GROUNDED
EXPERTISE

Report on Groundwater Impact Assessment

Green Square Stage 3

960A Bourke Street,
Zetland

Prepared for Mirvac Green Square Pty Ltd

Project 72258.23

15 December 2025

Douglas PARTNERS | GROUNDED EXPERTISE

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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.

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Report on Groundwater Impact Assessment
Green Square Stage 3
960A Bourke Street, Zetland

1. Introduction

1.1 The Project

This report supports one of the detailed State Significant Development Applications (SSDA) (SSD-83899206) and concurrent rezoning being lodged with the Department of Planning, Housing and Infrastructure (DPHI) for the construction of three mixed-use Build-to-Rent buildings at 960A Bourke Street (the site). The site is also known collectively as Sites 7, 17 and 18 of the Green Square Town Centre (GSTC) and is legally described as Lot 6, DP 1199427. The proponent for the SSDA is Mirvac Green Square Pty Limited.

The proposal aims to:

- Respond to the housing challenges facing Sydney through the delivery of diverse housing types in a highly accessible location;
- Demonstrate the strategic and site-specific merit of accommodating the proposed height and FSR of development on the site;
- Contribute to the establishment of Green Square as a town centre through a mixed-use approach and use urban design principles to integrate residential and non-residential land uses;
- Improve the pedestrian connectivity throughout the site, while encouraging the direct connections to public transport and the existing street network; and
- Appropriately respond to neighbouring development and public domain within the GSTC through podium and tower forms with appropriate massing, which protect solar access and minimise environmental impacts.

From a groundwater impact perspective, the project involves temporary dewatering for the basement excavation, followed by the construction of fully-tanked subterranean structures where there is an interface with the groundwater table. Long-term dewatering is not proposed and therefore groundwater take will be limited to the construction phase of the project.

1.2 This Report

This report presents the results of a Groundwater Impact Assessment (GIA) undertaken on the site.

It is understood that the development will include the construction of three residential buildings over a common basement, and pedestrianised laneways. The buildings will be up to 19 to 20-storeys and will be constructed over a common one-level basement which will be approximately 5 m below the ground surface levels. The basement will not cover the full site footprint and therefore some structure will be constructed at or near the ground surface.

Various investigations have been undertaken to provide information on the subsurface conditions on the site and have included the drilling of boreholes, the installation of groundwater monitoring wells, level monitoring and permeability testing, laboratory testing and engineering interpretation.

The purpose of this GIA is to address the Secretary's Environmental Assessment Requirements (SEARs) for the project.

This GIA is based on information from the geotechnical investigations undertaken at and near the site including:

- Report on Preliminary Geotechnical Investigation Rev 1 dated 1 March 2011 (Project 72258.00);
- Report on Pavement Investigation and Design Rev 1 dated 28 February 2011 (Project 72258.00);
- Report on Geotechnical Investigation for GSTC Stage 3 Rev 0 dated 12 December 2025 (Project 72258.23); and
- Dewatering Management Plan, Green Square Site 9A and 9B Rev 3 dated 7 September 2020 (Project 84310.05).

This report must be read in conjunction with all appendices including the notes provided in Appendix A.

1.3 Deviations from Guidelines

This GIA has been prepared in general accordance with 'Minimum requirements for site groundwater investigations and reporting" (DPIE, 2022). The following deviations have been identified along with justifications.

- Section 3.2.1 Temporary construction dewatering. Continuous level monitoring has not been undertaken for 3 months prior to lodgement. Monitoring was undertaken in 2015. The hydrogeological regime on the site is well known from previous developments on immediately adjacent sites. The aquifer is within a backfilled quarry and variances in groundwater levels are not significant. The absence of this data is not expected to change the results and recommendations of this report.
- Section 3.3 Hydraulic conductivity testing. Testing has been undertaken within the quarry backfill but not within the underlying rock which is expected to govern the inflow volumes as the fill will be 'cut-off' from the excavation. Instead, we have relied on back-calculated values from the site immediately to the south in the same aquifer (backfilled quarry). This is considered to be more indicative of actual conditions than a series of slug tests at isolated locations which could be affected by variable conditions within the fill/rock materials.

2. Site Description

2.1 General

The site is legally known as Lot 6 DP 1199427 and is bounded by Tweed Place and a multi-storey residential building to the north-west, Ebsworth Street and multi-storey residential buildings to the north-east, Paul Street to the south-east, and Green Square Library and Plaza to the south-west. It has an area of approximately 5,130 m^2.

The site is currently covered with asphalt and was recently used to house temporary site sheds and provide vehicle parking for an adjacent development. A temporary public walkway links Green Square Library and Plaza with Ebsworth Street through the centre of the site.

An aerial image of the site is shown in Figure 1.

Figure 1: Aerial view of development site

2.2 Topography

The ground surface on the site slopes gently downwards to the north and west at grades in the order of 2% to 3%. The surface levels vary from about RL 18.1 m relative to the Australian Height Datum (AHD) near the south-eastern corner of the site to RL 15.1 m AHD in the north-western corner.

3. Published Data

3.1 Geology

The *Sydney 1:100 000 Geological Series Sheet* shows that the site is underlain by Quaternary-aged medium to fine-grained marine sands with podsols. Although not mapped, there is a significant depth of fill across the Stage 3 site associated with previous land uses as a clay/shale quarry and its subsequent backfilling.

The site is therefore not underlain by the Botany Sands as nearby sites are but rather Ashfield Shale.

An extract of the mapping is provided in Figure 2.

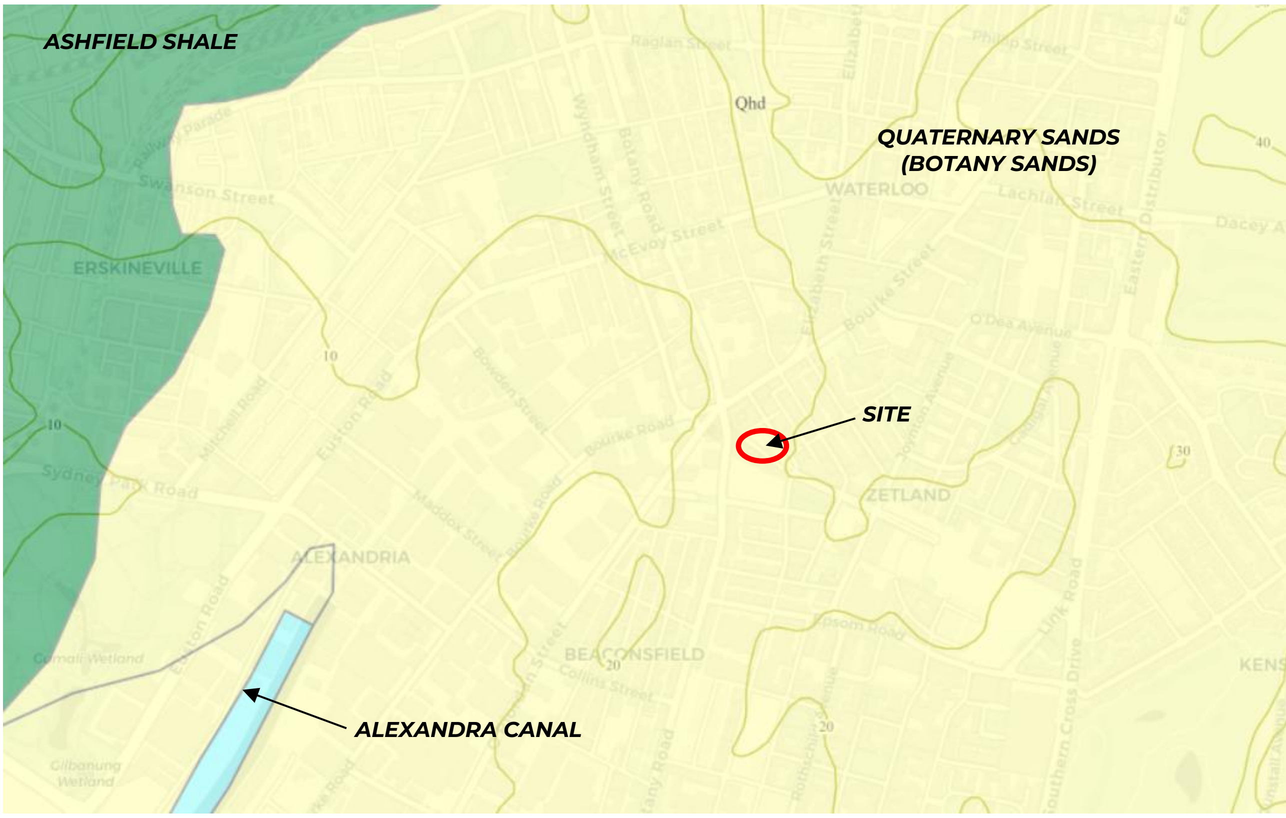

Figure 2: Extract from geological map with surface contours shown at 10 m intervals to AHD

3.2 Groundwater

A search of the NSW Office of Water groundwater database indicated that the closest groundwater wells to the site are:

- GW112478 – monitoring bore installed in 2011, 100 m to the south-west, with a standing water level recorded at 3.7 m depth; and
- GW115448 – monitoring bore installed in 2015, 65 m to the east, with a standing water level recorded at 8.9 m depth.

No production bores are located near the site.

Reference to the Greater Metropolitan Region Groundwater Sharing Plan (2023) indicates that underlying aquifers are of the Botany Sands Groundwater Source (soil aquifer) and the Sydney Basin Central Groundwater Source (rock aquifer).

3.3 Other Mapping

A summary of selected other relevant geotechnical mapping for the site is included in Table 1.

Table 1: Summary of Other Mapping

Map type	Site Conditions	Reference
Soil Landscape	**Tuggerah** – gently undulating to rolling coastal dune fields (Aeolian).	Sydney 1:100 000 Soils Landscape Sheet, (NSW DECC, 2008)
Acid Sulfate Soil	**No known risk** – site is located outside of areas of known acid sulfate risk and outside of the EPI – Acid Sulfate Soil Class mapping.	Acid Sulfate Soil Risk, (NSW DECC, 1994-1998); Environmental Planning Instrument – Acid Sulfate Soils (NSW DPHI, 2019)
Salinity	**No known risk** – the site is located outside of the salinity potential zones identified in the Environmental Planning Instrument - salinity mapping and outside of the Western Sydney mapping.	Western Sydney Salinity Risk Mapping (NSW DPIE, 2002) Environmental Planning Instrument – Salinity (State of NSW & NSW DPHI, 2017)
Groundwater dependant ecosystems (GDEs)	**Lachlan Swamps** – high potential aquatic GDEs about 3 km south-east of site in Eastlakes/Daceyville. **Eastern Suburbs Banksia Scrub** – low, moderate and high potential terrestrial GDEs about 2.5 km north-east of site in Centennial Park.	Groundwater Dependant Ecosystems Atlas (Bureau of Meteorology, 2020)

Based on the published mapping summarised in Table 1, an Acid Sulfate Soils Management Plan (ASSMP) and Salinity Management Plan (SMP) are not considered to be required for the project.

4. Previous Field Work

4.1 Geotechnical investigations

Boreholes have been drilled on the site to depths ranging between 14.4 m and 18.2 m depth. Borehole locations from the investigation are shown on Drawing 1 in Appendix B. A summary of the subsurface conditions encountered within the site is as follows:

- FILL – sandy and clayey fill with varying proportions of ripped sandstone, brick, glass, charcoal, ash, rubber, wood, steel, lead and organic material to depths of between 4.4 m and 12.1 m. Numerous obstructions resulted in slow drilling progress;
- NATURAL SOILS – silty clay from 5.5 m to 11.1 m depth in bore 18-1. Sand, clayey sand, clay and sandy clay from 4.4 m to 12.5 m depth in bore P3. Silty sand and sand from 9.8 m to 12.3 m depth in bore I3. Natural soil was not encountered in the other boreholes where filling was directly underlain by bedrock;

- BEDROCK – sandstone, siltstone and laminite from depths of between 9.6 m and 12.3 m to the base of the bores at between 14.4 m and 18.2 m depth. In some bores the rock had a veneer of weathered material overlying medium and high strength rock, while in others the rock was medium or high strength from its surface.

4.2 Groundwater Investigation

Groundwater observations were made in the temporary groundwater monitoring wells installed following the completion of drilling and prior to permeability testing. A summary of these observations is provided in Table 2.

Table 2: Summary of Groundwater Observations in Groundwater Monitoring Wells

Date of Observation	RL of Groundwater (m, AHD)		
	DP7-2	DP7-3	DP18-1
5 June 2015	11.7	11.6	13.4

Groundwater levels were monitored using the vented loggers installed in the wells. The loggers were configured to record water levels at two-hourly intervals during the monitoring period.

A graphical summary of the monitoring data is shown in Figures 3 to 5. Daily rainfall information recorded by the Bureau of Meteorology at Sydney Airport is also included on the graphs. It should be noted that the daily rainfall totals are reported as rainfall in the 24 hours to 9 am rather than from midnight to midnight.

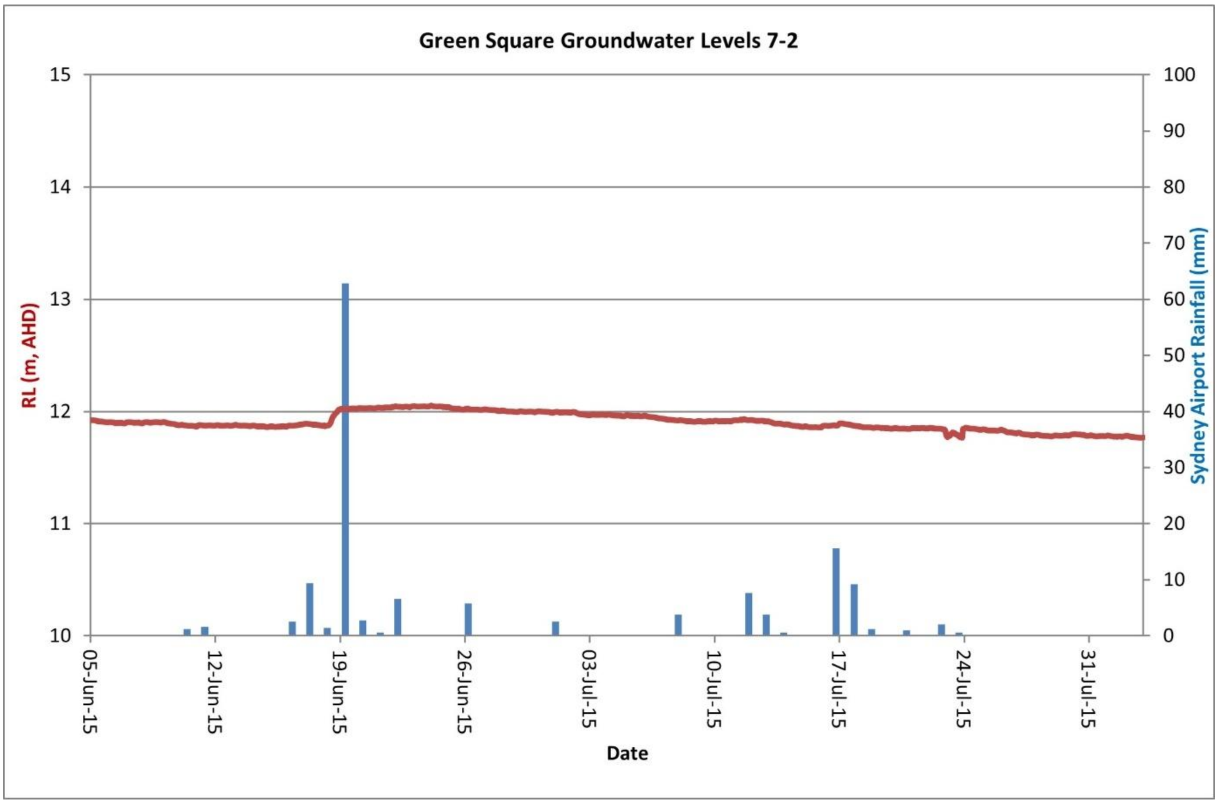

Figure 3: Results of Groundwater Monitoring in Monitoring Well 7-2

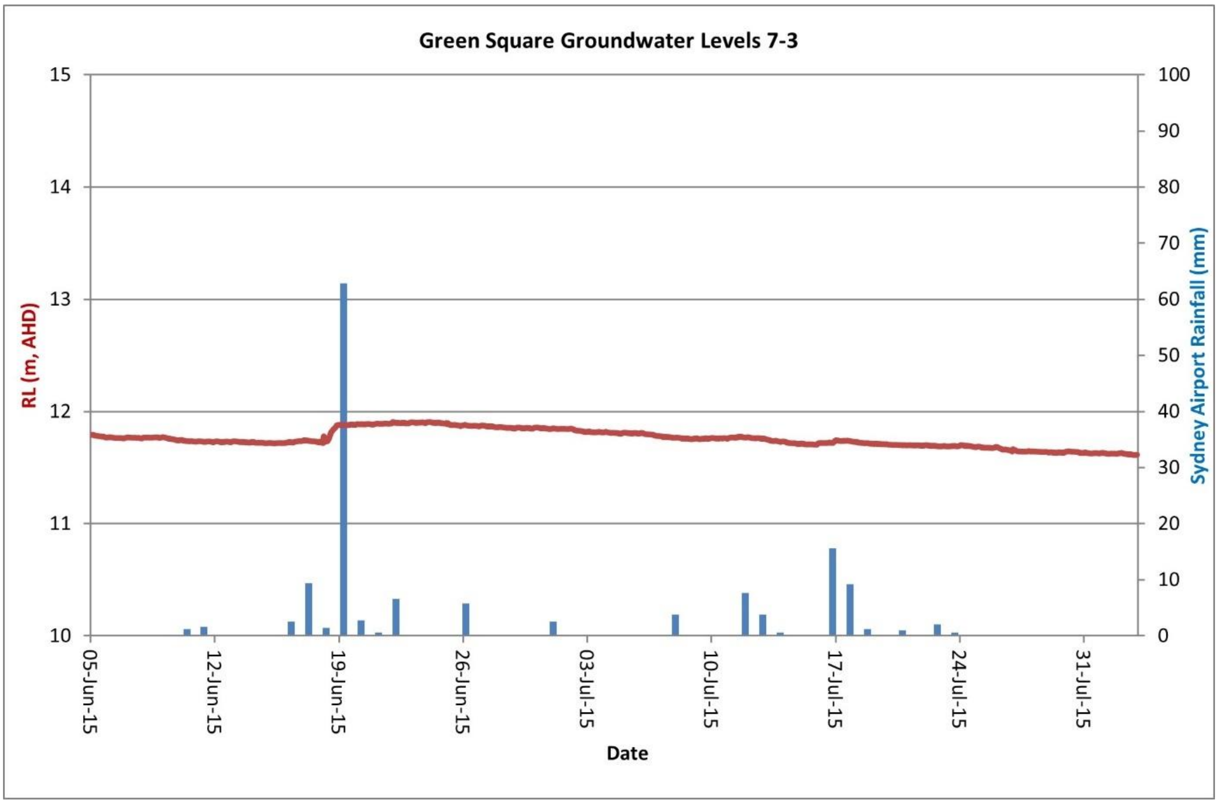

Figure 4: Results of Groundwater Monitoring in Monitoring Well 7-3

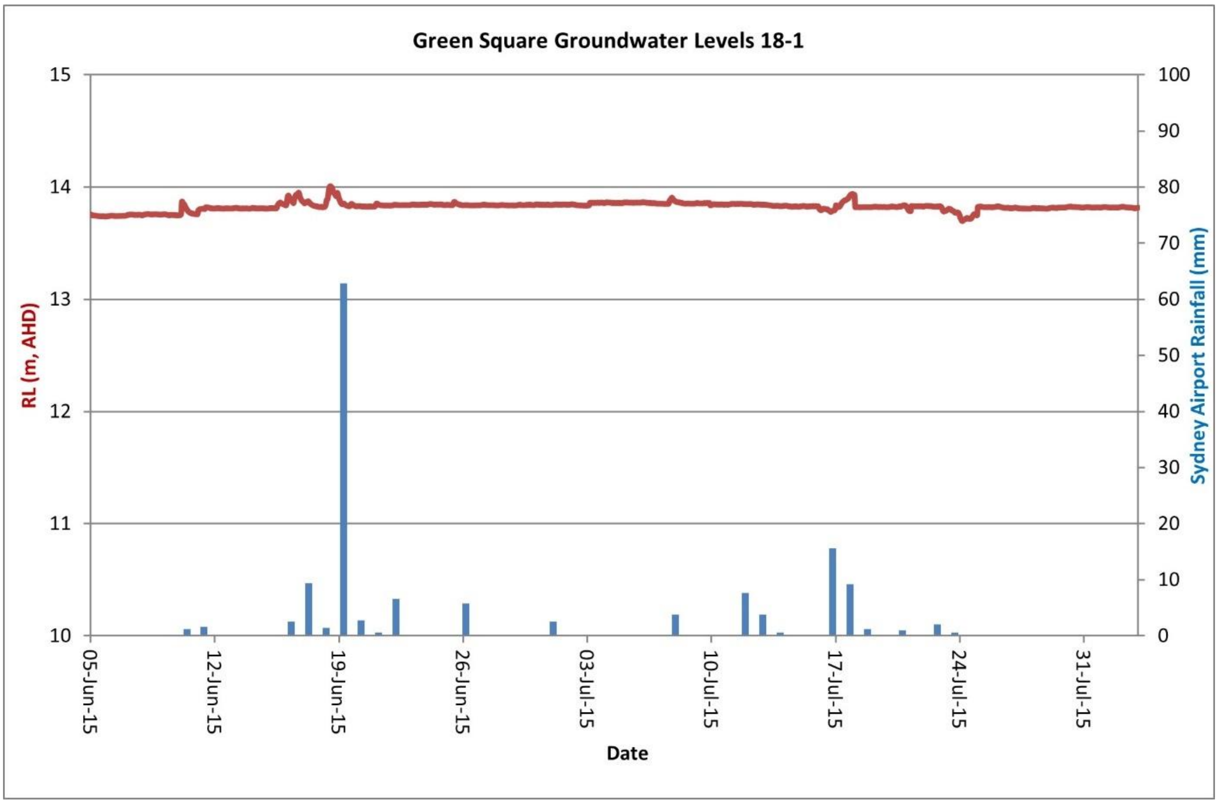

Figure 5: Results of Groundwater Monitoring in Monitoring Well 18-1

4.3 Hydraulic Conductivity Testing

Specific hydraulic conductivity testing was not undertaken in the bedrock materials on the site as the field work was completed in various stages prior to the publication of "Minimum requirements for building site groundwater investigations and reporting" (DPIE, 2022). However, this testing has previously been undertaken on the site immediately to the south (Project 84310.05, 2020) which is in the same geology and is therefore considered representative for this construction dewatering GIA.

The average permeability of the soils and weathered rock on the site to the south was determined using back-calculation of actual dewatering volumes to be an average of 5 x 10^{-7} m/s. The fill is more permeable, however cut-off walls will mean the bedrock permeability will govern inflows.

5. Conceptual Hydrogeological Model

The site is located in the central portion of a former shale quarry that was mined for brick making purposes. Upon completion of quarrying activities, the Waterloo incinerator was constructed which received municipal waste for incineration. The ash from the incinerator was used to backfill the former quarry, along with other non-combustible waste such as bricks and concrete. The aquifer on the site is therefore considered more likely to be associated with the rock aquifer (the Sydney Basin Central Groundwater Source) rather than the soil aquifer (the Botany Sands Groundwater Source).

Back-calculation of the average permeability of the quarry backfill and weathered rock on the site immediately to the south indicates a value of 5 x 10^{-7} m/s. The groundwater level is at or around RL 12.0 m AHD across most of the site and RL 14.0 m AHD at the southern end.

The natural groundwater flow direction is likely to be to the south-west (towards Alexandra Canal) however the former quarry would interrupt this flow path and fill the quarry zone prior to discharge towards the south-west over the former quarry walls.

The excavation design includes water-tight cut-off walls founded within the bedrock beneath the fill, and therefore the rock aquifer will be the source of the groundwater requiring temporary removal. Alternative walls such as sheet-piles would also be acceptable for reducing inflows, however are unlikely to be as effective and therefore slightly higher (but still acceptable) inflows may be experienced in this case.

It is expected that water inputs to the ground profile beneath the site include:

- Rainfall infiltration on the site and surrounds, including water flowing downslope laterally through the natural soils and bedrock from areas of higher topography (i.e. the east); and
- Possible anthropogenic recharge from seepage from nearby leaking water mains and / or stormwater pipes, garden irrigation etc.

Water outputs or losses from the ground beneath the site include:

- Evapotranspiration from the vegetation on nearby sites; and
- Nearby dewatering projects or drained basements.

6. Groundwater Inflow Assessment

6.1 Inflow Assessment

6.1.1 Theory of analytical solution

The Marinelli and Niccoli (2000) method presents a simple analytical solution for predicting the groundwater inflow to an open excavation below the water table. This method of inflow prediction is reliant on the following assumptions:

- Lowering the water table decreases the saturated thickness of subsurface materials providing excavation inflow;
- Relative to seepage from the excavation walls (where present), significant inflow occurs through the excavation base;
- The rock formation is semi-infinite below the excavation and no impermeable boundary exists at depth; and
- Steady state flow conditions exist near the excavation.

Under this method two zones are identified; Zone 1 represents flow through the excavation walls (negligible in this case due to cut-off walls) above the base and Zone 2 extends from the bottom of the excavation downward and considers flow into the excavation base. The analytical model assumes no flow occurs between the two zones.

The Zone 1 analytical solution considers steady-state, unconfined, horizontal radial flow with uniformly distributed recharge at the water table. The analytical solution assumes the following:

- The excavation walls are approximated as a right circular cylinder;
- Groundwater flow is horizontal;
- The static water table is approximately horizontal;
- Uniform distributed recharge occurs across the site as a result of surface infiltration (rainwater); and
- Groundwater flow toward the excavation is axially symmetric.

The groundwater inflow through the excavation walls is determined by the following equation:

$$Q_1 = W \pi (r_o^2 - r_p^2)$$

Where Q_1 is the inflow rate, W is the distributed recharge flux, r_o is the radius of influence (maximum extent of groundwater cone depression) and r_p is the effective excavation radius.

The radius of influence (r_o) is determined by iteration process using the following equation:

$$h_o = \sqrt{h_p^2 + \frac{W}{K_{h1}}\left[r_o^2 \ln\left(\frac{r_o}{r_p}\right) - \frac{(r_o^2 - r_p^2)}{2}\right]}$$

Where h_o is the initial saturated thickness above the excavation base, h_p is the saturated thickness above the excavation base and K_{h1} is the horizontal hydraulic conductivity of materials within Zone 1.

The Zone 2 analytical solution considers steady-state flow to one side of a circular disk (excavation base) of constant and uniform drawdown. The analytical solution assumes the following:

- Hydraulic head is initially uniform throughout Zone 2;
- The excavation base has a constant hydraulic head equal to the elevation of the excavation base;
- Flow into the excavation base is three-dimensional and axially symmetric; and
- Materials within Zone 2 are anisotropic.

The groundwater inflow through the excavation base is determined by the following equations:

$$Q_2 = 4\, r_p \left(\frac{K_{h2}}{m_2}\right)(h_o - d)$$

$$m_2 = \sqrt{\frac{K_{h2}}{K_{v2}}}$$

Where K_{h2} and K_{v2} are the horizontal and vertical hydraulic conductivity of materials in Zone 2 and d is the depth of water in the excavation (typically 0).

6.1.2 Input parameters

The input parameters are based on the information contained in this report and are summarised in Table 3.

Table 3: Input parameters for inflow assessment

Parameter	Value
Initial saturated thickness (h_o)	2 m
Saturated thickness above excavation (h_p)	0 m
Effective excavation radius (r_p)	26.5 m
Radius of influence (r_o)	70 m
Horizontal hydraulic conductivity (K_h)	5.0×10^{-7} m/s
Vertical hydraulic conductivity (K_v)	1.7×10^{-7} m/s
Distributed recharge flux (W)	6.6×10^{-5} m/day
Depth of water in excavation (d)	0 m

Sensitivity analyses were undertaken to assess the impact of intersecting more permeable ground conditions, shallower water table and a lower ratio of horizontal to vertical hydraulic conductivity. The sensitivity cases analysed are summarised below:

- Sensitivity case 1 – assuming the fill and weathered rock has a higher hydraulic conductivity (K_h of 1.0 x 10^{-6} m/s and K_v of 3.3 x 10^{-7} m/s);
- Sensitivity case 2 – assuming the fill and weathered rock has a lower ratio of vertical to horizontal hydraulic conductivity (K_h/K_v=1); and
- Sensitivity case 3 – assuming the groundwater table is about 2 m higher than the level adopted in the baseline case (i.e. new level at RL 14.0).

6.1.3 **Inflow results**

Groundwater inflows into the basement excavation were calculated for the baseline case and each sensitivity case using the methods and input parameters previously outlined. The predicted yearly groundwater inflows into the basement under the baseline case and each sensitivity case are presented in Table 4.

Table 4: Summary of inflow calculations results

Case	Inflow (ML/y)
Baseline	1.9
Sensitivity case 1	3.8
Sensitivity case 2	3.4
Sensitivity case 3	3.8

It is noted that the precision to which the results are presented does not represent the accuracy of the predictions; the level of precision is provided to allow comparison of scenarios. In reality, the accuracy will be lower because of the inherent variability in key parameters such as hydraulic conductivity and recharge and results could vary significantly. The sensitivity analysis attempts to simulate the possible variations in inflows arising from these variations in key parameters.

Updates to NSW regulations in June 2025 now provide a Water Access Licence (WAL) exemption for any volume of groundwater taken in connection with the construction of buildings and infrastructure in designated coastal areas which includes this development site. A Dewatering Management Plan and the monitoring of water volumes and quality are necessary, however the WAL and associated access rights (shares) will not be required.

6.1.4 **Drawdown**

The radius of the drawdown curve was calculated to be 70 m. The cutoff walls will help to reduce the drawdown immediately adjacent to the excavations. As the surrounding structures are founded in rock (not the uncontrolled backfill material that underlies much of Green Square Town Centre), and the water levels within the fill are likely to have been lowered to similar levels previously during dewatering on other development sites, drawdown is unlikely to cause issues to surrounding structures.

7. Potential Risks Associated with Dewatering

7.1 Aquifer Interference Policy

The NSW Aquifer Interference Policy (AIP) indicates that the term "aquifer" is commonly understood to mean a groundwater system that is sufficiently permeable to allow water to move within it, and which can yield productive volumes of groundwater. A groundwater system is defined as any type of saturated geological formation that can yield low or high volumes of water. However, for the purpose of the AIP, the term aquifer has the same meaning as groundwater system and includes low yielding and saline systems.

Table 1 in Section 3.2.1 of the AIP outlines minimal impact considerations. The AIP indicates that "if predicted impacts are less than the Level 1 minimal impact considerations, then these impacts will be considered as acceptable". The following minimal impact considerations are outlined for less productive porous and fractured rock groundwater sources:

- Less than or equal to 10% cumulative variation in water table 40 m from any high priority GDE or high priority culturally significant site;
- A cumulative pressure head decline of no more than 2 m at any water supply work; and
- Any change in groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity.

7.2 Risk Assessment

An assessment of the potential effects of dewatering on neighbouring properties and groundwater receptors has been summarised in Table 5.

Table 5: Assessment of potential effects of dewatering

Item	Comment
Impacts on potential GDEs	There are no GDEs within the predicted radius of groundwater depression, hence drawdown impacts on GDEs will not occur. Closest GDE is 2.5 km away.
Water supply losses by neighbouring users	There are no registered groundwater users within the predicted radius of groundwater depression, hence drawdown impacts on any registered groundwater users will not occur.
Potential subsidence of neighbouring structures	All neighbouring structures are founded on bedrock. The settlements induced by groundwater drawdown within the weathered rock profile with high deformation moduli are predicted to be negligible.

The excavation is not expected to impact any GDEs or groundwater supply works in the area and potential settlements are predicted to be negligible. Hence, the proposed works are considered to be acceptable with reference to the AIP "Level 1 minimal impact" considerations.

7.3 Groundwater Contamination

Assessment of groundwater contamination was undertaken by JBS&G as part of their Detailed Site Investigation (Ref. 69329/167608 Rev0 dated 8 September 2025). The groundwater was found to contain elevated levels of heavy metals, PAHs and ammonia, and noted that the levels are representative of urban background conditions. It is usual for urban groundwater to require treatment prior to discharge during dewatering activities. Treatment will need to be managed under a Dewatering Management Plan (DMP) that will need to be prepared prior to the commencement of dewatering.

8. Conclusion

The project requires temporary dewatering during construction only; the final subsurface structures will be fully tanked where they interface with the groundwater.

The assessment confirms that dewatering volumes are expected to be in the order of 2 ML to 4 ML per year.

An exemption for a Water Access Licence will apply for the construction dewatering, however a Dewatering Management Plan and associated monitoring and reporting will still be required.

The groundwater drawdown in the vicinity of the site is expected to be acceptable, noting that the water levels within the fill are likely to have been lowered to similar levels previously during dewatering on other development sites.

The predicted impacts of dewatering are considered to be less than the Level 1 minimal impact considerations detailed in the AIP and are considered acceptable.

A Dewatering Management Plan should be prepared for the construction phase of the project.

9. References

J. Hvorslev. (1951). Time Lag and Soil Permeability in Ground-water Observations

Department of Primary Industries: Office of Water (2012) NSW Aquifer Interference Policy

ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australia New Zealand Environment Conservation Council.

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

Douglas. (2025b). *Detailed Site Investigation, Flide Street, Caringbah, Affordable Housing, 2 Flide Street, Caringbah NSW.* (Douglas reference: 233414.04.R.002.Rev1).

DPE. (2022). *Minimum requirements for building site groundwater investigations and reporting.* NSW Department of Planning and Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NHMRC. (2008). *Guidelines for Managing Risks In Recreational Water.*

NHMRC. (2025). *Australian Drinking Water Guidelines 6 2011, Version. 4.0 June 2025*. Canberra: National Health and Medical Research Council, National Resource Management Ministerial Council.

NSW Government. (2021). *State Environmental Planning Policy (Resilience and Hazards) 2021.* NSW Government.

10. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Zetland, in line with Douglas' proposal dated 12 November 2025 and acceptance received from Mirvac Green Square Pty Ltd. This report is provided for the exclusive use of Mirvac Green Square Pty Ltd 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 Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas 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 Douglas' field testing has been completed.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical/groundwater components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed ‘safety in design’ assessment is outside the current scope of this report and requires additional project data and assessment.

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. Douglas 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 Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

This report provides specialist advice only and no part of it is considered a Regulated Design under the Design and Building Practitioner Act 2020 (NSW).The scope of work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

Appendix A

About This Report

About this Report

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.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

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.

continued next page

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.

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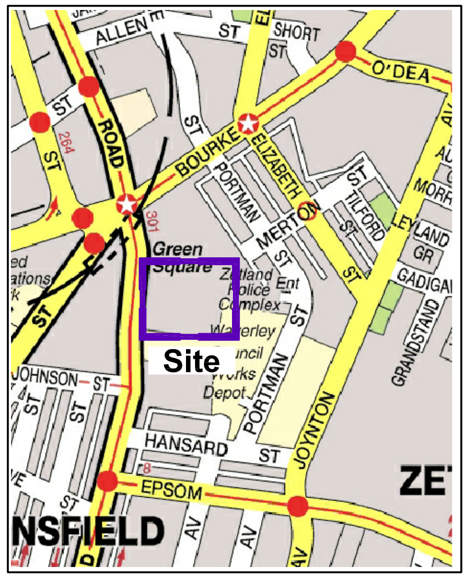
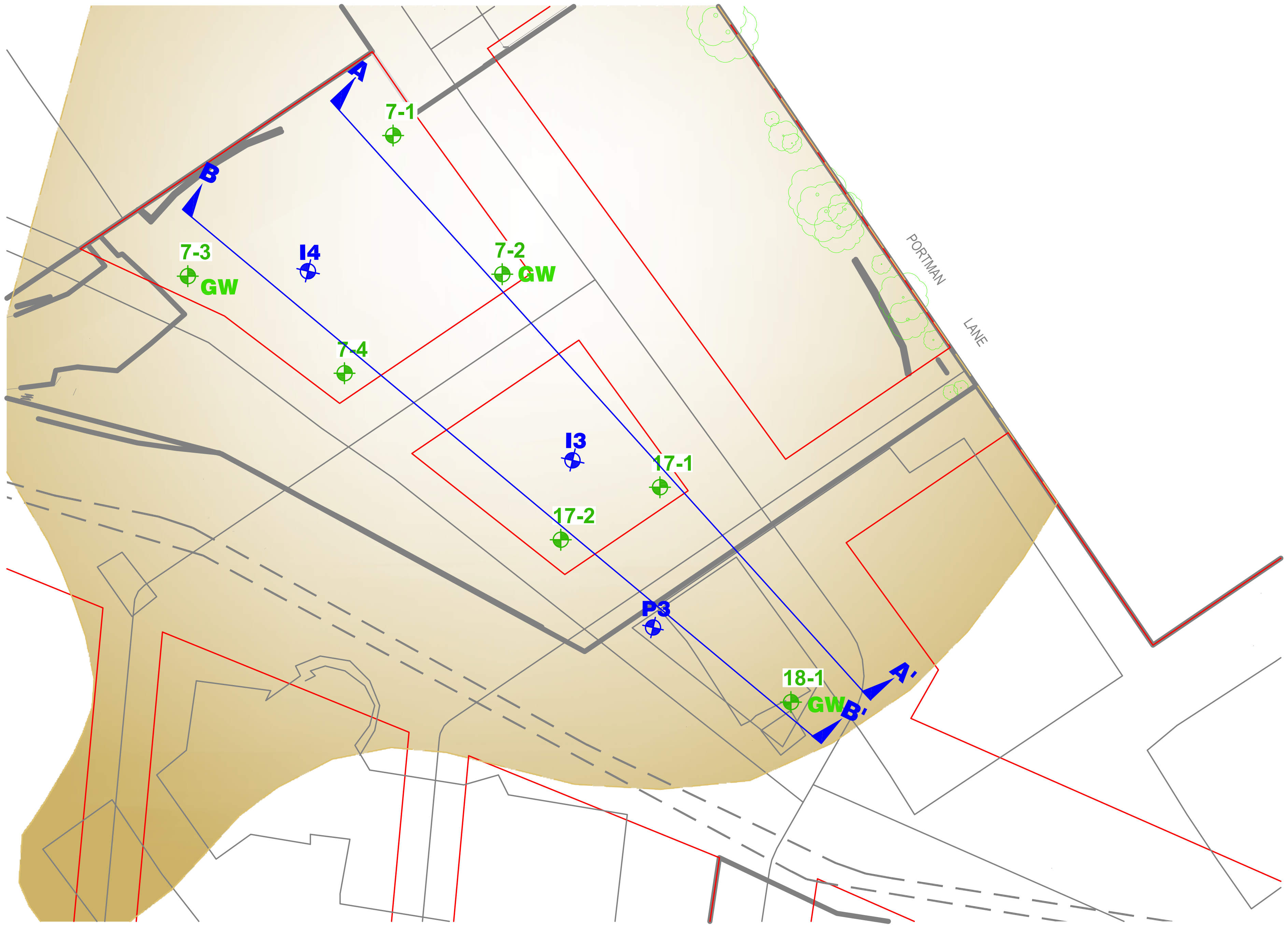
Appendix B

Drawing



Locality Plan



LEGEND

Current Borehole Location

GW Current Groundwater Well Location

Previous Borehole Location (2011)

Approximate location of former quarry and land fill based on previous investigations. Indicative only.

NOTE:
Base drawing from ADW Johnson Pty Ltd
(Drawing 7355-10 Detail)

0 10 20 30 40 50 75 100m

1:1000 @ A3

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: Mirvac Green Square Pty Ltd		TITLE: **Locations of Boreholes**	PROJECT No: 72258.23
OFFICE: Sydney	DRAWN BY: PSCH	**Stage 3**	DRAWING No: G1
SCALE: As shown	DATE: 12.12.2025	**960A Bourke Street, Zetland**	REVISION: A