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22 June 2026

Horsham Downs Estate

319 Gordonton Road, Hamilton

GROUNDWATER AVAILABILITY & DRAWDOWN ASSESSMENT

Horsham Downs Estate Limited

Job No. s 9(2)(b)(ii) | Version 4



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Version Control

Document version information	
Job number	s 9(2)(b)(ii)
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Review and Update History

Revision	Date	Comments
A	28 October 2025	Initial draft for internal review
0	13 November 2025	Issue to client
1	20 November 2025	Updated following client comments
2	03 December 2025	Updated following client comments
3	18 June 2026	Updated following client comments
4	22 June 2026	Updated following client comments

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1.0 INTRODUCTION

Horsham Downs Estate Limited ("HDEL") intends to utilise the 'fast-track' process (Fast Track Approvals Act 2024) for a proposed residential development for approximately 900 residential units (hereafter referred to as "the Project").

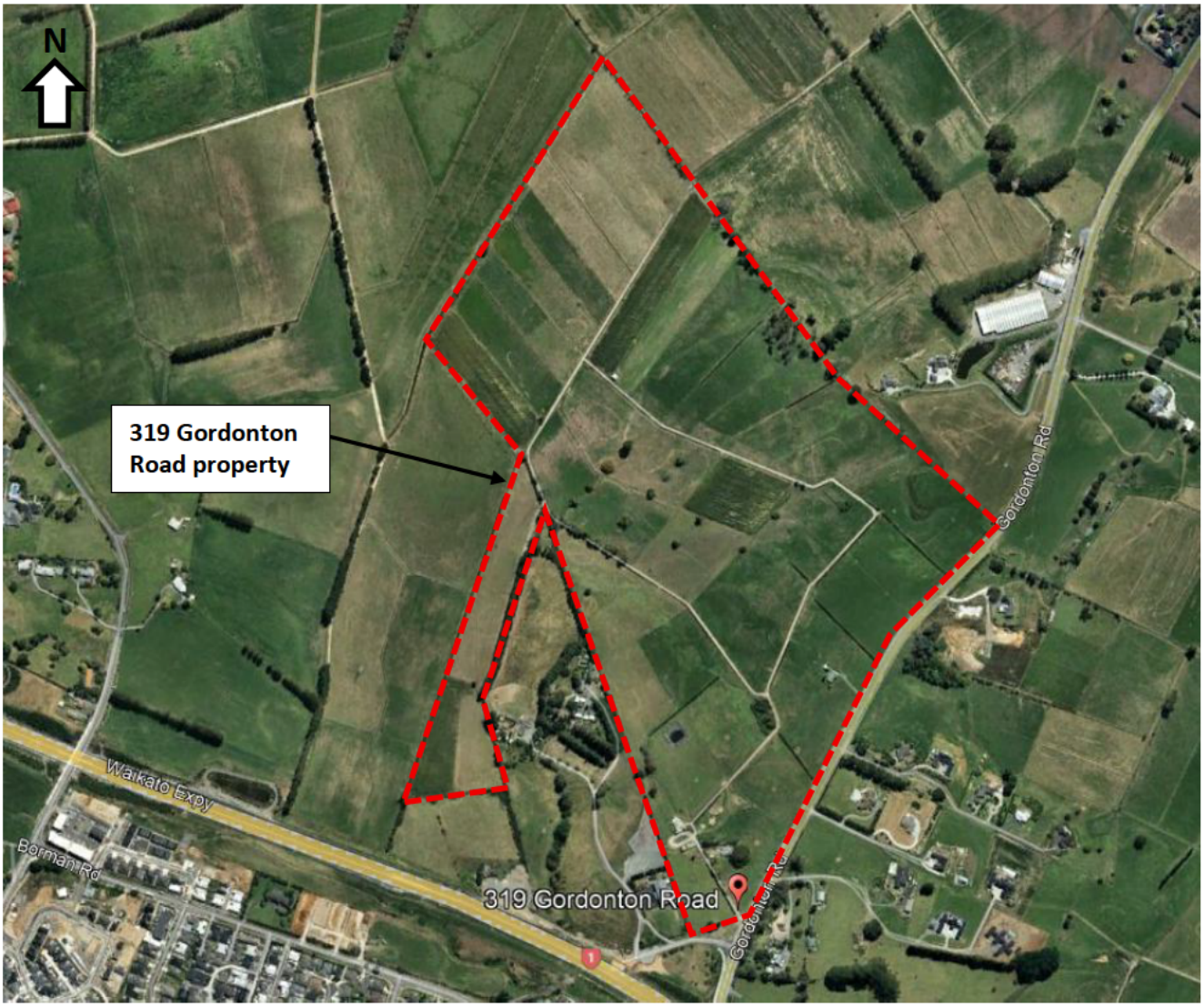
CMW Geosciences (CMW) was engaged by HDEL to carry out a high-level assessment to determine water availability from onsite sources to service the Project. Specifically, this report addresses a potential permanent water take from a proposed new water bore (well) located at the project site, 319 Gordonton Road, Hamilton.

2.0 SITE DESCRIPTION

2.1 Site Location

The project site comprises an area of approximately 54 hectares and is located at 319 Gordonton Road, Hamilton as shown on Figure 1 below.

Figure 1: Site Location Plan (Ref. Google Earth)



ELLP have also partnered with 14C Haynes Place, which is shown on the above Figure 1.

2.2 Landform

The current general landform, together with associated features located within and adjacent to the site is presented on the attached Site Investigation Plan (Wells) as ***Drawing 01.***

The eastern site boundary is defined by a prominent north–south trending ridgeline, which rises to approximately RL55m in the southeast corner. This ridgeline exhibits a moderate westward gradient (up to 1V:3.5H), descending to around RL 31 m where it transitions into low-lying plains at the base of the rolling hill terrain. These plains continue to gently slope toward the northwest, reaching approximately RL28m along the northern site boundary.

The site is bound to the east by Gordonton Road which runs along the north-south ridgeline, to the south by existing rural residential housing and to the north and west by pastural farmland.

3.0 PROPOSED DEVELOPMENT

At the time of undertaking this investigation and of writing this report the project was in the early stages of planning and it was anticipated that this hydrogeological and geotechnical investigation would provide details of preliminary feasibility options for the site. From our understanding, the high-level concept is for a residential development with neighbourhood centre.

4.0 INVESTIGATION RESULTS

4.1 Machine Boreholes & Piezometers

The drilling contractor Brown Bros Drilling was engaged by the client to undertake the drilling of two machine boreholes denoted MW01 and MW02, these were drilled using wash bore drilling techniques to depths of up to 19m to install piezometers within shallow aquifers and facilitate aquifer pumping test monitoring. Engineering logs of the boreholes including well details are provided in ***Appendix B***.

4.2 Aquifer Pumping Test

A controlled aquifer pumping test was conducted within an existing 90m deep well (WRC Consent ref. 72_9843) to evaluate the hydraulic properties of the underlying aquifer system. Existing farm water bores/wells located within the site were unable to be accessed to conduct a pumping test. Therefore testing was conducted on Well 72_9843 located in the 14C Haynes Place property adjacent to (encompassed by) the project site, with the landowner's consent.

The Bore log from Well 72_9843 (refer to ***Appendix B)*** indicates a relatively short permeable screen length of 10m at a depth of 68 to 78m. The test involved pumping over 30 hours, with discharge rates maintained at a steady level to induce a measurable drawdown in the aquifer.

To monitor aquifer response, the two monitoring wells outlined above were installed at strategic locations within the expected zone of influence. These wells were equipped with pressure transducers and manual dip meters to record groundwater level fluctuations in real time throughout the test duration.

5.0 GROUND MODEL

5.1 Published Geology

Published geological maps[1] for the area depict the regional geology as comprising Walton Subgroup consisting of silts, sands, muds and gravels forming the rolling hill topography. The rolling topography is typically mantled by a sequence of volcanics ashes (Hamilton / Kauroa Ashes).

Piako Subgroup alluvial soils consisting of silts, sands, gravels and peats form the low-lying plains.

5.2 Stratigraphic Units

The ground conditions encountered and inferred from the investigation were generally consistent with the published geology for the area. The lithological descriptions of the Production Well obtained on the Wells NZ website and Monitoring Wells obtained from Brown Bros Drilling are summarised in Table 1, 2 and 3 below.

Table 1: Lithological Log for Production Well - 72 Station 9843

Description	From (mbgl)	To (mbgl)	From (~RLm)	To (~RLm)	Hydrogeological Interpretation
Clay (Volcanic Ashes)	0.0	17.0	44	27	Aquitard
Silt, gravels, silty gravels (Puketoka Formation)	17.0	38.0	27	6	Aquifer (A2)
Peats (Puketoka Formation)	38.0	48.0	6	-4	Aquitard
Pumiceous fine sands (Walton Subgroup)	48.0	71.0	-4	-27	Aquifer (A3)
Peat (Walton Subgroup)	71.0	79.0	-27	-35	Aquitard
Pumiceous coarse sands (Walton Subgroup)	79.0	>81.0	-35	>-37	Aquifer (A3)

Table 2: Lithological Log for MW01

Description	From (mbgl)	To (mbgl)	From (~RLm)	To (~RLm)	Hydrogeological Interpretation
Silty Clay / Clayey Silt (Volcanic Ashes)	0.0	9.5	46	36.5	Aquitard
Silty fine sands (Puketoka Formation)	9.5	14.5	36.5	31.5	Aquifer (A1)
Fine Sandy Clay (Puketoka Formation)	14.5	>15.0	31.5	>31	Aquitard

[1] Edbrooke, S.W. (compiler) 2005: Geology of the Waikato area. Institute of Geological & Nuclear Sciences 1:250000 geological map 4.

Table 3: Lithological Log for MW02

Description	From (mbgl)	To (mbgl)	From (~RLm)	To (~RLm)	Hydrogeological Interpretation
Silty Clay / Clayey Silt (Volcanic Ashes)	0.0	7.5	43	35.5	Aquitard
Silty fine sands (Puketoka Formation)	9.5	12.8	35.5	30.2	Aquifer (A1)
Fine Sandy Clay (Puketoka Formation)	14.5	18.0	30.2	25	Aquitard
Pumiceous fine sands (Puketoka Formation)	18.0	>19.0	25	>24	Aquifer (A2)

The distribution of these units is illustrated on the appended Geological Section (***Drawing 02***).

5.3 Groundwater

The above outlined lithological logging indicates a multi-layered aquifer system with a shallow potentially confined aquifer (Aquifer 1) located between approximately RL29m and RL38m, a secondary confined aquifer (Aquifer 2) located at RL8m to RL28m, and a third confined deep aquifer (Aquifer 3) located at depths greater than RL3m.

Measured groundwater levels prior to testing are as follows:

- Aquifer 1 (WM01) 8.60 mbgl (~RL37.40m)
- Aquifer 2 (MW02) 10.06 mblgl (~RL34.44m)
- Aquifer 3 (Well72_9873) 16.13mbgl (~RL27.87m)

According to the Wells NZ database, there are 33 bores within a 1 kilometre radius of the site boundaries, which all but a single bore, are drilled into the two shallow confined aquifers (denoted A1 and A2).

A number of these bores are actually simple standpipe piezometer installations, not water abstraction wells.

Details for these wells / piezometers are included in ***Appendix A***.

6.0 PUMPING TEST ANALYSIS

6.1 Results

A constant rate pumping test was performed on Production Well 1(72_9843) with water level measurements recorded during the test and following the end of the pumping period. Two nearby standpipe piezometers were monitored during the pumping and recovery periods, Monitoring Well MW1 located 60m from Production Well 1, and Monitoring Well MW2 located 135m from Production Well 1. The constant rate pumping test commenced on 15 October 2025 at 8am. Following pretesting which indicated a maximum flow rate of 3.5m^3/hr, the bore was pumped at a rate of 3m^3/hour for 30 hours and 40 minutes. Following the cessation of pumping, the water level recovery in the production well was monitored for a further 24 hours.

The static water level was recorded in Production Well 1 as 16.13mbgl prior to the commencement of the pumping test. A water level of approximately 16.95mbgl was recorded at 30 hours following commencement of the pumping, equating to a maximum drawdown of 0.82m. After 24 hours following cessation of the pumping within Production Well 1 the water level had recovered to 75% of the maximum drawdown (0.21m of total 0.82m).

Monitoring Well MW01, screened within the upper aquifer unit (Aquifer 1), exhibited a maximum drawdown of 40 mm over a 24-hour monitoring period. This drawdown is considered negligible and is likely attributable

to influences other than abstraction from Production Well 1 (environmental fluctuations / equipment error). On this basis, pumping within the source aquifer (Aquifer 3) is not assessed to have a measurable effect on the overlying aquifer (Aquifer 1).

Monitoring Well MW02, screened within the intermediate aquifer unit (A2), exhibited a maximum drawdown of 140 mm over a 24-hour monitoring period. This magnitude of drawdown is considered negligible and is most plausibly attributable to routine diurnal abstraction associated with surrounding agricultural and residential production wells and environmental fluctuations. .

6.2 Aquifer Parameters

Appendix D includes the test analysis using the Theis solution for Aquifer 3. Derived aquifer parameters from the results provide an indication of T & S as follows:

- Transmissivity (T) – 250 m^2/day
- Storativity (S) – 3.2

Assuming 50 m thickness (b) of aquifer, the Specific Storage (Ss) would be S/b = 3.2/58 = 0.064, and the hydraulic conductivity would be T/b = 250/50 = 5 m/day.

For this preliminary assessment the accuracy of the results is limited due to a number of factors:

- There is no monitoring bore in the confined aquifer.
- The pumping bore is only partially penetrating.
- A minor interruption to pumping occurred during the test.

Using the test data we have undertaken an assessment of potential well yield based on extrapolating the tested well screen length over the known permeable thickness of the deep aquifer.

For the existing well an indicative yield of 450m^3/day (164,250m^3/year) has been calculated.

7.0 PRELIMINARY ASSESSMENT OF EFFECTS

7.1 Effects on Neighbouring Bores

We understand from initial communication with Waikato Regional Council that there is no known groundwater take limit in this area, however a more detailed assessment on groundwater availability and assessment of effects will be undertaken as part of any substantive application.

According to the WRC database, there are 33 bores within the one-kilometre buffer. The vast majority of nearby wells are drilled into the shallow and intermediate aquifers (Aquifer 1 & Aquifer 2) overlying the proposed source aquifer (Aquifer 3). Based on the above results, we anticipate there to be negligible effects on neighbouring wells outside the proposed development site.

7.2 Settlement

Drawdown-induced settlement is typically associated with reductions in pore water pressure and resulting increase in effective stress within compressible soils e.g. soft silts, loose sand. At this site, based on review of geotechnical borehole data, the Walton Subgroup soils are typically stiff to hard silts and clays and dense sands that are not considered compressible.

In this case, the potential for settlement is considered negligible, as the source aquifer is located at depths greater than 30mbgl, where hydraulic separation from near-surface soils limits the transmission of drawdown

effects. The pumping test results suggest that drawdown effects on the overlying shallow aquifers are negligible, with minimal impact expected.

Accordingly, pumping from the source aquifer is not anticipated to result in adverse settlement impacts.

7.3 Aquifer Yield

Based on the pumping test, the bore yield was approximately 72 m^3/day, and subsequent analysis extrapolating the bore screen length over the permeable aquifer zone indicates a potential bore yield in the order of 450 m^3/day. However, this preliminary assessment should be considered an order of magnitude yield.

Based on these results, the aquifer is indicated to have moderate transmissivity and storativity and therefore has potential for sustaining moderate abstraction rates without inducing significant regional drawdown, provided pumping is managed within sustainable limits. – which are yet to be determined by long term pumping test to assess sustainable yield and effect of any boundary conditions and potential effects on other nearby wells.

It is noted from the Production Well 1 drillers log that the screen zone of the bore is only partially penetrating the aquifer. For a fully-penetrating bore a higher yield would be expected.

8.0 CONCLUSION

Monitoring results indicate that pumping from Production Well 1 has induced only negligible drawdown in both the source aquifer (Aquifer3) and the overlying aquifers (Aquifer 1 and Aquifer 2). From this preliminary testing for feasibility assessment purposes, Aquifer 3 is considered to provide potential for water supply, provided abstraction is managed within appropriate limits to maintain long-term aquifer performance.

Based on experience and local knowledge of nearby production wells there is considered potential for yield more than the initial 450m^3/day.

More detailed testing and investigation will be undertaken as part of the substantive application.

9.0 CLOSURE

This report has been prepared for use by Horsham Downs Estate Limited, their appointed representatives, and those reviewing/evaluating the application for Referral under the FTAA according to their instructions in relation to the Horsham Downs Estate Project outlined in Section 1 of this report.

Where a party other than Horsham Downs Estate Limited or those listed in the preceding paragraph seeks to rely upon or otherwise use this report, the consent of CMW should be sought prior to any such use. CMW can then advise whether the report and its contents are suitable for the intended use by the other party.

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APPENDIX A

Drawing 01: Site Investigation Plan (Wells)

Drawing 02: Geological Section



LEGEND

- Site Boundary
- Existing Water Bores
- Existing Piezometers
- CMW Piezometers
- 2m Contours

Google Satellite

NOTES:

1. Basemap adapted from Google Satellite Imagery
2. Contours sourced from LINZ
3. Existing water bores sourced from Wells Aotearoa New Zealand
4. Existing Piezometers sourced from NZGD and Wells Aotearoa New Zealand

0 100 200 300 400 500 m

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CLIENT	EIEIO LANDS LP	DRAWN	DB	PROJECT	HAM2025-0046
PROJECT	RESIDENTIAL DEVELOPMENT 319 GORDONTON ROAD, HAMILTON	CHECKED	KL	DRAWING	01
TITLE	SITE INVESTIGATION PLAN (WELLS)	REVISION	0	SHEET	A3L
		DATE	11/11/2025	SCALE	1:6000

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CLIENT:		DRAWN:	PROJECT:
PROJECT:		CHECKED:	DRAWING:
		REVISION:	SCALE:
TITLE:		DATE:	SHEET:

Table 2: Projected Drawdown Effects on Nearby Bores

BORE ID	Well Type	Elevation (RLm)	Screen Top (mbgl)	Screen Bottom (mbgl)	Aquifer Screened	Static Water Level Measured (mbgl)	Approx. Distance from Production Well 1 (m)
Bore 69 - Station 1882	Water well	58.0	51.8	57.9	A1	30.7	1050
Bore 69 - Station 539	Water well	42.5	-	-	-	-	650
Bore 69 - Station 1022	Water well	52.1	40.8	-	A1	-	450
Bore 69 - Station 479	Water well	35.6	-	-	-	-	1400
Bore 62 - Station 90	Water well	38.8	25.5	29	A1	3.0	560
Bore 62 - Station 49	Water well	54.7	30.48	-	A1	-	1400
Bore 69 - Station 161	Water well	57.9	45.82	-	A1	29.16	480
Bore 62 - Station 123	Water well	45.6	48.8	-	A2	52.7	800
Bore 62 - Station 151	Water well	45.6	48.77	-	A2	-	800
Bore 72 - Station 1768	Water well	35.7	6	10.5	A1	3.0	1450
Bore 72 - Station 2229	Water well	51.5	29.5	32.5	A1	18.0	980
Bore 72 - Station 4210	Water well	41.0	-	-	-	7.0	900

BORE ID	Well Type	Elevation (RLm)	Screen Top (mbgl)	Screen Bottom (mbgl)	Aquifer Screened	Static Water Level Measured (mbgl)	Approx. Distance from Production Well 1 (m)
Bore 72 - Station 9464	Standpipe piezometer	-	-	-	-	-	830
Bore 72 - Station 9489	Standpipe piezometer	39.0*	15	18	A1	-	780
Bore 72 - Station 9264	Standpipe piezometer	Destroyed – SH1 runs through this point now.					
Bore 72 - Station 9488	Standpipe piezometer	-	10	13	A1	-	460
Bore 72 - Station 8157	Standpipe piezometer	45.82	20.2	26.22	A1	17.4	790
Bore 72 - Station 8158	Standpipe piezometer	56.43	21.1	27.45	A1	4.3	360
Bore 72 - Station 8164	Standpipe piezometer	59.0	20.9	23.91	A1	-	480
Bore 72 - Station 9358	Standpipe piezometer	-	-	-	-	-	530
Bore 72 - Station 9359	Destroyed – SH1 runs through this point now.						
Bore 72 - Station 10249	Water well	-	41	47	A2	2.32	920
Bore 72 - Station 9843	Water well	Production Well 1 (72_9843) – used in pump testing.					
Bore 62 - Station 107	Water well	38.7	30.5	-	A1	-	980
Bore 69 - Station 1811	Water well	40.0	-	-	-	-	60
Bore 62 - Station 27	Water well	60.3	48.8	-	A1	-	1050

BORE ID	Well Type	Elevation (RLm)	Screen Top (mbgl)	Screen Bottom (mbgl)	Aquifer Screened	Static Water Level Measured (mbgl)	Approx. Distance from Production Well 1 (m)
Bore 62 - Station 106	Water well	45.8	30.5	-	A1	-	1200
Bore 69 - Station 1376	Water well	45.5	-	-	-	-	830
Bore 69 - Station 2000	Water well	40.0	-	-	-	-	1150
Bore 72 - Station 2349	Water well	51.0	-	-	-	-	600
Bore 72 - Station 3268	Water well	40.9	-	-	-	-	1200
Bore 72 - Station 7648	Water well	46.0	-	-	-	-	980
Bore 72 - Station 7649	Water well	43.0	-	-	-	-	1450
Bore 72 - Station 6357	Water well	37.0	-	-	-	-	1440
Bore 72 - Station 6469	Water well	60.0	-	-	-	-	940
Bore 72 - Station 6403	Water well	40.0	14.5	19.2	A1	-	1050
Bore 72 - Station 9354	Standpipe piezometer	-	-	-	-	-	600
Bore 72 - Station 9357	Piezometer standpipe	Destroyed – SH1 runs through this point now.					
Bore 72 - Station 9265	Water well	-	-	-	-	-	200
Bore 72 - Station 9266	Water well	-	-	-	-	-	240

BORE ID	Well Type	Elevation (RLm)	Screen Top (mbgl)	Screen Bottom (mbgl)	Aquifer Screened	Static Water Level Measured (mbgl)	Approx. Distance from Production Well 1 (m)
Bore 72 - Station 9580	Water well	-	-	-	-	-	1400
Bore 72 - Station 11111	Water well	43.0*	88.3	101.5	A3	27.8	1250
Notes: *RLm added to dataset using LINZ contour set.							

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APPENDIX B
Machine Borehole Logs

BOREHOLE LOG - MW01

Client: EIEIO Land Development
Project: 319 Gordonton Road
Site Location: 319 Gordonton Road, Hamilton
Project No.: HAM2025-0046
Date: 13/10/2025
Borehole Location: Refer to Site Plan Logged by: KL Checked by:AS Scale: 1:50 Sheet 1 of 2

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Position: Projection:
Datum: Survey Source: Site Plan

Well	Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Recovery	Drilling Method/ Support	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
					0		OL: Organic SILT: dark brown. No plasticity. (Topsoil)						
							CH: Silty CLAY: orange brown. High plasticity. (Hamilton Ash)						
					1								
					2								
					3								
					4								
					5		ML: Clayey SILT: brown. Low plasticity. (Kauroa Ashes)				HA		
					6								
					7								
					8		ML: Fine Sandy SILT: cream. Low plasticity. (Puketoka Formation)						
					9								
					10		SP: Silty Fine SAND: light grey. Poorly graded. Pumiceous (Puketoka Formation)						

Dynamic Cone Penetrometer (Blows/100mm): 5 10 15

Structure & Other Observations: Discontinuities: Depth; Defect Number; Defect Type; Dip; Defect Shape; Roughness; Aperture; Infill; Seepage; Spacing; Block Size; Block Shape; Remarks

Termination Reason: Target Depth Reached
Shear Vane No: DCP No:

Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - MW01

Client: EIEIO Land Development
Project: 319 Gordonton Road
Site Location: 319 Gordonton Road, Hamilton
Project No.: HAM2025-0046
Date: 13/10/2025
Borehole Location: Refer to Site Plan Logged by: KL Checked by:AS Scale: 1:50 Sheet 2 of 2

CMW Geosciences
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Position: Projection:
Datum: Survey Source: Site Plan

Well	Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Recovery	Drilling Method/ Support	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
					11		SP: Silty Fine Gravelly SAND: light grey. Poorly graded. Pumiceous. (Puketoka Formation)					5 10 15	
					12								
					13								
					14								
							CH: Fine Sandy CLAY: orange brown. High plasticity. (Puketoka Formation)						
					15		Borehole terminated at 15.0 m						
					16								
					17								
					18								
					19								
					20								

Termination Reason: Target Depth Reached
Shear Vane No: DCP No:

Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - MW02

Client: EIEIO Land Development
Project: 319 Gordonton Road
Site Location: 319 Gordonton Road, Hamilton
Project No.: HAM2025-0046
Date: 13/10/2025
Borehole Location: Refer to Site Plan Logged by: DB Checked by: AS Scale: 1:50 Sheet 1 of 2

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Position: Projection:
Datum: Survey Source: Site Plan

Well	Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Recovery	Drilling Method/ Support	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
					0		OL: Organic SILT: dark brown. Low plasticity. (Topsoil)						
							CH: CLAY: dark brown. High plasticity. (Hamilton Ash)						
							... at 0.80m, Becoming brown.						
					1								
					2		... at 2.00m, Becoming light brown.						
					3								
							ML: SILT: with trace fine sand and clay. Light brownish grey. Low plastcity						
							ML: SILT: with some fine to medium sand. Light brown. Low plasticity. (Kauroa Ashes)						
					4		CH: CLAY: with some silt. Brown mottled red and black. High plasticity. (Kauroa Ashes)						
							... at 4.16m, Becoming brown speckled black. Silt becoming absent.						
							ML: SILT: with some fine to medium sand and clay. Light brownish grey. Low plasticity. (Kauroa Ashes)						
					5		... at 4.71m, Becoming white streaked pink.						
							ML: Fine to medium sandy SILT: light pink. Low plasticity. (Kauroa Ashes)						
							ML: Silty CLAY: reddish brown streaked light brown speckled white. High plasticity. (Kauroa Ashes)						
					6		ML: Clayey SILT: with minor fine sand. Light brown streaked red. Low plasticity. (Kauroa Ashes)						
							... at 6.30m, Becoming speckled black.						
					7								
							ML: Fine to coarse Sandy SILT: light grey. Low plasticity. (Puketoka Formation)						
							SP: Silty fine to medium SAND: light grey speckled black. Poorly graded. (Puketoka Formation)						
					8								
							... at 8.51m, containing trace fine pumiceous gravel.						
					9								
							SW: Fine to coarse SAND: with some silt and minor fine to medium pumiceous gravel. Light grey. Well graded. Gravel: rounded. (Puketoka Formation)						
	14-10-2025				10								

Termination Reason: Target Depth Reached
Shear Vane No: DCP No:

Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

BOREHOLE LOG - MW02

Client: EIEIO Land Development
Project: 319 Gordonton Road
Site Location: 319 Gordonton Road, Hamilton
Project No.: HAM2025-0046
Date: 13/10/2025
Borehole Location: Refer to Site Plan

PRELIMINARY

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Logged by: DB Checked by: Scale: 1:50 Sheet 2 of 2

Position: Projection:
Datum: Survey Source: Site Plan

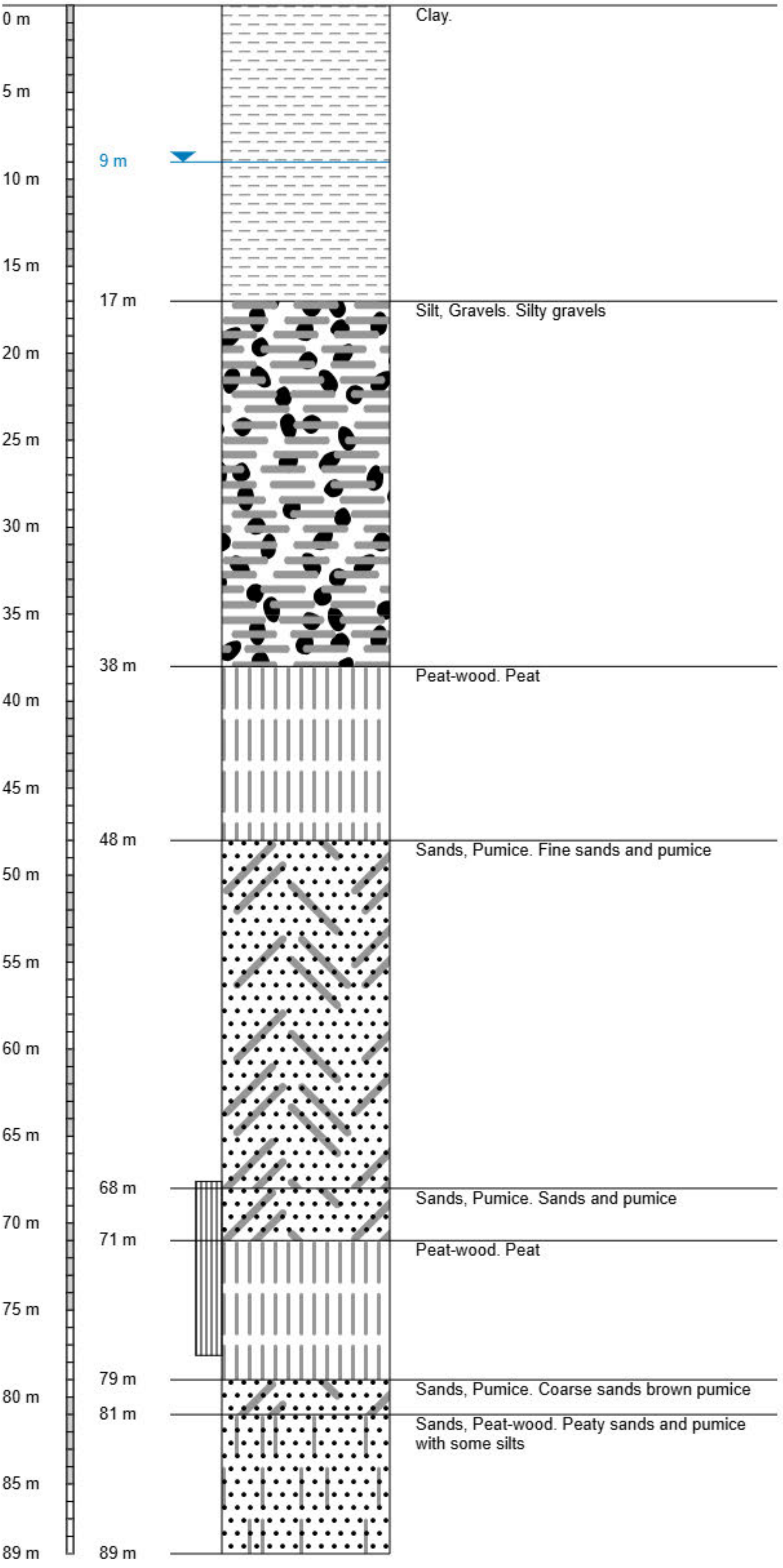
Well	Groundwater	Samples & Insitu Tests: Depth	Samples & Insitu Tests: Type & Results	RL (m)	Depth (m)	Graphic Log	Material Description	Moisture Condition	Consistency/ Relative Density	Recovery	Drilling Method/ Support	Dynamic Cone Penetrometer (Blows/100mm)	Structure & Other Observations
					11							5 10 15	
					12		SW: Fine to coarse SAND: with trace fine gravel. Yellowish grey. Well graded. Gravel: subrounded (Puketoka Formation) ... at 11.64m, heavy iron staining. SW: Silty fine to coarse SAND: with trace fine pumiceous gravel. Light brown. Well graded. gravel: subrounded. (Puketoka Formation) ... from 12.20m to 12.24m, moderate iron staining. ... at 12.55m, Becoming orange mottled black. ... at 12.59m, sand becoming fine.						
					13		CH: Silty CLAY: greyish brown. High plasticity. (Puketoka Formation) ... at 13.15m, Becoming light orange. ... at 13.32m, Becoming speckled black. ... from 13.48m to 13.55m, Becoming light grey mottled black.						
					14		... at 14.07m, Becoming light brown.						
					15		ML: SILT: White. Low plastcity. (Puketoka Formation) ... from 15.10m to 15.20m, Becoming light brown.						
					16		... from 16.51m to 16.55m, Becoming mottled green. MH: Clayey SILT: white streaked light orange. High plastcity, (Puketoka Formation) ... at 17.00m, minor iron staining.						
					17								
					18		SP: Silty fine SAND: grey. Poorly graded. (Puketoka Formation)						
					19		Borehole terminated at 19.0 m						
					20								

Termination Reason: Target Depth Reached
Shear Vane No: DCP No:

Remarks:

This report is based on the attached field description for soil and rock, CMW Geosciences - Field Logging Guide, Revision 3 - April 2018.

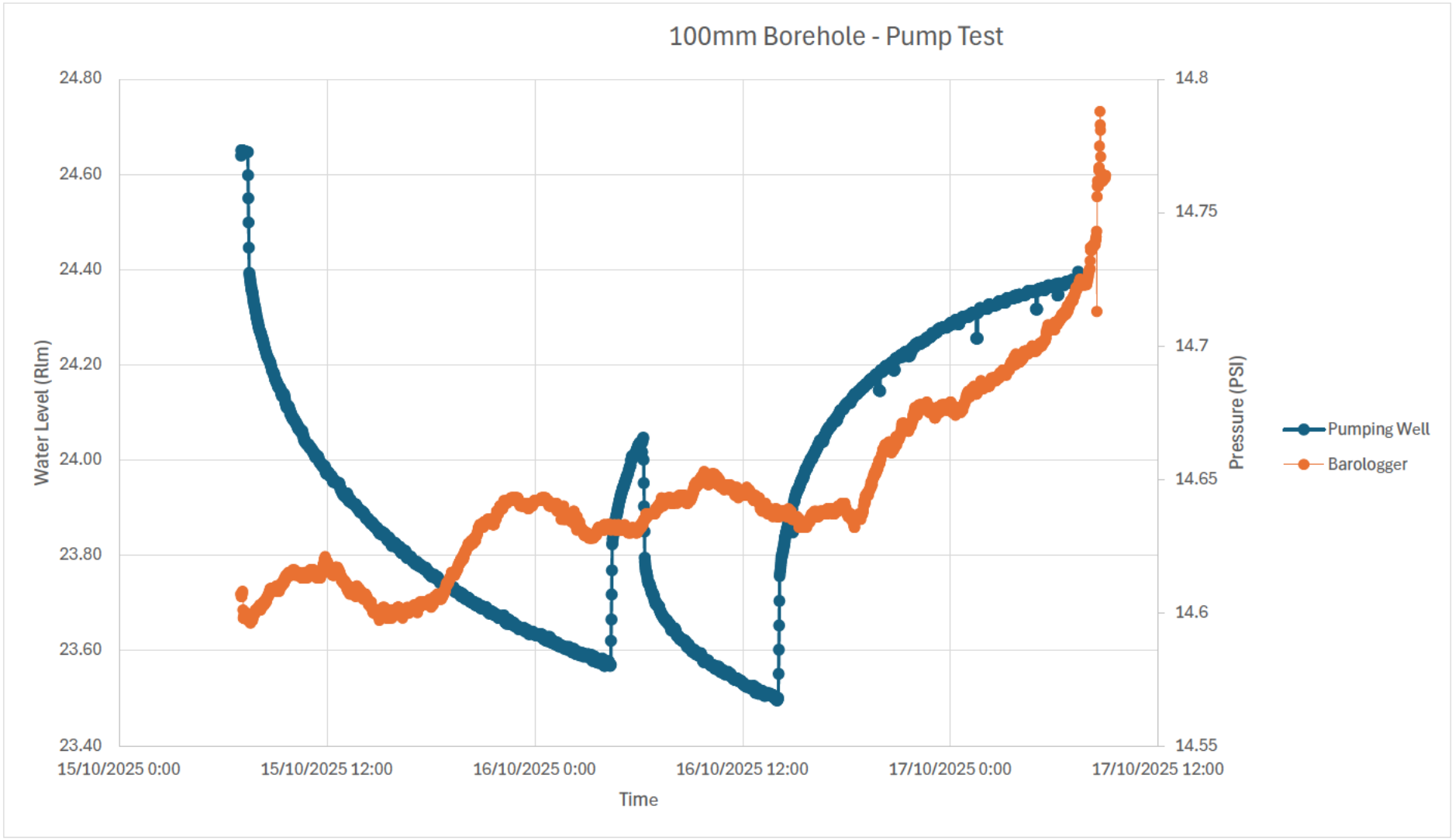
Council well number : 72_9843
Well name : Bore 72 - Station 9843
Drilling company : McMillan Drilling NI Limited
Drilling date : 27/04/2018
Drilling method : -
Locality : -
Total depth drilled : 89m
NZTM : 1801561 : 5822883

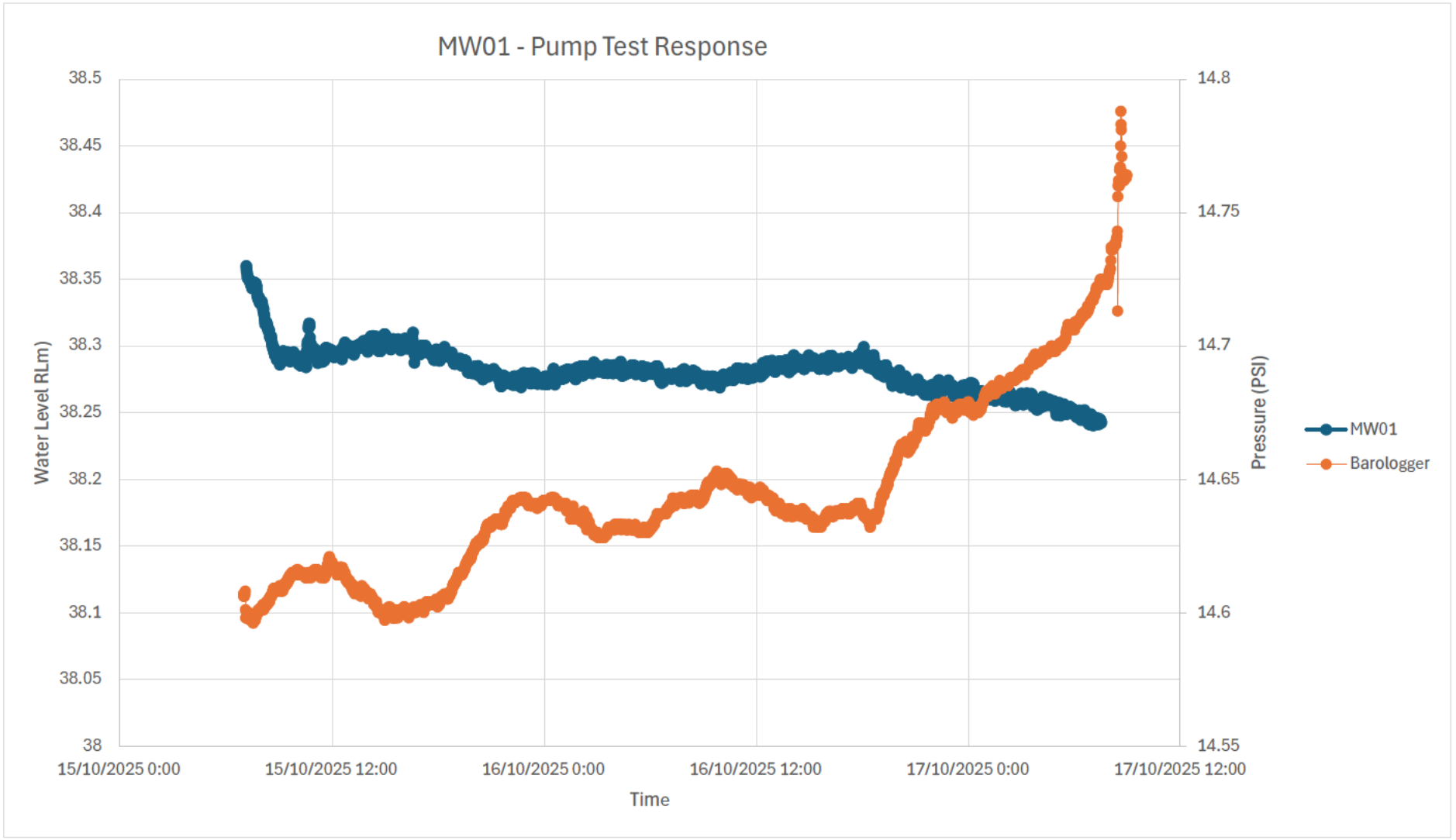


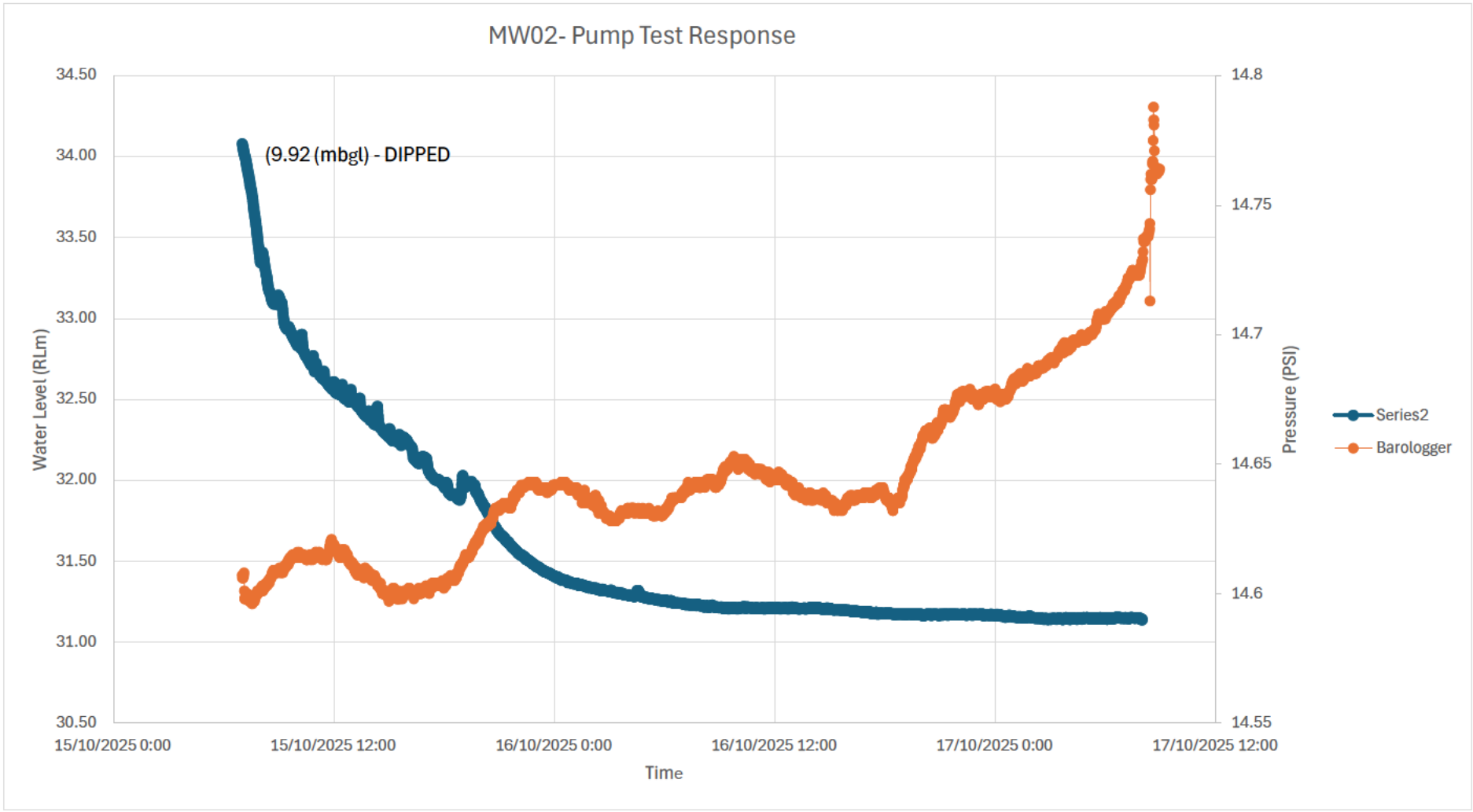
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APPENDIX C

Pumping test Results & Analysis


100mm Borehole - Pump Test
Water Level (Rlm)
24.80
24.60
24.40
24.20
24.00
23.80
23.60
23.40
Pressure (PSI)
14.8
14.75
14.7
14.65
14.6
14.55
15/10/2025 0:00
15/10/2025 12:00
16/10/2025 0:00
16/10/2025 12:00
17/10/2025 0:00
17/10/2025 12:00
Time
Pumping Well
Barologger


MW01 - Pump Test Response
38.5
38.45
38.4
38.35
38.3
38.25
38.2
38.15
38.1
38.05
38
Water Level RLm)
14.8
14.75
14.7
14.65
14.6
14.55
Pressure (PSI)
15/10/2025 0:00
15/10/2025 12:00
16/10/2025 0:00
16/10/2025 12:00
17/10/2025 0:00
17/10/2025 12:00
Time
MW01
Barologger


MW02- Pump Test Response
(9.92 (mbgl) - DIPPED
Water Level (RLm)
Pressure (PSI)
Time
34.50
34.00
33.50
33.00
32.50
32.00
31.50
31.00
30.50
14.8
14.75
14.7
14.65
14.6
14.55
15/10/2025 0:00
15/10/2025 12:00
16/10/2025 0:00
16/10/2025 12:00
17/10/2025 0:00
17/10/2025 12:00
Series2
Barologger

BROWN BROS (NZ) LTD PUMP TEST RECORD - WOP4

Date:	15 October 2025	**Pumping Bore:**	Yes ~~No~~
Owner:	Pemberton	**Observation Bore:**	~~Yes~~ No
Address	14A Hayes Place Hamilton	**Drawdown Test:**	Yes ~~No~~
Location Co-ordinates:		**Recover Test:**	~~Yes~~ No
Bore #:	4" Existing Bore		

Time Data		**Water Level Data**		**Screen Data**	**Discharge Data**
Test Start:	15/10/2025 8.00am	SWL (m)	16.13	Top of Screen (m)	Orifice dia (mm)
Test End:	16/10/2025 14.40pm	Pump (m)	33.80?	Bottom of Screen (m)	Orifice plate dia (mm)
Duration:	30hrs 40mins	Bore Depth (m)		Top of J Latch (m)	V-notch (mm)
		Casing Depth (m)			

Clock Time	Interval Time (min)	Depth to WL (m)	Drawdown (m)	Flow (m^3/hr)	Notes
8am	0	16.13		3	
	1	16.30		3	
	2	16.32		3	
	3	16.32		3	
	4	16.32		3	
	5	16.33		3	
	7	16.34		3	
	9	16.34		3	217 PPM 16.6 °C
	12	16.34		3	
	15	16.35		3	
	20	16.35		3	217 PPM 16.8 °C
	25	16.36		3	
	30	16.38		3	
	35	16.39		3	
	40	16.40		3	
	45	16.40		3	
	50	16.41		3	
	55	16.42		3	
9am	60	16.43		3	210 PPM 17.6 °C
	75	16.45		3	
	90	16.47		3	211 PPM 17.8 °C
	105	16.49		3	
10	120	16.50		3	
	140	16.51		3	209 PPM 17.9 °C
	160	16.53		3	
11	180	16.54		3	
12am	240	16.59		3	206 PPM 18.6 °C
1pm	300	16.62		3	207 PPM 18.4 °C
2	360	16.66		3	208 PPM 18.6 °C
3	420	16.68		3	207 PPM 18.6 °C
4	480	16.70		3	209 PPM 18.7 °C
5	540	16.73		3	210 PPM 18.8 °C
6	600	16.74		3	208 PPM 18.9 °C
7	660			3	
8	720			3	
9	780			3	
10	840			3	
11	900			3	
12pm	960			3	
1am	1020			3	
2	1080			3	
3	1140			3	
4	1200			3	
5	1260			3	Bore turned off for estimated 30 mins
6	1320		16.74	3	
7	1380		16.74	3	211 PPM 18.9 °C
8	1440		16.81	3	209 PPM 18.8 °C

BROWN BROS (NZ) LTD PUMP TEST RECORD - WOP4

Date:	15 October 2025	**Pumping Bore:**	Yes ~~No~~

Owner:	Pemberton	**Observation Bore:**	~~Yes~~ No
Address	14A Hayes Place Hamilton	**Drawdown Test:**	Yes ~~No~~
Location Co-ordinates:		**Recover Test:**	~~Yes~~ No
Bore #:	4" Existing Bore		

Time Data		**Water Level Data**		**Screen Data**	**Discharge Data**
Test Start:	15/10/2025 8.00am	SWL (m)	16.13	Top of Screen (m)	Orifice dia (mm)
Test End:	16/10/2025 14.40pm	Pump (m)	33.80?	Bottom of Screen (m)	Orifice plate dia (mm)
Duration:		Bore Depth (m)		Top of J Latch (m)	V-notch (mm)
		Casing Depth (m)			

Clock Time	Interval Time (min)	Depth to WL (m)	Drawdown (m)	Flow (m^3/hr)	Notes
9am	0	16.86		3	211 PPM 18.9 °C
10	1	16.88		3	209 PPM 18.7 °C
11	2	16.90		3	210 PPM 18.8 °C
12am	3	16.91		3	211 PPM 18.7 °C
1pm	4	16.92		3	208 PPM 18.6 °C
2	5	16.94		3	210 PPM 18.9 °C
3	7	16.95		3	211 PPM 18.8 °C
	9				
	12				
	15				
	20				
	25				
	30				
	35				
	40				
	45				
	50				
	55				
	60				
	75				
	90				
	105				
	120				
	140				
	160				
	180				
	240				
	300				
	360				
	420				
	480				
	540				
	600				
	660				
	720				
	780				
	840				
	900				
	960				
	1020				
	1080				
	1140				
	1200				
	1260				
	1320				
	1380				
	1440				

BROWN BROS (NZ) LTD PUMP TEST RECORD - WOP4

Date:	16 October 2025	**Pumping Bore:**	~~Yes~~	No
Owner:	Pemberton	**Observation Bore:**	~~Yes~~	No
Address	14A Hayes Place Hamilton	**Drawdown Test:**	~~Yes~~	No
Location Co-ordinates:		**Recover Test:**	Yes	~~No~~
Bore #:	4" Existing Bore			

Time Data		**Water Level Data**		**Screen Data**	**Discharge Data**
Test Start:	16/10/2025 14.40pm	SWL (m)	16.13	Top of Screen (m)	Orifice dia (mm)
Test End:	17/10/2025 8am	Pump (m)	33.80?	Bottom of Screen (m)	Orifice plate dia (mm)
Duration:	17hrs 20mins	Bore Depth (m)		Top of J Latch (m)	V-notch (mm)
		Casing Depth (m)			

Clock Time	Interval Time (min)	Depth to WL (m)	Drawdown (m)	Flow (m^3/hr)	Notes
14.40pm	0	16.95			
	1	16.78			
	2	16.76			
	3	16.76			
	4	16.75			
	5	16.75			
	7	16.74			
	9	16.74			
	12	16.73			
	15	16.72			
	20	16.71			
	25	16.70			
	30	16.69			
	35	16.68			
	40	16.67			
	45	16.67			
	50	16.66			
	55	16.65			
15.40pm	60	16.64			
	75				
	90				
	105				
	120				
	140				
	160				
	180				
	240				
	300				
	360				
	420				
	480				
	540				
	600				
	660				
	720				
	780				
	840				
	900				
	960				
	1020				
8am	1080	16.34			
	1140				
	1200				
	1260				
	1320				
	1380				
	1440				

BROWN BROS (NZ) LTD PUMP TEST RECORD - WOP4

Date:	15 October 2025	**Pumping Bore:**	~~Yes~~	No
Owner:	Pemberton	**Observation Bore:**	Yes	~~No~~
Address	319 Gordonton Road	**Drawdown Test:**	Yes	~~No~~
Location Co-ordinates:		**Recover Test:**	~~Yes~~	No
Bore #:	Monitor Well 1			

Time Data		**Water Level Data**		**Screen Data**		**Discharge Data**
Test Start:	15/10/2025 8.00am	SWL (m)	8.60m	Top of Screen (m)	9.00m	Orifice dia (mm)
Test End:	16/10/2025 14.40pm	Pump (m)		Bottom of Screen (m)	15.00m	Orifice plate dia (mm)
Duration:	30hrs 40mins	Bore Depth (m)	15.00m	Top of J Latch (m)		V-notch (mm)
		Casing Depth (m)				

Clock Time	Interval Time (min)	Depth to WL (m)	Drawdown (m)	Flow (m^3/hr)	Notes
8am	0	8.60			
	1				
	2				
	3				
	4				
	5				
	7				
	9				
	12				
	15				
	20				
	25				
	30				
	35				
	40				
	45				
	50				
	55				
	60				
	75				
	90				
	105				
	120				
	140				
	160				
	180	8.64			
	240	8.64			
	300	8.64			
	360	8.64			
	420	8.64			
	480	8.64			
	540	8.64			
	600	8.64			
	660				
	720				
	780				
	840				
	900				
	960				
	1020				
	1080				
	1140				
	1200				
	1260				
	1320				
	1380	8.64			
	1440	8.64			

BROWN BROS (NZ) LTD PUMP TEST RECORD - WOP4

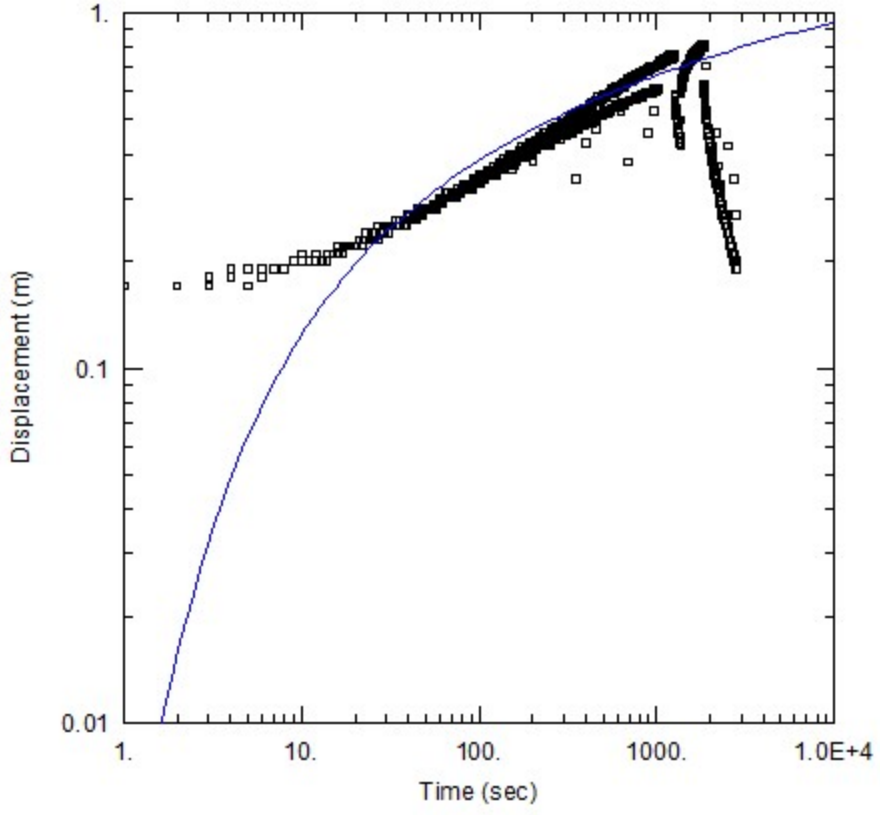
Date:	15 October 2025	**Pumping Bore:**	~~Yes~~ No
Owner:	Pemberton	**Observation Bore:**	Yes ~~No~~
Address	319 Gordonton Road	**Drawdown Test:**	Yes ~~No~~
Location Co-ordinates:		**Recover Test:**	~~Yes~~ No
Bore #:	Monitor Well 2		

Time Data		**Water Level Data**		**Screen Data**		**Discharge Data**
Test Start:	15/10/2025 8.00am	SWL (m)	10.06m	Top of Screen (m)	16.00m	Orifice dia (mm)
Test End:	16/10/2025 14.40pm	Pump (m)		Bottom of Screen (m)	19.00m	Orifice plate dia (mm)
Duration:	30hrs 40mins	Bore Depth (m)	19.00m	Top of J Latch (m)		V-notch (mm)
		Casing Depth (m)				

Clock Time	Interval Time (min)	Depth to WL (m)	Drawdown (m)	Flow (m^3/hr)	Notes
8am	0	10.06			
	1				
	2				
	3				
	4				
	5				
	7				
	9				
	12				
	15				
	20				
	25				
	30				
	35				
	40				
	45				
	50				
	55				
	60				
	75				
	90				
	105				
	120				
	140				
	160				
	180	9.92			
	240	9.92			
	300	9.92			
	360	9.92			
	420	9.92			
	480	9.92			
	540	9.92			
	600	9.92			
	660				
	720				
	780				
	840				
	900				
	960				
	1020				
	1080				
	1140				
	1200				
	1260				
	1320				
	1380	9.92			
	1440	9.92			

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APPENDIX D
Aquifer Parameters



WELL TEST ANALYSIS

Data Set: C:\...\319 Gordonton Rd.aqt
Date: 11/11/25 Time: 12:13:42

PROJECT INFORMATION

Company: CMW Geosciences
Project: GOL2025-0083
Location: Gordonton Rd Hamilton
Test Well: 4" existing bore
Test Date: Oct 2025

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
4" bore	0	0

Observation Wells

Well Name	X (m)	Y (m)
4" bore	0	0
4" mon	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 251.1 m^2/day
Kz/Kr = 0.1

S = 3.162
b = 50. m

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