



Priority Schools, PSBP2

EDUCATION FUNDING AGENCY

St Michael's Primary School, Berkshire, Geo-environmental Assessment

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Document history and status

Revision	Date	Description	By	Review	Approved
1	16/06/15	check, review - contamination	Paul Hollinghurst	Louise Beale	03/07/15
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Important note about your report

The sole purpose of this report and the associated services performed by Jacobs is to understand the geotechnical and contamination related risks and constraints as part of the PSBP2 scoping study in accordance with the scope of services set out in the contract between Jacobs and the Education Funding Agency. That scope of services, as described in this report, was developed with the Education Funding Agency.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Education Funding Agency and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the Education Funding Agency (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

The geo-environmental summary provided is an appendix to the main report and therefore should not be used in isolation from the main body of the report.

The information provided is a summary based on key information taken from a Landmark Envirocheck Report. Therefore the list of features and potential sources of information in the report should not be considered exhaustive. Subsequently upon further study some features may be considered more significant than originally thought which may alter the initial risk summary. As a consequence of this the study presented below should only be considered to be an initial summary for project scoping purposes. It is recommended that if the scheme is taken forward a full desk-based assessment is undertaken.

Note that the site visits have been carried out by surveyors as opposed to specialist geo-environmental staff. Therefore the site descriptions may not include all features that would be recognised by a specialist.

Due to the timescales and turnaround of these initial studies we have not allowed for consultation with the Local Authority on land contamination matters. If the study is taken forward to desk-based assessment then this activity should be undertaken at that stage.

Flood risk has been based on a review of information contained within the Envirocheck report which includes comment on flooding from rivers or the sea. This site has not been assessed for other sources of flooding such as surface water pluvial and groundwater.

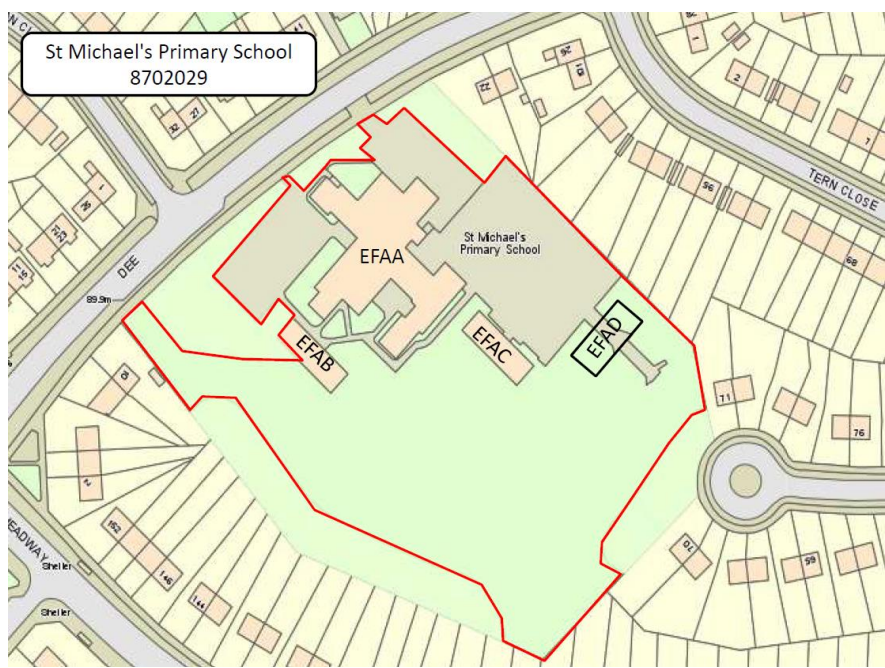
Cost ranges included in table within Section 2 are as provided by Education Funding Agency and site specific costing of further ground investigation has not been undertaken.

This report has been prepared on behalf of, and for the exclusive use of, Jacobs's client Education Funding Agency, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Education Funding Agency. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party

1. Site Summary Table

The following information has been obtained from a review of an Envirocheck report provided by Landmark Information Group (Appendix 4.3). Any further sources of information are indicated in the table below.

Notes	
Site Location	St. Michaels Primary School, Dee Road, Tilehurst, Reading, RG30 4AS NGR: 468070, 172990
Site Description	The site is approximately 3.5 km to the west of the centre of Reading within a predominantly residential area. The school buildings (three) and areas of hardstanding occupy the majority of the northern part of the site. There is a car park in the northern corner and two hard-surfaced outdoor areas: one is on the north-eastern school boundary, the other is close to the north-western boundary. A large playing field occupies the southern part of the site. Site area: 1.31 hectares. The site is situated on the top of a broad east-west oriented ridge. From the base plan and topographical contours the land appears to fall gently from the north to the south. Asbestos management plan (Re-Inspection, Assessment and Register of Asbestos Containing Materials at St Michael's Primary School, Dee Road, Tilehurst, Reading, RG30 4AS for Reading Borough Council; Enquin Environmental Limited, 2014) identified asbestos containing materials including cement products, insulating board, textiles and vinyl floor tiles. A condition assessment report (Education Property Condition Assessments, St. Michaels Primary School, DFES 2029, Executive Summary; Parson Brinckerhoff Ltd, 2005) identified three oil-fired boilers with oil storage tanks which were noted to be in poor condition. A recommendation was made to have the boiler replaced with gas-fired boilers. From the building survey it is understood that the tanks are still to be removed.

Notes	
Site Plan	
Historical Land Use Summary	On site: The site was part of open fields (possibly farmland) until 1961 when the school is shown is its approximate current layout. On the 1961-71 map four unidentified square-shaped structures are shown to the south-east of the playground. On the 2006 plan these structures are no longer shown (latest map present 1993), and buildings EFAB and EFAC are present. There are no obvious further changes from this time. Off site: The 1900 plan shows a brick works and associated pit approximately 300 m to the south-east. There are several other brick works and potteries with associated pits located beyond 500 m from site, mainly to the east and north-east. The 1931 plan shows the pits have expanded and encroached towards the site; 240 m to the south-east and 200 m to the north-east. By 1961 there had been significant residential development around the site; there is also a miniature rifle range approximately 250 m to the north-east. On the 1971 map structures, later identified as a depot, have been constructed in the pit to the north-east, and buildings, later identified as Meadway Precinct (retail park), have been constructed in the pit to the south-east. From current mapping and topographical contours it appears that the pits may not have been infilled. There are no obvious further significant changes.
Contemporary Land Uses	There are four contemporary trade directory entries within 250m of site. They relate to cleaning (blast cleaning, domestic and upholstery) and packaging and wrapping equipment and supplies. The closest is 118 m away. These are not considered likely to significantly impact the site. There are no fuel stations within 250 m. The closest is obsolete and was located 340 m to the east.
Landfill and other Waste Management Sites	There are no landfill sites, waste transfer station or waste management facilities within 1 km of the site.

Notes	
Fuel Storage Tanks	Three oil storage tanks (supplying the boilers at the school) are believed to still be in operation. The capacity or condition of the tanks was not discerned during the building survey as a small louvre door restricted the surveyor's view of the boiler room.
Radon	The property is in a lower probability radon area, as less than 1% of homes are above the action level (BGS, via Envirocheck).
Environmental Permits	There is one current environmental permit within 500 m which relates to a Local Authority Pollution Prevention and Control permit associated with a former petrol station 340 m east.
Pollution Incidents	No recent significant incidents.
Contaminated Land Designations	None
UXO	Based on our initial review of Zetica's UXB Risk Map, there is a LOW bomb risk for the area, including the site.

Notes	
Geology	Made Ground: Made Ground is not indicated on the geological maps. Some Made Ground and the possibility of obstructions are anticipated in association with foundations of demolished buildings east of the playground, though this is unlikely to be extensive or deep. Superficial: Geological mapping shows the site, other than the very southernmost tip, to be underlain by sand and gravel deposits from the Winter Hill Gravel. Superficial deposits are recorded as absent in the southern tip of the site. Bedrock: The site is shown to be underlain by the London Clay Formation which comprises poorly laminated, fissured blue-grey or grey-brown, slightly calcareous, silty to very silty clay or sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation. Comparison of the geological map with topographic information suggests the base of the London Clay may be around 10 m – 15 m below ground level at the site. The London Clay is underlain by the Lambeth Group which is generally comprised of clays, some silty or sandy; and typically 12 m - 16 m thickness in the Reading area. Geological Faults: No Faults are indicated within the site area. Mining, Quarries and Mineral Resources: The site is not within a coal mining reporting area as defined by the Coal Authority. The Envirocheck data shows records six BGS Recorded Mineral sites within 500 m of the site. These all relate to extraction from Lambeth Group minerals and are located as follows: • Former sand and gravel quarry 259 m south east at Prospect Park with a co-located former clay and shale quarry; • Former clay and shale quarry at Grovelands Tile and Pottery Works 334 m north east; • Former clay and shale quarry at Prospect Park Brick Works 335 m south east; • Former clay and shale quarry at Prospect Park 374 m east of the site; and • Former clay and shale quarry at Westwood Kiln 419 m south east. The Envirocheck identified four man-made mining cavities within 500 m of the site; all relate to historical chalk extraction, stated to be from the Lambeth Group although more likely from the Chalk Group which underlies the Lambeth Group. The mines are located: 303 m south east, 390 m north east; 446 m east and 460 m east of the site. These are not likely to have any impact on the site. There are no recorded natural cavities within 500 m of the site. Previous Investigations: The BGS holds no records of previous borehole activity or sampling on site or within 150 m of the site.

Notes	
Hydrogeology	Superficial: Secondary A Aquifers indicated to be beneath the site and immediate area. The southern boundary of the Aquifer appears to coincide with the southern boundary of the school. The Aquifer is not expansive and is not indicated to be in connection with other aquifers in the area. Bedrock: Unproductive Strata beneath the site and immediate area. Groundwater Abstractions: None within 1 km. Site not within a groundwater source protection zone.
Hydrology	Surface Watercourses: None significant within 1 km of site. The nearest surface watercourse, a land drain, is 120 m south of the site; flow direction is not indicated. Other water courses within 1 km appear to be land drains. Surface Water Quality: there are no surface water quality sampling points within 1 km of the site. Surface Water Abstractions: None within 1 km Discharge Consents: None significant within 500 m. The closest is 730 m to the south-west – down gradient of site.
Flood Risk	The site is located within indicative flood zone 1, i.e. low risk of flooding from fluvial / tidal sources. As site is larger than 1 hectare in area a full flood risk assessment is required for redevelopment.
Designated Environmentally Sensitive Sites	There is a local nature reserve (Lousehill Copse) 170m to the north-east. There are no other sensitive land uses within proximity of the site.

2. Summary of Preliminary Risk and Constraints

The expected ground investigation survey band is highlighted below with an explanation provided in bold for both geotechnical and contamination conditions.

GI Survey Band	Likely site geotechnical condition	Likely Site contamination condition	Likely site geotechnical recommendation	Likely costs of Intrusive GI
0	NA Refurbishment only	NA Refurbishment only	None required	£0k
1	Site with no significant geotechnical issues/challenges apparent. [Likely to be typical school redevelopment sites with underlying geology/soils likely to suit traditional foundation solutions]	Site with no significant contamination related issues/challenges apparent. [Likely to be typical school redevelopment sites with no history of industrial type uses or heavy contamination] Reason: No significant historical or contemporary potential sources of contamination on site or within the surrounding area. Potential for localised demolition rubble (including asbestos) to be present in area of former structures. Potential for localised contamination from existing oil tanks. If former pits have been filled potential for gas migration to site is low as permeable superficial geology not indicated to extend from site to these areas.	May require limited higher cost investigative approaches (e.g. rotary coring) or some additional testing. Full geo-environmental desk study required.	Up to £20k
2	Site with potential geotechnical issues/challenges apparent. [Likely to be typical school redevelopment sites with potential to require enhanced foundation solutions with additional investigation required to facilitate advice/understanding of the most likely solution or sites where the	Site with potential contamination issues/challenges apparent. [Likely to be typical school redevelopment sites with some historic use which may require additional testing or investigation	Likely to require higher cost investigative approaches (e.g. rotary coring to significant depths) and/or some increased scope and/or additional testing. Full geo-	£15k-£30k

	underlying geology/soils may or may not suit traditional foundation solutions and additional/enhanced investigation is required to facilitate advice/understanding of the most likely solution] Reason; Potential shrink swell hazard associated with London Clay including aggressive ground conditions towards concrete as a result of sulphates in the pyrite and gluconate. Potential for elevated groundwater in the Winter Hill Gravels. It is recommended that a detailed desk study assessing chalk mining in the vicinity of the site is undertaken.	required to facilitate advice/understanding of the most likely solution]	environmental desk study required.	
3	Site with geotechnical issues/challenges apparent. [Likely to be sites which may require additional testing or potential to require enhanced foundation solutions with additional investigation required to facilitate advice/understanding of the most likely solution]	Site with contamination issues/challenges apparent. [Likely to be sites with some historic use which may require additional testing or additional investigation required to facilitate advice/understanding of the most likely solution]	Likely to require higher cost investigative approaches (e.g. rotary coring to significant depths) and/or increased scope and/or additional testing. Full geo-environmental desk study required.	£20k-£50k
4	Site with significant geotechnical issues/challenges apparent. [Likely to be sites which require significant additional investigation to facilitate advice/understanding of any potential solution]	Site with significant contamination issues/challenges apparent. [Likely to be sites with former uses which create significant challenges such as those used as former landfill sites or for heavy industrial processes which require significant additional investigation to facilitate advice/understanding of any potential solution]	Likely to require higher cost investigative approaches with increased scope and significant testing suites. Full geo-environmental desk study required.	£35k+

