



# **Baseline Cemetery Site Suitability Assessment Wheatley Parish Council**

**Wheatley, Oxfordshire**

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## 1 Introduction

This document provides an initial assessment of the four sites provided to us by our client to determine their suitability for cemetery use, as requested by Wheatley Parish Council. The assessment will include a review of the soils and geology on site, the depth to groundwater, flood risk and groundwater vulnerability.

## 2 Site Assessment

The following provides an individual assessment of each of the four proposed sites.

### 2.1 Site A: Old London Road



Figure 1. Site A: boundary outlined in red.

Risk	Assessment (High, Moderate, Low)	Comment
Site Area	Moderate	Site A is approximately 3.15 hectares in size, comprising an area of open grassland.
Burials per Annum	Low	Expected to be around 5-10 per annum.
Source Protection Zones	Low	The site is not within any SPZ, with the nearest being approximately 14.5km south east.
Flood Risk	High	The majority of the site is classed as Flood Zone 1 which is at low risk of flooding from rivers and sea and as such is suitable for cemetery use. However, an approximately 30m wide strip of land adjacent to the southern site boundary is classed as Flood Zone 3 which is at high risk of flooding, associated with the River Thames to the east.

Risk	Assessment (High, Moderate, Low)	Comment
Superficial Geology	Moderate to High	<p>According to the British Geological Survey (BGS) there is largely an absence of superficial deposits on site except where River Terrace Deposits (sand and gravel) underlie the Wickham 2 soils to the north east. Some Alluvium deposits (clay, silt, sand and gravel) may be found to the southern boundary of the site.</p> <p>River Terrace Deposits are freely draining and where they overlie the relatively impermeable Ampthill Clay, perched water may be encountered. The presence of perched water is unlikely to pose a threat to groundwater if it is not struck within burial depth. However, local surface water features may be fed by these perched layers.</p> <p>Intrusive investigation would clarify the presence/absence of perched water. The EA deem sites with no superficial deposits as a high risk as pollutants can freely migrate to the underlying bedrock.</p>
Superficial Aquifer	Moderate	There are Secondary A superficial aquifers associated with the River Terrace Deposits and Alluvium Deposits to the north east and south respectively.
Bedrock Geology	Moderate	<p>The bedrock geology is mapped as Ampthill Clay Formation (mudstone) to the north east and Beckley Sand Member (sandstone) to the south west.</p> <p>Burials into the Ampthill Clay are likely to be deemed acceptable as there is unlikely to be groundwater within burial depth. However, perched water may be present above the Ampthill Clay where River Terrace Deposits are present.</p> <p>The Beckley Sand is relatively permeable and therefore there is the potential for groundwater to be shallow.</p>
Bedrock Aquifer	Moderate	<p>A Secondary A bedrock aquifer underlies the south west of the site, associated with the Beckley Sand Member.</p> <p>The Ampthill Clay is listed as unproductive strata.</p>
Groundwater Depth	Moderate	Groundwater was struck at 3.2m bgl in SP60NW76 (some 700m south east) within the Beckley Sand Member.
<b>Overall Risk</b>	<b>Moderate to High</b>	

## 2.2 Site B: Land near Holton, opposite A40



Figure 2. Site B: boundary outlined in red.

Risk	Assessment (High, Moderate, Low)	Comment
Site Area	Low	Site B is approximately 0.5 hectares in size, comprising an area of open grassland.
Burials per Annum	Low	Expected to be around 5-10 per annum.
Source Protection Zones	Low	The site lies outside of any Source Protection Zone, with the nearest some 14.5km south east.
Flood Risk	Low	The site is located within Flood Zone 1 and as such is suitable for cemetery development.
Superficial Geology	High	Due to the fact that there are no superficial deposits mapped on site, the risk to the underlying groundwater table is considered to be high.  The EA deem sites with no superficial deposits as a high risk as pollutants can freely migrate to the underlying bedrock.
Superficial Aquifer	Low	There are no superficial aquifers mapped on site due to the absence of any superficial geology.
Bedrock Geology	Moderate to High	The Wheatley Limestone Member forms the bedrock geology on site. Both intergranular and fracture flow is permitted through this Member.
Bedrock Aquifer	Moderate	The site is underlain by a Secondary A bedrock aquifer.
Groundwater Depth	Low	Groundwater was not encountered within SP50NE71 (approximately 80m south west) which reached a depth of 12.1m bgl into the Wheatley Limestone.
<b>Overall Risk</b>	<b>Moderate</b>	

### 2.3 Site C: Land adjacent to Wheatley Playing Fields, Holton



Figure 3. Site C: boundary outlined in red.

Risk	Assessment (High, Moderate, Low)	Comment
Site Area	Moderate	Site C is approximately 5.8 hectares in size, comprising an area of open grassland.
Burials per Annum	Low	Expected to be around 5-10 per annum.
Source Protection Zones	Low	The site lies outside of any Source Protection Zone, with the nearest some 15km south east.
Flood Risk	Low	The site is located within Flood Zone 1 and as such is suitable for cemetery development.
Superficial Geology	High	Due to the fact that there are no superficial deposits mapped on site, the risk to the underlying groundwater table is considered to be high.  The EA deem sites with no superficial deposits as a high risk as pollutants can freely migrate to the underlying bedrock.
Superficial Aquifer	Low	There are no superficial aquifers mapped on site due to the absence of any superficial geology.
Bedrock Geology	Moderate to High	The Wheatley Limestone Member forms the bedrock geology on site. Both intergranular and fracture flow is permitted through this Member.
Bedrock Aquifer	Moderate	The site is underlain by a Secondary A bedrock aquifer.
Groundwater Depth	Low	Groundwater was not encountered within SP50NE71 (around 475m south east) which reached a depth of 12.1m bgl into the Wheatley Limestone.
<b>Overall Risk</b>	<b>Moderate</b>	

## 2.4 Site D: Mrs Tomb's Field



Figure 4. Site D: boundary outlined in red.

Risk	Assessment (High, Moderate, Low)	Comment
Site Area	Moderate	Site D is approximately 4.7 hectares in size, comprising an area of open grassland and mixed vegetation.
Burials per Annum	Low	Expected to be around 5-10 per annum.
Source Protection Zones	Low	The site lies outside of any Source Protection Zone, with the nearest some 13km south east.
Flood Risk	High	The site is primarily located within Flood Zone 1 and as such is suitable for cemetery development. Land along the northern site boundary and the north-eastern corner is classed as Flood Zone 3 which is at a high risk of flooding.
Superficial Geology	High	<p>There is largely an absence of superficial deposits on site except where Alluvium Deposits are mapped along the northern site boundary and the north-eastern corner. Due to the fact that there are largely no superficial deposits mapped on site, the risk to the underlying groundwater table is considered to be high.</p> <p>The EA deem sites with no superficial deposits as a high risk as pollutants can freely migrate to the underlying bedrock.</p>

Risk	Assessment (High, Moderate, Low)	Comment
Superficial Aquifer	Low	There are no superficial aquifers mapped on site due to the absence of any superficial geology.
Bedrock Geology	Moderate to High	The north and east of the site are underlain by the Beckley Sand Member whilst the south west is underlain by the Wheatley Limestone Member.
Bedrock Aquifer	Moderate	The site is underlain by a Secondary A bedrock aquifer.
Groundwater Depth	Moderate to High	Groundwater was struck in SP60NW158 (some 460m north east) at 1.5m bgl and in SP60NW159 (some 430m north east) at 1.8m bgl into the Beckley Sand.  No groundwater was encountered within SP50NE71 (approximately 1.1km north east) which reached a depth of 12.1m bgl into the Wheatley Limestone.  Further investigation would be required to ascertain the depth to groundwater on site.
<b>Overall Risk</b>	<b>Moderate to High</b>	

### 3 Conclusions and Recommendations

This initial desktop assessment has found that two of the four sites (B-C) are classed as moderate risk whilst Site A and Site D are moderate to high risk. The moderate to high risk associated with Site A is mainly attributed to the risk of perched water between the River Terrace Deposits and Ampthill Clay to the north east, which could be within burial depth and/or feed surface water features if present. Additionally, the south of the site is classed as Flood Zone 3. Site A has therefore been ruled out for further consideration for cemetery development.

It is suggested that Site D, which was also classed as a moderate to high risk should also be ruled out at this time as the northern boundary and north-eastern corner are within Flood Zone 3 and groundwater is likely to be shallow where the Beckley Sand is present to the north and east.

Sites B and C are both solely within Flood Zone 1 and are directly underlain by the Wheatley Limestone Formation. Based on local borehole records into the Wheatley Limestone, groundwater was not encountered within the 12.1m bgl and as such, sites B and C are expected to be compliant with current EA standing advice. Further intrusive investigation in the form of excavating trial pits would be required to ascertain the depth to groundwater on site.

It is also worth considering the lifespan of both Site B and Site C. Site B is approximately 0.5 ha (1.2 acres) and Site C is considerably larger, covering 5.8 ha (14.3 acres). Typically, one acre can provide enough space for up to 750 burials for a traditional/lawn cemetery. With approximately 5-10 burials per annum currently being undertaken within the parish, assuming the worst-case that there are 10 burials per annum, Site B has the capacity for 90 years' worth of burials ( $1.2 \times 750 / 10$ ) and Site C has the capacity for 1,072.5 years' worth of burials ( $14.3 \times 750 / 10$ ). Although Site C offers the more long-term cemetery solution, Site B still has a sufficient lifespan to support the burial needs of the Borough for at least 90 years. It should be noted that these calculations have not factored in the footprint of any proposed administration buildings, Chapels, facilities, roads and car parking which would somewhat reduce the capacity of each site.