



Groundwater Flood Risk Assessment

Project: 7 Purssell Close, Maidenhead, Berkshire, SL6 3XU
18 August 2026



EXECUTIVE SUMMARY

This site-specific Groundwater Flood Risk Assessment has been prepared by Air & Flood Consultants in respect of 7 Purssell Close, Maidenhead, Berkshire, SL6 3XU. The proposed development comprises an extension and associated alteration to the existing dwelling at ground level. No basement or other below-ground accommodation is proposed.

The risk of groundwater flooding at the site is assessed as Low.

The assessment rests on four lines of evidence: the water levels held by the British Geological Survey for eleven Chalk boreholes and wells measured since 1977 within 2.1 km of the site, together with four earlier records read in full; the Environment Agency groundwater monitoring record; the borough Strategic Flood Risk Assessment, which remains the policy authority for this source; and the [proprietary Air & Flood Consultants groundwater flood risk model](#).

The principal finding is that the water table in the Chalk beneath the site stands several metres below ground level, and is expected to remain so in an extreme event. Every measurement made in the Chalk within 2.1 km since 1977 falls between 23.24 to 26.17 mAOD, with a median of 24.54 mAOD; the nearest, at 480 m, reads 24.89 mAOD and the most recent, of 14 May 2025, reads 23.44 mAOD. Against a site ground level of 32.69 mAOD, that is a depth to water of some 7.3 to 8.2 m.

Applying the largest range between median and highest recorded level observed at any Environment Agency station retained for this site, 3.2 m at Shottesbrooke Park over 49 years, gives an extreme high-stand at the site in the order of **28.1 mAOD**, approximately 4.6 m below ground level. Carrying the full uncertainty band on the mid-range level gives an upper bound of 30.1 mAOD, still 2.6 m below ground level. The conclusion is not sensitive to that band.

That finding is qualified in two respects. The borough Strategic Flood Risk Assessment places the site in the class $\geq 75\%$ of the Environment Agency Areas Susceptible to Groundwater Flooding dataset, which is the highest of the four classes mapped. Separately, groundwater monitoring undertaken 250 m to the south in 2022 recorded water at 1.98 m below ground level in the shallowest of six wells. Both matters are examined in this assessment and carried into the recommendations.

The AFC model returns a rating of Low at low confidence, having declined to resolve the regional piezometric surface from the monitoring stations available. The modelled depth to water of 2.99 m derives from topographic position alone and is not relied upon as a design level.

Subject to the recommendations set out below, the proposed development is considered to be acceptable in groundwater flood risk terms. The principal mitigation is the absence of below-ground accommodation, which removes the receptor most exposed to this source of flooding.



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INTRODUCTION

Purpose and Scope

Groundwater flooding occurs where the water table rises above ground level, or above the formation level of a below-ground structure, resulting in the emergence of water at the surface or its ingress into the structure. It is typically slow in onset and slow to recede.

There is no open national groundwater flood risk dataset equivalent to the Environment Agency Flood Map for Planning. Assessment of this source therefore relies on the borough Strategic Flood Risk Assessment as the policy authority, supported by measured ground investigation data, Environment Agency monitoring records and hydrogeological screening. This assessment addresses groundwater alone; the remaining sources of flooding are addressed in the site-specific Flood Risk Assessment.

The Site and the Proposal

Item	Detail
Site address	7 Purssell Close, Maidenhead, Berkshire, SL6 3XU
National Grid reference	E: 486352; N: 179179
Site area	246 m ² (0.0246 ha)
Local Planning Authority	Royal Borough of Windsor and Maidenhead
Lead Local Flood Authority	Royal Borough of Windsor and Maidenhead
Proposed development	An extension and associated alteration to the existing dwelling at ground level
Below-ground accommodation	None proposed
Flood Zone	Flood Zone 1
Groundwater Source Protection Zone	Source Protection Zone 3 (Total Catchment)
Ground level (EA LiDAR 1 m DTM)	32.46 – 33.22 mAOD across the site (mean 32.80 mAOD; 32.69 mAOD adopted in the AFC model)

The site occupies a mid-slope position on ground falling gently to the south-west (see Figure 2). The Cut, a statutory main river and a tributary of the Thames, lies 1,407 m to the south-east at approximately 24.05 mAOD. A dry valley with a floor at 25.4 to 26.0 mAOD runs south-south-east from a point approximately 670 m from the site and forms the nearest potential groundwater discharge control.



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Site Location

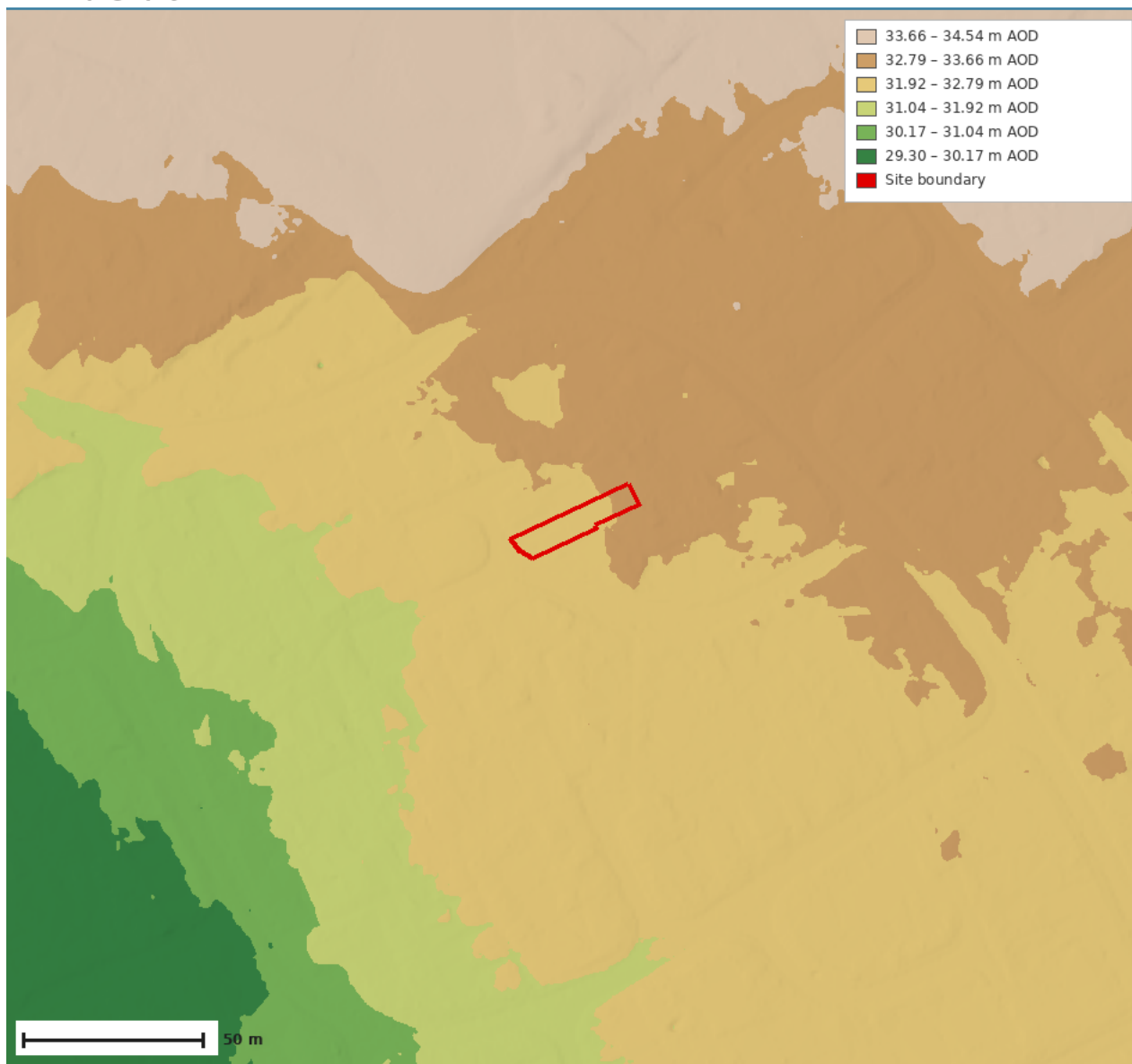


Figure 1: Site location



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Topography — EA LiDAR 1 m DTM (elevation)



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Figure 2: Ground levels across the site and its surroundings, derived from the Environment Agency LiDAR 1 m composite digital terrain model



POLICY CONTEXT

National Policy

The National Planning Policy Framework requires a site-specific flood risk assessment to consider flooding from all sources. The Planning Practice Guidance on flood risk and coastal change identifies groundwater among those sources. Where development is proposed in an area susceptible to groundwater flooding, the assessment is required to establish the likely groundwater levels and to demonstrate that the development will be safe for its lifetime.

Local Policy

Policy NR1 (Managing Flood Risk and Waterways) of the Royal Borough of Windsor and Maidenhead Borough Local Plan 2013–2033, adopted on 8 February 2022, is the flood risk policy for the borough. Paragraph 12.2.13 of the same plan identifies the Strategic Flood Risk Assessment, most recently revised in 2017/18, as the evidence base for flood risk.

Strategic Flood Risk Assessment

The Royal Borough of Windsor and Maidenhead Strategic Flood Risk Assessment (Level 1), June 2017 (Revision 07) is the policy authority for groundwater flood risk within the administrative area. SFRA paragraph 7.3.3 states that, where a proposed development is identified as being in an area where there is a possible risk of groundwater flooding, groundwater monitoring results must be submitted with the flood risk assessment, and that the assessment must also consider the impact groundwater may have on the effectiveness of any adopted sustainable drainage system. Paragraph 7.4.1 states that within all areas of the borough groundwater levels and soil permeability should be assessed on site at an early stage. The classification read at the site is given in the Historic Flooding and SFRA Mapping section, and the requirement for on-site groundwater monitoring is addressed in the Recommendations section.

A Level 2 Strategic Flood Risk Assessment was published in April 2018. Its listed scope is the sequential and exception testing of allocated sites and it has not been reviewed for this assessment.



GROUND CONDITIONS

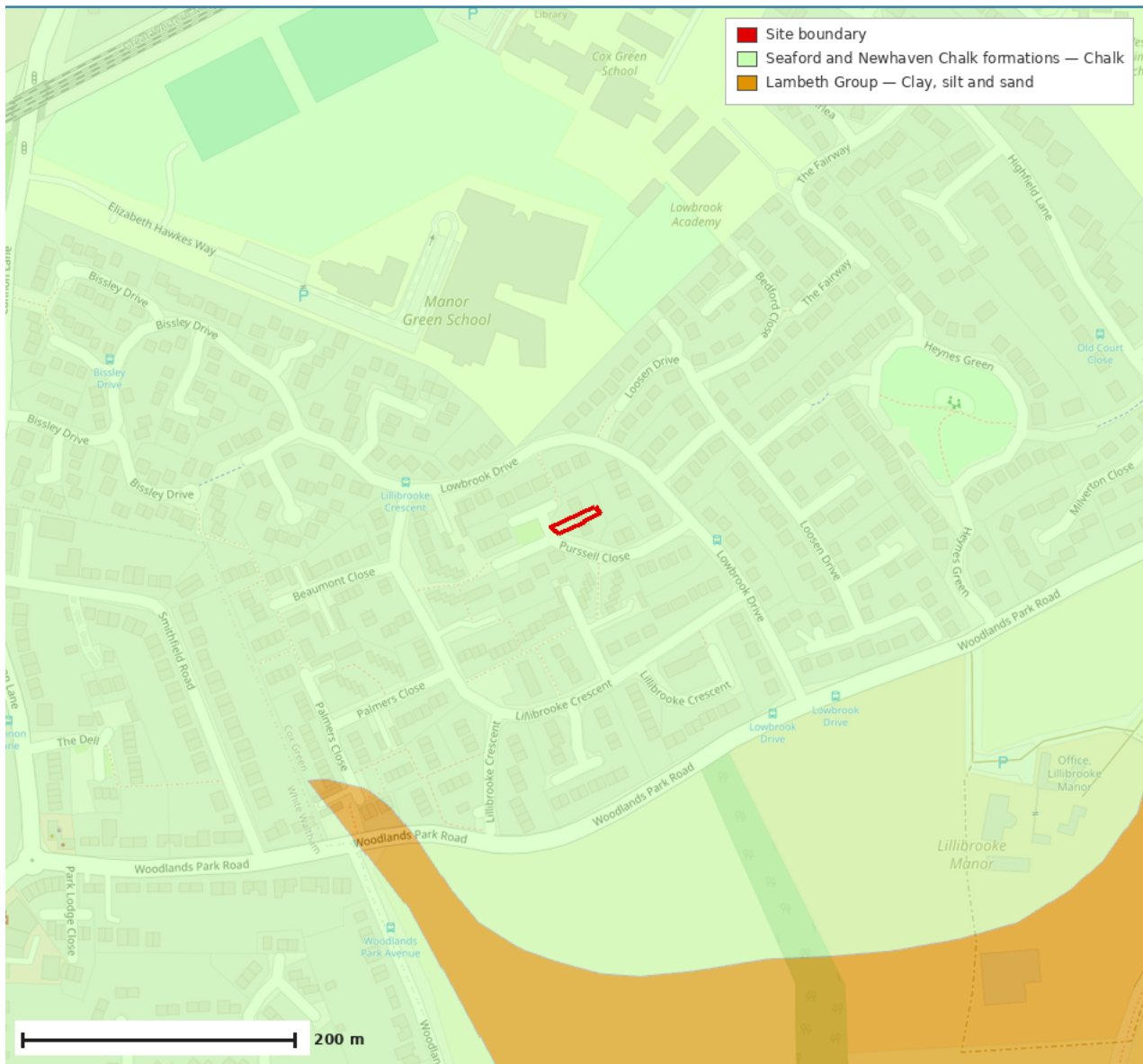
Geology

Unit	Lithology	Aquifer designation
Superficial: None mapped	BGS 1:50,000 mapping records no superficial deposit at the site	Not applicable
Bedrock: Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated)	Chalk (White Chalk Subgroup)	Principal Aquifer

The site is underlain by the White Chalk Subgroup, classified by the British Geological Survey as a highly productive aquifer in which flow is virtually all through fractures and other discontinuities (see Figure 3). A fractured Chalk aquifer transmits water readily and drains readily. Where it is unconfined and stands above the local discharge boundary, the water table sits at depth and responds to recharge over a season rather than over a storm. That is a different setting from a permeable superficial deposit resting on an aquiclude, in which a shallow water table is confined to a horizon of limited thickness and can rise within days.



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Bedrock Geology (BGS 1:50,000)



Contains British Geological Survey materials (c) UKRI 2026. Legend built from the units identified within the extent; swatches are the BGS map colours. Basemap (c) OpenStreetMap contributors.

Figure 3: Bedrock geology, BGS 1:50,000 mapping

Cover over the Chalk

No superficial deposit is mapped at the site, or anywhere within 420 m of it, by the British Geological Survey (see Figure 4). The records read nearby nevertheless log a cover over the Chalk at several locations, and the pattern is explained by the bedrock mapping rather than by the superficial mapping.

The feather-edge of the Lambeth Group, a Palaeogene clay, silt and sand sequence, is mapped 300 m to the south-south-west of the site at E 486274; N 178889, and it outcrops more extensively to the south and south-east (see Figure 3). The site itself stands on the Chalk outcrop, just beyond that edge.



Record	Distance	Position relative to the Lambeth Group edge	Cover logged over the Chalk
BGS SU87NE122, Woodlands Park Works	674 m NW	Away from the edge, on the Chalk outcrop	None — Chalk logged from ground level
BGS SU87NE118, Park View	480 m WSW	Close to the edge	5.00 m of clay and chalk with flints
BGS SU88SE82, Cox Green BH3	1,234 m NE	Away from the edge	1.20 m of clay and stones
Lillibrooke ground investigation	250 m S	On or adjacent to the outcrop	Topsoil and Made Ground over the Lambeth Group; the White Chalk Subgroup reached at 3.00 to 3.20 m
BGS SU87NE269, Ockwells Manor	1,333 m ESE	On the outcrop	5.10 m of clay
BGS SU87NE123 and SU87NE132	518 m E and 1,292 m SSW	—	No strata log held; each recorded only as a dug well in Chalk

The records that log a clay-rich cover lie on or close to the Lambeth Group outcrop; the one record that logs Chalk from ground level lies away from it, to the north-west. The Lillibrooke assessment states at its paragraph 4.9 that the Maidenhead Chalk aquifer is unconfined at that location, which is consistent with a cover of only 3.00 to 3.20 m there. The site sits between the two settings.

Two consequences follow. Where a cover is present the Chalk head beneath it is semi-confined and rises above the level at which it is encountered: at Ockwells Manor the water rose 2.13 m from the strike level, and at Cox Green BH1 it rose 1.83 m. And where the cover is present, water may be held within it above the Chalk water table. The thickness and continuity of any cover at the site itself are not established by the available records and are a matter for intrusive investigation.

The mapped junction also bears on the recorded groundwater emergence discussed later in this assessment. The British Geological Survey record for 2 Haywood Cottages notes a bourne rising at the junction of the Chalk and the Tertiary beds after wet periods, and that junction is the same feature mapped 300 m to the south-south-west of this site.



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Superficial Deposits (BGS 1:50,000)

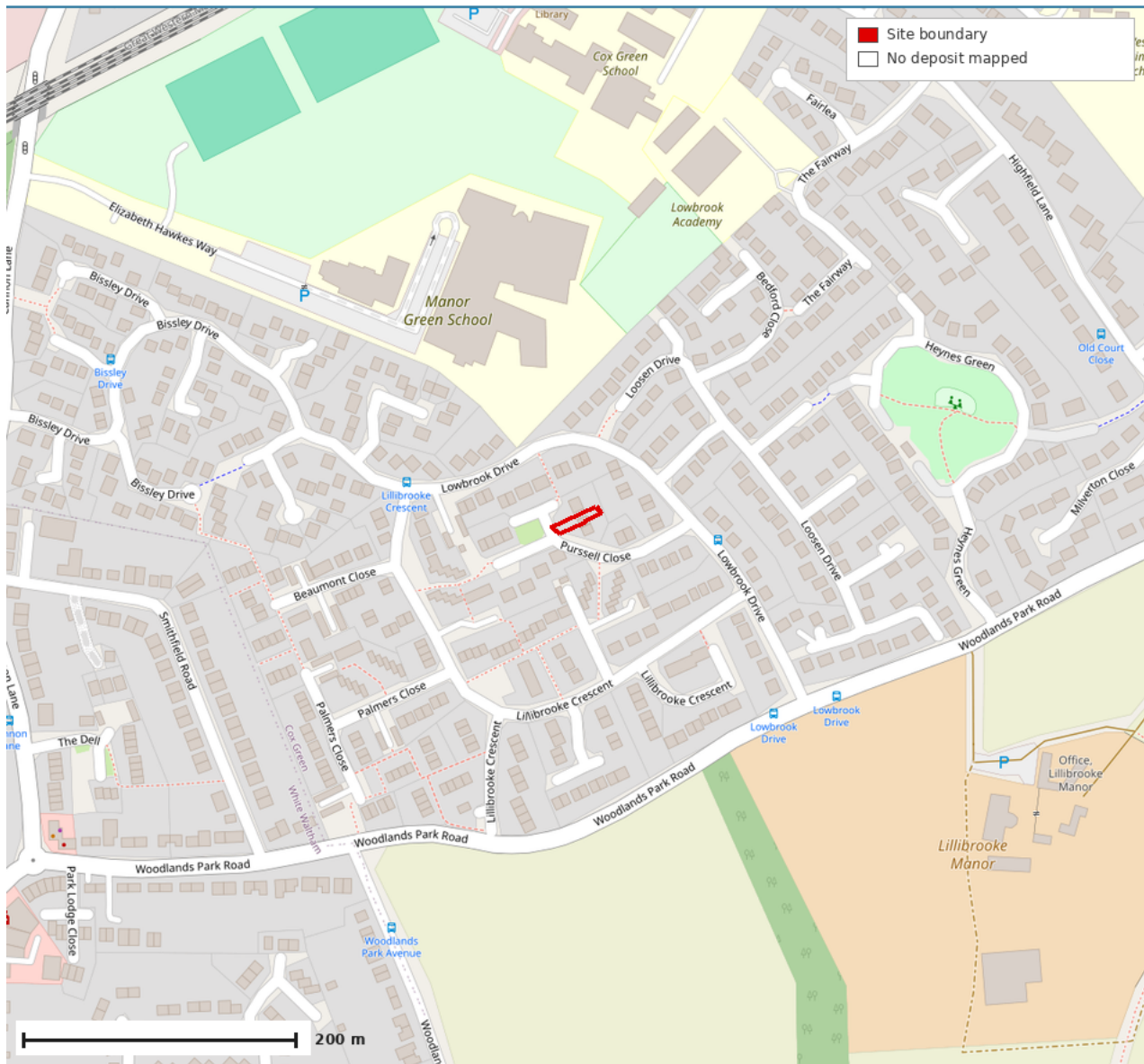


Figure 4: Superficial deposits, BGS 1:50,000 mapping. No deposit is mapped within the extent shown

Soils

The Cranfield Soilscales classification at the site is Soilscape 7, *Freely draining slightly acid but base-rich soils*, of loamy texture and freely draining drainage class.

Source Protection

The site lies within Source Protection Zone 3, the total catchment of a public water supply source (see Figure 5). The Zone 1 inner protection boundary lies 510 m to the south. The Environment Agency's open dataset carries the zone number and no source name; by coincidence of geometry the Zone 1 polygon 680 m to the



south encloses four boreholes recorded by the British Geological Survey at White Waltham and drilled in 2008 and 2009, and the source is understood on that basis to be the White Waltham groundwater source. The Lillibrooke assessment separately records a South East Water abstraction well in the south-west corner of that allocation, approximately 250 m to the south of this site.



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Hydrogeology — Source Protection Zones & Boreholes

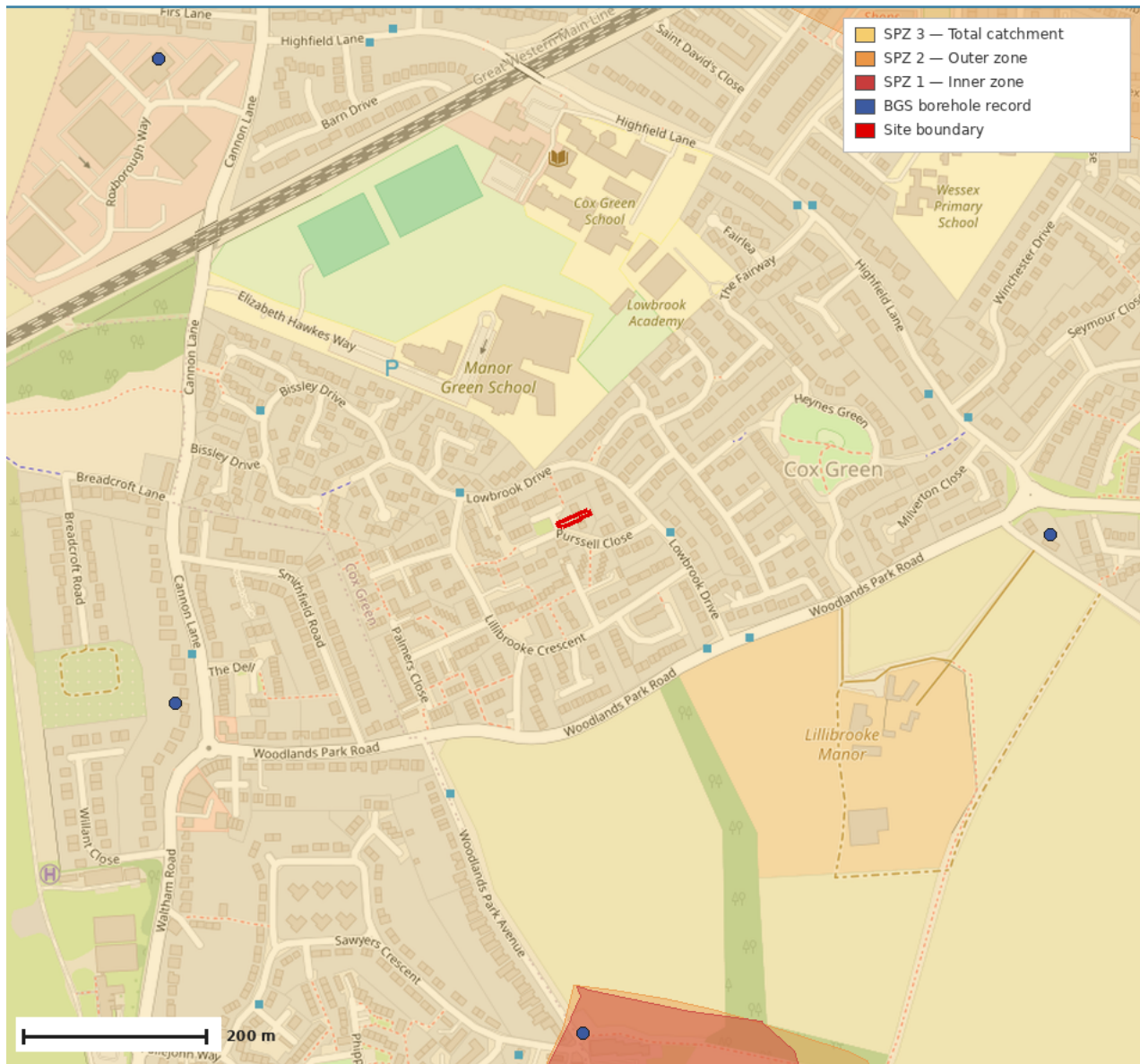


Figure 5: Hydrogeology — Environment Agency Source Protection Zones and BGS borehole records



BOREHOLE RECORD

A search of the BGS GeoIndex over a 2 km envelope returned 170 borehole records and 30 water wells, of which 145 carry a downloadable scan; 71 scans were retrieved and 28 read. The four records nearest the site that provide a water level in the Chalk are reproduced in full below and at Appendix A (see Figure 6). Every measured level within 2.1 km, including those not reproduced individually, is tabulated in the Modern Groundwater Record section that follows.

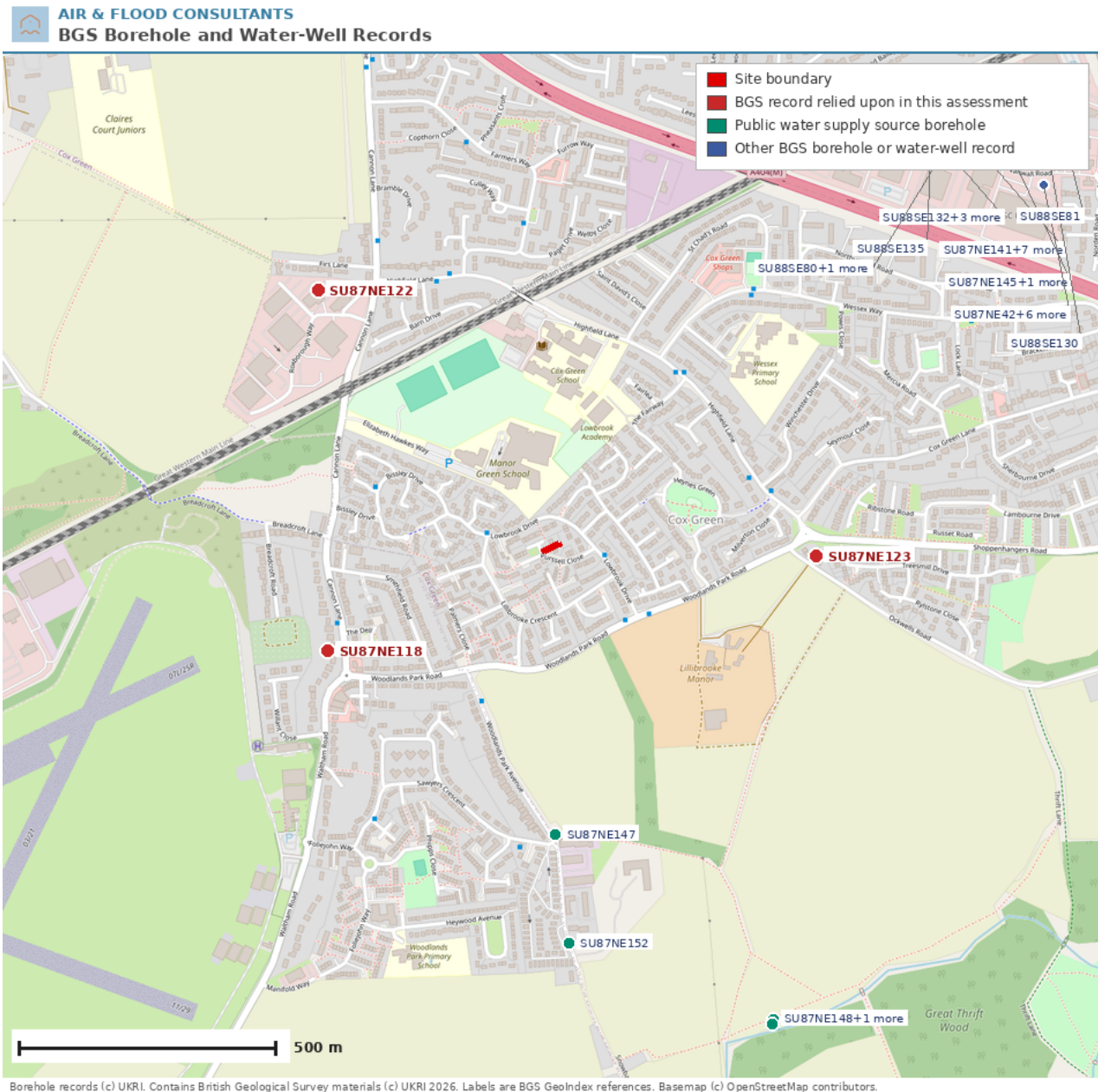


Figure 6: BGS GeoIndex borehole and water-well records in the vicinity of the site, labelled by BGS reference



Records within the Search Extent

Every British Geological Survey record falling within the extent of Figure 6 is listed below, 33 in total, so that each labelled point on that figure can be identified. Depth is the recorded length of the borehole where the register holds one.

Reference	Name	Distance	Depth (m)	Year	Water level
SU87NE118	Park View, Cannon Lane, Maidenhead	477 m WSW	17.0	—	Water level 24.89 mAOD, June 1996
SU87NE123	Cottage near Lowbrook Farm, White Waltham	520 m E	—	—	Water levels 24.08 – 25.91 mAOD, 1937–1942
SU87NE147	White Waltham ABH	557 m S	—	2008	Public water supply source borehole; record not open
SU87NE122	Woodlands Park Works, Maidenhead	674 m NW	76.2	1941	Water level 28.65 mAOD, 1941 (semi-confined)
SU87NE152	White Waltham Site B	768 m S	—	2009	Public water supply source borehole; record not open
SU87NE148	Shrubbery Copse, White Waltham SOBH	1012 m SSE	—	2008	Public water supply source borehole; record not open
SU87NE149	Shrubbery Copse, White Waltham COBH	1021 m SSE	—	2008	Public water supply source borehole; record not open
SU88SE132	Cox Green Tube 3	1104 m NE	19.0	1992	No water level in the open record
SU88SE133	Cox Green Tube 4	1119 m NE	19.0	1992	No water level in the open record
SU87NE143	Geoffrey House Maidenhead WS 4	1141 m NE	—	2002	No water level in the open record
SU87NE144	Geoffrey House Maidenhead WS 5	1141 m NE	—	2002	No water level in the open record
SU88SE134	Cox Green Tube 6	1143 m NE	18.0	1992	No water level in the open record
SU87NE141	Geoffrey House Maidenhead 2	1157 m NE	—	2002	No water level in the open record



Reference	Name	Distance	Depth (m)	Year	Water level
SU88SE136	Cox Green Tube 8	1159 m NE	17.0	1992	No water level in the open record
SU87NE142	Geoffrey House Maidenhead 3	1162 m NE	—	2002	No water level in the open record
SU88SE135	Cox Green Tube 7	1169 m NE	18.0	1995	No water level in the open record
SU88SE206	Geoffrey House Maidenhead WS 2	1183 m NE	—	2002	No water level in the open record
SU88SE131	Cox Green Tube 2	1183 m NE	18.0	1992	No water level in the open record
SU87NE145	Geoffrey House Maidenhead WS 6	1185 m NE	—	2002	No water level in the open record
SU88SE207	Geoffrey House Maidenhead WS 3	1190 m NE	—	2002	No water level in the open record
SU87NE45	Norden Road, Maidenhead TP 4	1194 m NE	3.0	—	No water level in the open record
SU87NE48	Norden Road, Maidenhead TP 7	1194 m NE	3.0	—	No water level in the open record
SU87NE46	Norden Road, Maidenhead TP 5	1194 m NE	3.2	—	No water level in the open record
SU87NE43	Norden Road, Maidenhead TP 2	1194 m NE	3.2	—	No water level in the open record
SU87NE47	Norden Road, Maidenhead TP 6	1194 m NE	3.0	—	No water level in the open record
SU87NE44	Norden Road, Maidenhead TP 3	1194 m NE	3.5	—	No water level in the open record
SU87NE42	Norden Road, Maidenhead TP 1	1194 m NE	3.0	—	No water level in the open record
SU88SE205	Geoffrey House Maidenhead WS 1	1198 m NE	—	2002	No water level in the open record
SU88SE204	Geoffrey House Maidenhead 1	1219 m NE	—	2002	No water level in the open record
SU88SE82	Cox Green, Maidenhead BH3	1234 m NE	76.0	—	No water level in the open record
SU88SE80	Cox Green, Maidenhead BH1	1247 m NE	107.0	—	No water level in the open record



Reference	Name	Distance	Depth (m)	Year	Water level
SU88SE130	Cox Green Tube 1	1257 m NE	17.0	1992	No water level in the open record
SU88SE81	Cox Green, Maidenhead BH2	1332 m NE	107.0	—	No water level in the open record

BGS SU87NE118 — Park View, Cannon Lane, Maidenhead (480 m west-south-west)

Recorded as H.D. Drilling Ltd for Mrs J. M. Bell, record ref. 7183, June 1996. 300 mm drilled diameter to 5.00 m, reducing to 200 mm to 17.00 m. Ground level is taken as 33.19 mAOD. The record states 35 m AOD. The EA LiDAR 1 m DTM returns 33.19 mAOD at the same grid reference and the BGS water-well datum field records 33 m. The stated level differs by 1.81 m and is not adopted.

Depth (m bgl)	Stratum	Base level (mAOD)
0.00 – 5.00	Clay and chalk with flints	28.19
5.00 – 17.00	Chalk with flints, recorded as unstable at 17.00 m	16.19

Groundwater was encountered at **8.30 m below ground level**, equivalent to **24.89 mAOD**, within the Chalk, in 26 June 1996. Water was encountered at 8.50 m and the rest level on completion recorded as 8.30 m, the water having risen 0.20 m. Plain steel casing is grouted from 0.50 m to 5.00 m, sealing the overlying clay, so the recorded level is the head in the Chalk. A one-hour test drew the level down 0.20 m and it recovered within 30 minutes. The pumping rate is entered as 3.27 against a units box reading 'm³/d : l/s' and the intended unit is not stated on the record, so no transmissivity is inferred from it.

BGS SU87NE123 — Cottage 200 yd north-east of Lowbrook Farm, White Waltham (518 m east)

Recorded as Geological Survey record 269/202; levels measured by Wessex Water Company for the Air Ministry, 1937 to 1942. Hand-dug well in Chalk. Ground level is taken as 32.31 mAOD. The record states a surface level of +106 ft OD, equivalent to 32.31 mAOD. The EA LiDAR 1 m DTM returns 31.69 mAOD, so the stated level sits 0.62 m above LiDAR, within the ±10 m grid-reference tolerance carried by the record. The stated level is adopted.

Groundwater was encountered at **7.01 m below ground level**, equivalent to **25.30 mAOD**, within the Chalk, in January 1937. The record carries a short series rather than a single reading. The typed abstract reads: 'R.W.L. +83. Jan. 1937; +85 (max.); +80 (min.). 1940; +83 (max.); +79 (min.). 1942.' The observed range is therefore +79 to +85 ft OD, equivalent to 24.08 to 25.91 mAOD, and the mid-range of that series is 24.99 mAOD. A manuscript note dated 23 July 1959 records that the well was to be filled in.

**BGS SU87NE122 — Anti-Attrition Metal Co. Ltd, Woodlands Park Works, Maidenhead (674 m north-west)**

Recorded as Isler and Co. Ltd, Geological Survey record 269/19, 1941. Lining tubes 15¼ in reducing to 8 in. Ground level is taken as 36.58 mAOD. The record states a surface level of +c.120 ft OD, expressly approximate. The EA LiDAR 1 m DTM returns 37.57 mAOD, so the stated level sits 0.99 m below LiDAR.

Depth (m bgl)	Stratum	Base level (mAOD)
0.00 – 1.52	Chalk	35.06
1.52 – 76.20	Chalk with flints	-39.62

Groundwater was encountered at **7.93 m below ground level**, equivalent to **28.65 mAOD**, within the Chalk, in 1941. Water was encountered at +c.60 ft OD (18.29 mAOD) and rose 10.36 m to a rest level of +c.94 ft OD. The pumped level is recorded as unchanged from the rest level at a yield of 1,450 gallons per hour. Both the surface level and the rest level are recorded as approximate, and the rise of 10.36 m from strike to rest indicates a semi-confined head at depth rather than a water table. The record is reported for completeness and is not used in the estimate of the water table at the site. It is also the only record read within 2 km that logs Chalk from ground level, with no cover.

BGS SU87NE132 — 2 Haywood Cottages, White Waltham (1,292 m south-south-west)

Recorded as Water Resources Board record 269/201, well ref. SU87/5; levels measured by the Mid-Wessex Water Company as their well No. 22, 1937 to 1966. Hand-dug well in Chalk, 28 ft 11 in deep. Ground level is taken as 33.07 mAOD. The Water Resources Board continuation sheet states +108.5 ft OD, equivalent to 33.07 mAOD; the primary Geological Survey record states 108.6 ft as a levelled value. The EA LiDAR 1 m DTM agrees to within 0.5 m.

Groundwater was encountered at **6.25 m below ground level**, equivalent to **26.82 mAOD**, within the Chalk, in January 1937. The rest water level recorded in January 1937 is +88 ft OD, equivalent to 26.82 mAOD. The value of this record is that it also holds an annual maximum and minimum series covering 19 years between 1940 and 1966, rather than a single observation. The mean annual maximum is 27.00 mAOD and the mean annual minimum 25.46 mAOD, giving a mid-range level of 26.23 mAOD and a mean annual range of 1.54 m. The highest level recorded is 28.10 mAOD on 8 February 1961 and the lowest 24.99 mAOD in 1940. A manuscript note on the same record states that approximately 950 yd to the south-east, at about +95 ft OD, a bourne rises at the junction of the Chalk and the Tertiary beds after wet periods.

Datum Convention

One rule has been applied to every record. Where the level stated on the record agrees with the EA LiDAR 1 m composite digital terrain model to within 1.00 m, the stated level is adopted; where it does not, the LiDAR level is adopted and the discrepancy is reported. Of the records relied upon, only Park View fails that test, at 1.81 m, and its own BGS water-well datum field agrees with LiDAR rather than with the log.



MODERN GROUNDWATER RECORD

The four records reproduced above include two from the 1930s and 1940s. The assessment does not rest on them alone. Every water level measured in the Chalk within 2.1 km of the site since 1977 and held in the open record is set out below, 11 in total.

Record	Location	Distance	Date	Water level (mAOD)
BGS SU87NE118	Park View, Cannon Lane	480 m WSW	June 1996	24.89
BGS SU88SE132	Cox Green Tube 3	1,101 m NE	23 November 1992	24.72
BGS SU88SE133	Cox Green Tube 4	1,116 m NE	23 November 1992	23.80
BGS SU88SE134	Cox Green Tube 6	1,140 m NE	23 November 1992	25.15
BGS SU88SE135	Cox Green Tube 7	1,166 m NE	23 November 1995	24.64
BGS SU88SE131	Cox Green Tube 2	1,180 m NE	23 November 1992	23.98
BGS SU88SE130	Cox Green Tube 1	1,254 m NE	23 November 1992	24.54
BGS SU87NE269	Ockwells Manor	1,333 m ESE	14 May 2025	23.44
BGS SU88SE197	Altwood School	1,347 m NNE	16 September 2004	23.24
BGS SU87NW22	Feens Farm, Littlewick Green	1,485 m WNW	August 1977	26.17
BGS SU87NE140	Old Bailey, Foxborough Court	2,045 m ENE	February 2007	23.40

The eleven levels span 23.24 to 26.17 mAOD with a median of 24.54 mAOD. Six of them are observation boreholes at Cox Green read on a single day in November 1992 and are therefore one synoptic observation rather than six independent ones. Setting those aside, the remaining five span 23.24 to 26.17 mAOD. The nearest record to the site, at 480 m, reads 24.89 mAOD; the most recent measurement anywhere in the search area, made on 14 May 2025 at Ockwells Manor, reads 23.44 mAOD.

Against a site ground level of 32.69 mAOD, a mid-range water table of 24.5 to 25.4 mAOD corresponds to a depth to water of approximately 7.3 to 8.2 m. That range is bracketed by the two nearest records, which lie on



opposite sides of the site: Park View at 24.89 mAOD 480 m to the west-south-west, and the Lowbrook Farm cottage well at 25.30 mAOD 518 m to the east.

The Piezometric Surface

A least-squares plane has been fitted to the measured levels to give a regional water-table surface. Two records are excluded from the fit and the reason is given rather than assumed: SU87NE122 records a semi-confined head that rose 10.36 m from the level at which water was encountered, and SU88SE80 is an abstraction borehole whose level moved 4.88 m in two months in 1960 as its own pumps cycled. Neither is a water-table observation. The fit to the remaining 18 levels is set out below, with three alternatives reported so that the sensitivity to the choice of dataset is visible.

Fit	n	Level at the site	Gradient	R ²	RMS residual
Water-table observations only	18	25.43 mAOD	1.11 m/km falling towards 057°	0.875	0.59 m
All measured levels	20	25.58 mAOD	1.28 m/km falling towards 074°	0.768	0.86 m
1977 to 2025 only	11	24.74 mAOD	—	—	—
1937 to 1955 only	9	26.09 mAOD	—	—	—

The four fits return between 24.74 and 26.09 mAOD at the site, a spread of 1.35 m. Removing the two records that are not water-table observations improves the fit materially, from a root-mean-square residual of 0.86 m to 0.59 m, and turns the gradient from 074° to 057°. The primary fit is adopted: **25.43 mAOD at the site**, on a surface falling at 1.11 m/km towards the north-east, which is the direction of the Thames.



Figure 7: Chalk piezometric surface fitted to the measured water levels, with the observations, the site and the recorded bourne emergence

Depth to the water table is then derived by subtraction, in a single step:

Term	Source
Ground level	Environment Agency LiDAR 1 m composite digital terrain model, resampled to an 8 m grid over a 5.2 km square centred on the site
less the water level	the fitted piezometric surface above, evaluated at the centre of each 8 m cell



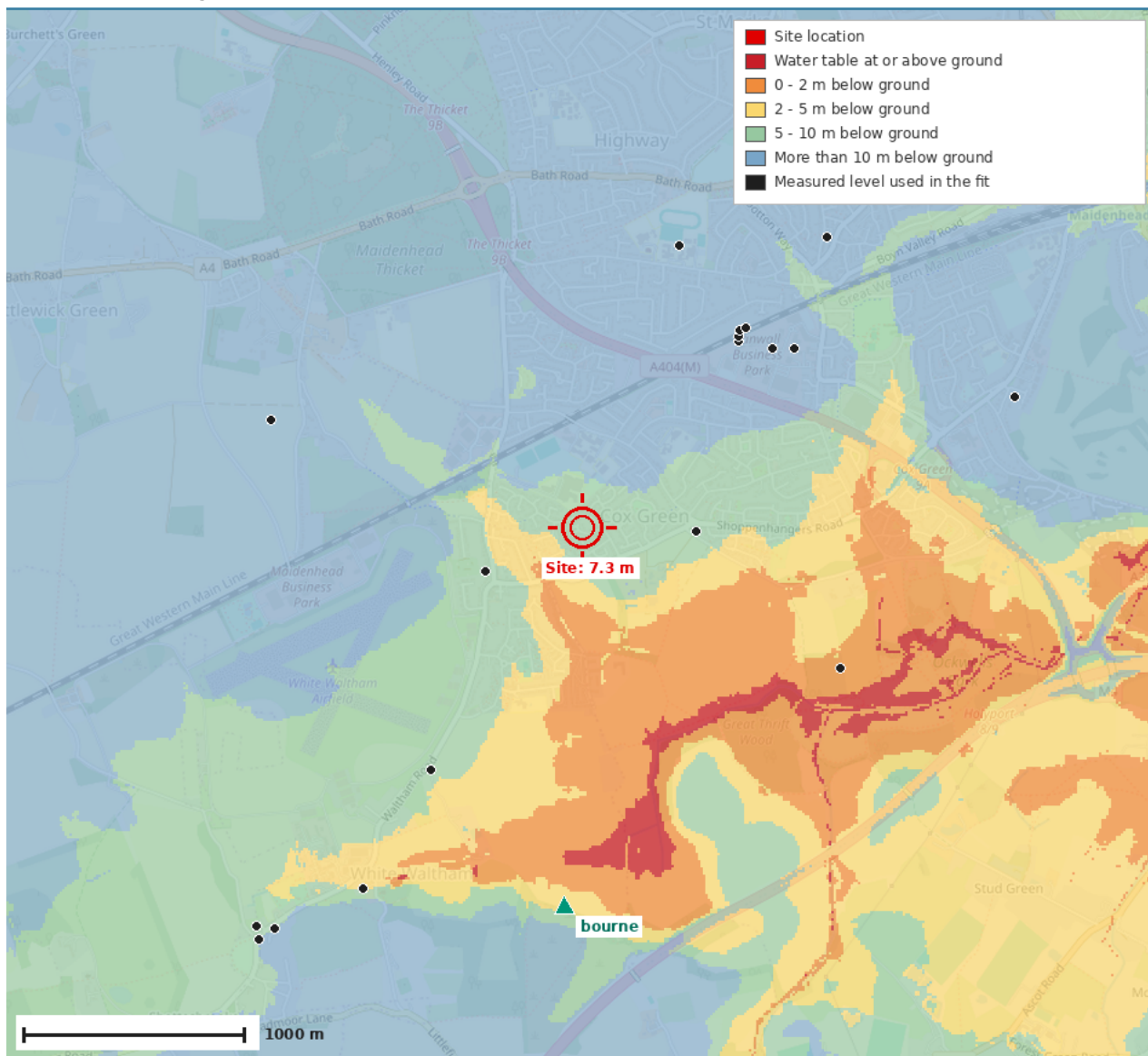
Term	Source
= depth to water	positive where the water table lies below ground; negative where the fitted surface reaches or exceeds ground level

At the site the result is 7.3 m. No interpolation, smoothing or hydraulic routing is applied, and no allowance for an extreme high-stand is included: the result represents mid-range conditions, and an extreme high-stand would raise the water table by approximately 3.2 m throughout. The surface is a regional plane fitted to observations spanning 88 years and is least reliable away from the measured points and within the floodplain to the east, where the water table is controlled by the river rather than by the regional gradient. It is an indication of the shape of the surface, not a flood extent.

One feature of it is worth drawing out. The band in which the fitted surface reaches or exceeds ground level coincides with the dry valley running south-south-east from the site, and the bourne recorded on BGS SU87NE132 falls on the edge of that band. The surface was fitted without reference to either feature, so the agreement is a check on the fit rather than a product of it.



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Indicative Depth to the Chalk Water Table



Ground level less the fitted piezometric surface. Mid-range conditions; an extreme high-stand would raise the water table by approximately 3.2 m throughout. The surface is a regional plan EA LiDAR 1 m composite DTM resampled to 8 m, less the fitted Chalk piezometric surface. Indicative only. Contains public sector information licensed under the Open Government Licence v3.0. Basemap (c) Op

Figure 8: Indicative depth to the Chalk water table, being the LiDAR ground model less the fitted piezometric surface, under mid-range conditions

The uncertainty on the adopted mid-range level is taken as ± 1.5 m, which is wider than the formal standard error of any of these fits and reflects the spread between them, the mixing of observation dates over 88 years and the seasonal range of the aquifer.



GROUNDWATER REGIME

Environment Agency Monitoring

Environment Agency groundwater monitoring stations within 10 km have been reviewed. Only those whose hydrogeological regime can reasonably be transferred to the site are retained; stations screened in a confined horizon, standing in a markedly different topographic position, or holding too short a record are excluded from the quantitative estimate and carried as context.

Station	Distance	Record	Median (mAOD)	Highest recorded (mAOD)	Range, median to highest
Shottesbrooke Park	2.91 km	1977–2026 (378 readings)	32.19	35.38	+3.20 m
Whistley Green	9.00 km	1977–2026 (270 readings)	33.12	35.76	+2.64 m
Hamble Brook	10.07 km	1998–2026 (459 readings)	32.21	33.93	+1.72 m
Stubbings	2.71 km	1950–2026 (436 readings)	—	—	Excluded — context only
Blackmoor	3.88 km	2011–2022	—	—	Excluded — context only
Maidenhead Ditch	3.94 km	2006–2017	—	—	Excluded — context only
Summerleaze	4.62 km	2006–2018	—	—	Excluded — context only
Pigeon House Lane	9.16 km	2001–2013	—	—	Excluded — context only

Levels are given at each station's own borehole, not at the site. The quantity taken forward is the **observed** range between the median and the highest level recorded, rather than a level fitted to a stated annual exceedance probability. Two reasons. First, groundwater annual maxima in the Chalk are strongly serially dependent, so a level fitted by extreme-value methods to an annual maximum series carries a longer effective return period than its nominal one; the AFC model reports that caveat with its own output. Second, at two of these stations the fitted 1% level falls below a level that has actually been observed within the record, which is not a defensible basis for a design allowance. The observed range makes no distributional assumption and can be checked against the published record.

The Maidenhead Ditch and Summerleaze stations are excluded because their estimated extreme levels stand 5.49 m and 15.59 m respectively above the ground level at their own boreholes, which indicates a confined horizon whose head cannot be transferred to an unconfined position. The Blackmoor and Pigeon House Lane



stations were excluded by the screening on the length of the annual maximum series available to it at the time of the run; the published record for each in fact extends further than the model retrieved, and their exclusion should be read as precautionary rather than as a finding about the stations.

The Stubbings Record

Stubbings is the nearest Environment Agency station, at 2.71 km, and holds the longest record in the search area, from 1950 to 2026. It is excluded from the quantitative estimate for two reasons, both of which are given here because the station would otherwise be the obvious one to use.

The first is position. The station stands at 68.46 mAOD on the Chiltern dip slope, 35.77 m above the site, and its water table moves through 14.33 m. That amplitude is characteristic of a deep unconfined Chalk borehole high on an interfluvium and is not representative of a valley-side position 35 m lower, where the three retained stations move through 1.72 to 3.20 m.

The second is a single data point. The record contains one reading of 22.65 mAOD, on 20 October 2022. The station's published metadata give a datum of 69.19 mAOD and a borehole depth of 45.72 m, placing the base of the borehole at 23.47 mAOD; the reading therefore lies 0.82 m below the bottom of its own borehole. It is the only one of 436 readings below that base, the next lowest level in 76 years is 28.41 mAOD, and the station read 33.07 mAOD six months before it and 35.63 mAOD six months after. The reading is treated as an artefact and excluded, and the record minimum is taken as 28.41 mAOD.

Seasonal and Extreme Range in the Chalk

The quantity required by this assessment is not an absolute level at a distant station but the range through which the water table moves in this aquifer, which can then be applied to the measured level at the site.

Record	Basis	Range from median or mid-range to the highest recorded level
EA Shottesbrooke Park	49 years of record; 2.91 km from the site; the closest analogue in ground level and setting	+3.20 m (median 32.19 mAOD; highest 35.38 mAOD, 25 February 2014)
EA Whistley Green	49 years of record; 9.00 km	+2.64 m (median 33.12 mAOD; highest 35.76 mAOD)
BGS SU87NE132, Haywood Cottages	19 years of annual maxima and minima between 1940 and 1966; 1,292 m from the site	+1.87 m (mid-range 26.23 mAOD; highest 28.10 mAOD, 8 February 1961)
EA Hamble Brook	28 years of record; 10.07 km	+1.72 m (median 32.21 mAOD; highest 33.93 mAOD)

The four values span 1.72 to 3.20 m. The largest, **+3.20 m**, is adopted. It comes from the nearest and longest of the retained stations, and it is taken in preference to the mean because the two shortest records in the set are the least likely to contain an extreme. The Haywood Cottages figure of +1.87 m is a lower bound in any



event: the observation period runs to 27 years with a gap between 1943 and 1950, and the well is only 8.81 m deep, so the lowest stands may have been truncated by the base of the well.

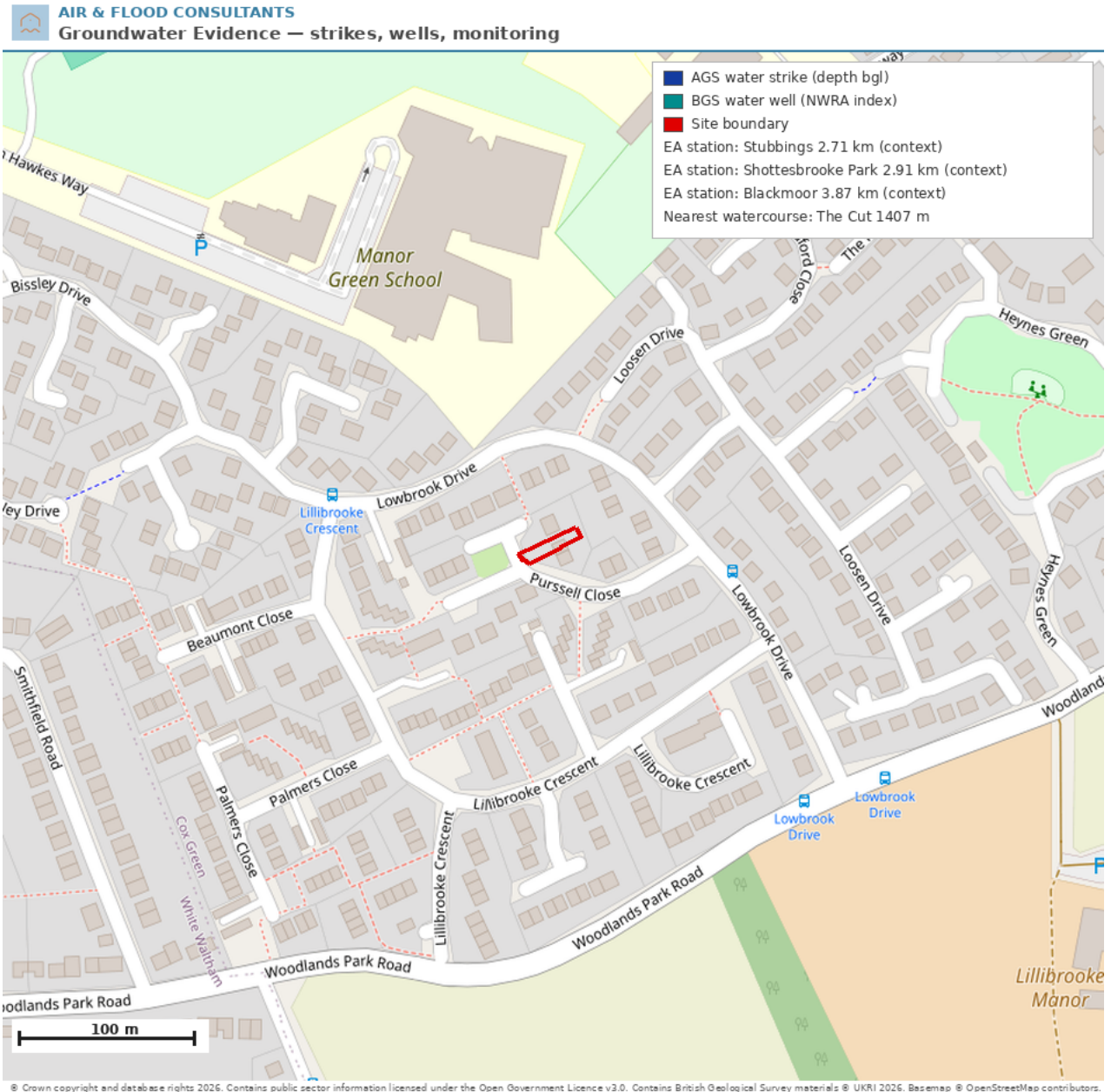


Figure 9: Groundwater evidence base — Environment Agency monitoring stations, BGS water wells and recorded flood outlines in the vicinity of the site



HISTORIC FLOODING AND SFRA MAPPING

Environment Agency Groundwater Alert Areas

The site does not lie within an Environment Agency groundwater flood alert area. The nearest is Groundwater flooding in East Maidenhead (061FAG23Mdnhead), the nearest edge of which lies 4.2 km to the north-east. No record of a groundwater flood alert covering the site has been identified.

Recorded Flooding

The site does not lie within any recorded flood outline attributed to groundwater, and no groundwater flooding is recorded at the property or within 5 km. The only groundwater flooding recorded in the Strategic Flood Risk Assessment is at paragraph 4.2.32, which records that of approximately 170 properties confirmed as flooded internally between December 2013 and February 2014, one was flooded from groundwater. The document records no groundwater flooding at Cox Green or in the south-west of the borough.

RBWM Section 19 Flood Investigation, Maidenhead Surface Water Flooding September 2024 records that no groundwater flooding was observed during the September 2024 event, the flooding being attributed to surface water running over ground already at capacity. Antecedent conditions were extreme: rainfall over the six months to September 2024 was 146% of the long-term average, the September soil moisture deficit was 0 to 1 mm against a long-term average of 88 mm, and groundwater levels at the nearest indicator site were classed as exceptionally high. Within the Cox Green ward, three properties were flooded internally and two externally in the Cox Green ward. The nearest mapped flooding hotspot lies approximately 70 m to the north-north-west, centred on the Manor Green School campus off Elizabeth Hawkes Way; the site itself lies outside every mapped hotspot. That the mechanism recorded was surface water rather than groundwater emergence, in a month with regional groundwater classed as exceptionally high and the soil at field capacity, is direct evidence about this location and is weighed accordingly in the Assessment section.

Recorded Groundwater Emergence

One record of groundwater emergence has been found in the search area. A manuscript note on BGS SU87NE132 states that approximately 950 yd to the south-east of that well, at about +95 ft OD, a bourne rises at the junction of the Chalk and the Tertiary beds after wet periods. That places the emergence point at approximately 28.96 mAOD, some 1,700 m to the south of the site and 3.73 m below its ground level. The significance of that level is examined in the Interpretation of the Modelled Output section, where it provides an independent check on the extreme high-stand derived from the monitoring records.

SFRA Susceptibility Mapping

Figure E — Areas Susceptible to Groundwater Flooding (drawing 0499-SFRA-105 Rev A, 19 May 2017) of the Royal Borough of Windsor and Maidenhead Strategic Flood Risk Assessment (Level 1), June 2017 (Revision 07) places the site within the class $\geq 75\%$ of the Environment Agency Areas Susceptible to Groundwater Flooding, 1 km grid, which is the highest of the four classes mapped (see Figure 10). Each vertex of the site boundary was tested against the georeferenced map and every one returns the same class. The reading is corroborated in that the same dataset and the same classification are carried on the sheet 'Groundwater Flood Risk' (November 2025) at Annex 1 of the draft RBWM Local Flood Risk Management Strategy 2026–2041, nine years later.

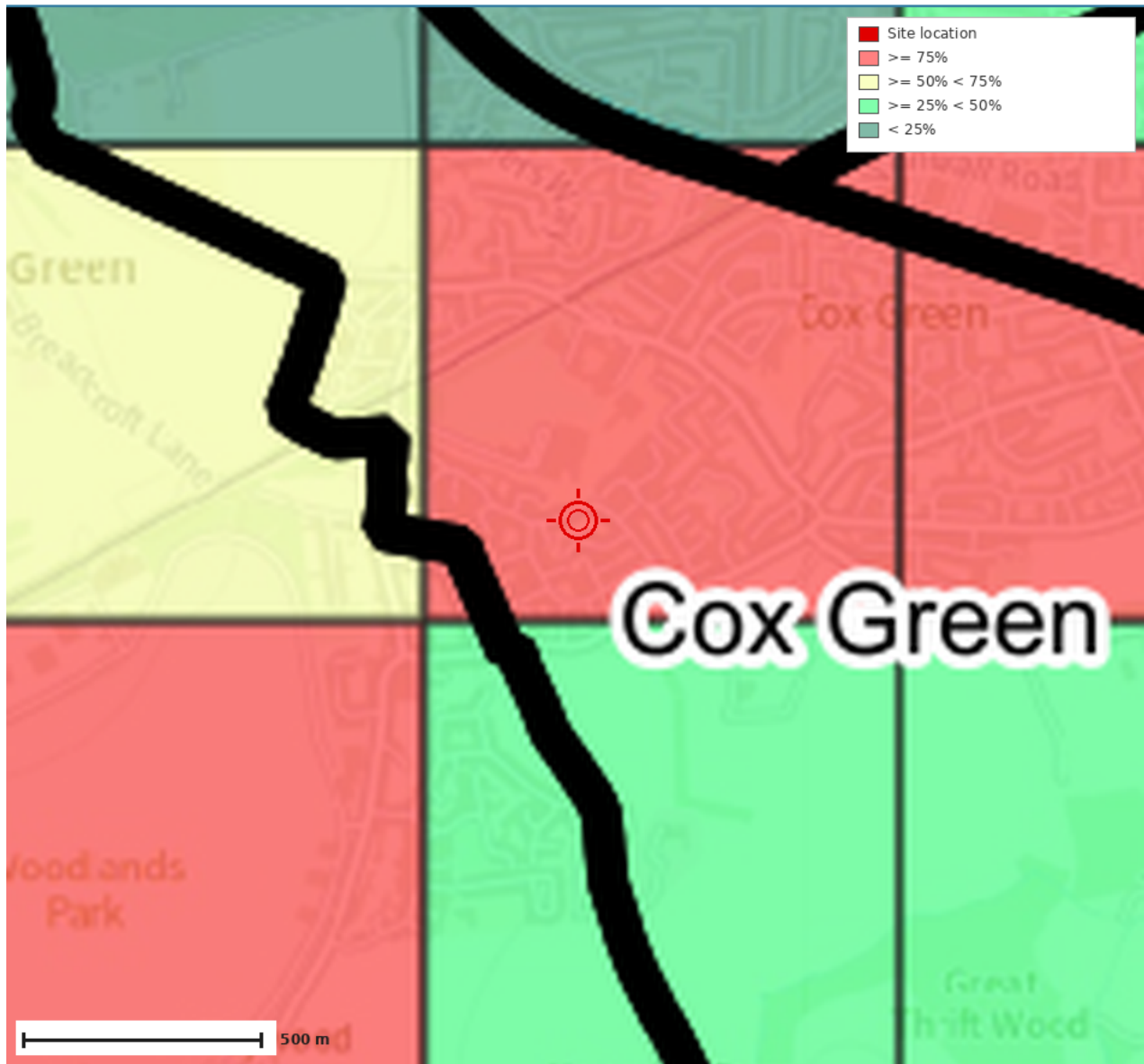


The site is not centrally placed within its 1 km cell. The nearest boundary with a different class lies 179 m to the south, where the classification falls two bands to $\geq 25\% < 50\%$; the western boundary lies 352 m away, where it falls one band. A 1 km grid product cannot resolve conditions at the scale of a single plot, and the classification should be read as placing the site within a susceptible area rather than as a statement about the site itself.



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Susceptibility to Groundwater Flooding



Extract from Annex 1, sheet 'Groundwater Flood Risk' (Nov 2025), RBWM draft Local Flood Risk Management Strategy 2026-2041. Layer: EA Areas Susceptible to Groundwater Flooding, 1 km grid. OGL v3.0. OS

Figure 10: Environment Agency Areas Susceptible to Groundwater Flooding, as mapped by the Royal Borough of Windsor and Maidenhead, with the site location indicated

The classification is one of susceptibility rather than likelihood. SFRA paragraph 4.2.16 states that the maps show the proportion of each 1 km grid square in which conditions permit groundwater to emerge, that they do



not show the likelihood of groundwater flooding occurring, and that only isolated locations within the overall susceptible area are likely to suffer the consequences of groundwater flooding. As the borough Strategic Flood Risk Assessment, it remains the policy authority for this source.



THE LILLIBROOKE GROUND INVESTIGATION

A ground investigation was carried out 250 m to the south in support of the Lillibrooke Manor outline application, and its results are the nearest measured groundwater data to the site. They are reported here in full, because the monitoring results and the infiltration results bear on different parts of this assessment and are drawn from the same page of the same document (Flood Risk Assessment and Drainage Strategy, Lillibrooke, Cox Green (Glanville Consultants, ref. 023_4140366_ML, Issue 6, 30 August 2023), Tables 1 to 3, submitted under application 23/00834/OUT).

Ground Conditions and Water Encountered

The strata recorded comprise Topsoil and Made Ground overlying the Lambeth Group with the White Chalk Subgroup beneath. The six soakaway trial pits reached the White Chalk Subgroup at 3.00 to 3.20 m below ground level. During the intrusive works, groundwater was recorded between 2.80 and 3.00 m below ground level during the intrusive investigation. Ground levels across that allocation are 27 to 32 mAOD, falling from north-east to south-west at an average gradient of 1 in 60.

Monitoring Results

Six dual-purpose monitoring wells were installed and read on 5 occasions between 9 September to 26 October 2022. Depths to water, in metres below ground level, are reproduced below.

Well	09/09/22	14/09/22	27/09/22	11/10/22	26/10/22
WS01	1.98	2.10	2.18	2.22	2.10
WS02	3.79	3.84	3.92	4.00	3.88
WS03	Dry	Dry	Dry	Dry	Dry
WS04	Dry	Dry	Dry	Dry	2.88
WS05	2.40	2.45	2.54	2.56	2.20
WS06	Dry	Dry	Dry	Dry	Dry

Three wells held water at every visit, a fourth from the final visit only, and two were dry throughout. The three continuously wet wells each fell steadily between 9 September and 11 October and recovered by 26 October, a coherent seasonal signal at three different depths. Two readings bear directly on this site: the shallowest, 1.98 m below ground level at WS01, and the deepest, 4.00 m at WS02.

The mechanism cannot be resolved from the information available. Water standing at 1.98 to 2.56 m in WS01 and WS05 sits above the rockhead recorded at 3.00 to 3.20 m in the trial pits, and would therefore be perched or semi-confined within the Lambeth Group; water at 3.79 to 4.00 m in WS02 sits within the Chalk. The installed depths, ground levels and locations of the six wells are recorded in Part 1 of the associated ground appraisal report, which has not been made available, so the readings cannot be converted to levels and a shallow water table cannot be distinguished from perched water. Both readings are treated as measured facts and neither mechanism is asserted.



What the Lillibrooke Readings Bound

A conclusion can nonetheless be drawn without knowing which well sits where. Ground levels across the Lillibrooke allocation range from 27 to 32 mAOD. Taking the shallowest reading of the whole campaign, 1.98 m below ground level, and placing it at the highest ground on that allocation, gives a water level of **30.02 mAOD**. That is the highest level the Lillibrooke data can support anywhere on that site, and it remains **2.67 m below the ground level at 7 Purssell Close**. Placed at the lower ground on that allocation the same reading gives 25.02 mAOD, consistent with the modern Chalk record set out above.

Infiltration Results

Six soakaway tests to BRE Digest 365 were carried out at 3.00 to 3.20 m below ground level, returning infiltration rates of 2.6×10^{-5} to 3.8×10^{-3} m/s. Every test is remarked as infiltration within the White Chalk Subgroup. The Lillibrooke assessment concludes at paragraph 4.10 that the use of soakaways is potentially feasible across the whole development, subject to other geotechnical considerations. These results are carried into the Recommendations section, where they support a different conclusion on infiltration drainage from the one that the presence of a clay-rich cover would otherwise suggest.



PROPRIETARY AIR & FLOOD CONSULTANTS GROUNDWATER FLOOD RISK MODEL

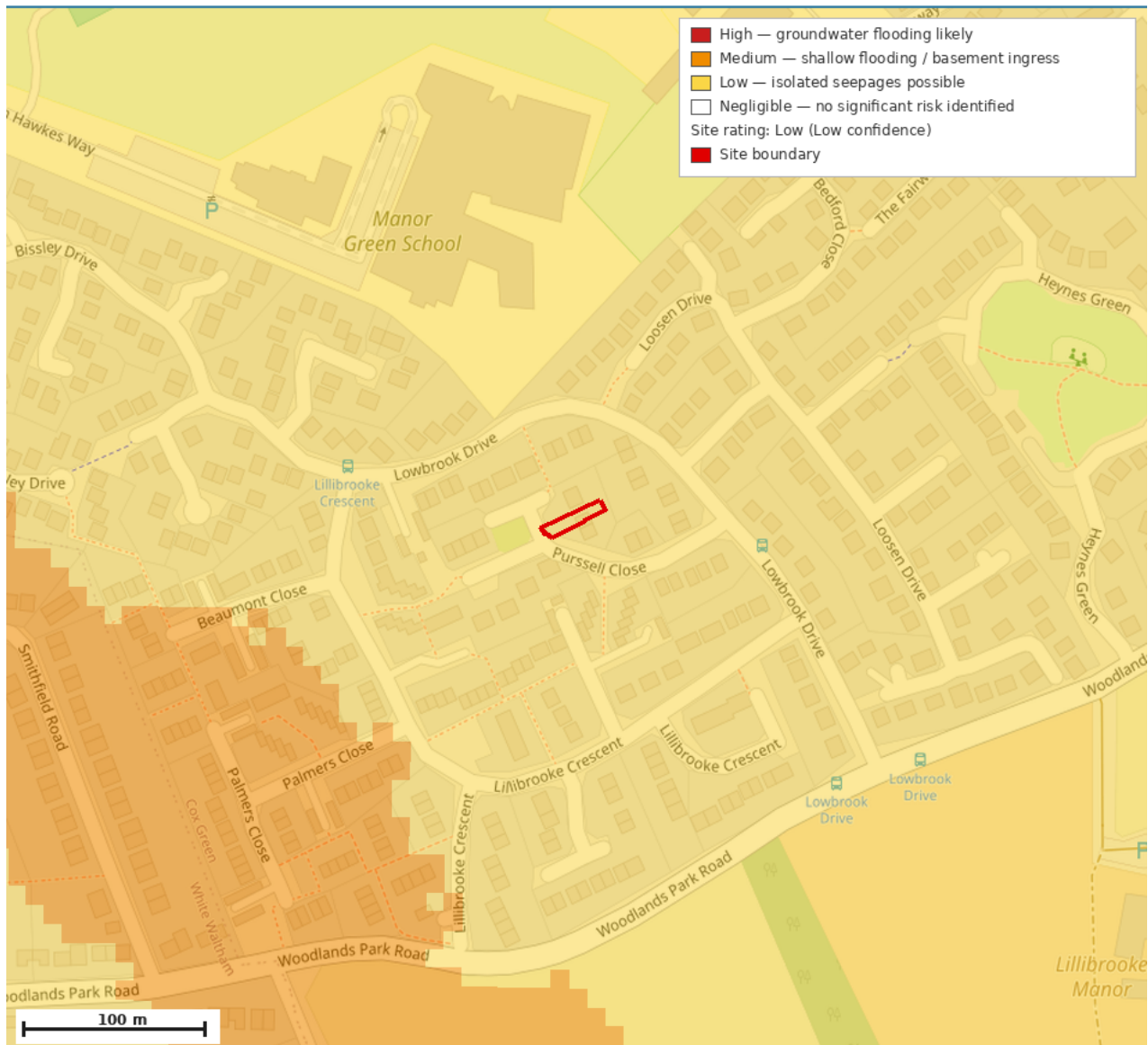
Method

The site has been assessed using the AFC model, version v2.1, calibrated against GeoSmart GW5 outputs in July 2026. The model draws Environment Agency LiDAR terrain, British Geological Survey geology and hydrogeology, Environment Agency groundwater levels, BGS water strikes and wells, recorded flood outlines and mapped watercourses across the whole site polygon, and returns an indicative four-class screening on a 1 in 100-year (1% annual exceedance probability) basis. It is a screening tool intended to prioritise further assessment. It is not a substitute for site-specific ground investigation, and it does not displace the borough Strategic Flood Risk Assessment as the policy authority for this source.

Output

Parameter	Value
Rating	Low
Confidence	Low
Mechanism	Clearwater flooding within a consolidated aquifer
Emergence	Not modelled at any point within the site footprint
Minimum depth to water	2.99 m (lowest cell within the site)
Median depth to water	2.99 m across the footprint
Governing evidence	None; the screening ran in susceptibility mode, on topographic position alone
Site area by class	Low across 100% of the footprint

Depth to water is defined as ground level minus modelled water level. A positive value therefore indicates that the modelled water table stands below ground level (see Figure 11).



Indicative screening — not a substitute for site-specific assessment. Method: the proprietary Air & Flood Consultants groundwater flood risk model v2.1 (airandfloodconsultants.co.uk/groundwater-flood-risk-map).

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Figure 11: AFC model — groundwater flood risk classes. Indicative screening on a 1% AEP basis; not a substitute for site-specific assessment.

The modelled water table lies within 5 m of ground level. That is below the threshold for a risk class but is relevant to substructure waterproofing, soakaway feasibility and any below-ground element.



INTERPRETATION OF THE MODELLED OUTPUT

What the modelled depth to water does and does not establish

The modelled minimum depth to water of 2.99 m is an estimate of a potentiometric surface, being the level to which groundwater would rise in an open standpipe. It is not a measurement and it is not a design level. Because it is positive, it establishes that the model does not predict emergence at the surface within the site footprint. It does not establish the depth at which water would be encountered in an excavation, and no such depth is derived from it in this assessment.

Uncertainty in the modelled value

The AFC model sets the groundwater level from measured evidence in order of preference: local water strikes, then a river base-level proxy, then the transferred Environment Agency monitoring heads. At this site none of those routes resolved. The reason is set out below.

Step	Outcome	Comment
Local water strikes within 1.2 km	None retrieved	The BGS AGS borehole index returned no digital logs with a usable shallow strike. The model does not parse scanned records or third-party site investigation reports, so neither the levels read for this assessment nor the Lillibrooke water strike at 2.80 to 3.00 m were available to it
River base-level proxy	Not applicable	The proxy fills cells in which a permeable superficial deposit is in hydraulic continuity with a watercourse. No superficial deposit is mapped at the site and the mechanism identified is clearwater flooding within the Chalk, so no cell qualified
Transferred EA station heads	Unresolved	The four stations admitted by the model transfer to the site as Stubbings 28.21 mAOD, Shottesbrooke Park 33.27 mAOD, Whistley Green 33.87 mAOD, Hamble Brook 32.58 mAOD, a spread of 5.7 m, exceeding the model's 5 m agreement tolerance
Fallback	Susceptibility mode	The screening reverted to topographic position alone and reported low confidence, rather than adopting one of four contradictory levels

The consequence is that the modelled depth to water of 2.99 m is an inference from the site's position in the landform, not a water-level calculation, and the rating in this assessment is not derived from it. The model's behaviour is nonetheless correct: a level drawn from four contradictory inputs would carry a confidence the data do not support.

The reason the transferred heads disagree is set out in the Groundwater Regime section. Stubbings stands 35.77 m above the site on the Chiltern dip slope and moves through 14.33 m; the three retained stations



stand within 5.15 m of the site's ground level and move through 1.72 to 3.20 m. No single transfer coefficient reconciles two positions that far apart in the same flow system.

Reconciliation with the measured levels

A ground investigation borehole gives a single observation on one day. An assessment of flood risk requires an extreme high-stand. The two are different quantities, and comparing them directly produces an apparent contradiction. The method applied is to establish a mid-range level at the site from the measured record, and then to add the range that the aquifer itself has been observed to move through.

Step	Basis	Level
Modern measured record, 11 points 1977–2025 within 2.1 km	Median of all eleven	24.54 mAOD
Nearest measured record (BGS SU87NE118, 480 m WSW, June 1996)	Chalk head, cover cased and grouted off	24.89 mAOD
Nearest historic record (BGS SU87NE123, 518 m E, 1937–1942)	Observed range 24.08 – 25.91 mAOD	25.30 mAOD
Adopted mid-range level at the site	Bracketed by the two nearest records; a 20-point plane fit returns 25.58 mAOD; uncertainty ± 1.5 m	24.5 – 25.4 mAOD
Range to the extreme high-stand	Largest observed median-to-maximum range at any retained station (Shottesbrooke Park, 49 years)	+3.2 m
Implied extreme high-stand at the site	Against a site ground level of 32.69 mAOD	≈ 28.1 mAOD
Upper bound, carrying the full uncertainty band	$25.4 + 1.5 + 3.2$	30.1 mAOD

The central estimate places the extreme water table approximately 4.6 m below ground level. The upper bound, which compounds the highest end of the adopted mid-range with the full uncertainty allowance and the largest observed range, places it 2.6 m below ground level. The conclusion that the water table remains below ground level does not depend on where within that band the true value lies.

Independent check against a recorded emergence

The estimate above is derived from levels measured in boreholes. An independent check is available from a level at which groundwater has been observed to emerge. The bourne noted on BGS SU87NE132 rises after wet periods at approximately 28.96 mAOD, some 1.7 km due south of the site. Projecting that level to the site along the fitted water-table gradient gives **27.9 to 28.3 mAOD**: on the water-table fit the site lies 0.97 km down-gradient of the bourne, giving 27.9 mAOD; on the all-points fit it lies 0.42 km down-gradient, giving 28.3



mAOD. The site is down-gradient of the bourne on both fits, so the projected level is lower than the observed one in each case.

That range and the 28.1 mAOD derived from the monitoring records agree to within 0.2 m, and they are reached by different routes: one from a measured mid-range level plus a monitored range, the other from a field observation of the level at which water actually reaches the surface in this valley system. Both place the extreme water table between 4 and 5 m below the ground level at the site. The position of the bourne is recorded only as 'about 950 yd' south-east of the well, so its grid reference carries perhaps ± 100 m, which is worth about ± 0.1 m on the projected level.

The measurements the assessment does not have

Three limits on the evidence are stated here rather than left to the Limitations section, because each could change the estimate.

- **No measurement has been made at the site.** The nearest measured level is 480 m away and dates from 1996. The borough Strategic Flood Risk Assessment requires groundwater monitoring results to be submitted with a flood risk assessment where a site is identified as being at possible risk, and none exists for this site. The recommendation for a monitored standpipe follows from that requirement.
- **Present-day levels are influenced by abstraction.** A public water supply source developed at White Waltham in 2008 and 2009 lies approximately 680 m to the south, and the Lillibrooke assessment records a further abstraction well approximately 250 m to the south. No licensed quantity or drawdown estimate is available. The direction of the effect is to depress present-day levels, so the modern record is likely to understate an unabstracted water table. A plane fitted to the nine records made up to 1955, which pre-date the White Waltham source, returns 26.09 mAOD at the site against 24.74 mAOD for a plane fitted to the eleven records from 1977 onwards, a difference of 1.35 m. That comparison is confounded, because the historic points lie predominantly up-gradient to the south-west and the modern points down-gradient to the north-east, and it is reported as an indication of direction rather than as a measured decline. The adopted mid-range of 24.5 to 25.4 mAOD sits between the two populations rather than at the lower end.
- **Four records that would resolve the question are not open.** The South East Water source boreholes at White Waltham and Shrubbery Copse, within 1.1 km, are held by the British Geological Survey under a charge and have not been read. They are 2008 and 2009 source-development boreholes and would carry pumping tests and observation-borehole records. They may be purchased from the BGS or requested from the undertaker.

Climate Change

No published climate change allowance exists for groundwater levels in England, in the way that peak river flow and peak rainfall allowances exist for fluvial and surface water flooding. The absence is stated rather than filled with an assumed figure.

Three points bear on the lifetime of the development. The measured record relied upon spans 1937 to 2025 and already contains the wettest and driest sequences in the instrumental record for this catchment, including the droughts of 1976, 1997 and 2022 and the winters of 2000/01 and 2013/14. UK Climate Projections 2018 indicate wetter winters and drier summers for southern England, which would tend to raise winter recharge



and winter groundwater levels while lowering summer levels; the net effect on the annual maximum is expected to be an increase, of a magnitude that no published national allowance quantifies. The margin between the estimated extreme high-stand and ground level at this site is 4.6 m on the central estimate and 2.6 m on the upper bound, which is greater than the 1.54 m by which the water table has been observed to move within a single year in this aquifer. The measures recommended below do not depend on a specific allowance being adopted.

Conclusions Supported by the Evidence

Three independent lines of evidence place the extreme Chalk water table below the site ground level of 32.69 mAOD:

Line of evidence	Extreme water table	Site ground level
Modern measured record plus the observed range at Shottesbrooke Park	≈ 28.1 mAOD	32.69 mAOD
Recorded bourne emergence at 28.96 mAOD, projected to the site on the fitted gradient	27.9 to 28.3 mAOD	32.69 mAOD
Lillibrooke monitoring, shallowest reading placed at the highest ground on that allocation	≤ 30.02 mAOD	32.69 mAOD

- **Supported by the evidence:** the Chalk water table beneath the site is expected to remain below ground level during an extreme event, at a depth of the order of 4 to 5 m and in no case less than 2.6 m. This conclusion carries the rating.
- **Not supported by the evidence:** that groundwater will not be encountered within the depth of a normal excavation. Water was recorded at 1.98 m below ground level 250 m from the site, and at 2.80 to 3.00 m during the intrusive works on the same allocation.
- **Not relied upon:** the modelled depth to water of 2.99 m, which derives from topographic position alone, and the Environment Agency Stubbings reading of 22.65 mAOD, which lies below the base of its own borehole.



ASSESSMENT

The risk of groundwater flooding at the site is assessed as **Low**. The basis of the assessment is summarised below.

Evidence	Finding	Weight
Geology	White Chalk Subgroup, Principal Aquifer, with no superficial deposit mapped at the site and cover of uncertain thickness recorded nearby	Strong
Borough SFRA	≥ 75% of the Environment Agency Areas Susceptible to Groundwater Flooding dataset — the highest class mapped, confirmed at every boundary vertex, at 1 km resolution	Strong (policy authority)
Modern measured record	Eleven Chalk levels within 2.1 km measured between 1977 and 2025, spanning 23.24 – 26.17 mAOD, approximately 6.5 – 9.5 m below site ground level	Strong (measured)
EA monitoring	Three retained stations; observed range from median to highest recorded level of 1.72 – 3.20 m, giving an extreme high-stand at the site of ≈ 28.1 mAOD against ground level of 32.69 mAOD	Strong
Recorded groundwater emergence	A bourne rising after wet periods at 28.96 mAOD, 1.7 km south, equivalent to 27.9 – 28.3 mAOD at the site, 4.4 to 4.8 m below site ground level	Strong (observed)
Recorded flooding	No groundwater flooding recorded at the site, in the Cox Green area or within 5 km. In September 2024, with regional groundwater exceptionally high and the soil at field capacity, the flooding recorded in this ward was attributed to surface water	Mitigating
EA groundwater alert area	The site lies outside every alert area; the nearest is 4.2 km distant	Mitigating
Nearby monitoring, 2022	Water at 1.98 – 4.00 m bgl in four of six wells 250 m south, and encountered at 2.80 – 3.00 m during the intrusive works; levels not obtainable, mechanism unresolved	Adverse
AFC model	Low at low confidence; susceptibility mode, regional piezometric surface unresolved	Supporting only
Below-ground accommodation	None proposed	Mitigating



The rating of Low reflects two findings held together. The Chalk water table is measured, is some 7.3 to 8.2 m below ground level, and is not expected to rise closer than 2.6 m to the surface even on the most conservative reading of the evidence; that excludes a rating of Medium or High. Against that, the site sits in the highest susceptibility class mapped by the borough Strategic Flood Risk Assessment, no measurement has been made at the site itself, and water was recorded at 1.98 m below ground level 250 m away; those exclude a rating of Negligible. Seepage into excavations and into shallow below-ground elements may occur; flooding of the property from this source is not expected.



IMPLICATIONS FOR THE PROPOSED DEVELOPMENT

The following characteristics of the proposal materially reduce the consequence of the rating:

- **No basement or below-ground accommodation is proposed.** Groundwater flooding damages buildings principally through ingress into below-ground rooms. The proposal contains none, and the receptor most exposed to this source is therefore absent.
- **The proposal is an extension at ground level.** The finished floor level is to match or exceed that of the existing dwelling, which stands above the surrounding external ground.
- **No deep excavation is proposed.** Foundations are anticipated to be conventional strip or trench-fill at normal depth, above both the adopted mid-range Chalk water table at 24.5 to 25.4 mAOD and the estimated extreme high-stand at approximately 28.1 mAOD.

The residual matters requiring attention are the possibility of water being encountered in excavation at shallower depth than the Chalk water table, and the design of any infiltration drainage. Both are addressed below.



RECOMMENDATIONS

Measures Secured by the Design

- No below-ground accommodation. This is the principal mitigation on which the assessment relies.
- A finished floor level set at or above that of the existing dwelling, and above the adjacent external ground level.

Substructure

- Below-ground elements, comprising the foundations, the ground slab and any service ducts, should be designed to be water-resistant in accordance with **BS 8102:2022** (*Protection of below ground structures against water from the ground*). Given the rating and the absence of below-ground accommodation, a Grade 1 environment with Type A (barrier) or Type B (structurally integral) protection is anticipated to be sufficient.
- A land drain should be provided around the perimeter of the extension where practicable, discharging away from the structure, so that any water held within the cover over the Chalk is intercepted before it reaches the substructure.
- Buried services should be provided with clay stanks at building entries. Granular service surrounds are a recognised preferential pathway for water into otherwise sound structures.
- Excavations should be anticipated to encounter water within the cover over the Chalk, particularly between autumn and spring. Water was recorded at 1.98 m below ground level 250 m to the south in an autumn in which the aquifer stood at the 4.5th percentile of a 49-year record. Temporary sump pumping should be allowed for in the construction programme.

Drainage

The evidence on infiltration is mixed and is set out before the recommendation, because the conclusion runs against what the presence of a clay-rich cover would otherwise suggest.

- Six BRE Digest 365 tests carried out 250 m to the south at 3.00 to 3.20 m below ground level returned infiltration rates of 2.6×10^{-5} to 3.8×10^{-3} m/s, every one of them within the White Chalk Subgroup, and the assessment for that site concluded that soakaways are potentially feasible across the whole development. **Infiltration drainage is therefore not ruled out at this site.**
- Those rates were obtained within the Chalk, below the cover. A soakaway founded within the clay-rich cover recorded at several nearby locations would not function as designed, and the depth to rockhead at this site is not established.
- The depth to the Chalk water table, of the order of 7.3 to 8.2 m, leaves approximately 4.3 to 5.2 m of unsaturated ground beneath a feature founded at 3 m, in excess of the 1 m normally required between the base of an infiltration feature and the seasonal high water table.
- **BRE Digest 365 infiltration testing at the proposed invert level remains required** before any infiltration drainage component is designed, together with confirmation of the depth to rockhead and of the unsaturated depth available at the seasonal high water table.



- The site lies within Source Protection Zone 3, and the Environment Agency's approach to groundwater protection restricts the infiltration of anything other than clean roof drainage close to a public water supply source. The position should be confirmed with the Environment Agency before any infiltration component other than clean roof drainage is designed.

Further Investigation

- **A monitored standpipe should be installed at the site and read over a winter period.** SFRA paragraph 7.3.3 requires groundwater monitoring results to be submitted with the flood risk assessment where a site is identified as being at possible risk of groundwater flooding, and paragraph 7.4.1 requires groundwater levels and soil permeability to be assessed on site at an early stage. This site is in the highest susceptibility class mapped. The measurements relied upon in this assessment are drawn from records 480 m and 518 m away, dating from 1996 and 1937.
- The standpipe should be installed to a depth sufficient to penetrate the Chalk beneath any cover, and should be read at least monthly between October and April, so that water held within the cover can be distinguished from the Chalk water table.
- Where a trial pit is excavated for foundation design, the depth and stratum of any water entry should be recorded, together with the date, and the pit left open long enough for a rest level to establish.
- The impact of groundwater on the effectiveness of any adopted sustainable drainage system should be reported, as SFRA paragraph 7.3.3 also requires.



LIMITATIONS

- There is no open national groundwater flood risk dataset. The borough Strategic Flood Risk Assessment remains the policy authority for this source.
- The AFC model is an indicative screening tool. It estimates a potentiometric surface and does not route emergent flow; it therefore does not produce a flood depth.
- At this site the screening ran in susceptibility mode at low confidence, the regional piezometric surface having been reported as unresolved. The modelled depth to water is an inference from topographic position and is not a water-level calculation.
- No intrusive investigation has been carried out at the site itself, and no groundwater level has been measured at the site. The nearest measured level is 480 m away and dates from June 1996.
- The extreme high-stand is derived by adding an observed range to a measured mid-range level. It is not a level of stated annual exceedance probability. Groundwater annual maxima in the Chalk are serially dependent, so extreme-value estimates in this aquifer carry a longer effective return period than their nominal one.
- Present-day levels are influenced by public water supply abstraction within 700 m, for which no licensed quantity or drawdown estimate is available.
- Four South East Water source boreholes within 1.1 km hold records that are not available under open licence and have not been read. Those records would constitute the definitive local dataset and may be purchased from the British Geological Survey or requested from the undertaker.
- The Lillibrooke ground investigation results are reproduced from a third-party flood risk assessment. The installed depths, ground levels and locations of the six monitoring wells are recorded in Part 1 of the associated ground appraisal report, which has not been made available, so the readings cannot be converted to levels.
- A Level 2 Strategic Flood Risk Assessment was published in April 2018 and has not been reviewed. Its listed scope is the sequential and exception testing of allocated sites.
- Ground levels are derived from the Environment Agency LiDAR 1 m composite digital terrain model, with a stated vertical accuracy of ± 0.15 m, and have not been confirmed by topographic survey.
- The SFRA susceptibility classification expresses susceptibility rather than likelihood, at a resolution of 1 km.
- No published climate change allowance exists for groundwater levels in England. The position adopted is set out in the Interpretation of the Modelled Output section.



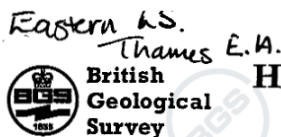
CONCLUSIONS

1. The risk of groundwater flooding at 7 Purssell Close, Maidenhead, Berkshire, SL6 3XU is assessed as **Low**.
2. Every water level measured in the Chalk within 2.1 km of the site since 1977 and held in the open record falls between 23.24 to 26.17 mAOD, with a median of 24.54 mAOD. A mid-range water table of 24.5 to 25.4 mAOD is adopted at the site, approximately 7.3 to 8.2 m below the ground level of 32.69 mAOD.
3. Adding the largest range between median and highest recorded level observed at any retained Environment Agency station, 3.2 m over 49 years at Shottesbrooke Park, gives an extreme high-stand in the order of 28.1 mAOD, approximately 4.6 m below ground level. Carrying the full uncertainty band gives an upper bound of 30.1 mAOD, still 2.6 m below ground level. Emergence of the Chalk water table at the site is not expected.
4. That estimate is corroborated independently by a recorded bourne 1.7 km to the south, which rises after wet periods at 28.96 mAOD and projects to 27.9 to 28.3 mAOD at the site on the fitted water-table gradient, and by the Lillibrooke monitoring, whose shallowest reading cannot correspond to a level above 30.02 mAOD anywhere on that allocation.
5. The site lies in the highest of the four classes of the Environment Agency Areas Susceptible to Groundwater Flooding dataset as mapped by the borough Strategic Flood Risk Assessment. That classification expresses susceptibility rather than likelihood at a resolution of 1 km, and the Strategic Flood Risk Assessment states that only isolated locations within a susceptible area are likely to suffer the consequences of groundwater flooding.
6. Water may be encountered in excavation at shallower depth than the Chalk water table. Groundwater was recorded at 2.80 to 3.00 m below ground level during the intrusive works 250 m to the south, and at 1.98 m in the shallowest monitoring well on that site in an autumn in which the aquifer stood at the 4.5th percentile of a 49-year record. Temporary dewatering should be allowed for.
7. The proposed development is considered to be acceptable in groundwater flood risk terms, subject to the measures set out in the Recommendations section, in particular the absence of below-ground accommodation, the provision of a perimeter land drain and clay stanks at service entries, an allowance for water in excavations, and confirmation of infiltration feasibility by BRE Digest 365 testing at the proposed invert level together with the Source Protection Zone position.
8. A monitored standpipe should be installed at the site and read over a winter period, as SFRA paragraphs 7.3.3 and 7.4.1 require, so that the design groundwater level is established by measurement at the site rather than inferred from records at a distance.



APPENDIX A — BGS BOREHOLE RECORDS

Scanned British Geological Survey records for the four boreholes and wells relied upon in this assessment. The records are typewritten or handwritten and no machine-readable strata log is available; they are reproduced as scanned, under the BGS Open Government Licence. In order of appearance: SU87NE118 Park View, Cannon Lane, sheets 1 and 2 (480 m west-south-west, June 1996, water encountered at 8.30 m below ground level, 24.89 mAOD); SU87NE123 Cottage near Lowbrook Farm, the typed abstract carrying the 1937 to 1942 water levels followed by the manuscript record (518 m east, 24.08 to 25.91 mAOD); SU87NE122 Woodlands Park Works (674 m north-west, 1941, 28.65 mAOD, semi-confined); and SU87NE132 2 Haywood Cottages, the record followed by the Water Resources Board continuation sheet carrying the annual maximum and minimum series (1,292 m south-south-west, 24.99 to 28.10 mAOD). The continuation sheet reproduced covers 1951 to 1964; the 1965 and 1966 entries are on a further sheet not held in the scanned record.

British
Geological
SurveyBGS ID: 432959 : BGS Reference: SU87NE118
British National Grid (27700) : 485920,178970

HYDROGEOLOGY RESEARCH GROUP

SU87/60

269

Form WR-38 (BGS)

BOREHOLE RECORD

A SITE DETAILS		SU87NE 118	
Borehole drilled for	Mrs. J.M. Bell Ref: 7123		
Location	Park View, Cannon Lane, Maidenhead, Berks		
NGR (8 fig.)	SU 8592 7897	Please attach site plan	
Ground Level (if known)	35 M AOD		
Drilling Company	H.D. Drilling Ltd		
Date of Drilling	Commenced June 1996	Completed June 1996	
B CONSTRUCTION DETAILS			
Borehole Datum (if not ground level)	G.L.	above	m below GL
(point from which all measurements of depth are taken e.g. flange, edge of chamber, etc.)			
Borehole drilled diameter	300 mm from G.L.	to 5.0	m/depth
	200 mm from 5.0	to 17.0	m/depth
	mm from	to	m/depth
Casing material plain steel diameter and type (e.g. if plain steel, plastic slotted)	200 mm from 0.5	to 5.5	m/depth
diameter	mm from	to	m/depth
diameter	mm from	to	m/depth
diameter	mm from	to	m/depth
Grouting details	0.5 to 5.0 M below G.L.		
Water struck at	8.5	m (depth below datum — mbd)	
		m (depth below datum — mbd)	
Rest water level on completion	8.3	mbd	
C TEST PUMPING SUMMARY (Please supply full details on Forms WR-39)			
Test Pumping Datum (if different from borehole datum)	G.L.	m	above below borehole datum (mbd)
Pump Suction depth	15.0	mbd	
Water Level (Start of Test)	8.3	mbd	
Water Level (End of Test)	8.5	mbd	
Pumping rate	3.27	m ³ /d./s	
for	1.0	days/hours	
Recovery to (from end of pumping)	8.3 mbd	in 30 mins: hrs:mins	
Date(s) of measurements	26.06.96		
Please supply chemical Analysis if available. Not available.			



D STRATA LOG			
Geological Classification	Description of strata	Thickness	Depth
(BGS only)		m	m
	Clay and chalk with flints. Chalk with flints (unstable at 17.0 metres) END OF BOREHOLE.	5.0 12.0	5.0 17.0
(continue on separate page if necessary)			
Other comments (e.g. gas encountered, saline water intercepted, etc.)			

FOR OFFICIAL USE ONLY

FILE

CONSENT NO.

NGS REF NO.

LIC NO.

PURPOSE

NRA REF NO.

DATE REC:

COPY TO:

ENTERED BY:



British
Geological
Survey

BGS ID: 432964 : BGS Reference: SU87NE123
British National Grid (27700) : 486870,179170

269/202 Cottage, 200 yd N.E. of Lowbrook Farm, White Waltham.
(Filled in)

Surface +106. Shaft. Depth unknown. Date unknown.

R.W.L. +83. Jan. 1937; +85 (max.); +80 (min.). 1940; +83 (max.); +79 (min.).
1942.

Uck

...

...

27+

27+

SU87/26

Contact BGS: ngdc@bgs.ac.uk

British
Geological
SurveyBGS ID: 432964 : BGS Reference: SU87NE123
British National Grid (27700) : 486870,179170

RECORD OF WELL (SHAFT OR BORE)

At Colage 200 yds N.E. of Lambrook FarmTown or Village White WalthamCounty Berkshire Six-inch quarter sheet 21 N.W.

For Mr. _____

Exact site of well At Colage, a few yds S. of junctionof farm road with main roadAttach a tracing from
a map, or a sketch-
map, if possible.Level of ground surface above sea-level (O.D.) 106 feet.Is well-top at ground level? ✓ If not, state how far above; below; _____ feet.

Shaft _____ ft., diameter _____ ft. Details of headings _____

Bore _____ ft.; diameter of bore: at top _____ ins.; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS

Month _____ Year _____	Rest-level of water _____ ft. above below well-top. Suction at _____ ft. Yield on _____ hours' days'
	pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.),
	with depression of _____ feet. Recovery to _____ in _____ mins. hours.

WORKING CONDITIONS

Rest-level of water in _____ (month), _____ (year), _____ ft. above below well-top.
Highest " in _____ (month), _____ (year), _____ ft. above below "
Lowest " in _____ (month), _____ (year), _____ ft. above below "
Suction at _____ ft. Rate of pumping _____ galls. per _____ for _____ hours per day.
with average depression of _____ ft. Recovery to _____ in _____ mins. hours

Quality of water (attach copy of analysis if available) _____

Well made by unknown Date of well _____Information from Mr Ministry (the M. W. L. Co.)

ADDITIONAL NOTES.

Deep well in Chalk. Measurements of water level taken
by W. W. L. Co. and supplied to Mr Ministry (i.e.
connected with discussion on average disposal from
RAF camp.)

R.W.L. Jan 1937 : F.S. 00
1940 Max 65 }
Min 60 }
1941 Max 65 }
Min 60 }
1942 Max 63 }
Min 60 }

Visited 23.7.59.
Well struck by
occupier of house &
be fixed in. Kenn

DATE 19/44 BY BGS

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	
24/9/44	269	269		o	o

(17208) W1.42901/0877 10,000 2/41 A. & E.W.L.L. Op. 686



British
Geological
Survey

BGS ID: 432963 : BGS Reference: SU87NE122
British National Grid (27700) : 485890,179670

SU87/25

269/19 Anti-Attrition Metal Co., Ltd., Woodlands Park, Maidenhead

Surface +c.120. Lining tubes: 15 1/4 x 8 in from 1 1/2 down. Water struck at +c.60.
R.W.L. +c.94. P.W.L. +c.94. Suction +c.70. Yield 1,450 g.p.h. Isler, 1941.

Uck)
? Mck) ... 250 250

NATURE OF STRATA (and any special remarks)		THICKNESS		DEPTH	
		Feet	Inches	Feet	Inches
Chalk		5	0	5	0
Chalk & flint		24	5	24	5
[No soil in the hole at base, none in the hole]					

Contact BGS: ngdc@bgs.ac.uk

British
Geological
SurveyBGS ID: 432973 : BGS Reference: SU87NE132
British National Grid (27700) : 485690, 178070

RECORD OF WELL (SHAFT OR BORE)

At Cottage 700 yds. SW of Heywood LodgeTown or Village White WalthamCounty Berks Six-inch quarter sheet 21 N.W.

For Mr. _____

Exact site of well Cottage at junction of White Waltham Laneroad from Heywood Farm with main roadAttach a tracing from
a map, or a sketch-
map, if possible.Level of ground surface above sea-level (O.D.) 108.6 feet.Is well-top at ground level? yes If not, state how far above; _____ feet.Shaft 4.5 ft., diameter 28.2 ft. Details of headings _____

Bore _____ ft.; diameter of bore: at top _____ ins.; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS Rest-level of water _____ ft. above well-top. Suction at _____ ft. Yield on _____ hours' days' pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.), Year _____ with depression of _____ feet. Recovery to _____ in _____ mins. hours.

WORKING CONDITIONS Rest-level of water in _____ (month), _____ (year), _____ ft. above well-top. Highest " in _____ (month), _____ (year), _____ ft. above " Lowest " in _____ (month), _____ (year), _____ ft. above " Suction at _____ ft. Rate of pumping _____ galls. per _____ for _____ hours per day. with average depression of _____ ft. Recovery to _____ in _____ mins. hours

Quality of water (attach copy of analysis if available) _____

Well made by unknown Date of well _____Information from The Minister (Mr. Weston)

ADDITIONAL NOTES.

Dug Well in Chalk. Measurements of water level taken by Messrs Water Co. and supplied to the Minister. (In connexion with discussions of average depth from R.A.F. Camp).

R.W.L. Jan 1937 : 88.00.
1940. Max. 90.00
Min. 82.00
1941. Max. 90.00
Min. 85.00
1942. Max. 85.00
Min. 83.00

Mont 950 yds. S.E. at about 95 ft. O.D. a house sits at the junction of the Chalk Tuffery bed, after last period.

LOG OF STRATA OVERLEAF.

Notes 25.7.59, Dug Well.
GEOLOGICAL SURVEY AND MUSEUM
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map.	on 6" Map.
26/9/1944	269	269		0	0

British
Geological
SurveyBGS ID: 432973 : BGS Reference: SU87NE132
British National Grid (27700) : 485690,178070

WATER RESOURCES BOARD		G.S. Ref. Number	Well Ref. Number
CONTINUATION SHEET (1)		269/201	SU87/5
Date and Initials	NOTES: (Rule off after each entry) No. 2 Haywood Cottages, White Waltham. O.D. + 108.5 Depth of well 28 ft. 11 in.		
WATER LEVEL DATA:			
Date of Observation	Maximum R.W.L.*	R.W.L. Minimum R.W.L.*	Date of Observation
8/3/51	+ 90.8 4 A.D.	+ 85.0 4 A.D.	2/4/51
1/1/52	87.8 "	83.3 "	9/9/52
16/3/53	86.7 "	82.8 "	5/9/53
7/7/54	85.2 "	83.2 "	18/2/54
12/1/55	84.5 "	83.2 "	7/12/55
2/3/56	86.2 "	83.4 "	14/9/56
12/4/57	87.7 "	83.6 "	2/7/57
23/5/58	88.6 "	83.3 "	12/9/58
13/5/59	89.6 "	83.0 "	19/4/59
9/2/60	91.9 "	83.8 "	25/8/60
8/2/61	92.2 "	83.3 "	17/11/61
26/3/62	87.3 "	82.8 "	19/10/62
23/11/63	86.8 "	84.2 "	28/8/63
12/5/64	88.6 "	82.5 "	18/12/64

* State whether Inst. and whether above surface or below Ordnance Datum.

DR W0982/1/165 2m 6/65 TXL

Contact BGS: ngdc@bgs.ac.uk