Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Updated Preliminary Site Investigation

Former Oatley Bowling Club
River Road, Oatley

Prepared for
Hurstville City Council

Project 73308.01
January 2016

Douglas Partners
Geotechnics / Environment / Groundwater

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		22 January 2016
Reviewer		22 January 2016

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666
Fax (02) 9809 4095

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Report on Updated Preliminary Site Investigation
Former Oatley Bowling Club
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1. Introduction

This report presents the results of an updated preliminary site investigation (PSI) undertaken for the former Oatley Bowling Club at River Road, Oatley. The investigation was commissioned in an email dated 8 December 2015 by Claire Stuckey of Hurstville City Council and was undertaken in accordance with Douglas Partners' proposal dated 8 December 2015.

This updated PSI report by Douglas Partners Pty Ltd (DP) outlines the findings from a site inspection, a search of publically available records, a review of aerial photographs, and a review of the previous phase 1 contamination assessment report for the former Oatley Bowling Club, Oatley, NSW ('the site').

This PSI is to be used as part of the application to re-zone the site from its former use as a bowling club (recreational land use) and redevelop the property to an aged care facility (residential land use). This assessment is to be conducted in accordance with NSW State Planning Policy No. 55 – Remediation of Land (SEPP 55).

2. Scope of Works

The scope of works for the updated PSI is as follows:

- Review of previous versions of the report prepared in 2006 and 2012;
- Inspection of the site to document features and specifically any changes since 2012;
- Review of EPA databases;
- Aerial photograph review; and
- Preparation of this PSI.

3. Site Description

3.1 Site Location and Description

The subject site occupies an area of approximately 1 hectare and is bounded by residential properties to the north, a railway line and Oatley station to the east and Myles Bunphy Bushland Reserve to the west and to the south. The site comprises Lots 14-20 Section 3 Deposited Plan 7124 and is located within the Municipality of Hurstville, the parish of St George and County or Cumberland.

The site is irregular shaped and situated at the end of River Road, Oatley. An inspection of the site was carried out by an Environmental Engineer from DP on 21 January 2016. The following observations were made:

- The former single storey brick club building, garage and timber/metal shed at the site had been demolished. Inspection of the footprint of the former clubhouse buildings found that fibrous cement materials were present on the ground surface;
- The two bowling greens were still present and remained overgrown with weeds. On the upper and lower green an electrical box in the south east corner of the green was present. The greens were still supported by sandstone block retaining walls, however these appeared to be failing and one section had been braced to maintain structural integrity;
- There was a metal shed in the north-eastern corner of each green;
- Some small stockpiles of filling were noted, possibly associated with the demolition works;
- Fly tipping, littering and graffiti were seen to affect the site;
- There were many semi-mature trees and shrubs growing at the site and former landscaped areas were overgrown and poorly maintained;
- The telephone line above River Street had been damaged and hung close to the road surface; and
- The timber crib retaining walls used to support the embankment at the west of the site were in a poor state of repair.

A drawing showing key site features observed during the inspection (Drawing 1) is included in Appendix C, with a photographic record included in Appendix B.

3.2 Geology, Topography, Hydrogeology and Soils

Reference to the Sydney 1:100000 Geological Series Sheet indicates that the site is underlain by Hawkesbury Sandstone. Outcropping sandstone bedrock was also observed to be present at the site. On-site measurements show rock bedding to dip 20° to the south west.

The natural slope of the site was observed to fall to the south-west toward the adjacent bushland.

It is anticipated that groundwater beneath the site would also flow in the same direction as the topography in a south-west direction towards the bushland. Two groundwater bores were found within a 2 km radius of the subject site during DP (2012). A small creek flows in an approximately north-south direction in the bushland found to the west of the site; visually the water appeared to be of good quality.

Review of the Acid Sulphate Risk Maps for the area revealed that the site is located within an area of no known occurrence of acid sulphate soils.

4. Previous Reports

4.1 DP (2006)

DP previously completed a Phase 1 contamination assessment of the site in 2006, titled *Report on Preliminary Contamination Assessment, Oatley Bowling Club, Oatley* – December 2006 (Reference 44456A; DP, 2006). The assessment was carried out as part of a feasibility study for the proposed development of an aged care facility.

A desktop review of historical information indicated that the site was owned by private individuals from as early as 1914 up until 1948 after which it was acquired by Hurstville Council. A review of the aerial photographs and Council records indicated that the site remained mainly vacant/ covered by bushland between 1930 and 1960, after which the site was developed into a bowling club.

At the time of the assessment the site was unoccupied. A single storey brick club building with a garage below was located on the central eastern side of the site, two bowling greens on the northern section, a timber and metal shed opposite the club on the western side of the site and a large open area in the southern portion of the site, probably used for car parking.

The bowling greens on the northern section of the site were elevated above the natural level of the area and stepped down the slope with a difference in levels of approximately 3 m to 4 m between the greens. The greens were supported by sandstone block retaining walls. It was considered likely at the time that imported filling material was used to form the Bowling Green and the car park in the southern portion of the site. Filling material along the embankment in the south-eastern portion of the site comprised building rubble including bricks, scrap metal, plastic, concrete and fibre cement (which may contain asbestos). In addition, it was noted that the site is located adjacent to the railway line and it was considered possible that filling associated with the railway line, such as ash and charcoal may have been used at the site.

On the basis of the site history / information available, the potential for contamination associated with the site was assessed to be low to moderate. The main issues of potential concern identified were:-

- Potential application of pesticides and herbicides on the bowling greens;
- Application of the uncontrolled filling to form / level the site especially the bowling greens; and
- Potential presence of hazardous building material in the club building associated with structures.

The report recommended that subsurface sampling be undertaken as part of the proposed development to verify the nature, with respect to contamination, of the filling and natural material on-site. A waste classification in accordance with applicable NSW guidelines was also recommended to be undertaken for any material that is to be exported from the site.

Based on the available information, it was considered that the site may be made suitable for the proposed development.

4.2 DP (2012)

DP previously updated the 2006 report, titled *Update of Phase 1 Contamination Assessment Report, Former Oatley Bowling Club, Oatley* – December 2012 (DP, 2012). The assessment was used as part of the application to rezone the site from its former use as a bowling club (recreational land use) and redevelop the property to an aged care facility (residential land use).

During the walkover of December 2012 similar issues noted in 2006 were observed, however there were also other potential sources of contamination observed. The updated potential sources of contamination were:

- Potential application of pesticides and herbicides on the bowling greens;
- Potential PCBs associated with the electrical box found on the upper bowling green;
- Application of the uncontrolled filling to form/ level the site especially the bowling greens;
- Potential presence of hazardous building material remaining after the demolition of the former bowling club building; and
- Contamination associated with fly tipping and the small filling stockpiles present at the site.

As in 2006, no intrusive sampling was undertaken and therefore no detailed comments can be made with regard to the actual levels of subsoil contamination. It was recommended that subsurface sampling be undertaken as part of the proposed development to verify the nature, with respect to contamination, of the filling and natural material on-site. A waste classification in accordance with relevant NSW EPA guidelines was also recommended for any material that is to be exported from the site.

Based on the available information obtained in DP (2006) and the updated report; it was considered that the site was suitable for the proposed re-zoning and that it could be made suitable for an aged care facility following intrusive investigations to address the potential for contamination identified above.

5. Updated Information

Using the public databases held under the *Contaminated Land Management Act* 1997 and the *Protection of the Environment Operations Act* 1997, the listed groundwater bores registered with the NSW Office of Water, and recent aerial photography, the following information is now applicable to the site.

5.1 Public Database

A search of the NSW EPA website in January 2016 has revealed that no notices have been issued under the Contaminated Land Management Act, 1997 for the site.

A search of the Protection of the Environment Operations Act, 1997 found no records for the site, however, found the following record for a site approximately 800m north east of the property was noted:

- Notice No: 1071536 – AUSGRID (Energy Australia): 33 Judd Street, Oatley, NSW. The notice type is an S58 licence variation and is likely a continuation for a previous licence (No: 11994 – Expired March 2007) for the storage or waste generation of hazardous, industrial or Group A substances.

This property is positioned hydraulically up-gradient of the site, however given the distance it is unlikely to impact on groundwater quality beneath the site.

5.2 Groundwater Bores

A search of the NSW Office of Water borehole register has identified three bores that have been constructed within 1 km of the site, these are as follows:

- Bore GW112820
- Bore GW112819
- Bore GW112821

These three bores are located 750 m north east of the site and constructed in 2009 – used for monitoring purposes. The locations of these bores are shown in Appendix D.

5.3 Aerial Photograph Review

Aerial photographs of the site were obtained from the website Nearmap and reviewed to identify possible changes to the site since DP, 2012. The aerial photographs are provided in Appendix E. The following summarises the findings of the review:

2012

The 2012 image indicates that there are no buildings on site and the former bowling greens are covered in grass in the northern part of the site. The rest of the site is characterised by sporadic vegetation, grass and a former asphaltic roadway is present. The site is predominately surrounded by bushland from the Myles Dunphy Bushland Reserve on the south-western boundary. Residential properties lie to the north of the site and the eastern boundary is adjacent to the rail line which connects to Oatley Station along the Illawarra Line.

2013

The site and surrounding area appear relatively unchanged since 2012.

2014

The site and surrounding area appear relatively unchanged since 2013.

2015

The site and surrounding area appear relatively unchanged since 2014.

6. Discussion and Conclusions

The site remains relatively unchanged from the 2012 inspection with the exception of the observation of two metal sheds in the north-eastern corners of the greens and an electrical box in the south-eastern corner of the lower green. Given the appearance of these features (refer to site photographs) it is obvious that these features were omitted from the previous reports and are not new additions to the site. Topographically the site remains relatively unchanged.

During the walkover of January 2016 similar issues noted in the previous two investigations were observed. The potential sources of contamination are presently identified as:

- Potential application of pesticides and herbicides on the bowling greens;
- Potential PCBs associated with the electrical box found on the upper bowling green;
- Application of the uncontrolled filling to form/ level the site especially the bowling greens;
- Potential presence of hazardous building material remaining after the demolition of the former bowling club building; and
- Contamination associated with fly tipping and the small filling stockpiles present at the site.

It should be noted that as no intrusive sampling was undertaken as part of this current or the previous two assessments, no detailed comments can be made with regard to the actual levels of subsoil contamination. It is recommended, similarly to the 2012 recommendation, that subsurface sampling be undertaken as part of the proposed development to verify the nature, with respect to contamination, of the filling and natural material on-site. A waste classification in accordance with relevant NSW EPA guidelines should also be undertaken for any material that is to be exported from the site.

Based on the available information obtained in DP (2012) and the updated report it is considered that the site is suitable for the proposed re-zoning and that it could be made suitable for an aged care facility following intrusive investigations to address the potential for contamination identified above.

7. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at River Road, Oatley in accordance with DP's proposal dated 8 December 2015 and acceptance received from Claire Stuckey dated 8 December 2015. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Hurstville City Council for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological

processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Site Photographs

Photo 1 – Site Looking North

Photo 2 – Stream and bush land to the south and west

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Former Oatley Bowling Club** **Oatley, NSW**	PROJECT: 73308.01 PLATE No: 1 REV: -
	CLIENT: Hurstville City Council	DATE: Jan - 2016

Photo 3 – Footprint of former bowling club building

Photo 4 – Damaged timber retaining structures

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Former Oatley Bowling Club** **Oatley, NSW**	PROJECT: 73308.01 PLATE No: 2 REV: -
	CLIENT: Hurstville City Council	DATE: Jan - 2016

Photo 5 – Failing retaining wall for bowling greens (note metal brace)

Photo 6 – Electrical box on lower bowling green

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Former Oatley Bowling Club** **Oatley, NSW**	PROJECT: 73308.01 PLATE No: 3 REV: -
	CLIENT: Hurstville City Council	DATE: Jan - 2016

Photo 7 – Electrical box on upper bowling green

Photo 8 – Lower bowling green looking south-east

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Former Oatley Bowling Club** **Oatley, NSW**	PROJECT: 73308.01 PLATE No: 4 REV: -
	CLIENT: Hurstville City Council	DATE: Jan - 2016

Photo 9 – Littering to the south of the bowling greens

Photo 10 – Rubble Stockpile

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Former Oatley Bowling Club** **Oatley, NSW**	PROJECT: 73308.01 PLATE No: 5 REV: -
	CLIENT: Hurstville City Council	DATE: Jan - 2016

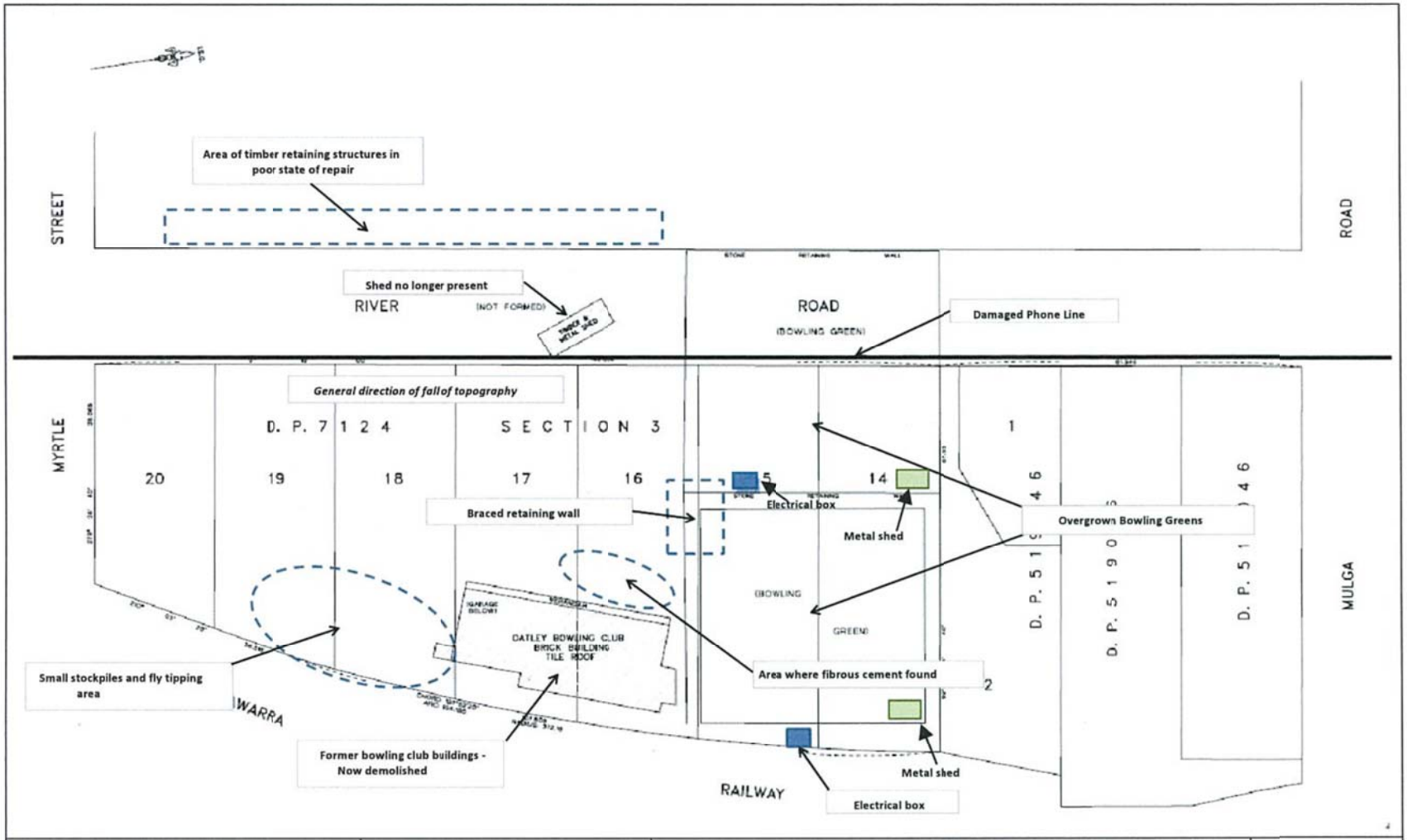
Photo 11 – Potential Asbestos Containing Material

Photo 12 – Metal shed on upper green

Douglas Partners Geotechnics / Environment / Groundwater	**Site Photographs** **Former Oatley Bowling Club** **Oatley, NSW**	PROJECT: 73308.01 PLATE No: 6 REV: -
	CLIENT: Hurstville City Council	DATE: Jan - 2016

Appendix C

Drawings



Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Hurstville City Council	TITLE: Site Features Former Oatley Bowling Club, Oatley, NSW	PROJECT No: 73308.01
	OFFICE: Sydney / DRAWN BY: JV		DRAWING No: 1
	SCALE: NTS / DATE: Jan 2016		REVISION: -

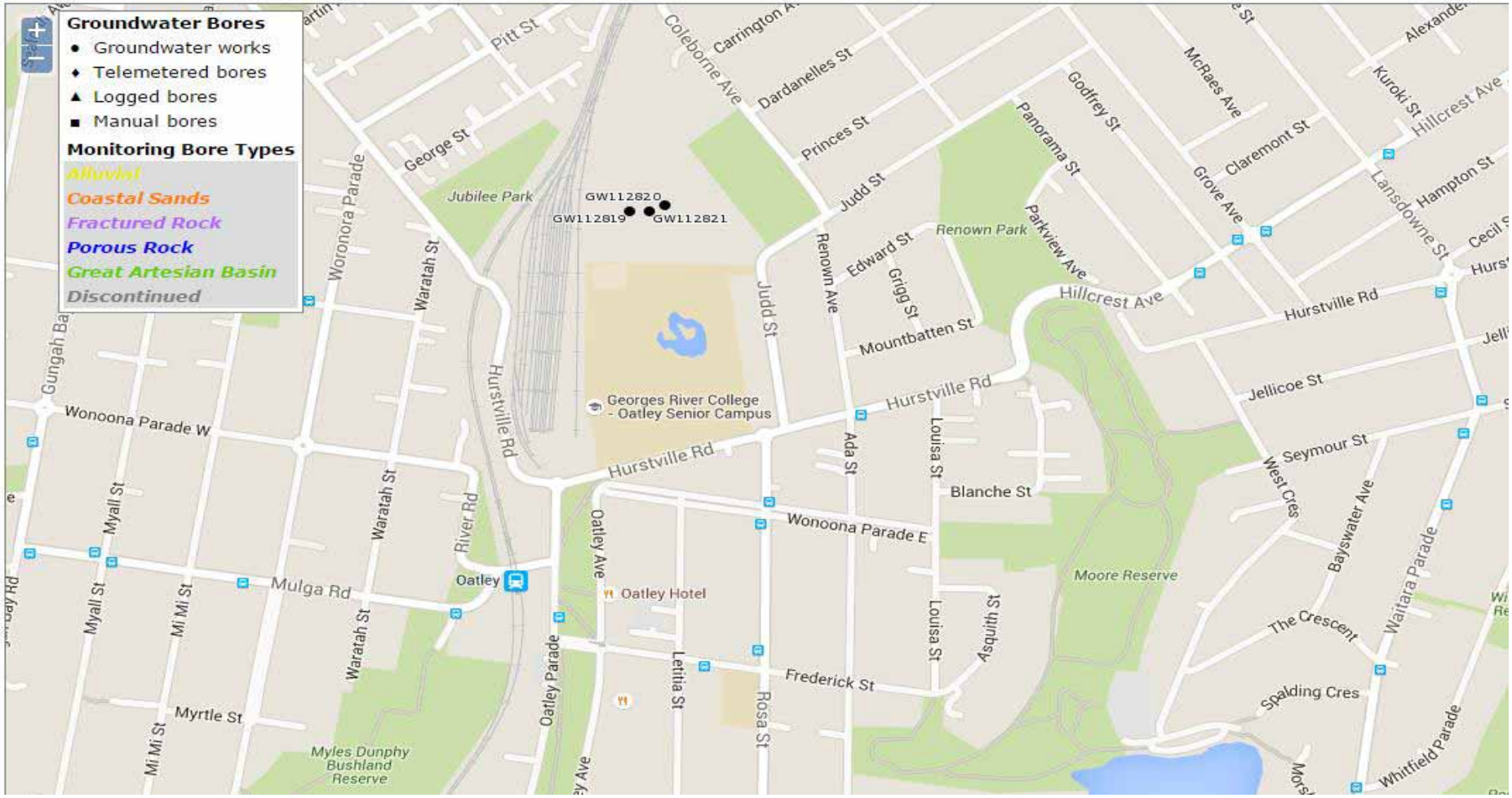
Appendix D

Groundwater Borehole Locations

All Groundwater Map

All data times are Eastern Standard Time

Map | Info



Douglas Partners Geotechnics | Environment | Groundwater	CLIENT: Hurstville City Council	**Groundwater Bore Locations**	PROJECT No: 73308.01
	OFFICE: Sydney	**Preliminary Site Investigation**	PLATE No: 1
	DATE: 6 Jan 2015	**Former Oatley Bowling Club**	REVISION: A

Appendix E

Aerial Photographs

N

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Hurstville City Council	**Historical Photograph- 2012**	PROJECT No: 73308.01
	OFFICE: Sydney	**Preliminary Site Investigation**	DWG No: E1
	DATE: 5 Jan 2016	**Former Oatley Bowling Club**	REVISION: 1

N

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT:	Hurstville City Council
OFFICE:	Sydney
DATE:	5 Jan 2016

Historical Photograph- 2013

Preliminary Site Investigation

Former Oatley Bowling Club

PROJECT No:	73308.01
DWG No:	E2
REVISION:	1

N

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Hurstville City Council	**Historical Photograph- 2014**	PROJECT No: 73308.01
	OFFICE: Sydney	**Preliminary Site Investigation**	DWG No: E3
	DATE: 5 Jan 2016	**Former Oatley Bowling Club**	REVISION: 1

N

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Hurstville City Council	**Historical Photograph- 2015**	PROJECT No: 73308.01
	OFFICE: Sydney	**Preliminary Site Investigation**	DWG No: E4
	DATE: 5 Jan 2016	**Former Oatley Bowling Club**	REVISION: 1