cottages, accessed off Crabtree Lane and situated at NGR TL 14920 14908 (Figure 2).

2.1 Context

It is understood that the proposed development comprises the construction of ~22 residential dwellings (Figure 3).

The works have been completed in line with the current regulations, guidance and good practice presented in Appendix A.

2.2 Agreed Scope of Works and Objectives

The scope of work that was agreed with the client is presented in Table 1.

Table 1 – Agreed Scope of Works and Objectives

Item	Scope of Works	Objectives
1	Site walkover	To identify any areas of potential contamination
2	Permeability testing	Investigate the drainage potential of the materials through BRE365 permeability testing.
3	Reporting	• Complete a Phase 1 desk-based study of the site to ascertain information on the site geology, hydrology, and surrounding land uses. • Provide recommendations on drainage potential.

3.0 PHASE 1 DESK STUDY

3.1 Information Sources

The sources of information that were used during the desk study included the following items:

- Site walkover (photos presented in Appendix B)
- Environmental database information (Appendix C)
- Publicly available information

3.2 Site Description and Walkover

The current site comprises an open field used by the landowners as a private garden and measures ~1.2ha measuring ~120m from north to south and ~100m from west to east and is accessed via a gated entrance off Crabtree Lane.

There were no bulk fuel storage tanks identified onsite, nor any signs of staining to the surface resulting from chemical or oil spillages.

3.2.1 Surrounding Area

The site lies within a semi-rural location comprises the following land uses:

- Northern Boundary: Harpenden Arts and Conference Centre and Katherine Warington School
- Southern Boundary: River Lea and residential dwellings
- Eastern Boundary: Open fields
- Western Boundary: Forge Cottages, with commercial land use further to west

3.3 Key Findings of Desk Study

The key findings from the database information pack are presented in Table 2 with the database presented in full in Appendix C.

Table 2 – Key Findings of Desk Study

Item	Details
Published geology	• Bedrock geology – Lewes Nodular Chalk Formation • Superficial geology – Kesgrave Catchment and Alluvium
Geological hazards	• Moderate natural ground subsidence and ground dissolution of soluble rocks • All other geological hazards are low
Ground Cavities	Solution pipe x 3 located 313m SW

Item	Details
Hydrogeology	• Principal Bedrock Aquifer • Secondary A Superficial Aquifer • SPZ Zone 3 • 1no potable abstraction 977m SW
Hydrology/flood risk	• River Lea runs along the southern boundary • Southern half of site situated within Flood Zone 3 (High Risk) • Recorded historical flood events on site from 1947, 1987 and 2007 • High surface/groundwater water flood risk
Current land use on site	Open field used as an priavte garden open space area to Forge Cottages
Current land use within 250m	• Sewage pumping station 6m W • Harpenden Mill Autocare and Garage 100m W • Old Batford Mill 150m W • Harpenden Arts and Conference centre 50m N • Katherine Warington School 120m N • Marquis Lane Allotments 60m SW • River Lea Southern site border • Residential Dwellings 100m S
Historical land use on site	Open field since 1879 until c1980 when Forge Cottages, with minor alterations until present day. The text *Surface of Water 18th February 1922* is present on 1922 map.
Historical land use with 250m	• Residential development is present from c1966 (100m S). • Further residential expansion appears within 100m of site from c1975 Northwest of site along Lower Luton Road. • Batford Mill from c1877 • Allotment gardens appear within 100m Southwest of site from c1992 until present • Sewage outfall within 200m southeast of site appears c1922 remains until 1993 • Sewage works c1877 ~250m south of site, disappears by c1884
Landfills/infilled land	• No historical landfills within 250m of site • Sand pit c1922 and c1948 onsite • Refuse heap c1922 and c1946 onsite • Gravel pit within 20m of site
Identified potential areas of concern	A: Potentially made ground
Pollution incidents	None recorded within 250m
Radon risk	• Less than 1% (Low risk – no protection measures) • Moderate risk (Between 3% and 5%) identified in Northwest corner
UXO risk	Moderate risk area
Environmental Sensitive Land Uses	• London Green Belt On site • Nitrate vulnerable Zone On site – LEE Surface water, Hatfield Groundwater • Priority Habitat Inventory On site – Coastal and floodplain grazing marsh • Batford Springs 153NW of site

3.4 Preliminary Risk Assessment

3.4.1 Identification of Critical Receptors

The identified potentially critical receptors are presented in Table 3.

Table 3 – Identification of Potential Receptors

Receptor Type	Current/Future	Receptor Details	Active
Human Health	Future	Residential receptors onsite	Yes
	Future	Construction workers onsite	Yes
	Current	Residential/commercial receptors offsite	Yes
Controlled waters	Current	Groundwater within aquifer	Yes
	Current	Groundwater within SPZ/licensed abstraction	Yes
	Current	Surface water body	Yes

The risks to onsite workers can be minimised by following appropriate health and safety guidance on site (i.e. wearing protective clothing and washing).

3.4.2 Identification of Potential Areas of Concern

The list of potential areas of concern on site and in the surrounding area are summarised in Table 4.

Table 4 – Identification of Potential Areas of Concern

Ref Area of Concern	Location	Potential Risk	Comments
A	Onsite	Potentially imported made ground	Hydrocarbons (TPH, BTEX, PAH), heavy metals, inorganics, asbestos, cyanide, phenols, ground gas
B	Onsite	Infilled land	

The potential contaminants of PCBs arising from the electricity substation located offsite have been discounted as PCBs are not considered to be sufficiently mobile or soluble[1].

3.4.3 Identified Potential Pathways

Human Health Pathways

The potential human health exposure pathways for a residential receptor are indicated in Table 5.

[1] Department of the Environment, 1996, Industry Profile: Engineering works. P.14 Sect 3.2.1

Table 5 – Identification of Potentially Active Human Health Exposure Pathways

Potential Pathway	Active/ Inactive	Notes
Ingestion of soil and dusts	Active	Qualitative Risk Assessment required.
Dermal contact with soils and dust	Active	Qualitative Risk Assessment required.
Ingestion of home grown produce	Active	Qualitative Risk Assessment required
Inhalation of dusts	Active	Qualitative Risk Assessment required
Inhalation of organic vapours (generated by shallow soils) in external areas or inside buildings	Active	Qualitative Risk Assessment required.
Inhalation of organic vapours generated by dissolved phase groundwater migrating offsite to neighbouring residential properties	Active	Qualitative Risk Assessment required.
Inhalation of organic vapours generated by dissolved phase groundwater migrating onto site from surrounding offsite sources	Active	Qualitative Risk Assessment required.
Contaminants from site entering groundwater and migrating into public water abstraction borehole for human consumption	Inactive	No potable abstractions within 500m. No further assessment necessary.

Controlled Waters Pathways

The potentially active controlled waters migration pathways are indicated in Table 6.

Table 6 – Identification of Potentially Active Controlled Water Pathways

Potential Pathway	Active/ Inactive	Notes
Impacted soils leaching to groundwater within Principal Aquifer	Active	Qualitative Risk Assessment required
Impacted soils leaching to groundwater and migration to surface water	Active	Nearest surface water borders south of site. Qualitative Risk Assessment required.

Ground Gas Pathways

The potential for ground gas risk depends on source-pathway-receptor linkages, with the age of infilling and type of waste as controlling factors. The potentially active migration pathways for ground gas are indicated in Table 7, along with a qualitative risk assessment.

Table 7 – Identification of Potentially Active Ground Gas Pathways

Potential Pathway	Active/ Inactive	Qualitative Risk Assessment	Notes
Potential for natural materials with high organic content, such as peat (>4% TOC)	Inactive	Low	No indicated by geology. No further assessment required.
Availability of readily degradable material, such as vegetable matter and food waste	Inactive	Low	No further assessment required.
Nature of fill material - depth of fill >1m, incohesive materials, poorly compacted and within unsaturated zone.	Active	Low/Moderate	Further assessment required.
Age of Materials - Ground gas generated from current/historical landfills <25yrs old	Inactive	Low	No landfills or mine workings recorded within 250m of site. No further assessment required.
Distance from receptor – a higher distance reduces the potential risk for offsite migration. High risk generally limited to within 100m distance.	Active	Low/Moderate	Commercial and residential receptors within 150m of site.
Presence of Preferential Pathways – fissures/fractures in bedrock or permeable strata beneath an impermeable cover	Active	Low/Moderate	Published bedrock geology is Lewes nodular chalk and Seaford chalk formation beneath Kesgrave catchment and Alluvium.
Chemical storage/spillages with potential for hydrocarbon vapours	Inactive	Low	No further assessment required.
Shallow or deep mine workings	Inactive	Low	No further assessment required.
Radon gas protective measures required	Active	Low/Moderate	<1% (Low risk). Moderate risk (Between 3% and 5%) identified in Northwest Corner. Basic protective measures required.

3.4.4 Qualitative Risk Assessment

A summary of the relevant pollutant linkages based on a source-pathway-receptors analysis is provided in Table 8.

Table 8 – Summary of Potentially Active Source-Pathway-Target Assessment

Sources	Potential Pathway	Potential Receptor	Risk Classification
Onsite Sources (Potentially imported made ground)	Dermal contact, outdoor and indoor inhalation, ingestion, homegrown produce	Human Health (Onsite Residential)	Low/Moderate
	Vapour inhalation from dissolved phase groundwater migrating from site to neighbouring properties	Human Health (Offsite Residential)	Low/Moderate
	Impacted soil leaching to groundwater within Principal Aquifer	Controlled Waters (Groundwater)	Low/Moderate
	Impacted soil leaching to groundwater and migration to surface water	Controlled Waters (Surface water)	Low/Moderate
Offsite Source (Industrial land uses)	Vapour inhalation from dissolved phase migration from offsite sources	Human Health (Onsite residential)	Low
Onsite Sources (Made ground)	Source for ground gas generation	Human Health (Onsite residential)	Low/Moderate
Radon sources	Source for radon gas from natural geology	Human Health (Onsite residential)	Low/moderate

4.0 PHASE II INVESTIGATION WORKS

4.1 Summary Of Works

The intrusive locations are detailed on Figure 4 and comprise the following:

- 4no. Trial Pits (TP1-TP4) were excavated to a maximum depth of 1.10m bgl for soakage testing.

All of the fieldwork was completed under the supervision of a WDE site engineer. Each location was scanned for underground services using a CAT/Genny prior to drilling. Soils were logged to British Standards by the supervising engineer.

4.2 Constraints/Selection of Intrusive Locations

Locations for intrusive investigation were provided by the client. Groundwater seepage encountered in:

- TP1.1 at 1.10m
- TP1.2 at 1.10m bgl
- TP2 1.10m bgl

Trial pits were terminated as soon as groundwater was encountered.

4.3 Field Results

4.3.1 Geology

The typical material/geology that was encountered during the intrusive works is summarised below in Table 9 and presented on the borehole logs in Appendix B.

Table 9 – Summary of Geology Proved Onsite

Units	Description	Min – Max Depth Base (m bgl)	Average Depth (m bgl)	Locations
Topsoil		0.20	0.00 – 0.20	All
Gravelly clay	Firm grey/brown gravelly clay	0.50+ – 1.10+	0.20 – 0.86+	All

4.3.2 Groundwater

Groundwater was encountered at 1.1m in TP1.1, TP1.2 and TP2.

4.3.3 Permeability Results

A summary of BRE365 soakage results is presented in Table 10 and in full in Appendix B.

Table 10 – Summary of BRE365 Soakage Testing

Location	Depth (m bgl)	Test Type	Strata	Drainage (m/sec) Test 1	Drainage (m/sec) Test 2	Drainage (m/sec) Test 3	Qualitative Soakage Potential
TP1.2	1.00	BRE365	Gravelly clay	1.18E-05	1.07E-05	8.33E-06	Moderate/Poor
TP2	1.00	BRE365	Gravelly clay	1.13E-05	6.93E-06	5.59E-06	Moderate/Poor
TP3	0.50	BRE365	Gravelly clay	9.09E-06	7.31E-06	7.10E-06	Poor
TP4	0.50	BRE365	Gravelly clay	8.01E-06	6.51E-06	3.64-06	Poor

The soakage testing indicates moderate to poor soakage rates. Groundwater was encountered at 1.10m bgl and therefore the site is not likely to be viable for shallow soakage's to ground.

A drainage engineer should be consulted further.

4.3.4 Revised Ground Gas Risk Assessment

An update to the ground gas risk assessment is presented in Table 11 which has incorporated the results obtained from this assessment.

Table 11 – Updated Ground Gas Risk Assessment

Identified Active Sources	Identified Active Potential Pathways	Potential Receptors	Quantitative Risk Assessment
No made ground encountered on site	No source	No source	Low

The revised ground gas risk assessment indicates a very low risk from ground gas (*Very Low/NHBC Green*).

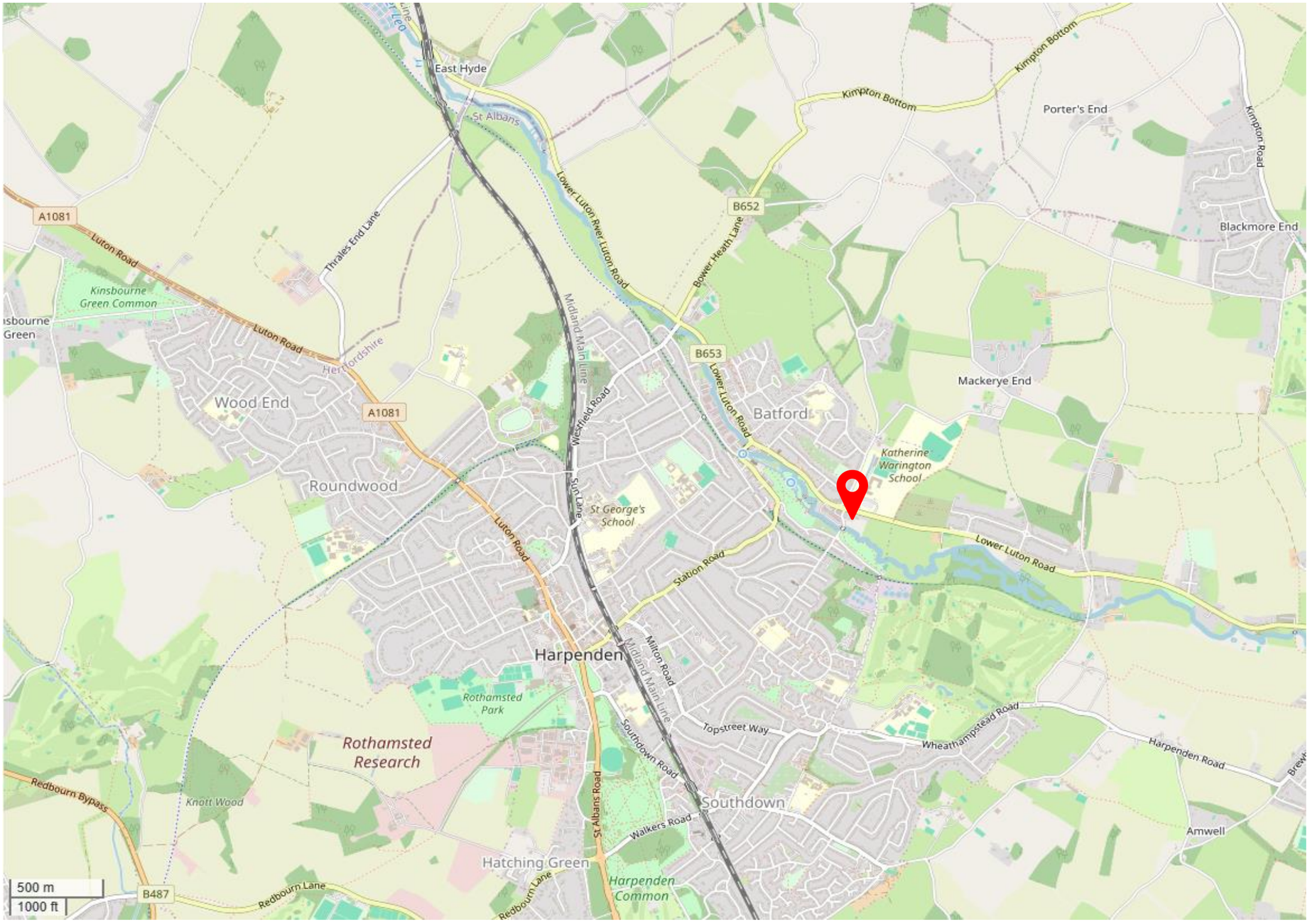
5.0 RECOMMENDATIONS FOR FURTHER WORK

The site has been assessed to have a low/moderate risk to future receptors from contamination.

WDE recommends that the following items are undertaken:

- Preliminary UXO report due to the moderate UXO risk identified
- BGS Radon report due to the low/moderate risk identified
- Additional investigations are undertaken to confirm the foundation design.
- Site won materials are reused in line with CL:AIRE Code of Practice.

FIGURES



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Client

JARVIS HOMES

Project

LOWER LUTON ROAD, HARPENDEN

Title

FIGURE 1: SITE LOCATION PLAN

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LEGEND

Client

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Project

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Title

FIGURE 2: CURRENT SITE PLAN

Approximate Scale

30 m
100 ft

Job number: 21372

02/05/2025

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LEGEND

Client

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Project

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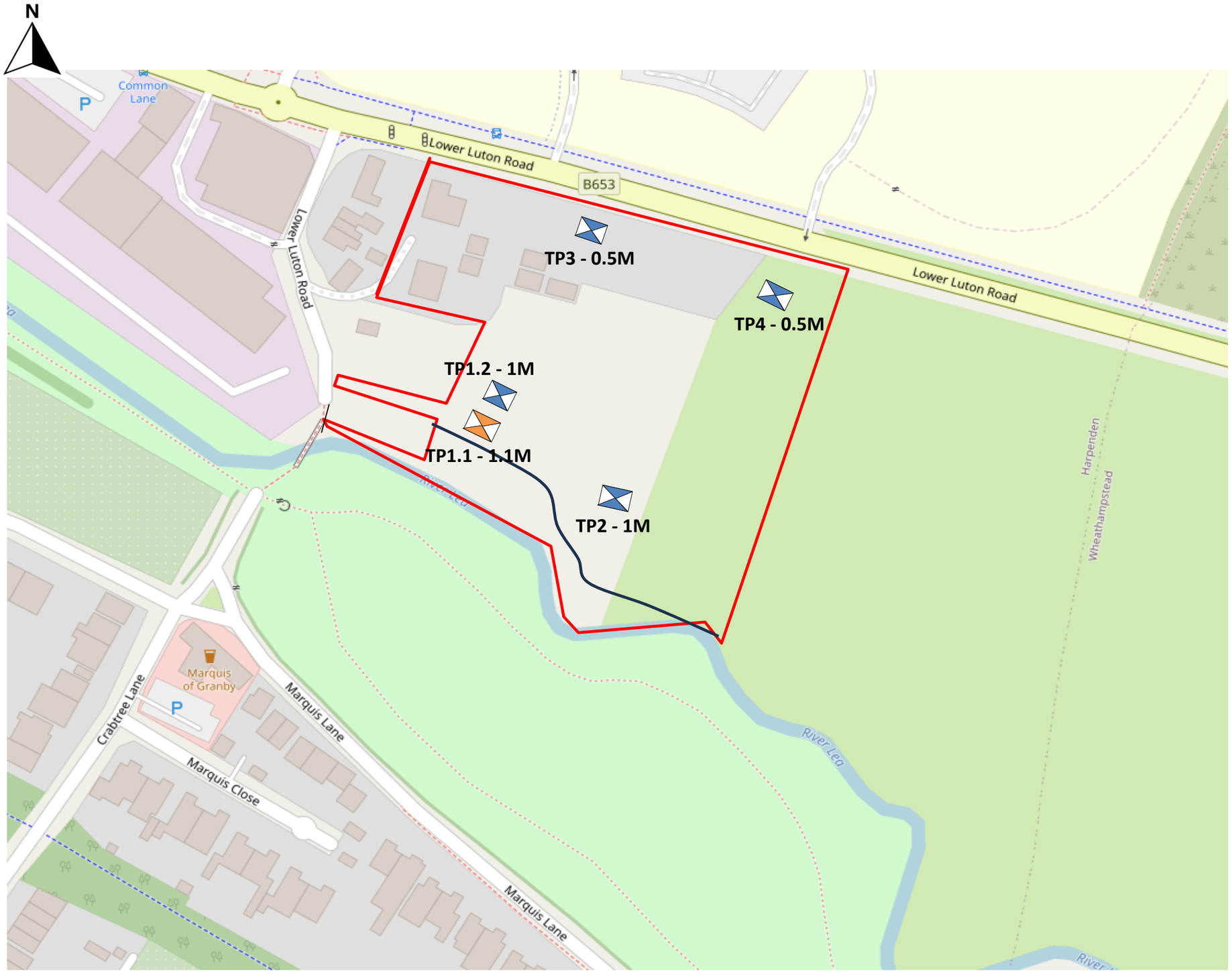
Title

FIGURE 3:PROPOSED SITE PLAN

Drawing supplied by client

Job number: 21372

02/05/2025



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LEGEND

- BRE365 Trial Pit
- **TP m** Trial pit Number and depth of trialpit
- Edge of Flood Plain
- Trial Pit

Client

JARVIS HOMES

Project

LOWER LUTON ROAD, HARPENDEN

Title

FIGURE 4: INTRUSIVE LOCATIONS

Approximate Scale

30 m
100 ft

Job number: 21372

02/05/2025

APPENDIX A: RELEVANT GUIDANCE AND LEGISLATION

WDE Consulting has duly taken account of the recommendation contained within relevant guidance documents and legislation during the preparation of this report.

CONTAMINATION

Part IIa of the Environmental Protection Act 1990 defined contamination in relation to continued land use and introduced the "polluter pays" principal. The Groundwater Regulations 1998 defined List 1 and List 2 substances and the procedures for preventing them from entering groundwater. The Water Resources Act of 1991 introduced the term "controlled waters" and gave powers to the Environment Agency to require remediation where there was pollution of controlled waters.

The National Planning Policy Framework[2] requires the following:

- The site is made suitable for its intended use, taking account of all ground conditions arising from natural and former activities, pollution arising from previous uses and proposals for mitigation including land remediation.
- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Ac 1990.
- Adequate site information, prepared by a competent person, is presented.

The methodology adopted for this report follows the guidance and procedures for Land Contamination Risk Management (LCRM) produced by the Agency[3]. The LCRM process provides a reasoned and structured mechanism to identify potential risk issues and, where necessary, provide a way forward to develop a robust risk management strategy to address potentially unacceptable risks in an appropriate manner. Contained within the LCRM Framework are the following stages:

1. Stage 1 risk assessment
2. Stage 2 options appraisal
3. Stage 3 remediation and verification

British Standards has issued guidance for the Investigation of Potentially Contaminated Sites[4] and for undertaking Site Investigations[5] which have duly been considered. An update to the potential human health exposure pathways is provided in the Environment Agency Soil Science Report SR3[6]. In 2008 the Environment Agency and the National House-Building Council (NHBC), Chartered Institute of Environmental Health (CIEH) released a joint publication for the Safe Development of Housing on Land

[2] Department of Communities and Local Government. March 2012
3 Environment Agency. 2020. Land Contamination Risk Management (LCRM)
[4] British Standards 2011. Investigation of Potentially Contaminated Sites-Codes of Practice. BS10175:2011
[5] British Standards. 2015. Code of Practice for Site Investigations. BS5930
[6] Environment Agency, August 2008, Updated technical background to the CLEA model, Science Report - SC050021/SR3

Affected by Contamination[7]. Guidance is provided in the CLR Report No 4 on sampling strategies for contaminated land[8].

QUALITATIVE RISK ASSESSMENT

The potentially active human health are based on the Agency Soil Science Report SR3[9]. The potential contaminants of PCBs arising from the electricity substation located offsite have been discounted as PCBs are not considered to be sufficiently mobile or soluble[10].

To assess the potential for risk, the Source ® Pathway ® Receptor relationships have been evaluated to determine whether there are potentially active pollutant linkages between sources and receptors. Only when there is an active pollutant linkage, can there be a potential risk to a receptor from a source via a particular pathway. Each active pathway has been assigned a qualitative assessment as to the level of risk as shown in the below table and as per R&D 66[7] .

Qualitative Risk Classification Scheme

		CONSEQUENCE			
		Severe	Medium	Mild	Minor
PROBABILITY (Likelihood)	High likelihood	Very High Risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

GROUND GAS

The following relevant guidance will be used to assess the risks posed by ground gas:

- CIRIA Assessing risks posed by hazardous ground gases to buildings[11]
- NHBC: Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present[12]
- NHBC: Technical Extra[13]

7 Environment Agency. 2008. Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D 66
8 DOE. 1994. Sampling Strategies for Contaminated Land. CLR Report No 4

9 Environment Agency, August 2008, Updated technical background to the CLEA model, Science Report - SC050021/SR3

10 Department of the Environment, 1996, Industry Profile: Engineering works. P.14 Sect 3.2.1
11 CIRIA 2007. Assessing Risks Posed by Hazardous Ground Gases to Buildings. C665
12 NHBC 2007. Guidance on Evaluation of Development Proposals on Sites where methane and carbon dioxide are present
13 NHBC 2016. Technical Extra. Ground Gas Update. April 2016. Issue 20

- The Building Regulations Site Preparation and resistance to contaminants and moisture. [14]
- British Standard. Guidance on Investigations for Ground Gas[15]
- NHBC guidance on Hazardous ground gas[16]

Summary of NHBC Traffic Light System

Gas Regime	Methane		Carbon Dioxide	
	Typical max %	Gas Screening Value (l/hr)	Typical max %	Gas Screening Value (l/hr)
Green	<1	<0.16	<5	<0.78
Amber 1	1 – 5	0.16 – 0.63	5 – 10	0.78 – 1.56
Amber 2	5 – 20	0.63 – 1.56	10 – 30	1.56 – 3.13
Red	20+	1.56+	30+	3.13+

SOAKAGE TESTING AND DESIGN

The following guidance has been followed during the soakage testing:

- Falling Head Tests in boreholes – BS5930[5]
- BRE Digest 365 2003 Soakage testing

The CIRIA publication[17] provides guidance as to the required distance of buildings from soakage's to ground in chalk as follows:

- 20m distance of soakaways from buildings where dissolution features are known to be prevalent
- 10m distance of soakaways from buildings where chalk is low density or unknown
- 5m distance of soakaways from buildings where chalk is of medium to high density

[14] Building Regulations 2004. Approved Document C, Site Preparation and resistance to contaminants and moisture.
[15] British Standards 2013. Guidance on Investigation for Ground Gas. BS8576. 2013
[16] NHBC 2023. Hazardous Ground Gas – an essential guide for housebuilders. NF94
[17] CIRIA. 2002. Engineering in Chalk. C574.

APPENDIX B: SITE PHOTOS

Photo 1 – Site Overview

Photo 2 – TP2 East of Site

Photo 3 – TP3 North of site

Photo 4 – TP2 Backfilled on completion

APPENDIX C: ENVIRONMENTAL DATABASE

Folder link: Appendix C - Environmental Database

APPENDIX D: FIELD LOGS

APPENDIX E: FIELD SHEETS

Trial Pit

TP1.1

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Lower Luton Road, Harpenden	21372	2025-04-09	2025-04-09

Client
Jarvis Homes

Consultant
Charlotte Bird

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(0.20)		TOPSOIL
						0.20		Firm grey/brown slightly gravelly cobbly CLAY. Gravels are fine to coarse rounded to angular.
						(0.90)		
						1.10		*End of Trial Pit at 1.10m*

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

Remarks
Groundwater encountered at 1.10m

Method, Plant, Stability, Dimensions

Logger

Trial Pit

TP1.1

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Lower Luton Road, Harpenden	21372	2025-04-09	2025-04-09

Client	Consultant	Contractor
Jarvis Homes	Charlotte Bird	

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
1.10				

Remarks

Groundwater encountered at 1.10m

Method, Plant, Stability, Dimensions **Logger**

Trial Pit

TP1.2

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Lower Luton Road, Harpenden	21372	2025-04-09	2025-04-09

Client
Jarvis Homes

Consultant
Charlotte Bird

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(0.20)		TOPSOIL
						0.20		Firm grey/brown slightly gravelly cobbly CLAY. Gravels are fine to coarse rounded to angular.
						(0.90)		
						1.10		*End of Trial Pit at 1.10m*

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

Remarks
Groundwater encountered at 1.10m

Method, Plant, Stability, Dimensions

Logger

Trial Pit

TP1.2

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Lower Luton Road, Harpenden	21372	2025-04-09	2025-04-09

Client	Consultant	Contractor
Jarvis Homes	Charlotte Bird	

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
1.10				

Remarks

Groundwater encountered at 1.10m

Method, Plant, Stability, Dimensions **Logger**

Trial Pit

TP2

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Lower Luton Road, Harpenden	21372	2025-04-09	2025-04-09

Client
Jarvis Homes

Consultant
Charlotte Bird

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(0.20)		TOPSOIL
						0.20		Firm grey/brown slightly gravelly cobbly CLAY. Gravels are fine to coarse rounded to angular.
						(0.90)		
						1.10		*End of Trial Pit at 1.10m*

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

Remarks
Groundwater encountered at 1.10m

Method, Plant, Stability, Dimensions
0.00 - 1.00m TP
Stable
L = 2.00m
W = 0.70m

Logger
CNB

Trial Pit

TP2

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Lower Luton Road, Harpenden	21372	2025-04-09	2025-04-09

Client	Consultant	Contractor
Jarvis Homes	Charlotte Bird	

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
1.10				

Remarks

Groundwater encountered at 1.10m

Method, Plant, Stability, Dimensions

0.00 - 1.00m TP

Stable

L = 2.00m

W = 0.70m

Logger

CNB

Trial Pit

TP3

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Lower Luton Road, Harpenden	21372	2025-04-09	2025-04-09

Client
Jarvis Homes

Consultant
Charlotte Bird

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(0.20) 0.20		TOPSOIL
						(0.30) 0.50		Firm orange/brown gravelly CLAY. Gravels are fine to medium rounded to subangular.
								End of Trial Pit at 0.50m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
Groundwater not encountered

Method, Plant, Stability, Dimensions
0.00 - 0.50m TP
Stable
L = 2.00m
W = 0.70m

Logger
CNB

Trial Pit

TP4

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP				1:25

Project Name	Project No.	Start Date	End Date
Lower Luton Road, Harpenden	21372	2025-04-09	2025-04-09

Client
Jarvis Homes

Consultant
Charlotte Bird

Contractor

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(0.20) 0.20		TOPSOIL
						(0.30) 0.50		Firm orange/brown gravelly CLAY. Gravels are fine to medium rounded to subangular.
								End of Trial Pit at 0.50m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

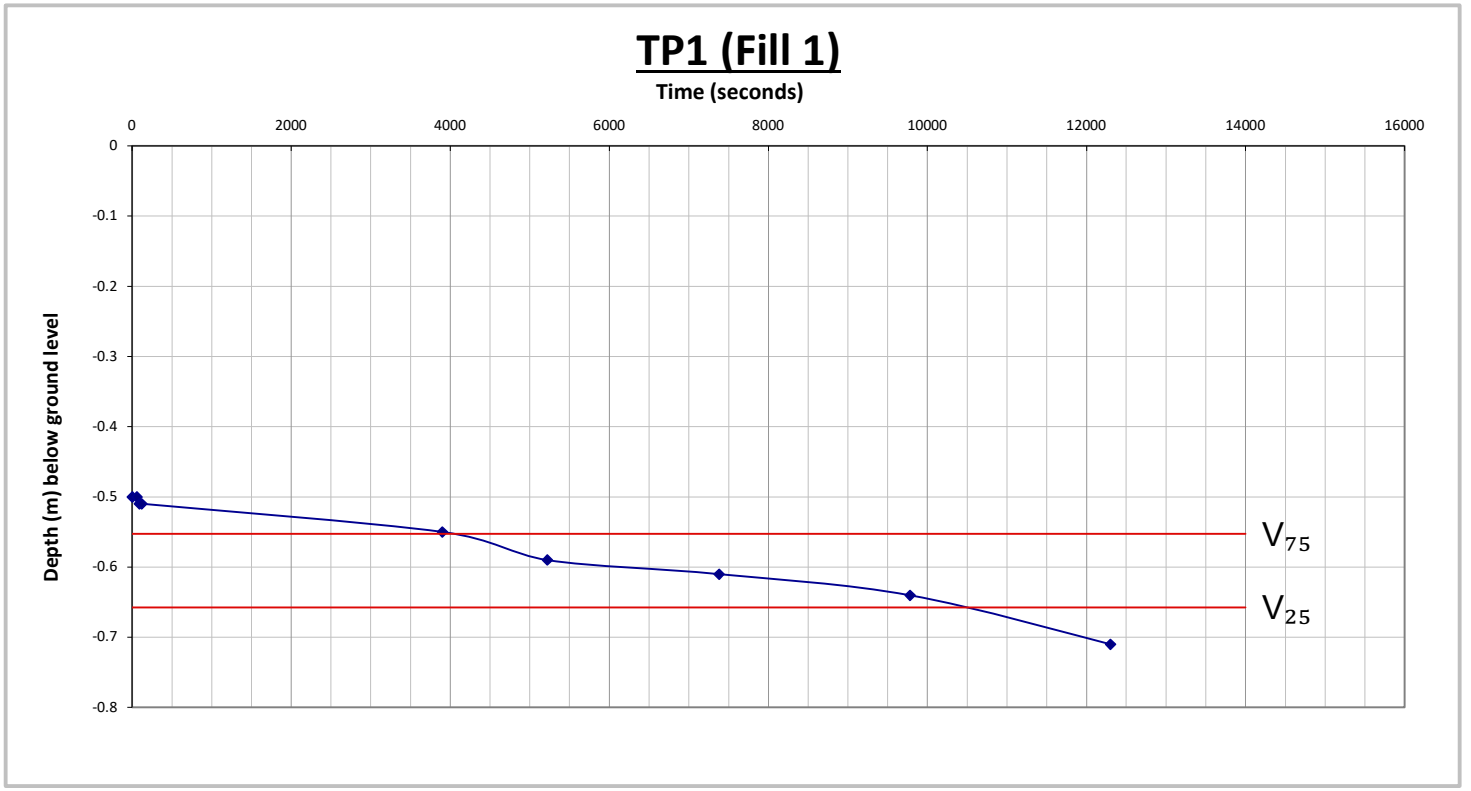
Remarks
Groundwater not encountered

Method, Plant, Stability, Dimensions
0.00 - 0.50m TP
Stable
L = 2.20m
W = 0.70m

Logger
CNB

Location	TP1 (Fill 1)
Length (m)	2.1
Width (m)	0.7
Depth (m)	1
Surface Area (m^2)	7.07
Depth of Water Lost (m)	0.21
Effective Storage Volume (Vp75-Vp25)	0.15435

Time (s)	Depth to Water (m)
0	-0.5
60	-0.5
90	-0.51
120	-0.51
3900	-0.55
5220	-0.59
7380	-0.61
9780	-0.64
12300	-0.71



Comments:

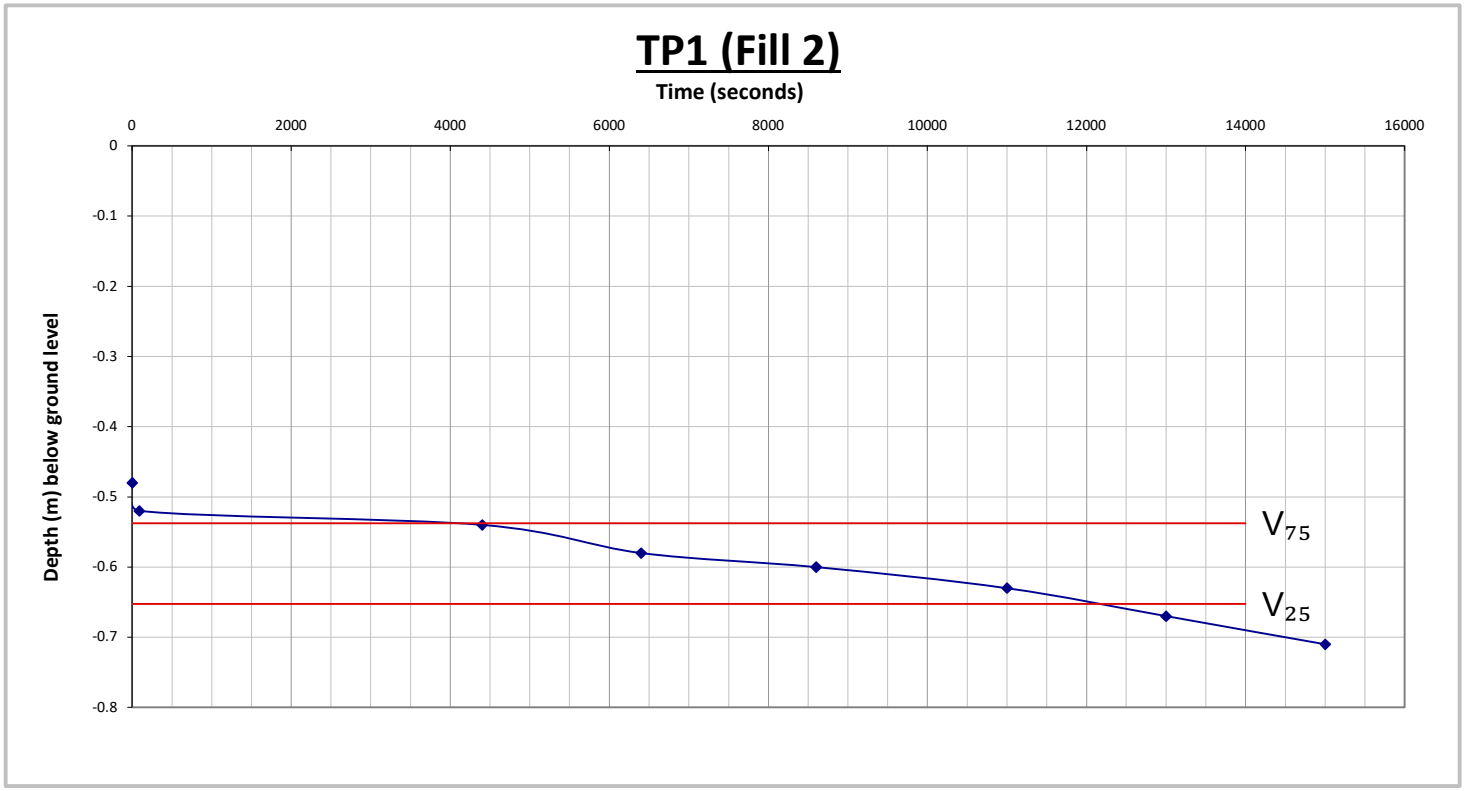
ap50	2.058
V_{75}	3,900
V_{25}	10250
tp75 - 25	6350

Vp	Amount of Water Lost	DTW bgl
75%	0.1575	-0.5525
25%	0.0525	-0.6575

Soil Infiltration Rate (m/sec)	1.18E-05

Location	TP1 (Fill 2)
Length (m)	2.1
Width (m)	0.7
Depth (m)	1
Surface Area (m^2)	**7.07**
Depth of Water Lost (m)	0.23
Effective Storage Volume (Vp75-Vp25)	**0.16905**

Time (s)	Depth to Water (m)
0	-0.48
90	-0.52
4400	-0.54
6400	-0.58
8600	-0.6
11000	-0.63
13000	-0.67
15000	-0.71



Comments:

ap50	**2.114**
V_{75}	5,000
V_{25}	12500
tp75 - 25	**7500**

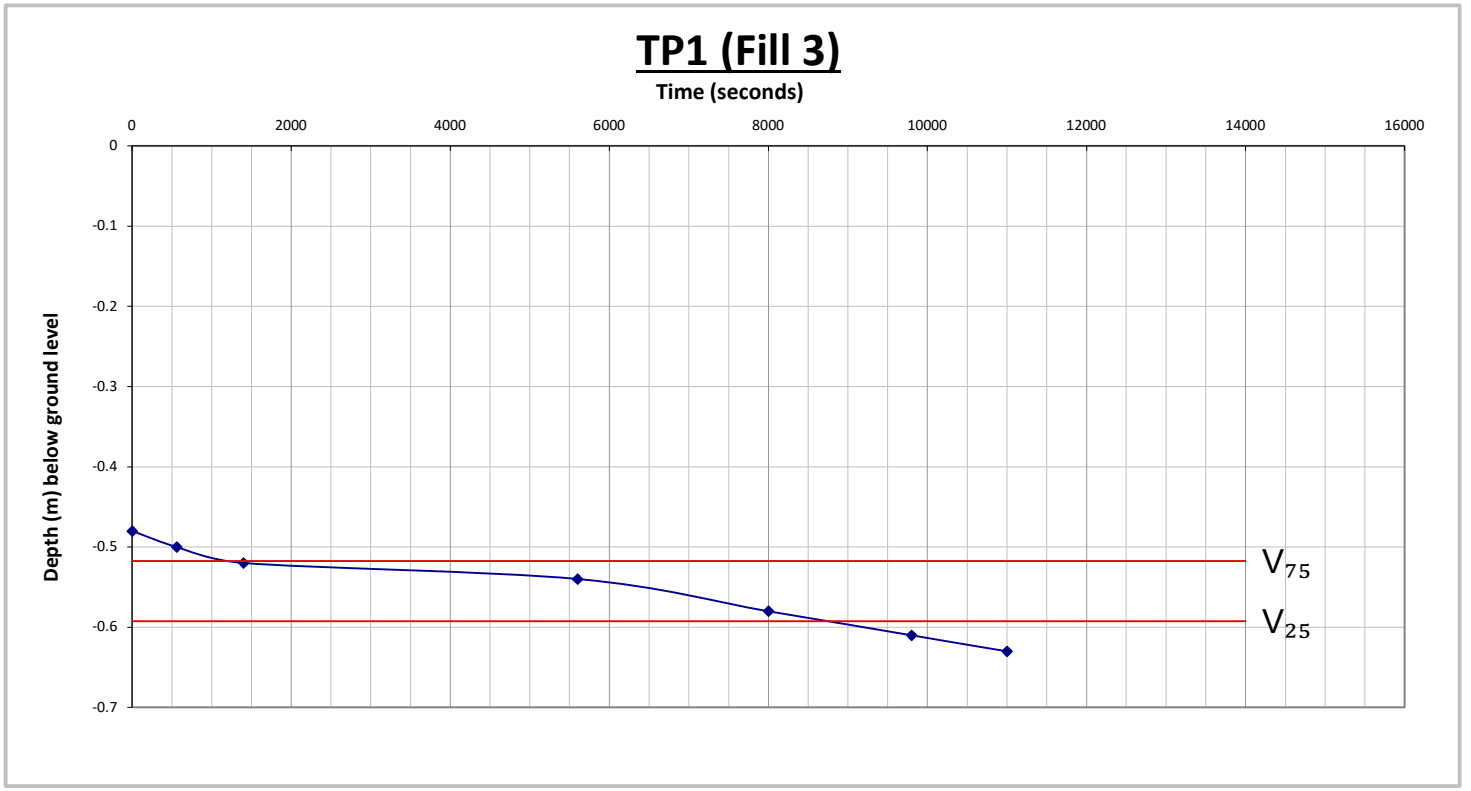
Vp	Amount of Water Lost	DTW bgl
75%	0.1725	-0.5375
25%	0.0575	-0.6525

Soil Infiltration Rate (m/sec)	1.07E-05

Location	TP1 (Fill 3)
Length (m)	2.1
Width (m)	0.7
Depth (m)	1
Surface Area (m^2)	**7.07**
Depth of Water Lost (m)	0.15
Effective Storage Volume (Vp75-Vp25)	**0.11025**

Time (s)	Depth to Water (m)
0	-0.48
560	-0.5
1400	-0.52
5600	-0.54
8000	-0.58
9800	-0.61
11000	-0.63

ap50	**1.890**
V_{75}	1,500
V_{25}	8500
tp75 - 25	**7000**



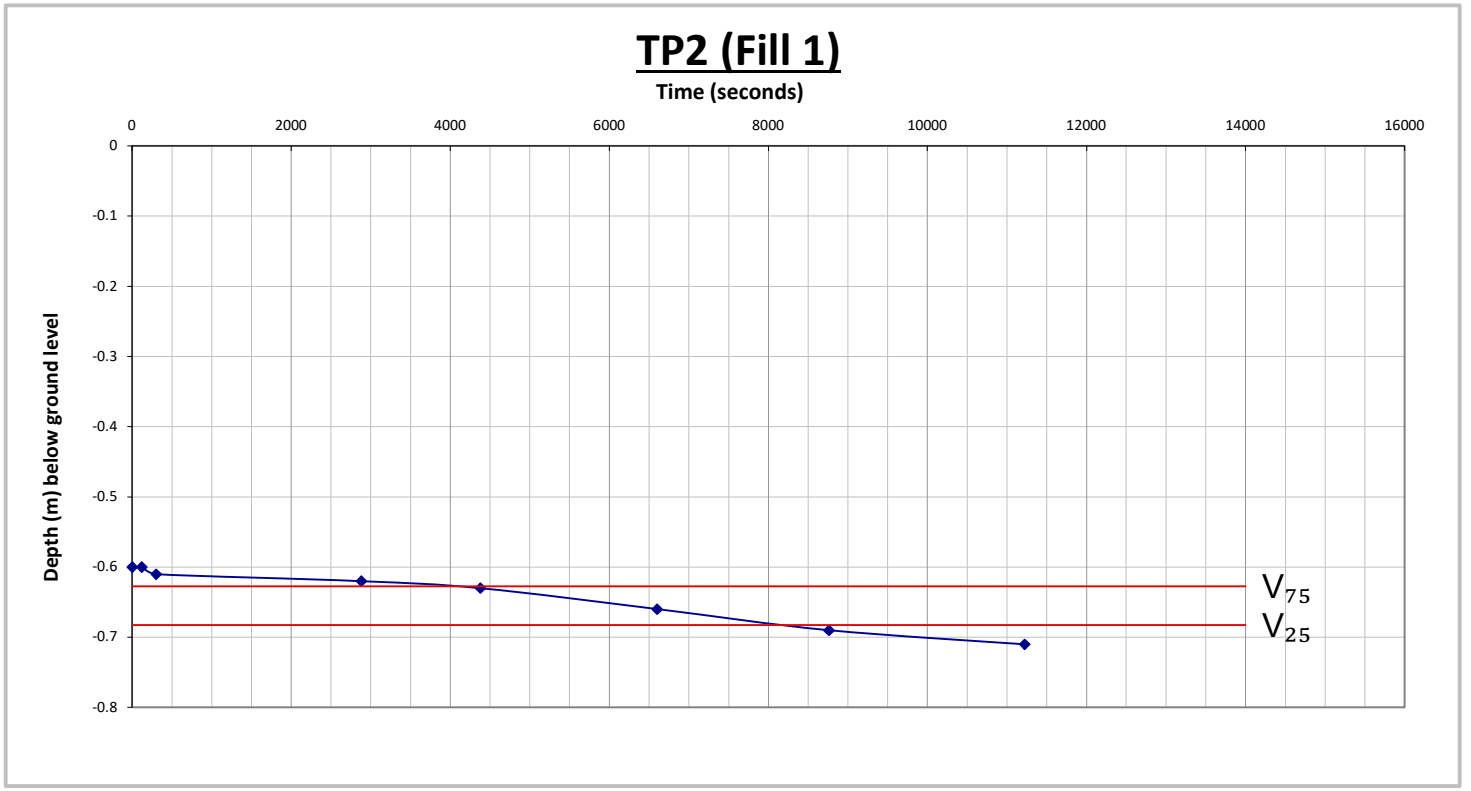
Comments:

Vp	Amount of Water Lost	DTW bgl
75%	0.1125	-0.5175
25%	0.0375	-0.5925

Soil Infiltration Rate (m/sec)	8.33E-06

Location	TP2 (Fill 1)
Length (m)	2
Width (m)	0.7
Depth (m)	1
Surface Area (m^2)	6.8
Depth of Water Lost (m)	0.11
Effective Storage Volume (Vp75-Vp25)	0.077

Time (s)	Depth to Water (m)
0	-0.6
120	-0.6
300	-0.61
2880	-0.62
4380	-0.63
6,600	-0.66
8760	-0.69
11220	-0.71



Comments:

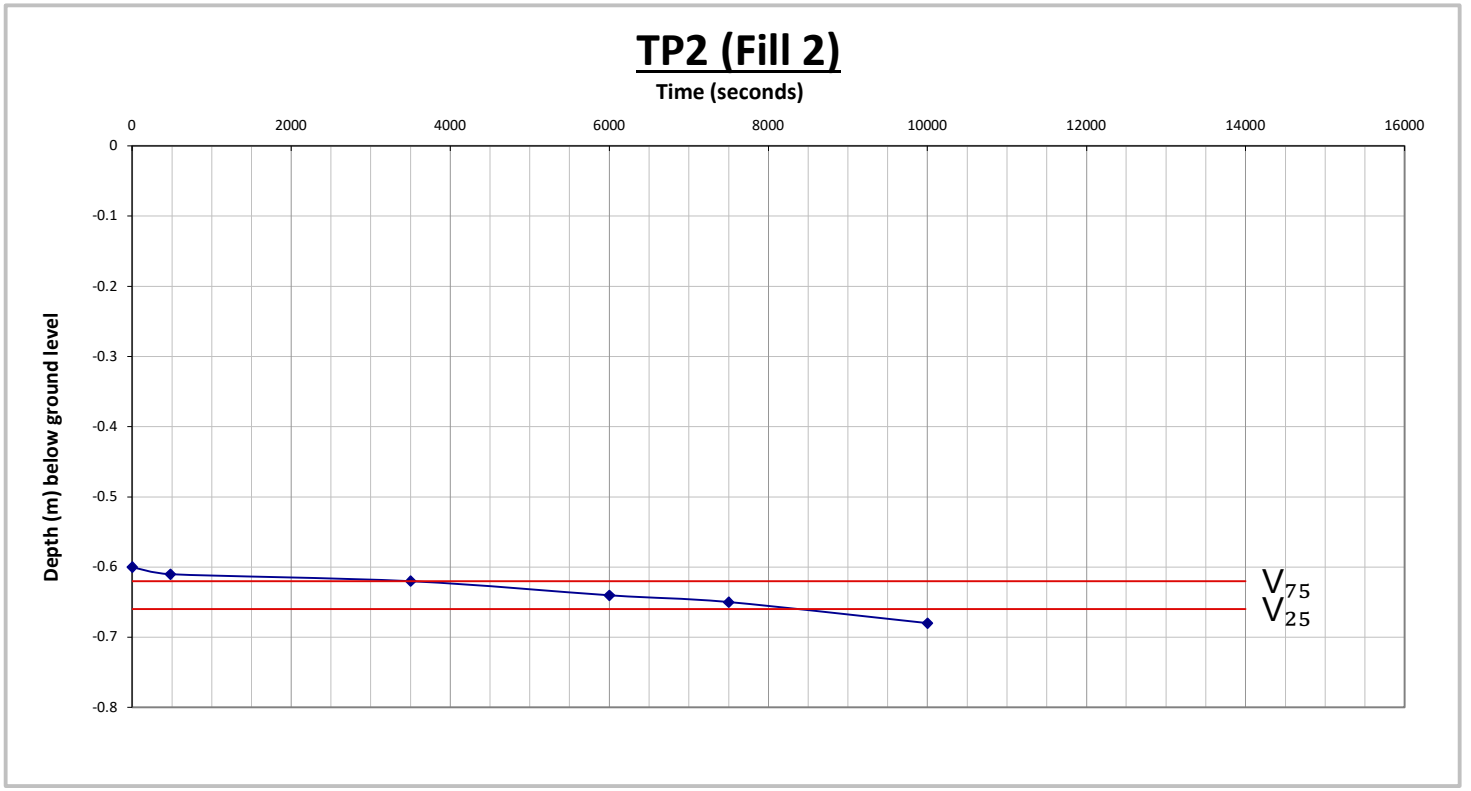
ap50	1.697
V_{75}	4,000
V_{25}	8000
tp75 - 25	4000

Vp	Amount of Water Lost	DTW bgl
75%	0.0825	-0.6275
25%	0.0275	-0.6825

Soil Infiltration Rate (m/sec)	1.13E-05

Location	TP2 (Fill 2)
Length (m)	2
Width (m)	0.7
Depth (m)	1
Surface Area (m^2)	6.8
Depth of Water Lost (m)	0.08
Effective Storage Volume (Vp75-Vp25)	0.056

Time (s)	Depth to Water (m)
0	-0.6
480	-0.61
3500	-0.62
6000	-0.64
7500	-0.65
10000	-0.68



Comments:

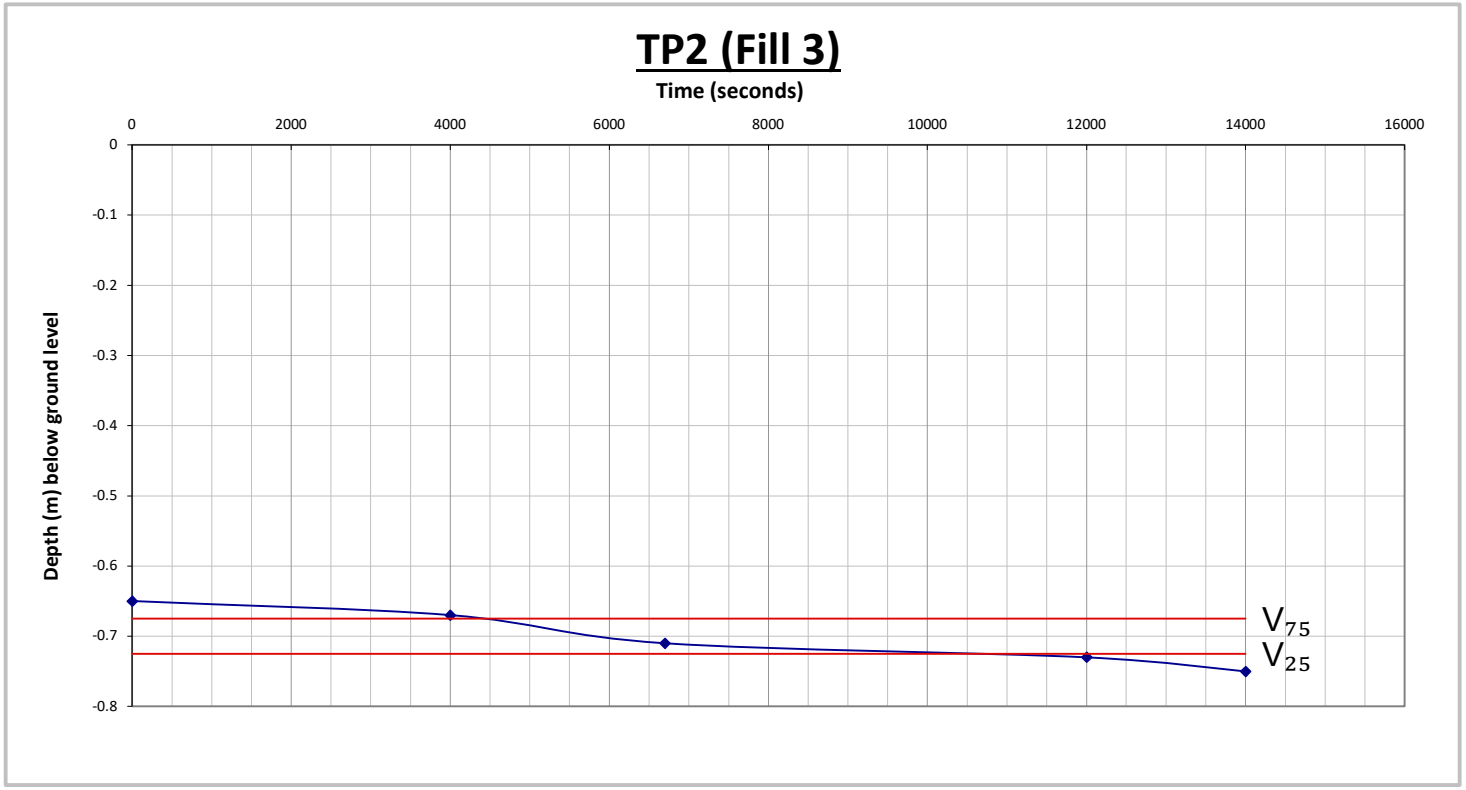
ap50	1.616
V_{75}	3,500
V_{25}	8500
tp75 - 25	5000

Vp	Amount of Water Lost	DTW bgl
75%	0.06	-0.62
25%	0.02	-0.66

Soil Infiltration Rate (m/sec)	6.93E-06

Location	TP2 (Fill 3)
Length (m)	2
Width (m)	0.7
Depth (m)	1
Surface Area (m^2)	6.8
Depth of Water Lost (m)	0.1
Effective Storage Volume (Vp75-Vp25)	0.07

Time (s)	Depth to Water (m)
0	-0.65
4000	-0.67
6700	-0.71
12000	-0.73
14000	-0.75



Comments:

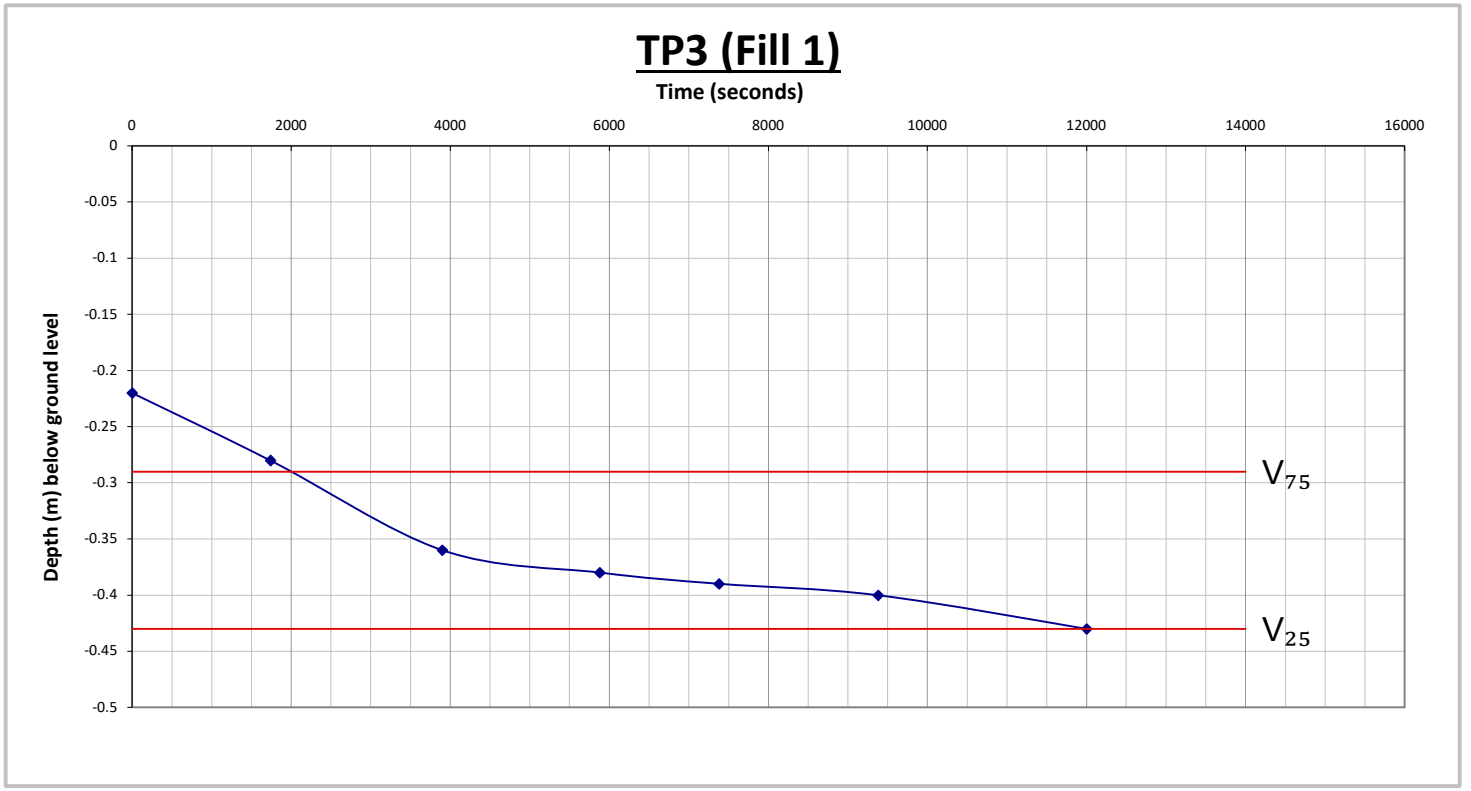
ap50	1.670
V_{75}	4,500
V_{25}	12000
tp75 - 25	7500

Vp	Amount of Water Lost	DTW bgl
75%	0.075	-0.675
25%	0.025	-0.725

Soil Infiltration Rate (m/sec)	5.59E-06

Location	TP3 (Fill 1)
Length (m)	2
Width (m)	0.7
Depth (m)	0.5
Surface Area (m^2)	4.1
Depth of Water Added (m)	0.28
Effective Storage Volume (Vp75-Vp25)	0.196

Time (s)	Depth to Water (m)
0	-0.22
1740	-0.28
3900	-0.36
5880	-0.38
7,380	-0.39
9380	-0.4
12000	-0.43



Comments:

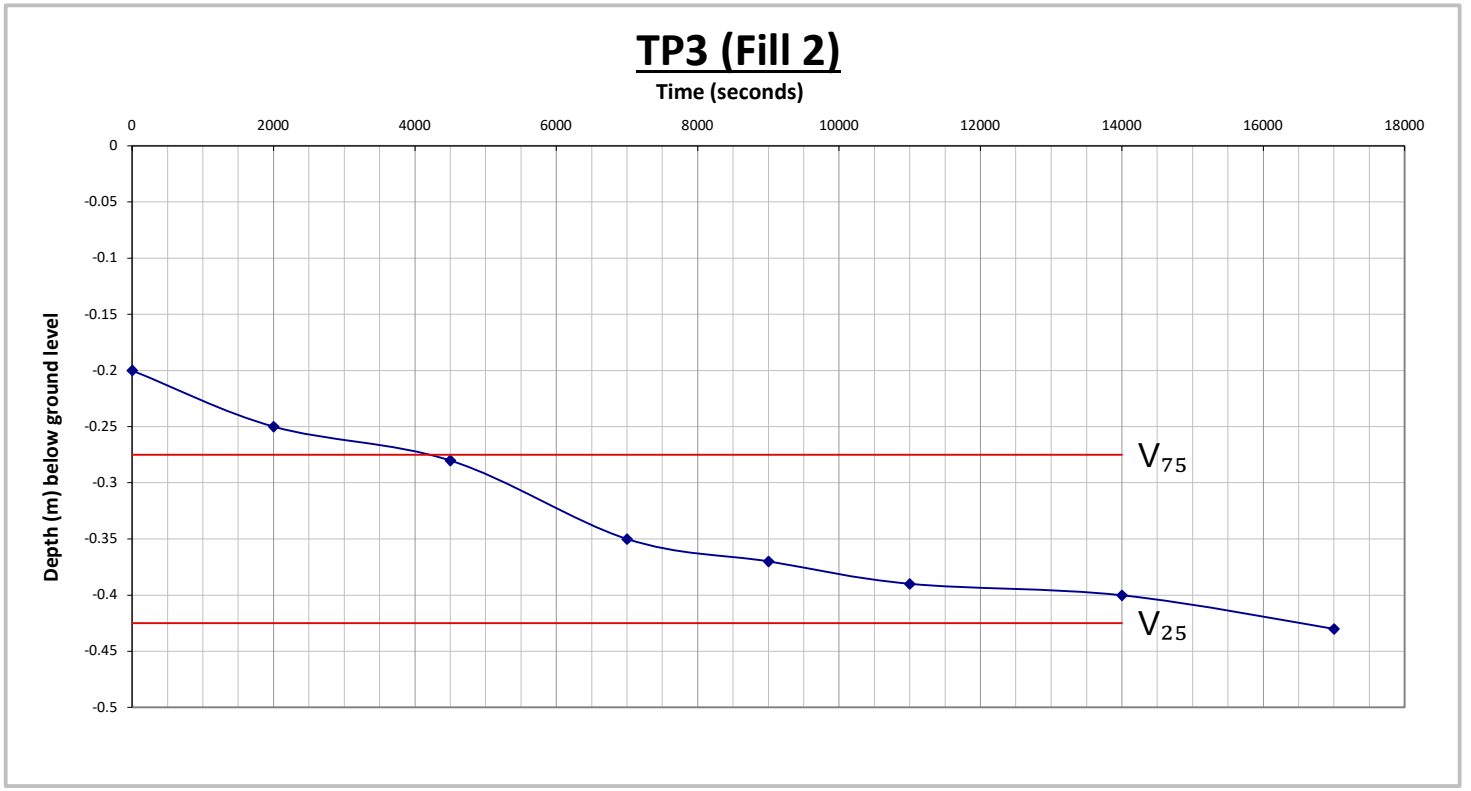
ap50	2.156
V_{75}	2,000
V_{25}	12000
tp75 - 25	10000

Vp	Amount of Water Lost	DTW bgl
75%	0.21	-0.29
25%	0.07	-0.43

Soil Infiltration Rate (m/sec)	9.09E-06

Location	TP3 (Fill 2)
Length (m)	2
Width (m)	0.7
Depth (m)	0.5
Surface Area (m^2)	4.1
Depth of Water Added (m)	0.3
Effective Storage Volume (Vp75-Vp25)	0.21

Time (s)	Depth to Water (m)
0	-0.2
2000	-0.25
4500	-0.28
7000	-0.35
9,000	-0.37
11000	-0.39
14000	-0.4
17000	-0.43



Comments:

ap50	2.210
V_{75}	4,000
V_{25}	17000
tp75 - 25	13000

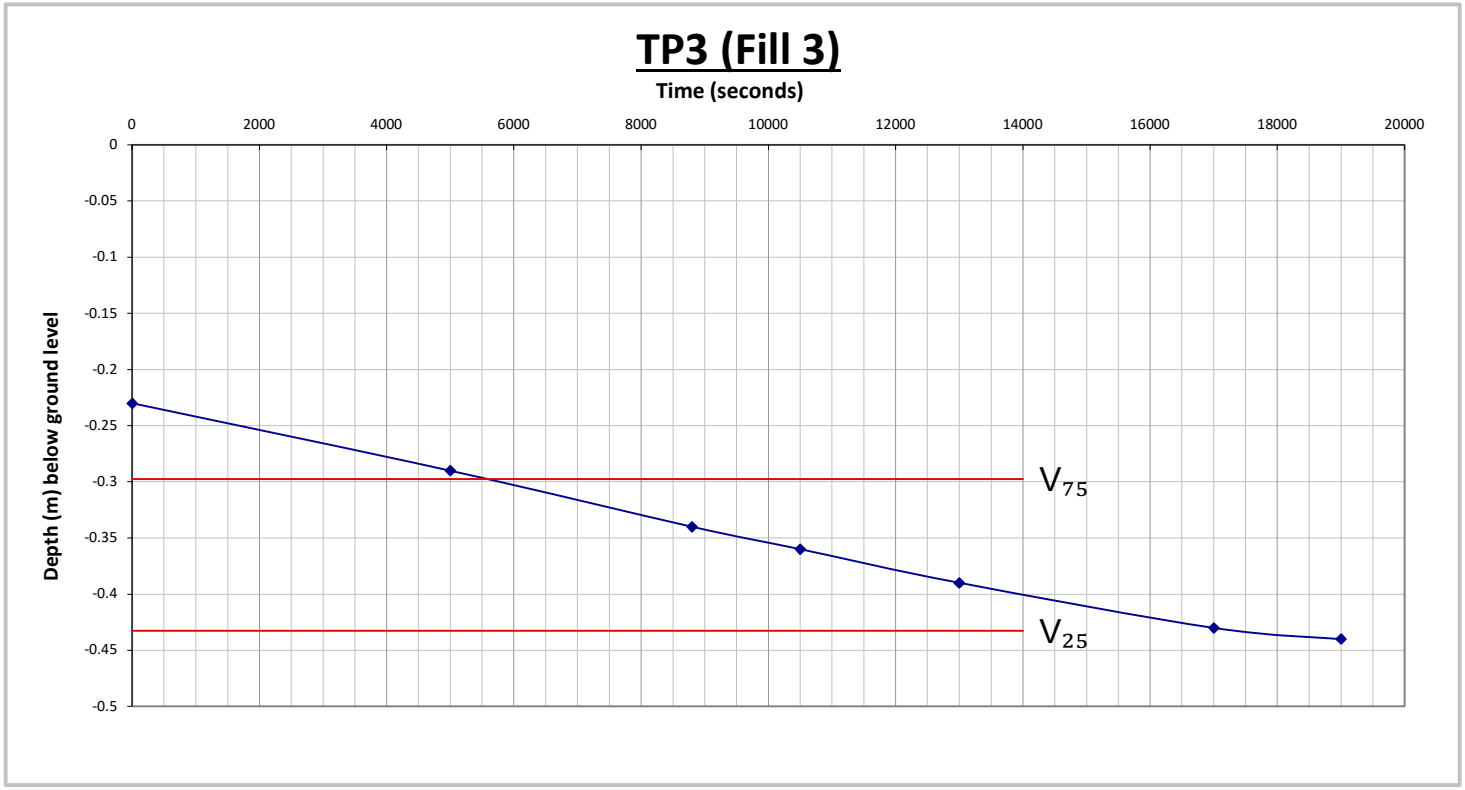
Vp	Amount of Water Lost	DTW bgl
75%	0.225	-0.275
25%	0.075	-0.425

Soil Infiltration Rate (m/sec)	7.31E-06

Location	TP3 (Fill 3)
Length (m)	2
Width (m)	0.7
Depth (m)	0.5
Surface Area (m^2)	**4.1**
Depth of Water Added (m)	0.27
Effective Storage Volume (Vp75-Vp25)	**0.189**

Time (s)	Depth to Water (m)
0	-0.23
5000	-0.29
8800	-0.34
10500	-0.36
13,000	-0.39
17000	-0.43
19000	-0.44

ap50	**2.129**
V_{75}	5,000
V_{25}	17500
tp75 - 25	**12500**



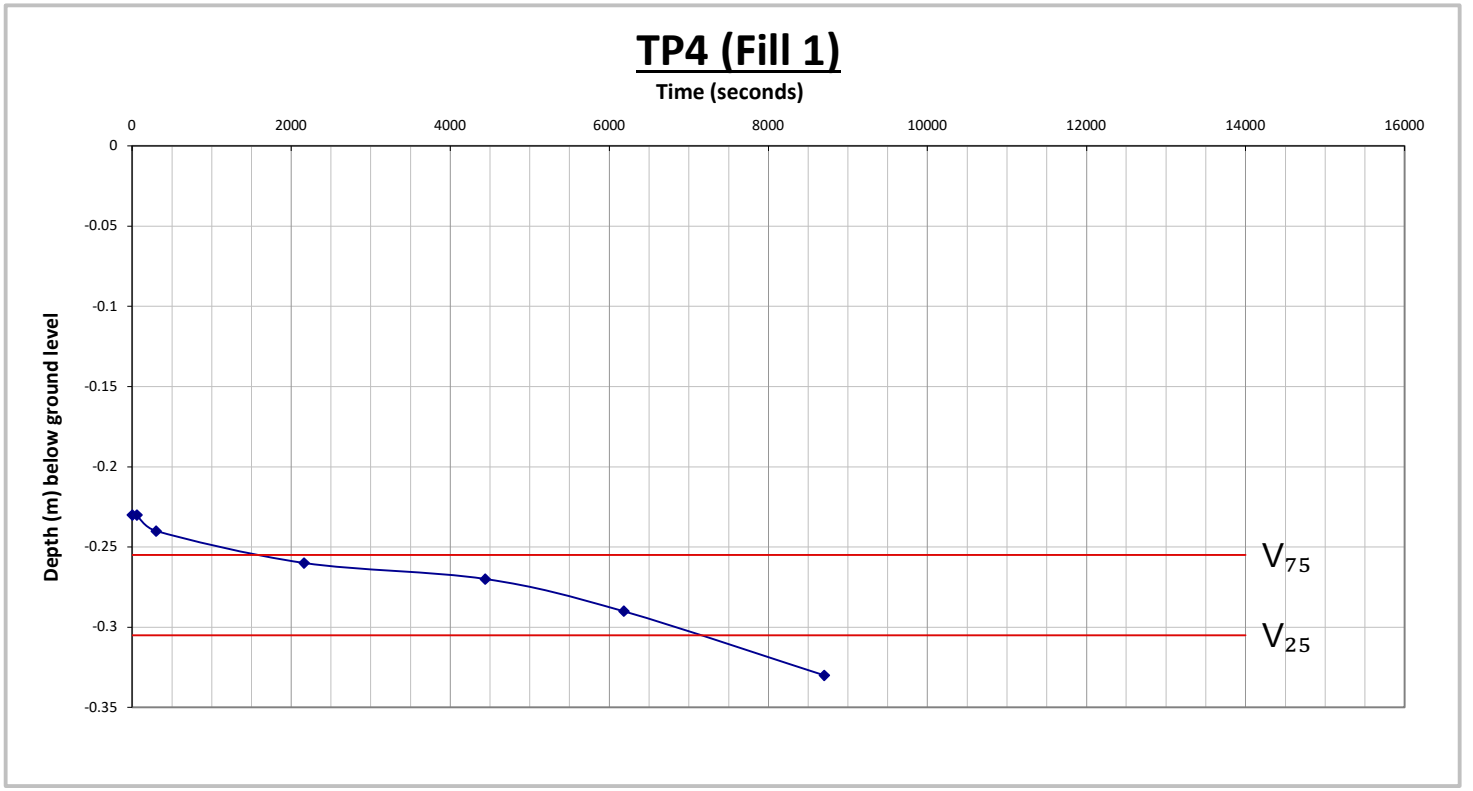
Comments:

Vp	Amount of Water Lost	DTW bgl
75%	0.2025	-0.2975
25%	0.0675	-0.4325

Soil Infiltration Rate (m/sec)	7.10E-06

Location	TP4 (Fill 1)
Length (m)	2.2
Width (m)	0.7
Depth (m)	0.5
Surface Area (m^2)	4.44
Depth of Water Lost (m)	0.1
Effective Storage Volume (Vp75-Vp25)	0.077

Time (s)	Depth to Water (m)
0	-0.23
60	-0.23
300	-0.24
2160	-0.26
4,440	-0.27
6180	-0.29
8700	-0.33



Comments:

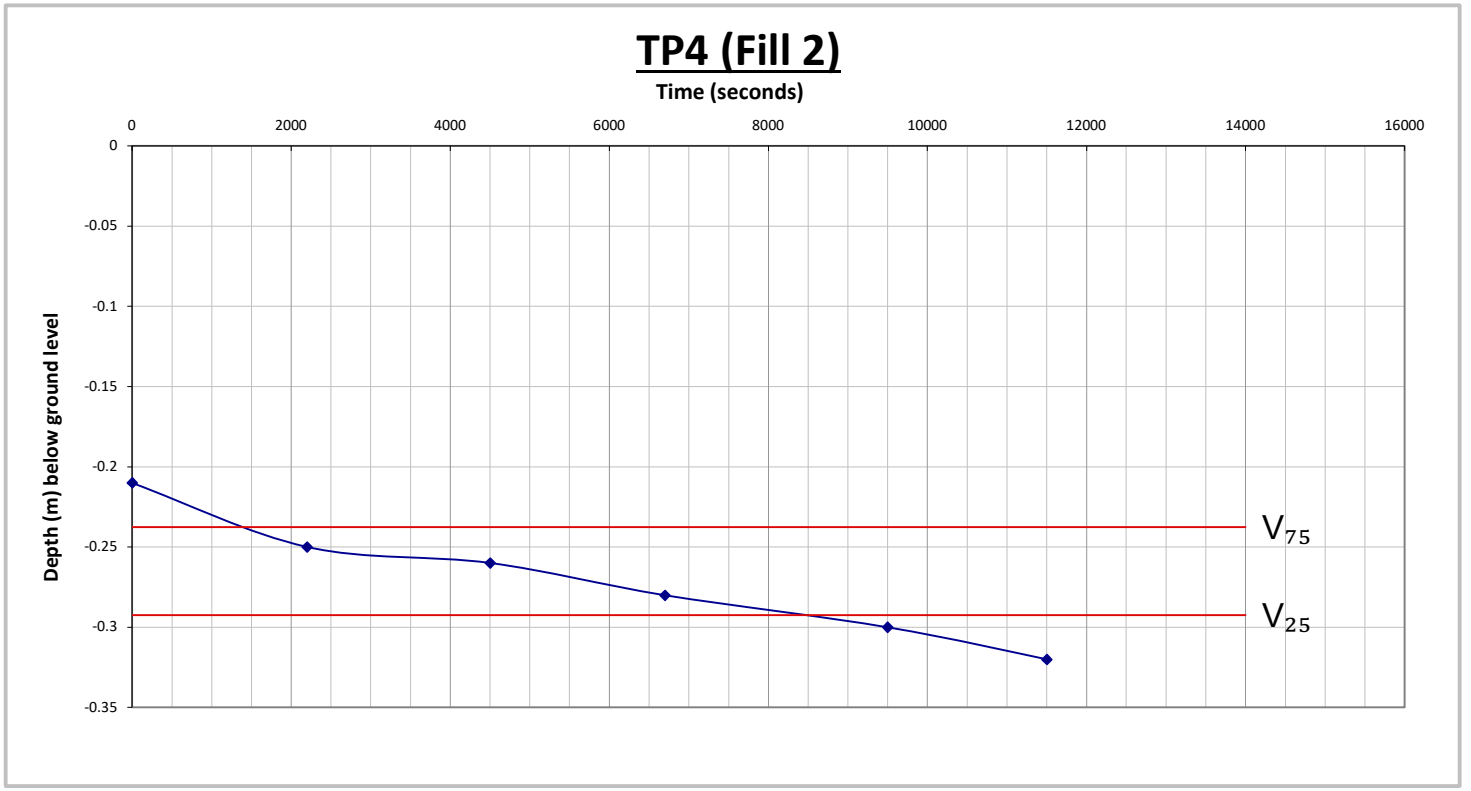
ap50	1.830
V_{75}	1,750
V_{25}	7000
tp75 - 25	5250

Vp	Amount of Water Lost	DTW bgl
75%	0.075	-0.255
25%	0.025	-0.305

Soil Infiltration Rate (m/sec)	8.01E-06

Location	TP4 (Fill 2)
Length (m)	2.2
Width (m)	0.7
Depth (m)	0.5
Surface Area (m^2)	4.44
Depth of Water Lost (m)	0.11
Effective Storage Volume (Vp75-Vp25)	0.0847

Time (s)	Depth to Water (m)
0	-0.21
2200	-0.25
4500	-0.26
6700	-0.28
9,500	-0.3
11500	-0.32



Comments:

ap50	1.859
V_{75}	1,500
V_{25}	8500
tp75 - 25	7000

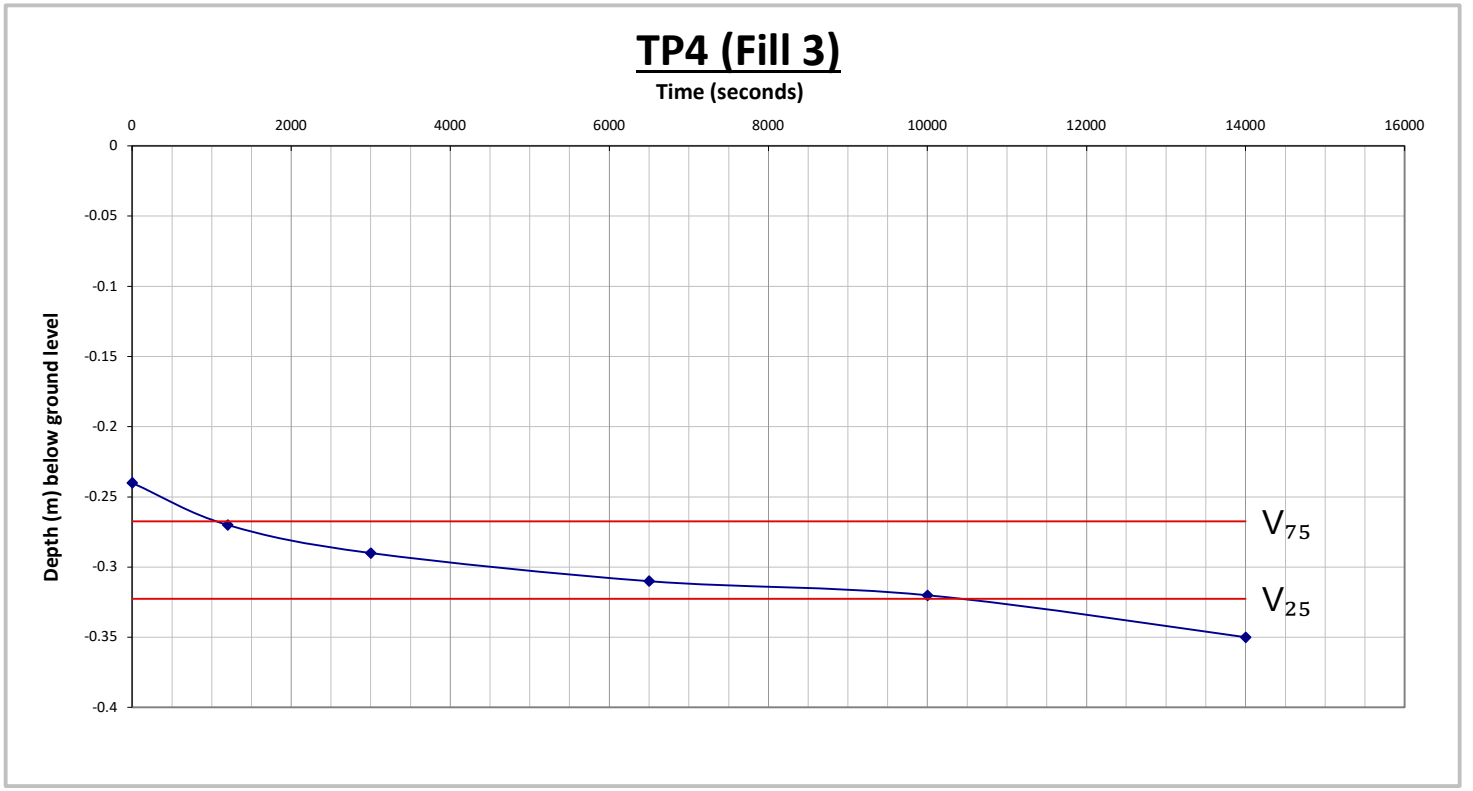
Vp	Amount of Water Lost	DTW bgl
75%	0.0825	-0.2375
25%	0.0275	-0.2925

Soil Infiltration Rate (m/sec)	6.51E-06

Location	TP4 (Fill 3)
Length (m)	2.2
Width (m)	0.7
Depth (m)	0.5
Surface Area (m^2)	4.44
Depth of Water Lost (m)	0.11
Effective Storage Volume (Vp75-Vp25)	0.0847

Time (s)	Depth to Water (m)
0	-0.24
1200	-0.27
3000	-0.29
6500	-0.31
10,000	-0.32
14000	-0.35

ap50	1.859
V_{75}	1,500
V_{25}	14000
tp75 - 25	12500



Comments:

Vp	Amount of Water Lost	DTW bgl
75%	0.0825	-0.2675
25%	0.0275	-0.3225

Soil Infiltration Rate (m/sec)	3.64E-06

WDE RANGE OF SERVICES

OUR SERVICES

- Phase 1 Desk Studies
- Geo-Environmental Assessments
- Geo-Site Assessments
- Remedial Strategies and DQRAs
- Soakage Testing: BRE365 and borehole permeability testing
- Remedial Verification & Closure Reports
- Environmental Monitoring Programmes
- Material Management Plans (MMP)
- Construction Environmental Management Plans (CEMP)
- Site Waste Management Plans on construction sites
- Developing sustainable waste strategies

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EXPLORATORY HOLE RECORDS
LOWER LUTON ROAD
HARPENDEN

Report Reference No. 136262

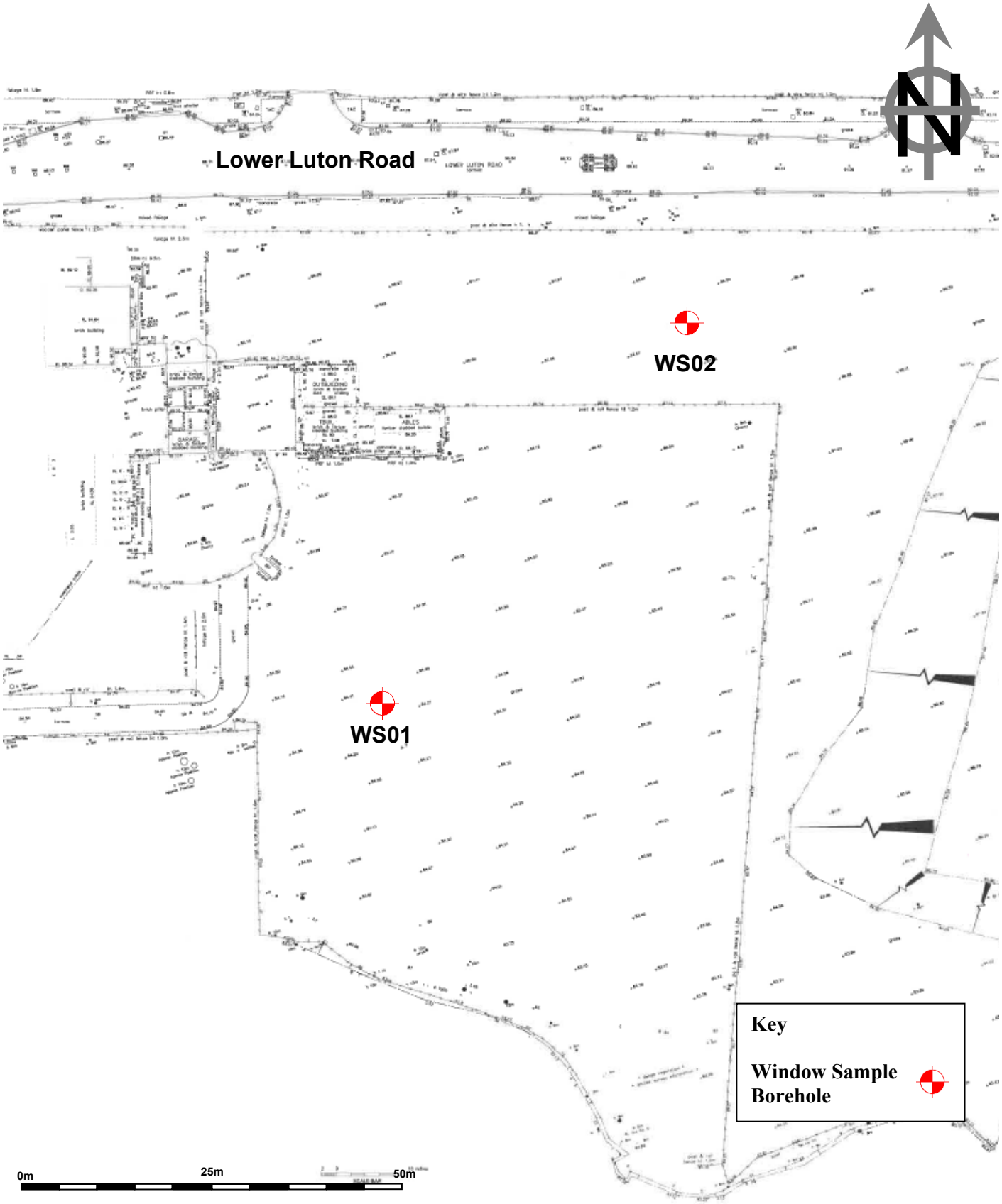
On behalf of: -

Jarvis Homes Limited
Burgundy House
21 The Foresters
Harpenden
AL5 2FB

July 2025

Exploratory Hole Location Plan

Reproduced from a plan provided by the client.



Project : Lower Luton Road, Harpenden

Client : Jarvis Homes Limited

Lucion
Protecting people and planet

LUCION GROUND ENGINEERING LIMITED
Peterborough Tel : 01733 566566

Project No.
136262

LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566	Site: Lower Luton Road, Harpenden			**WINDOW SAMPLE** **WS01**
	23/07/2025	Final Depth 4.00 m	Equipment Dynamic Sampling Rig	

Sample and In Situ Testing			Water Levels (Casing)	Well	Stratum Description	Legend	Depth (m)
Depth (m)	Type	Results					
0.20	D1				MADE GROUND - Brown, silty, gravelly SAND. Gravel of flint.		
0.50	D2				MADE GROUND - Dark brown, slightly gravelly, sandy SILT. Gravel of flint and plastic.		0.30
0.80	D3				Firm, becoming soft, then very soft, brown, orange brown and grey, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular to sub-angular flint.		0.70
			CW ▼				
1.20 1.20-2.00 1.35-1.65	D4 U1 CPT	N0 (1/0,0,0,0)			Very soft, light grey, silty, slightly organic CLAY.		1.25
					Very soft, thinly to thickly laminated, light grey and off-white, clayey SILT with occasional peaty root fragments.		1.50
2.00 2.00-3.00 2.15-2.45	D5 U2 SPT	N8 (3/2,3,1,2)	(2.00)		Very soft, dark brown, clayey, pseudofibrous PEAT.		1.95
			▼		Firm, brown and grey, slightly sandy, gravelly CLAY. Gravel of angular to rounded flint and chalk.		2.05
					Medium dense, orange brown and light brown, slightly clayey, sandy GRAVEL. Gravel of angular to sub-rounded flint.		2.15
			C ▽				
3.00-4.00 3.15-3.45	U3 CPT	N13 (6/4,4,2,3)	2.30 (3.00)				
4.15-4.45	CPT	N15 (4/4,4,4,3)	2.75 (4.00)		End of Borehole at 4.00m		4.00

Remarks
1. Starter pit excavated to 1.20m depth.
2. Borehole cased to 4.00m depth.
3. Gas monitoring standpipe installed to 4.00m depth.

Hole Diameter by Depth	
Depth (m)	Diameter (mm)
4.00	87

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Scale: 1:25

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KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisurbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ - Water Strike
▼ - Water Rise
MP - Mackintosh Probe
V - Vane Shear Test
N/* - SPT Blows
ES - Environmental Sample
▽ - Level On Completion
▼ - Level Casing Withdrawn
▼ - Standpipe Level

Groundwater Strike				
Strike (m)	Rose To (m)	Casing (m)	Sealed	Remarks
2.30	2.30	2.00	Not	Fast

Groundwater Observations			
Date	Depth (m)	Casing (m)	Water (m)
23/07/2025	4.00	4.00	2.75
23/07/2025	4.00		1.05

LUCION GROUND ENGINEERING LTD. Peterborough Tel : 01733 566566	Site: Lower Luton Road, Harpenden			**WINDOW SAMPLE** **WS02**
	23/07/2025	Final Depth 4.45 m	Equipment Dynamic Sampling Rig	

Sample and In Situ Testing			Water Levels (Casing)	Well	Stratum Description	Legend	Depth (m)
Depth (m)	Type	Results					
0.10	D4				MADE GROUND - Light brown, silty, gravelly SAND. Gravel of flint and brick.		
0.30	D1						
0.60	D2				Very stiff, becoming firm, brown and orange brown, slightly gravelly, silty CLAY. Gravel of angular to sub-rounded flint.		0.40
0.90	D3						
1.20	D5						
1.20-2.00	U1						
1.35-1.65	SPT	N5 (3/0,1,2,2)					
					Structureless CHALK of firm, off-white and white, gravelly SILT with occasional firm, brown clay partings. Gravel of angular to sub-angular, very weak to weak, low density chalk clasts, and occasional coarse gravel size flint nodules.		1.45
2.00	D6		(2.00)				
2.00-3.00	U2						
2.15-2.45	SPT	N72 (23/30,24,13,5)					
3.00	D7		(2.00)				
3.00-4.00	U3						
3.15-3.45	SPT	N13 (7/6,3,2,2)					
					...with iron staining on chalk clasts below 3.70m depth.		
4.00	D8		(2.00)				
4.15-4.45	SPT	N13 (7/2,3,5,3)	C				
					End of Borehole at 4.45m		4.45

Remarks
1. Starter pit excavated to 1.20m depth.
2. Borehole cased to 2.00m depth.
3. Gas monitoring standpipe installed to 4.00m depth.

Hole Diameter by Depth	
Depth (m)	Diameter (mm)
2.00	87
3.00	77
4.00	67

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Scale: 1:25

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KEY

D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
S/C - SPT Spoon/Cone
▽ - Water Strike
▼ - Water Rise
MP - Mackintosh Probe
V - Vane Shear Test
N/* - SPT Blows
ES - Environmental Sample
▽ - Level On Completion
▼ - Level Casing Withdrawn
▼ - Standpipe Level

Groundwater Strike

Strike (m)	Rose To (m)	Casing (m)	Sealed	Remarks
3.70	4.00	2.00	Not	Slow

Groundwater Observations

Date	Depth (m)	Casing (m)	Water (m)
23/07/2025	4.45	2.00	4.20

Appendix B

EXISTING PEDESTRIAN & CYCLE CROSSING

PED/CYCLE LINKS

LOWER LUTON ROAD

The Thatched Cottage

CRABTREE LANE

Batford Pumping Station

PED/CYCLE LINKS

EXISTING NATURAL HABITAT TO REMAIN

FOOT BRIDGE

LAP

PEDESTRIAN ACCESS MEADOW

FLOWER MEADOW

RIVER LEA

Southern Boundary of Proposed Allocation Site

ADJUSTED FLOOD PLAIN BOUNDARY (FLOOD PLAIN CAPACITY IMPROVED)

CURRENT FLOOD PLAIN CONTOUR

KEY:

- Communal / BNG
- Private gardens
- LAP Notional Local Area for Play
- Existing tree
- Proposed tree

N

Scale Bar 0m 5m 10m

Scale Bar 0m 5m 10m