24 November 2022
Job No: 1020519.1000-ENG-L1.v3

ID Ross Watt Road Pty Ltd
C/O Breese Pit Dixon Pty Ltd
1/19 Cato Street
Hawthorn East 3123

Attention: Jake Talbot

Dear Jake

89 Ross Watt Road, Gisborne
Desktop Groundwater Assessment

1 Introduction

ID Ross Watt Road Pty Ltd, engaged Tonkin & Taylor Pty Ltd (T+T) to undertake a geotechnical desktop study of groundwater effects on the Rosslynne Reservoir with regards to the proposed residential subdivision at 89 Ross Watt Road, Gisborne.

The work had been carried out in accordance with our proposal[1] dated 9 November 2022 which was accepted by Breese Pit Dixon Pty Ltd (BPD) via email dated 9 November 2022.

The objective of this desktop study was to assess the impact on groundwater from the development and on the Rosslynne Reservoir (in particular the Catchment area identified as catchment "E") shown in Figure 1. The desktop study was undertaken using publicly available geological and groundwater information of the subject site such as geological maps[2], Visualising Victoria's Groundwater[3] and our experience with similar sites.

The residential site covers an area of 85.57 hectares and yields around 750 to 800 residential lots. Internal and external pavements will be constructed as part of the development. Two open space areas with lightweight structures water mains, reticulated sewers including 150mm diameter sewer rising main and two drainage reserves are proposed within the site. The depth of any excavation within the site is not expected to be greater than 4m below the ground level (bgl).

[1] Tonkin & Taylor Pty Ltd (9 November 2022). *Variation Order – 89 Ross Watt Road, Gisborne – Groundwater Effects on Rosslynne Reservoir*. Geotechnical Desktop Study Ref: 1020519.1000-ENG-VO-001
[2] GeoVic - Earth Resources
[3] Visualising Victoria's Groundwater (vvg.org.au)

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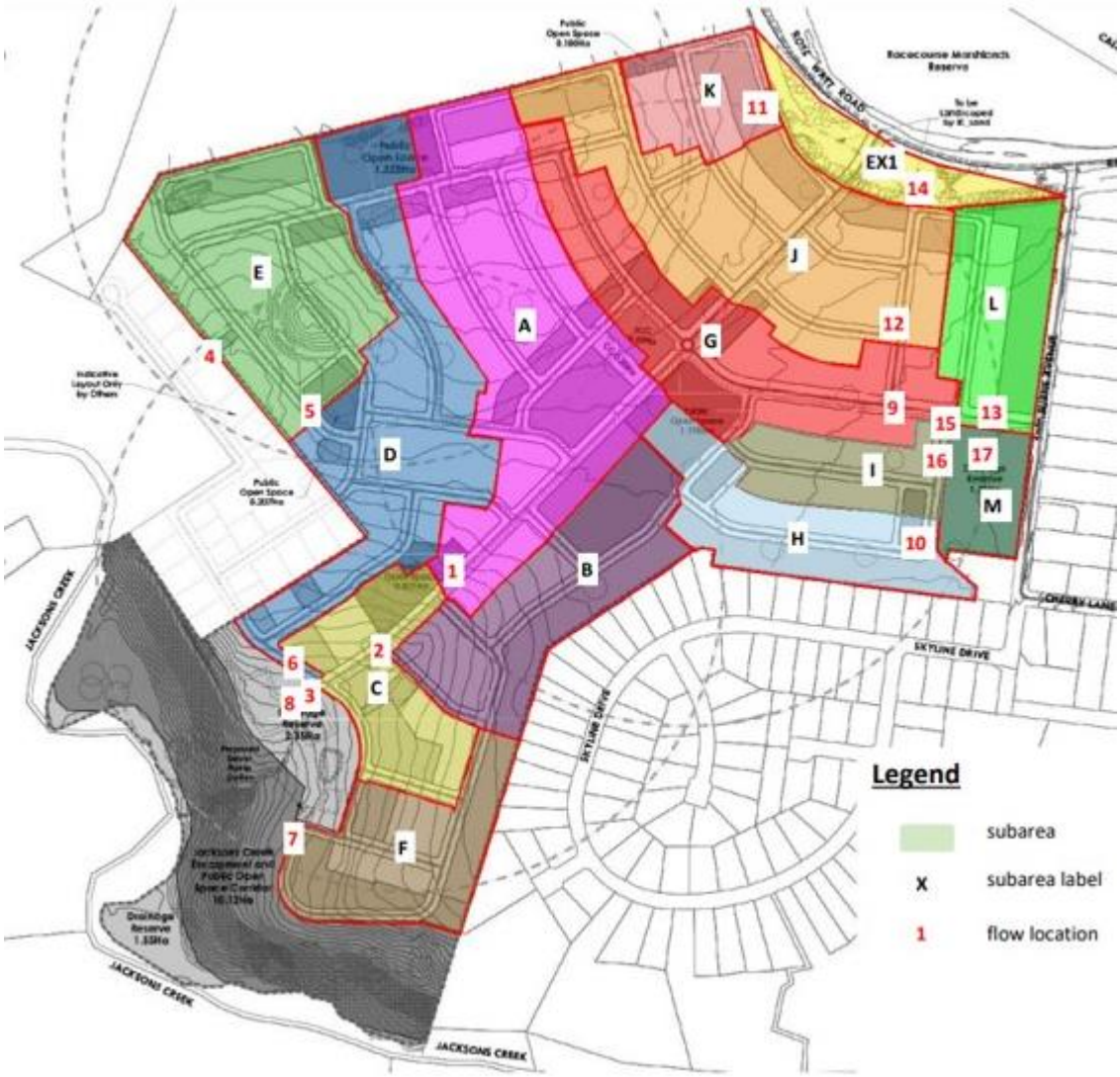

Figure 1: Catchment area plan

2 Desktop assessment

2.1 Regional geology

Based on the geological map of the area[4], the site is underlain by the Quaternary period Newer Volcanic Group. This geological unit is known to be associated with a soil profile consisting of medium to high plasticity clay often including basalt cobbles and boulders within the soil matrix overlying weathered basalt rock.

2.2 Regional groundwater

Published groundwater mapping[5] indicates that groundwater within the site is likely to be present at depths between 20m and 50m below ground level (bgl) for the majority of the site.

[4] VANDENBERG, A.H.M., 1997. Melbourne SJ 55-5 Edition 2 1:250,000 geological map. Geological Survey of Victoria.
[5] FedUni (2015). "Visualising Victoria's Groundwater." (internet data portal). Centre for eResearch and Digital Innovation, Federation University Australia, Mt Helen, Ballarat, Victoria. Retrieved from: https://www.vvg.org.au.

Groundwater is expected to be encountered within 5m bgl along Jackson's Creek, which is running along the southern and southwestern boundaries of the site.

Salinity of the groundwater is shown between 500 mg/L and 3,500 mg/L, which would classify the groundwater to be within the 'Segment A1' to 'Segment C' in accordance with the Table 5.3 of Part 5 Division 2 of the Environment Reference Standard (ERS) (2021).

A search of the online Visualising Victoria's Groundwater (VVG) database was undertaken to identify registered groundwater bores in the vicinity of the site, to further assist in establishing the groundwater condition beneath the site. The search identified six registered groundwater bores located within approximately 1 km radius of the site, with depths ranging between 6m to 91.5m bgl. Two of these wells were installed for groundwater investigation, while the other four bores are used for stock and domestic water. However, all these bores are not monitored and thus no further information on these wells is available. The lithology is broadly described as topsoil, clay, and scoria overlying basalt. No other information was available for these wells.

2.3 Previous investigations

Chadwick Geotechnics Pty Ltd has carried out a geotechnical investigation for the Rosslynne Reservoir to Magnet Hill comprising 11 boreholes to depths ranging between 4m and 18m bgl. The reference for the investigation report is 1018462.0000.R3.v1 dated May 2022[6].

The investigation encountered the following subsurface conditions:

- 0.2m to 1.2m thick Fill (Clayey Sandy Gravel/Gravelly Clay) overlying,
- 1.2m to 4.4m thick Newer Volcanic Group (medium/high plasticity and stiff to hard Silty Clay/Clay/Gravelly Clay) overlying,
- Weathered Basalt to various thickness underlain by,
- Weathered Siltstone.

Two (2) Groundwater monitoring wells have been installed at BH05 and BH12 as part of the geotechnical investigation, but groundwater monitoring has not been completed for either of these wells.

The Chadwick reported observation of groundwater levels one hour after completion of drilling in BH01 at 6.6m, BH04A at 10.2m, BH04C at 5.5m, BH05 at 2.8m and BH11 at 2.7m bgl.

For further detail including detailed engineering logs and borehole locations, please refer to Chadwick Geotechnics report 1018462.0000.R3.v1 dated May 2022.

2.4 Catchment "E" development area

Catchment E is the development area located closest to the Rosslynne Reservoir. The area has a gradual fall towards southwest. There is an existing farm dam located centrally within the Catchment E area. Based on available development plans we understand the above-mentioned farm dam will be backfilled and residential blocks will be established. No deep excavations such as wetland or temporary retarding basins are proposed in this area, which has the potential to infiltrate surface water and mix surface water with underlying groundwater.

[6] 1018462.0000.R3.v1 – Rosslynne Reservoir to Magnet Hill Geotechnical Investigation, dated May 2022

3 Discussion

Following summary is provided based on the desktop study.

- The water levels observed in BH01, BH04A, BH04C, BH05 and BH11 in the Chadwick Geotechnics report are not considered to be representative of groundwater levels as the water levels were measured within one hour of the drilling the boreholes, and the groundwater levels are possibly masked by the drilling water used in the coring process.
- The natural groundwater depth is shown to be greater than 20m bgl within the development area, with the groundwater depth reducing to less than 5m bgl in the vicinity of Jackson's Creek located to the south and to the southwest of the site.
- Currently proposed excavations within the site are not expected to be greater than 4m, hence the excavations are not expected to encounter groundwater during construction.
- If the existing farm dam located within Catchment E area is not appropriately lined, then the farm dam has the potential to intermix surface water with the groundwater and effect on the water quality of Rosslynne Reservoir. As the farm dam is proposed to be backfilled, the above risk is anticipated to be eliminated.
- If any water retaining structures such as permanent or temporary below ground wetlands and retarding basins are proposed within other catchment areas, the effect on the groundwater quality and the water quality of Rosslynne Reservoir is unlikely from those structures as long as they are appropriately lined with an impervious clay liner.
- Any water from house-hold activity such as gardening, and rainwater run-off is not expected to be contaminated, therefore not have an impact on the quality of groundwater and the water quality of the reservoir.

Based on the above discussion, the development is highly unlikely to pose negative effects on the groundwater beneath the site and not expected to pose negative effects on the water quality in Rosslynne Reservoir.

T+T was engaged by ID Ross Watt Road Pty Ltd to conduct a detailed geotechnical study on site, which include the installation several temporary piezometers to measure any groundwater within excavation depts. However, T+T is yet to complete this study at the time of this letter. The absence or presence and its effect (if any) on the development (or from the development to groundwater) will be further discussed within the geotechnical investigation once the study has been completed.

4 Applicability

This letter report has been prepared for the exclusive use of our client ID Ross Watt Road Pty Ltd, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Pty Ltd

Report prepared by:

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Prasanna Punchihewa
Principal Geotechnical Engineer
24-Nov-22
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Authorised for Tonkin & Taylor Pty Ltd by:

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Tim Chadwick
Project Director