



www.emmconsulting.com.au
 Suite 01, 20 Chandos Street
 St Leonards NSW 2065
 T: 02 9493 9500
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WATER MONITORING BORE LOG

Bore ID: PB10

Client: Snowy Hydro Limited Project: Snowy 2.0

Date completed: 21/11/2018

Project number: J17188

Drilling contractor: Watson Drilling

Elevation: 1382.0 mAHD

Drilling method: Air Rotary

Easting: 641299.1

Hydrogeologist: Jake Turi

Northing: 6038399.5

Static Water Level: 3.64 mBGL

Screened Formation: Temperance Formation

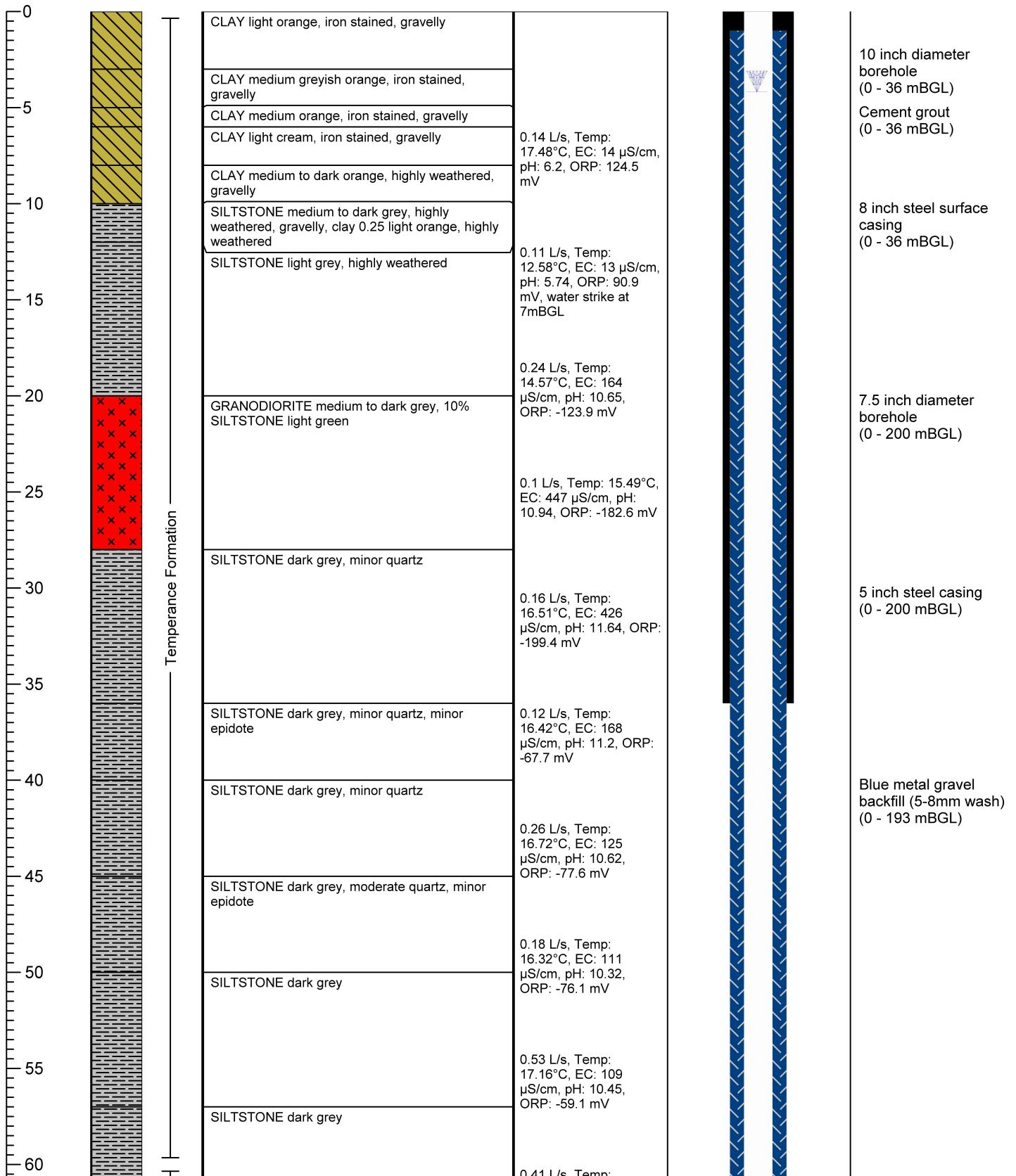
Date: 10/12/2018

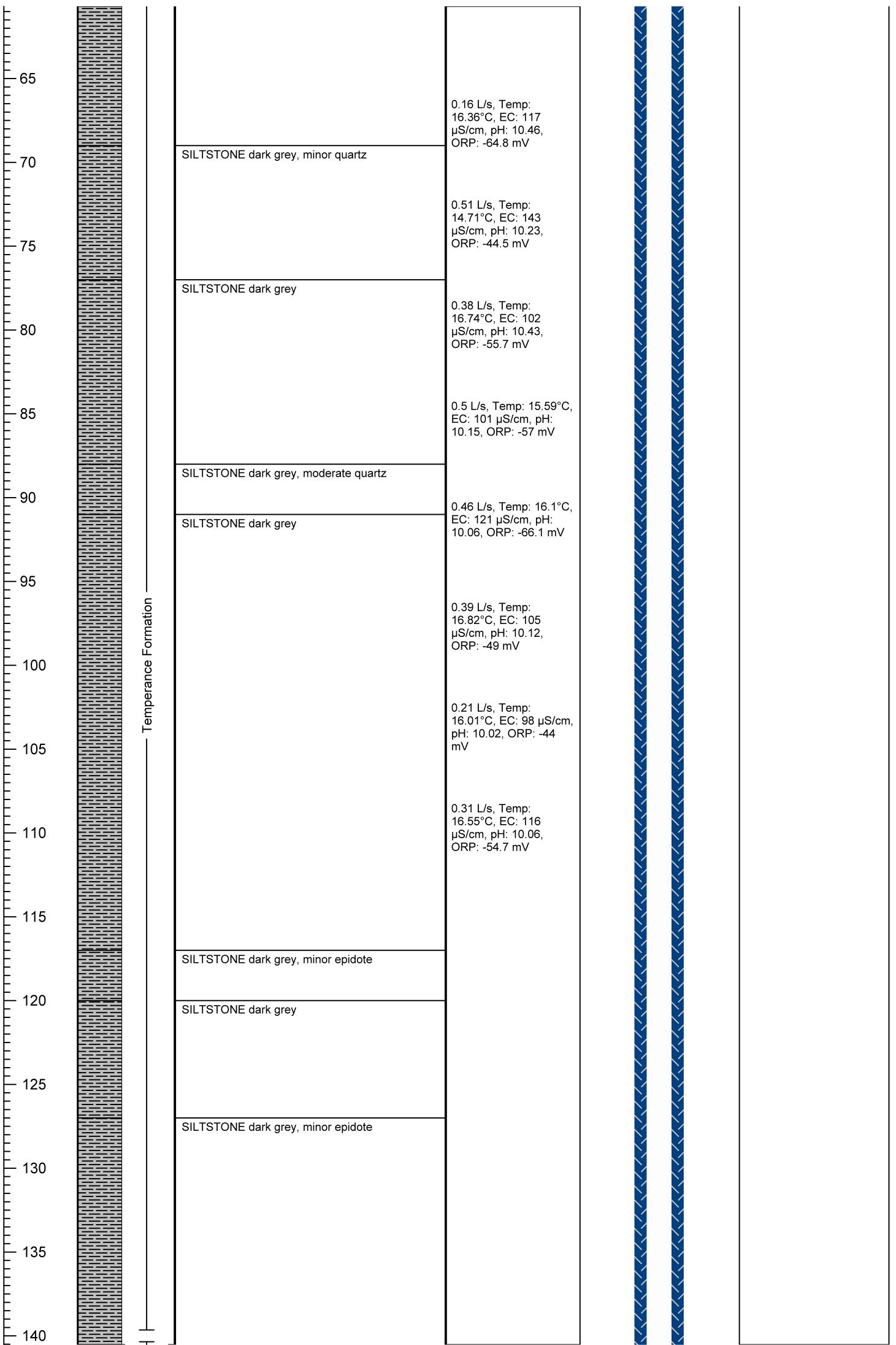
Total depth: 230 m

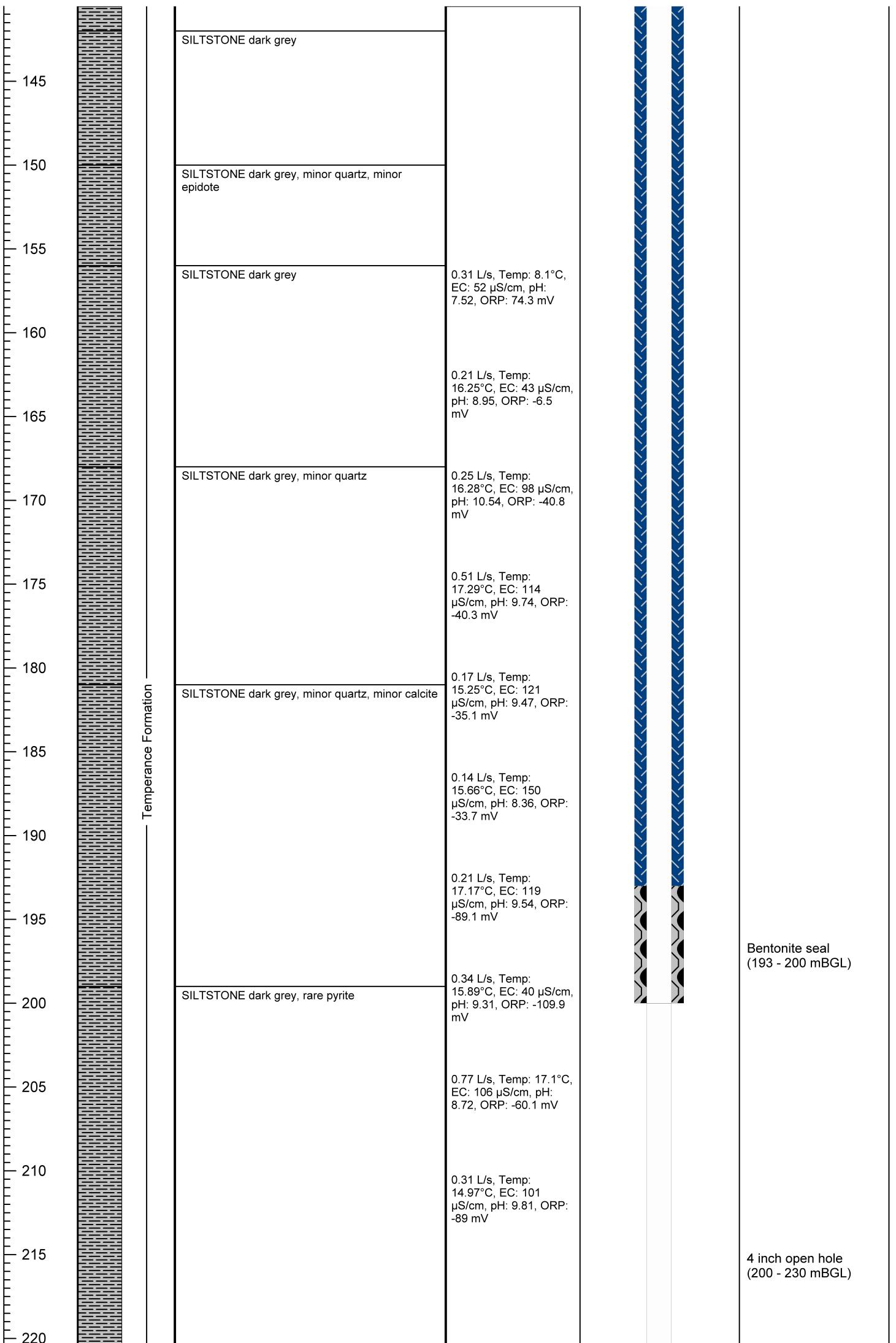
Screened depth: 200 - 230 m open hole

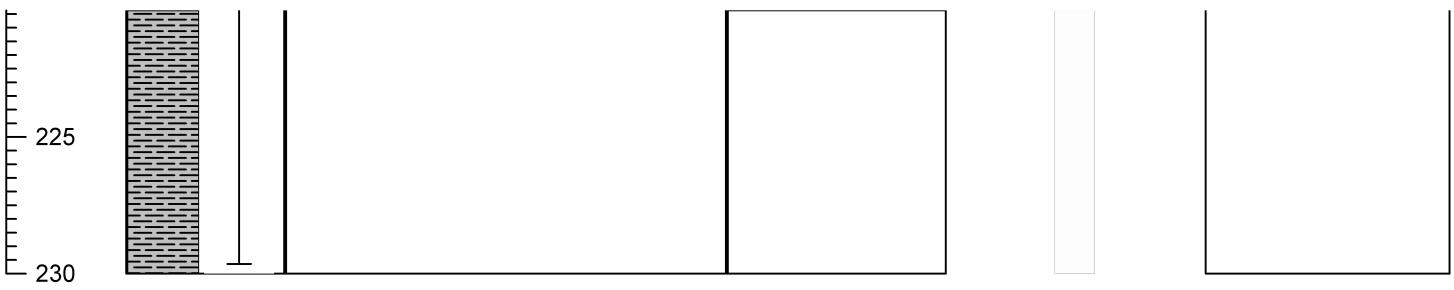
Casing: 5 inch steel casing

Depth (mbgl)	Lithology Graphic	Description	Drilling Notes	Bore Completion	
				Diagram	Design notes











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WATER MONITORING BORE LOG

Bore ID: MB11A

Client: Snowy Hydro Limited

Project: Snowy Hydro 2.0

Date completed: 01/02/2019

Project number: J17188

Drilling contractor: Watson Drilling

Elevation: 1485.1 mAHD

Drilling method: Air Rotary

Easting: 634500.2

Hydrogeologist: Jake Turi

Northing: 6038677.8

Static Water Level: 18.17 mBGL

Open Formation: Gooandra Volcanics

Date: 19/02/2019

Total depth: 24 mBGL

Open Depth: 17 - 23 mBGL

Casing: 126mm Class 9 PVC

Depth (mbgl)	Lithology Graphic	Description	Drilling Notes	Bore Completion	
				Diagram	Design notes
0		GREENSCHIST very fine to fine grained, dark grey, slightly oxidised, GREENSCHIST, 40% very fine to fine grained, light greenish grey, slightly oxidised, minor organic matter present			Cement grout
5		GREENSCHIST very fine to fine grained, dark grey, slightly oxidised, GREENSCHIST, 20% very fine to fine grained, light greenish grey			6 inch PVC surface casing
10		GREENSCHIST very fine to fine grained, dark grey, slightly oxidised, GREENSCHIST, 20% very fine to fine grained, medium brown			Blue metal gravel backfill (5-8mm wash)
15		GREENSCHIST very fine to fine grained, medium brown, slightly oxidised, GREENSCHIST, 10% very fine to fine grained, dark grey			5.5 inch diameter borehole
20		GREENSCHIST very fine to fine grained, light brown, GREENSCHIST, 10% very fine to fine grained, light grey	Temp: 9.4°C, DO: 21.8%, DO: 2.49 ppm, EC: 103.3 µS/cm, TDS: 66.95 g/L, pH: 5.7, ORP: 142.6 mV		50mm blank PN18 U-PVC casing (threaded)
		GREENSCHIST very fine to fine grained, dark grey, GREENSCHIST, 10% very fine to fine grained, medium grey			Bentonite seal
					50mm slotted PN18 U-PVC casing (0.5mm aperture)
					Gravel pack (5mm wash)
					50mm blank PN18 U-PVC sump (threaded)

Appendix D

Pump test reports

Memorandum

16 January 2019

Level 1, 70 Pirie Street
Adelaide SA 5000

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E info@emmconsulting.com.au
www.emmconsulting.com.au

To: Glynn Price
From: EMM Consulting Pty Limited
Subject: Slug test analysis report - PB06 site

Dear Glynn,

Please find below a brief technical report, prepared by EMM Consulting Pty Limited, summarising the rising/falling head tests undertaken at the PB06 (BH3104) site, located near Bullocks Hill and Zinc Ridge, Snowy Mountains, NSW (Figure 1).

1 Summary

Due to the slow recovery rate observed in the production bore, PB06, a pumping test was determined to be infeasible. It was therefore decided that the post-development groundwater recovery would instead be analysed at a later date.

As a short-term substitute, a series of rising and falling head tests (slug tests) were performed on monitoring bores MB08A and MB08B, adjacent to PB06, with the purpose of obtaining bulk hydraulic conductivity values.

A falling head test is achieved by introducing a 'slug' device to displace the water column within the monitoring bore causing the water level to instantaneously rise and water to flow from the bore into the aquifer via the well screen (Butler 1998). The water level decay is recorded until the water level has returned to static level.

A rising head test is then conducted where the slug is removed causing a reduction in the bore water level with respect to the screened formation. Water then moves from the formation into the bore via the well screen. The water level recovery is recorded until the water level has returned to static level.

Multiple slug tests were performed on MB08A due to its fast rate of recovery. Both falling and rising head tests were conducted by inserting and removing a slug from the bore respectively. Conversely, just the one rising head test was performed on MB08B due to its slow rate of recovery, and involved the removal of approximately 4 L of water via bailer.

For each slug test, an automatic water level logger with a measurement frequency of one second was used to record the change in head over time.

A summary of these tests is provided in Table 1.1.

Table 1.1 PB06 slug testing summary

Description	Detail
Test type	MB08A – six rising-head tests, four falling-head tests MB08B – one rising-head test (bailer) PB06 – one recovery test
Date	20 November 2018 (slug testing) 20 November to 10 December 2018 (PB06 recovery test)
Site location	BH3104, adjacent to Zinc Ridge Trail
Production bore	PB06 – screened from 298 – 318 mBGL ¹
Observation bores	MB08A – screened from 19 – 29 mBGL MB08B – screened from 278 – 298 mBGL
Initial water levels	PB06 – 292 mBGL measured on 20 November 2018 MB08A – 22.21 mBGL measured on 20 November 2018 MB08B – 22.44 mBGL measured on 20 November 2018

Notes: 1. mBGL = metres below ground level.



2 Conceptualisation and assumptions

A 2-dimensional conceptualised cross-section model for the PB06 site is shown in Figure 2.1 with the following details:

- The groundwater pumping/monitoring set-up at the PB06 site consisted of one production bore (PB06) and two monitoring bores (MB08A and MB08B).
- The production bore, PB06, is screened from 298 to 318 mBGL; and
- The monitoring bores, MB08A and MB08B were screened from 19 to 29 mBGL and 278 to 298 mBGL respectively.

AqteSolv was used to estimate the aquifer properties. AqteSolv is industry leading software for analysing aquifer tests using a variety of aquifer types and solutions.

The following additional assumptions were used to facilitate analysis:

- aquifers and aquitards are infinite in extent;
- aquifers are homogeneous and uniform in thickness;
- aquitards have a uniform vertical hydraulic conductivity;
- flow in aquitards are vertical;
- flow to the well is horizontal;
- the aquifer is conceptualised as one thick aquifer only;
- the initial water table at PB06 was approximately measured at 292 mBGL;
- with sufficient recovery time, the water level in PB06 would reach a level similar to those seen in MB08A and MB08B (approximately 22 mBGL), ie the initial displacement in PB06 is approximately 270 m; and
- the aquifer thickness assumed when modelling was 270 m (ie the water table from the monitoring bores minus the base of the screened interval for PB06).

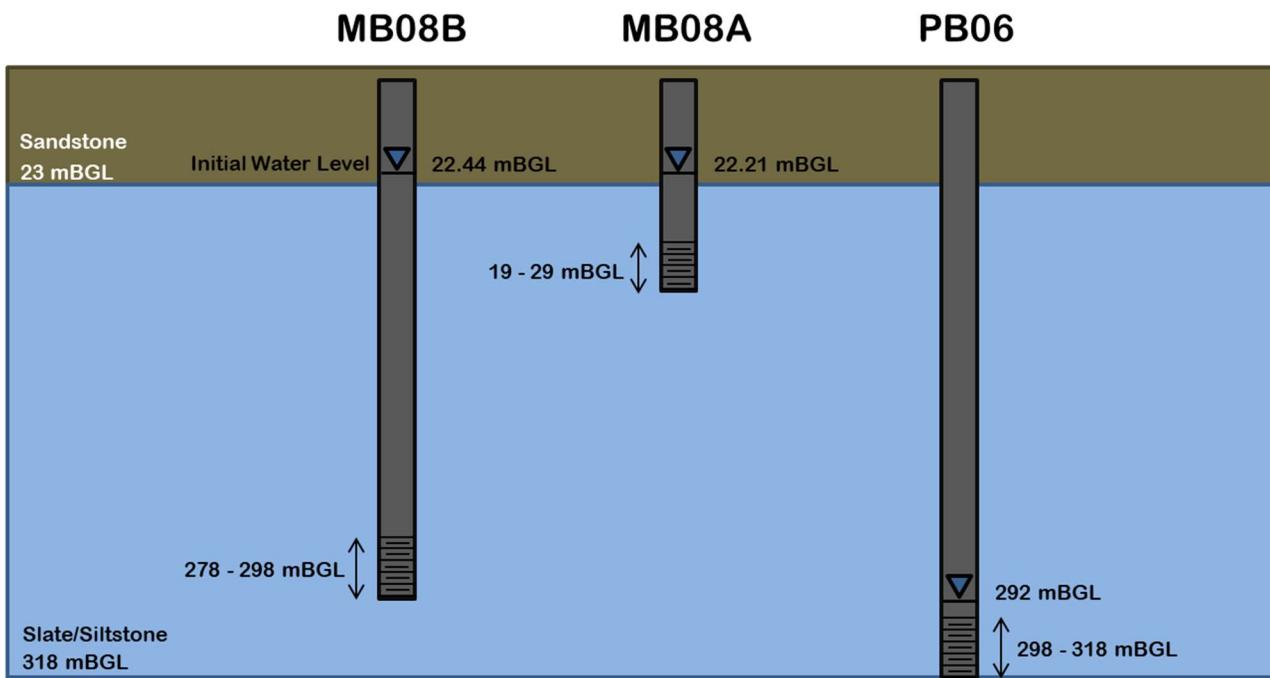


Figure 2 Conceptual cross-section of the PB06 site near Bullocks and Zinc Ridge

3 Analysis

The slug test data from MB08A and MB08B, as well as the recovery data from PB06, was analysed using AqteSolv. The slug tests were analysed using the Bouwer-Rice straight-line solution. The PB06 recovery data was analysed as a slug test using the Bouwer-Rice solution, and also as a pumping test using the Theis residual recovery solution. A summary of the results derived from the analysis of the slug testing data is presented in Table 3.1, while Table 3.2 summarises the PB06 recovery data. A brief discussion of these results is provided in Section 4 and the complete analysis of each test is shown in Appendix A.

Note that the displacement values for the falling head tests were converted from negative to positive values to allow the data to be analysed. Additionally, as the slug test data forms a convex curve in each case, the straight-line Bouwer-Rice test was performed on the data having a normalised head between 0.20 and 0.30, as recommended by Butler (1998).

Table 3.1 MB08A and MB08B slug testing summary

Bore	Number of tests	Rising-head average K (m/d) ¹	Falling-head average K (m/d)	Overall average K (m/d)
MB08A	6 rising-head 4 falling-head	0.88	0.66	0.80
MB08B	1 rising-head	1.80e-4 (AqteSolv) 6.20e-4 (Excel – Hvorslev)	-	4.00e-4

Notes: 1. m/d = metres per day.

Table 3.2 PB06 recovery analysis summary

Analysis method	Solution type	K (m/d)
Slug test	Hvorslev	3.90e-6
Pumping test	Theis (Recovery)	6.40e-7

Notes: 1. m/d = metres per day.

4 Discussion

All hydraulic conductivity results derived from slug testing at MB08A are generally in agreement, with a range of 0.47 – 1.20 m/d observed over the 10 tests. These relatively high hydraulic conductivity values agree with the observations made of quickly recovering water levels in this bore and are reflective of the less consolidated shallow weathered rock logged during drilling.

The rising head test result for MB08B was analysed using both an Excel-based solution (Hvorslev) and the straight-line Bouwer-Rice solution in AqteSolv. The hydraulic conductivity values derived using both analytical solutions were relatively similar - 6.2×10^{-4} and 1.8×10^{-4} . These values are comparatively lower than those derived from the shallower MB08A tests and supports the less permeable, compact nature of the deeper rock across the Plateau.

Recovery data collected at PB06 was analysed as both a Rising Head test and as a pumping test. The two analytical methods produced relatively consistent results - 3.90×10^{-6} and 6.40×10^{-7} , again indicating significantly less permeable rock conditions are apparent with depth.

Yours sincerely,



Bill Bull – Author

Environmental Engineer

bbull@emmconsulting.com.au



Sean Cassidy – Review

Associate Hydrogeologist

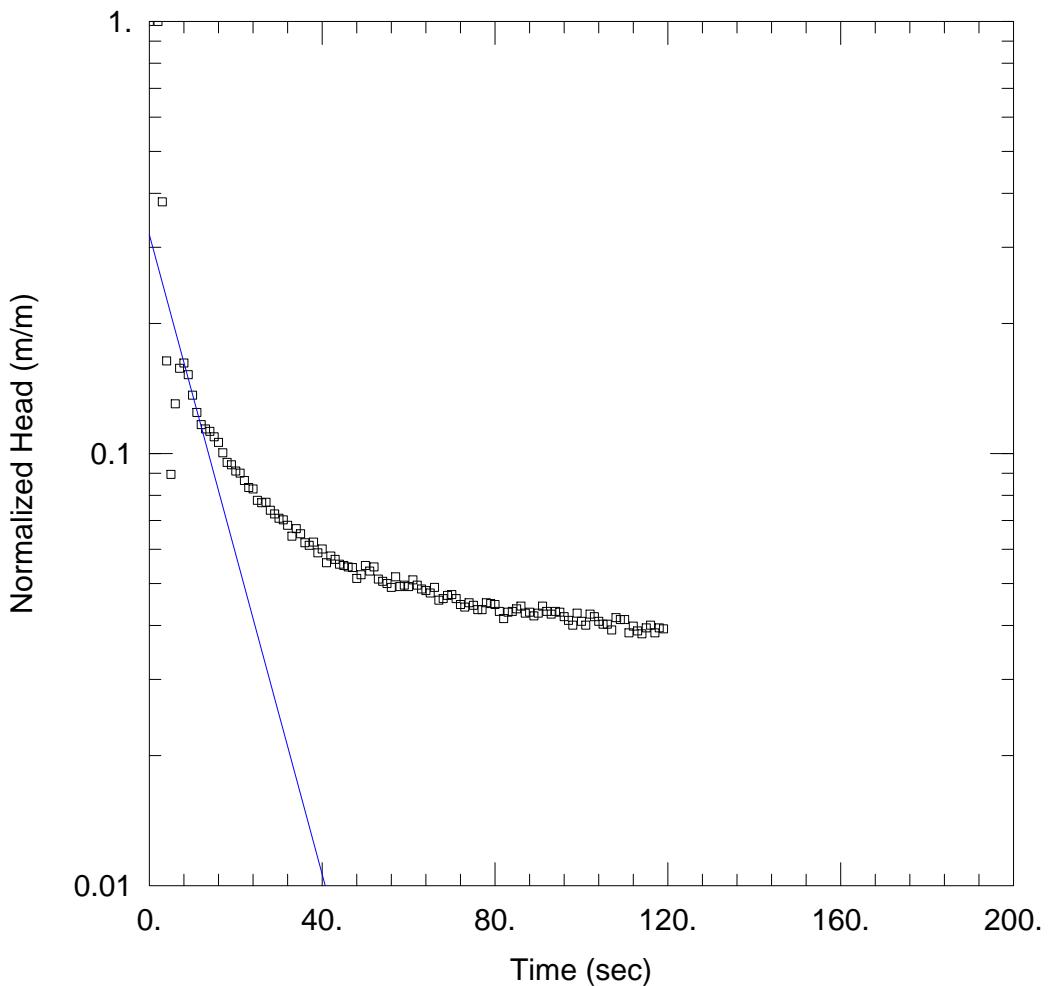
scassidy@emmconsulting.com.au

References

Butler, J. J. Jr., 1998, *The Design, Performance, and Analysis of Slug Tests*, Lewis Publishers, New York, 252p.

Appendix A

Slug Test Analyses



MB08A RISING-HEAD TEST 1

Data Set: T:\...\Test 1 slug out.aqt
 Date: 12/21/18

Time: 13:01:47

PROJECT INFORMATION

Company: EMM Consulting
 Project: J17188
 Location: Snowy
 Test Well: MB08A
 Test Date: 20/11/2018

AQUIFER DATA

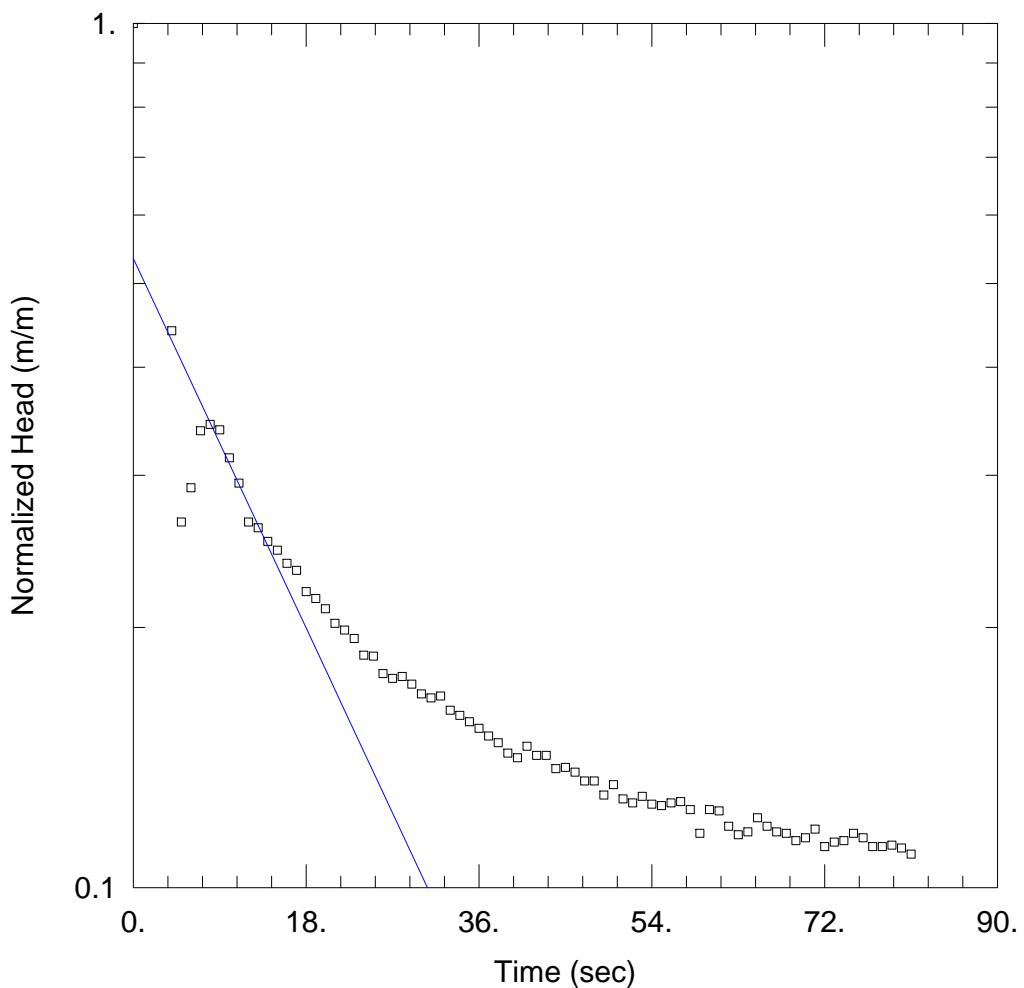
Saturated Thickness: 30. m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MB08A)

Initial Displacement: 0.494 m Static Water Column Height: 29.5 m
 Total Well Penetration Depth: 29. m Screen Length: 10. m
 Casing Radius: 0.025 m Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 $K = 1.197$ m/day $y_0 = 0.1586$ m



MB08A RISING HEAD TEST #2

Data Set: T:\...\Test 2 slug out.aqt

Date: 12/21/18

Time: 13:12:14

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MB08A)

Initial Displacement: 0.225 m

Static Water Column Height: 7. m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

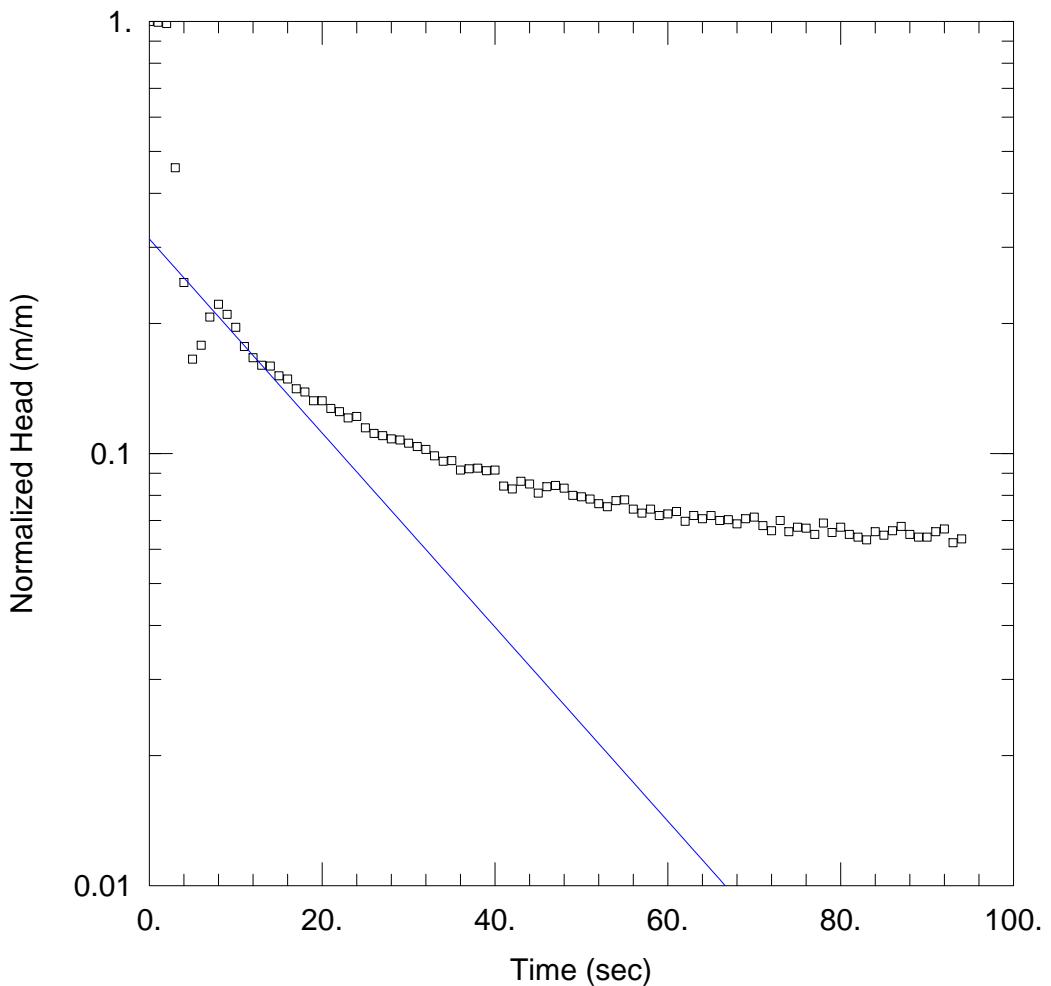
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.7685 m/day

y0 = 0.1203 m



MB08A RISING HEAD TEST #3

Data Set: T:\...\Test 3 slug out.aqt

Date: 12/21/18

Time: 13:13:37

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 8. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.32 m

Static Water Column Height: 7. m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

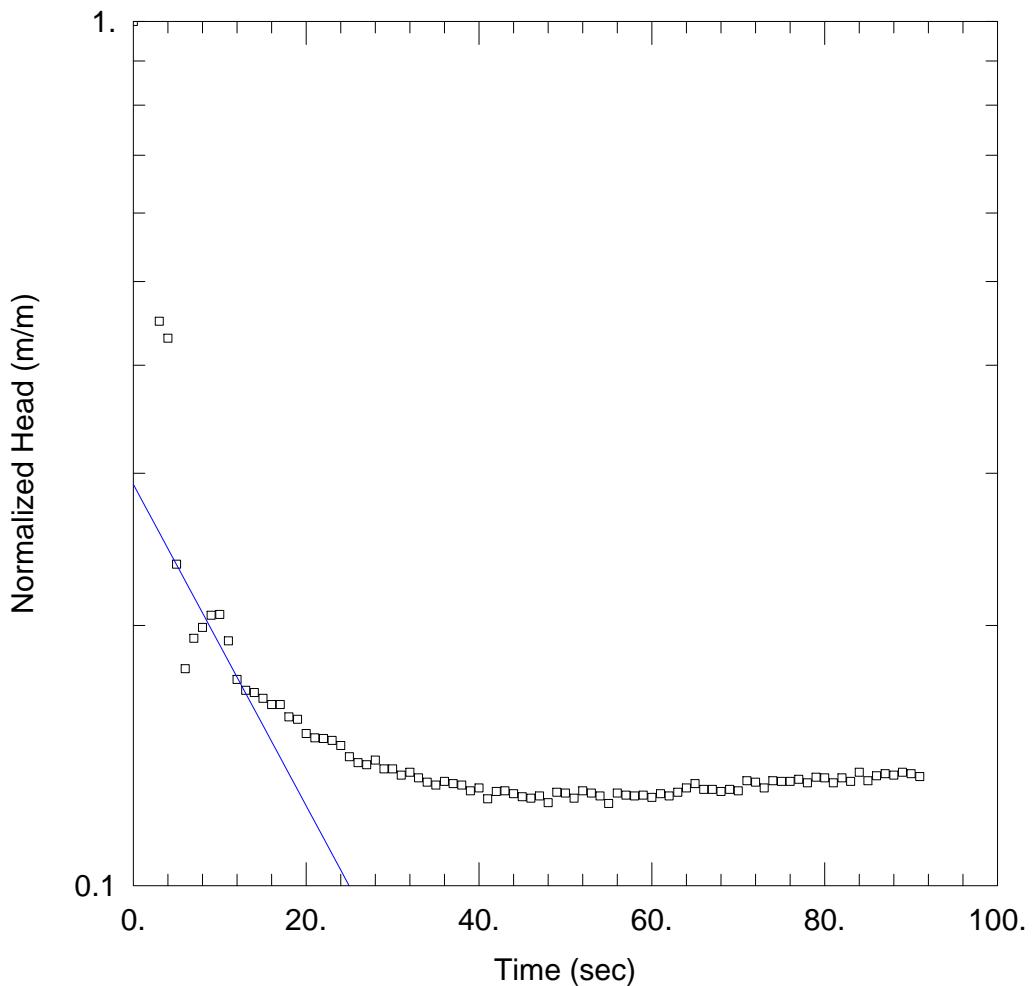
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.9502 m/day

y0 = 0.1003 m



MB08A RISING HEAD TEST #4

Data Set: T:\...\Test 4 slug out.aqt

Date: 12/21/18

Time: 13:15:01

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 8. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.4 m

Static Water Column Height: 7. m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

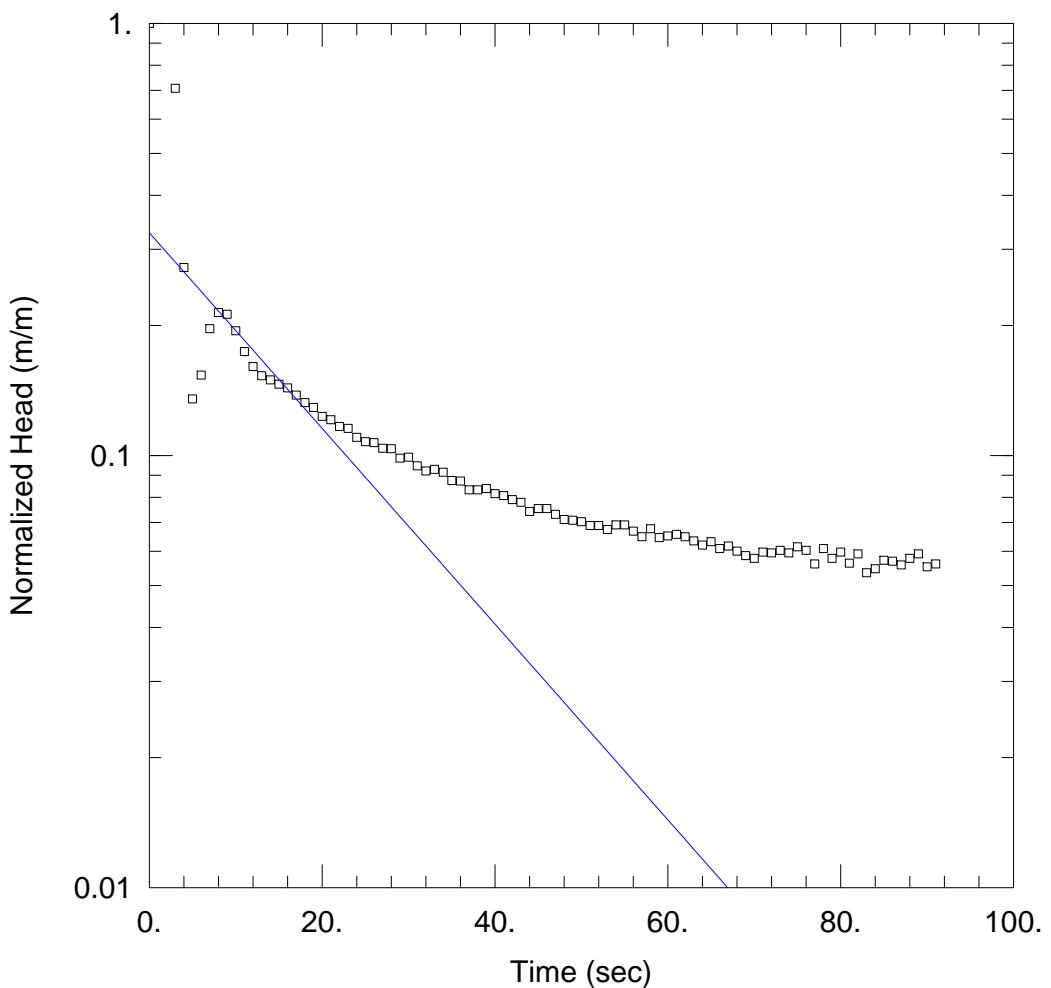
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.7871 m/day

y0 = 0.1165 m



MB08A RISING HEAD TEST #5

Data Set: T:\...\Test 5 slug out.aqt

Date: 12/21/18

Time: 13:16:04

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 8. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.353 m

Static Water Column Height: 7. m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

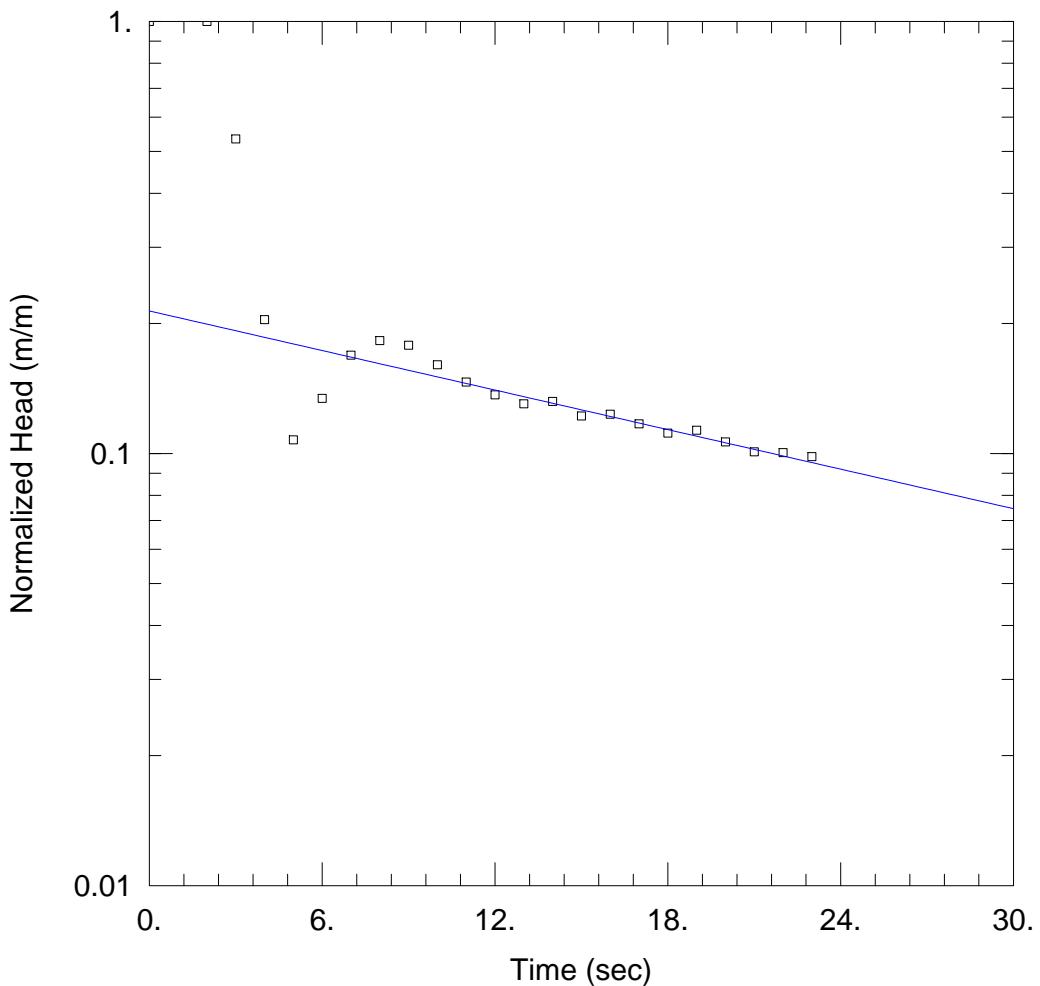
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.9584 m/day

y0 = 0.1157 m



MB08A RISING HEAD TEST #6

Data Set: T:\...\Test 6 slug out.aqt

Date: 12/21/18

Time: 13:17:42

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 8. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.425 m

Static Water Column Height: 7. m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

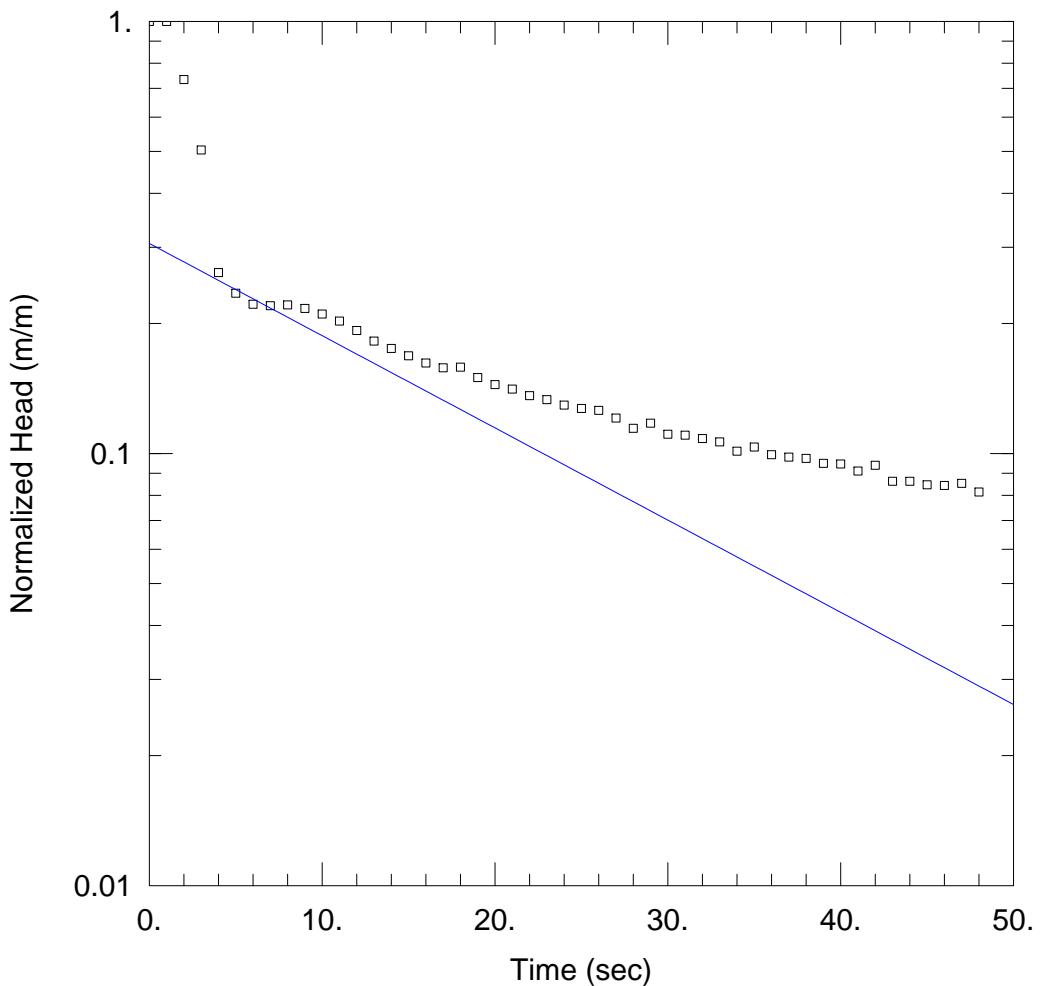
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.6455 m/day

y0 = 0.09083 m



MB08A FALLING HEAD TEST #1

Data Set: T:\...\Test 3 slug in.aqt

Date: 12/21/18

Time: 13:18:20

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.313 m

Static Water Column Height: 29.6 m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

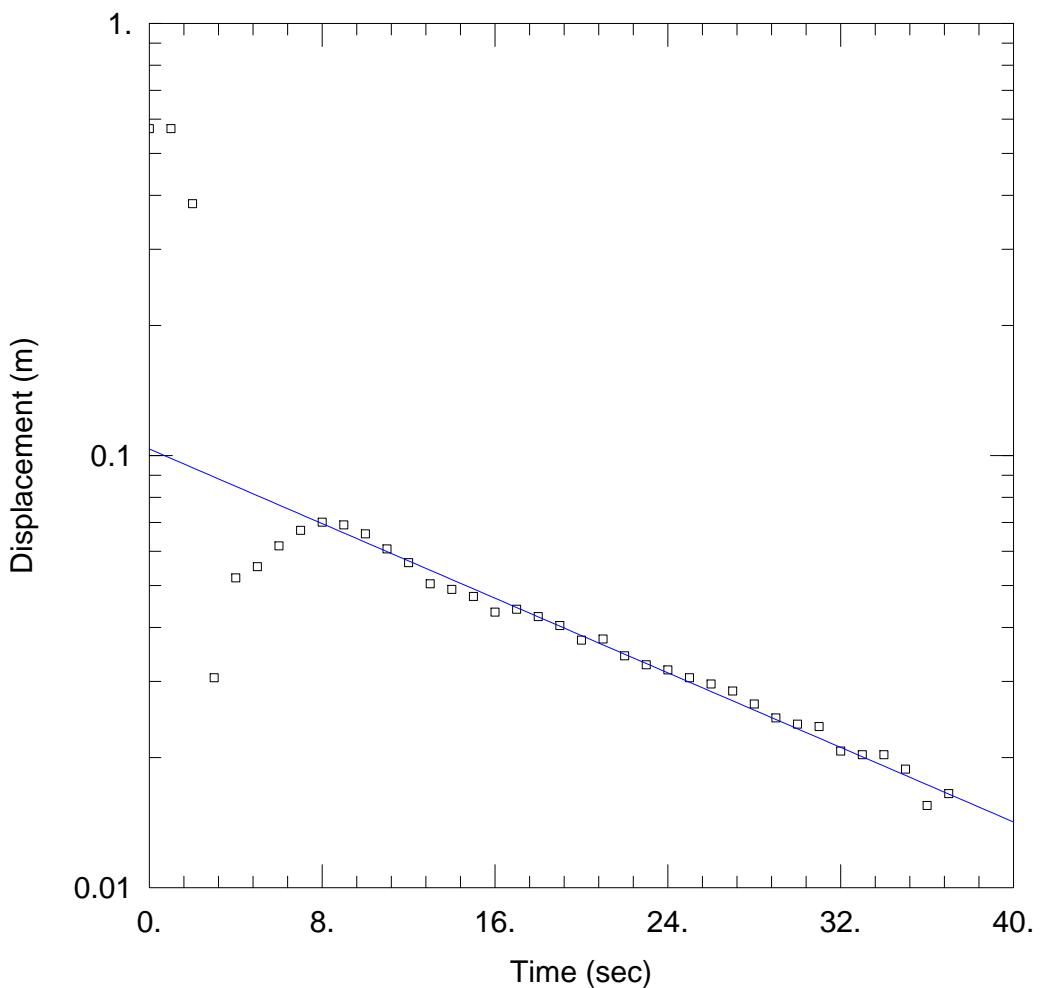
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.6903 m/day

y0 = 0.09584 m



MB08A FALLING HEAD TEST #2

Data Set: T:\...\Test 4 slug in.aqt

Date: 12/21/18

Time: 13:18:57

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.571 m

Static Water Column Height: 29.4 m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

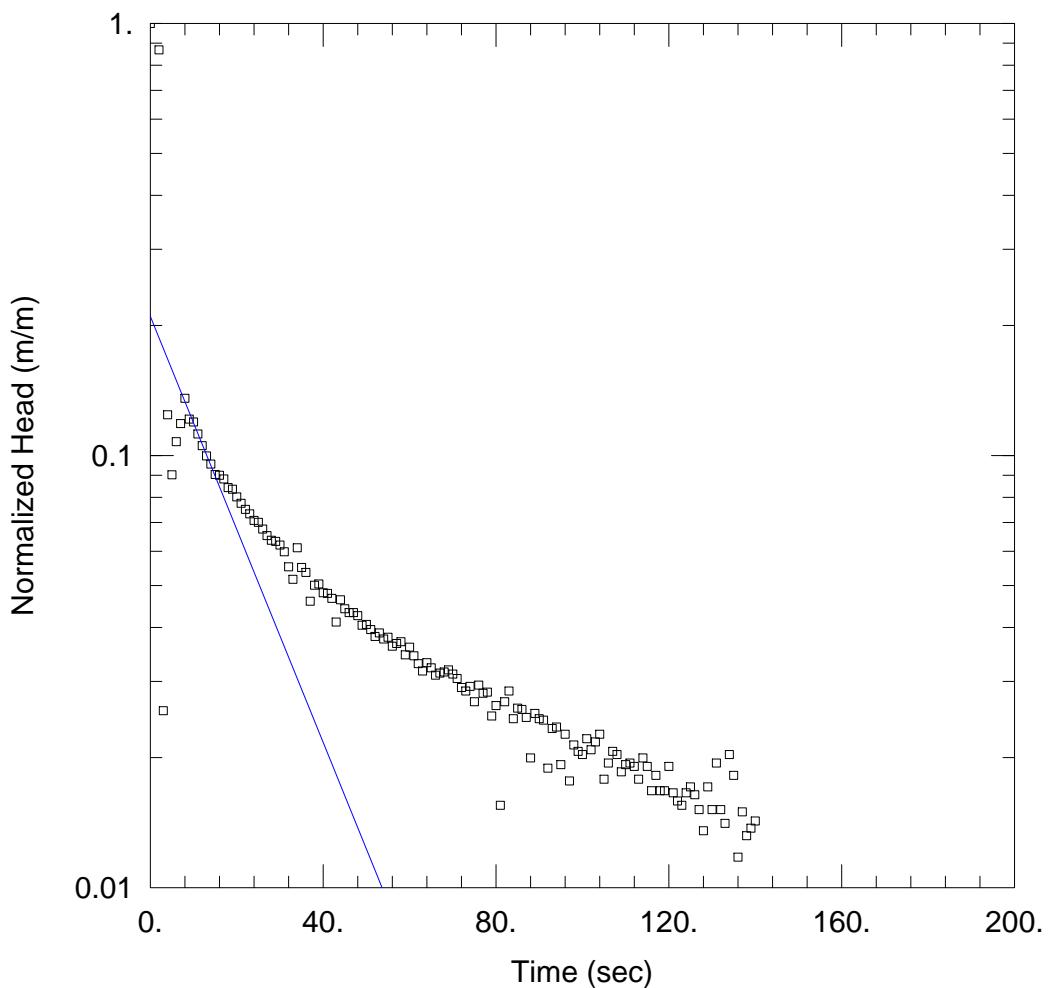
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.6979 m/day

y0 = 0.1035 m



MB08A FALLING HEAD TEST #3

Data Set: T:\...\Test 5 slug in.aqt

Date: 12/21/18

Time: 13:19:41

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.561 m

Static Water Column Height: 29.4 m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

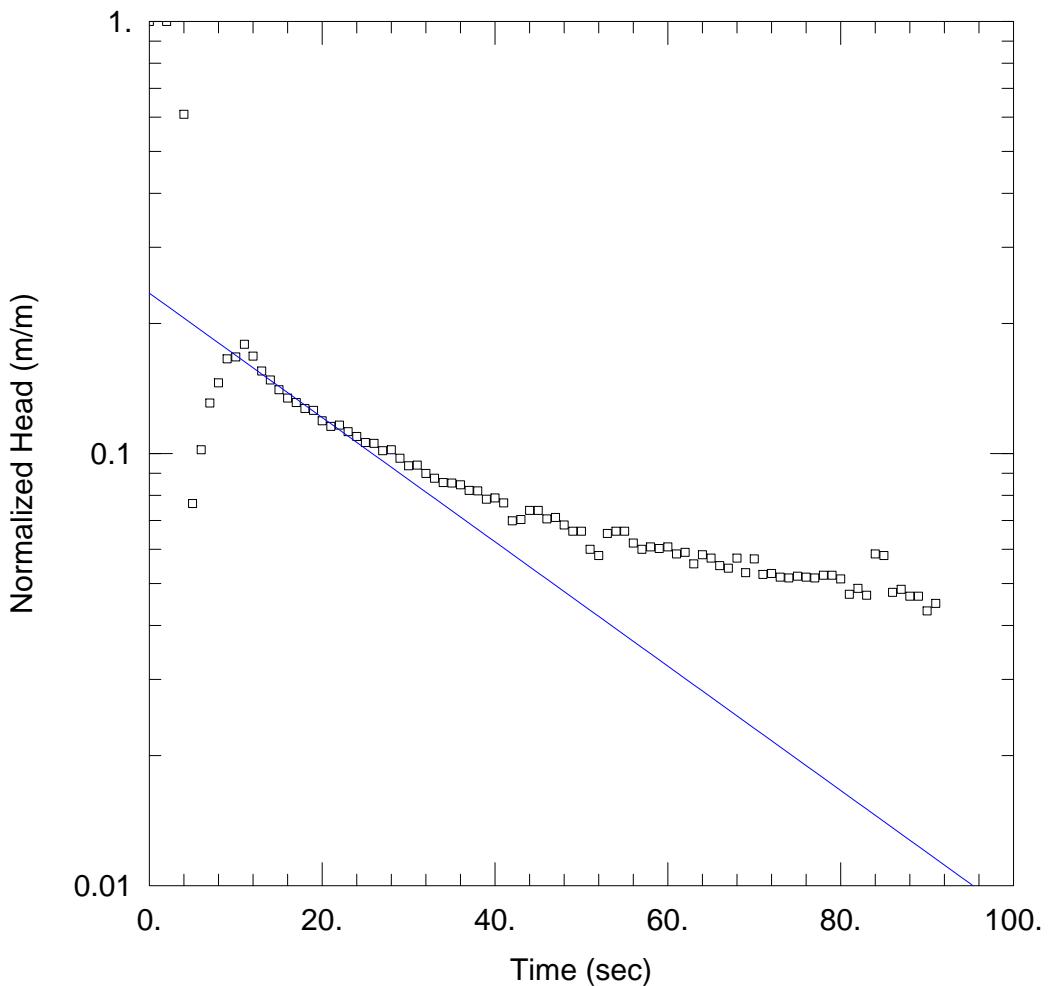
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.7974 m/day

y0 = 0.1177 m



MB08A FALLING HEAD TEST #4

Data Set: T:\...\Test 6 slug in.aqt

Date: 12/21/18

Time: 13:20:25

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08A

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 30. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.398 m

Static Water Column Height: 29.6 m

Total Well Penetration Depth: 29. m

Screen Length: 10. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

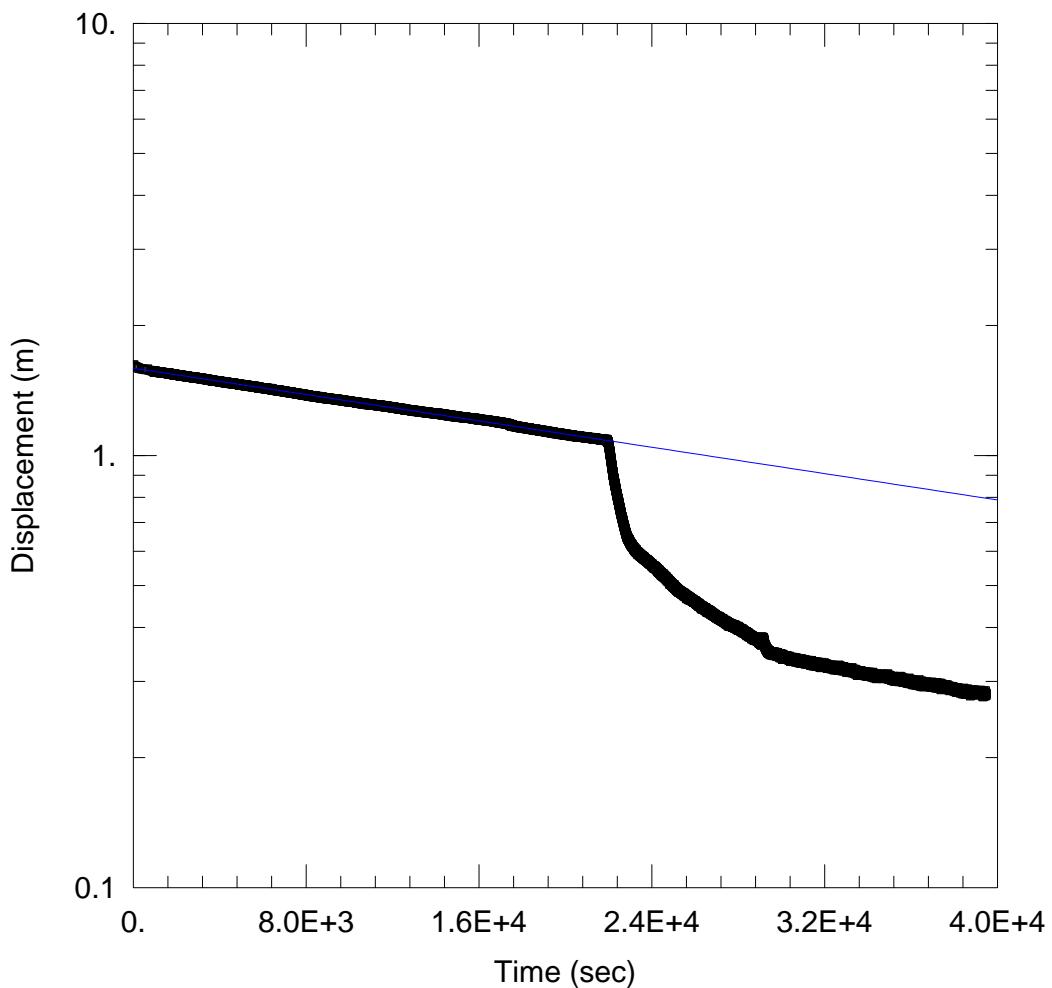
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.4654 m/day

y0 = 0.09351 m



MB08B RISING-HEAD TEST

Data Set: T:\...\MB08B Slug test.aqt

Date: 12/21/18

Time: 13:27:55

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: MB08B

Test Date: 20/11/2018

AQUIFER DATA

Saturated Thickness: 275. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MB08B)

Initial Displacement: 1.62 m

Static Water Column Height: 273.8 m

Total Well Penetration Depth: 298. m

Screen Length: 20. m

Casing Radius: 0.025 m

Well Radius: 0.025 m

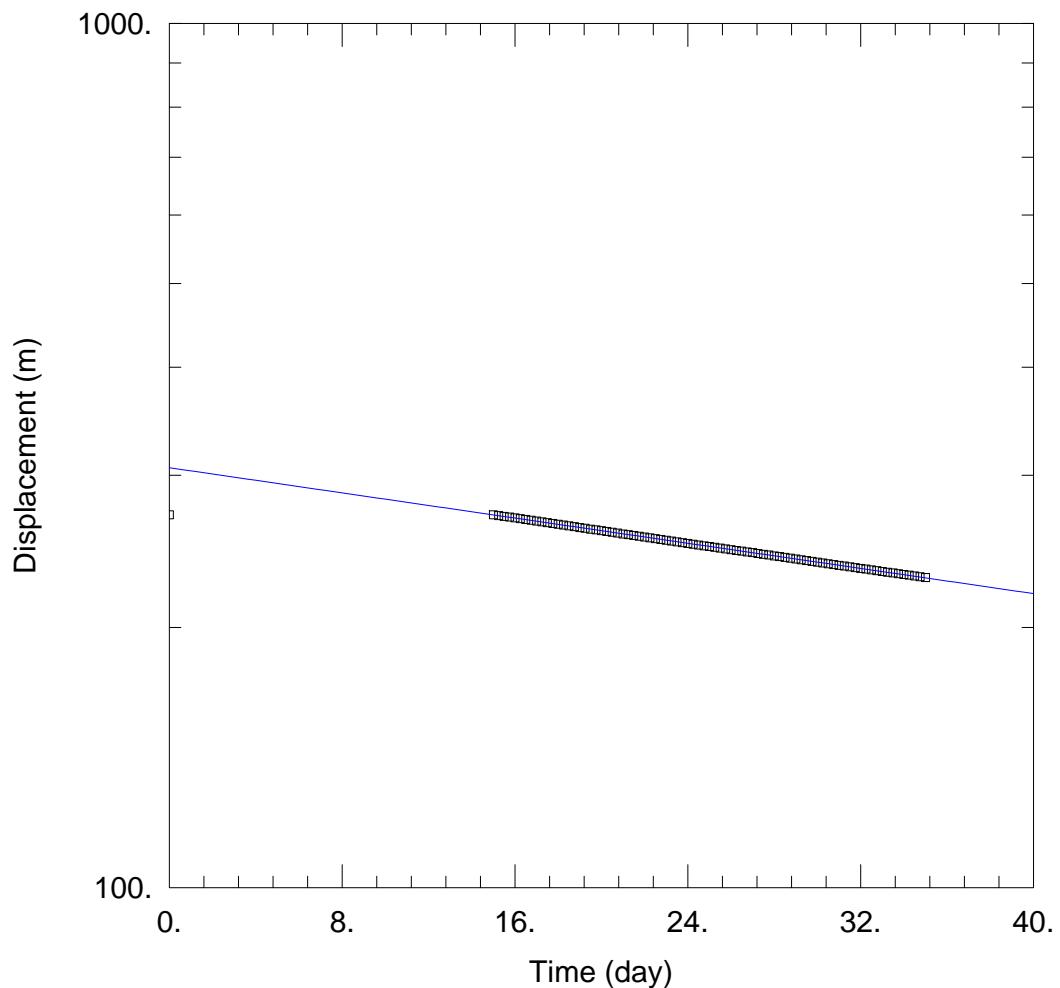
SOLUTION

Aquifer Model: Confined

Solution Method: Bouwer-Rice

K = 0.0001793 m/day

y0 = 1.592 m



WELL TEST ANALYSIS

Data Set: T:\...\PB06.aqt

Date: 12/21/18

Time: 11:06:09

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: PB06

Test Date: 20/11/2018 - 10/12/2018

AQUIFER DATA

Saturated Thickness: 300. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PB06)

Initial Displacement: 270. m

Static Water Column Height: 27.5 m

Total Well Penetration Depth: 318. m

Screen Length: 18. m

Casing Radius: 0.0508 m

Well Radius: 0.0508 m

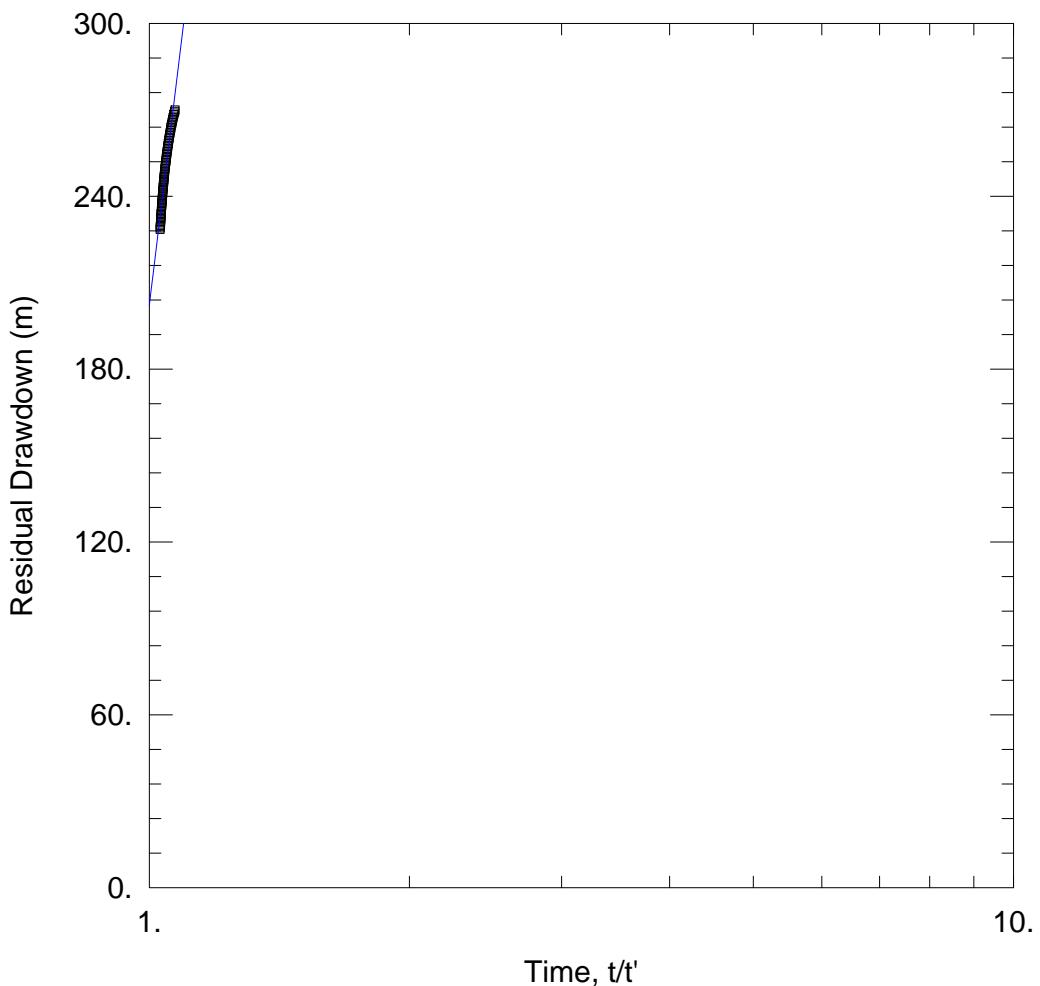
SOLUTION

Aquifer Model: Confined

Solution Method: Hvorslev

K = 3.944E-6 m/day

y0 = 306.1 m



WELL TEST ANALYSIS

Data Set: T:\...\PB06_Recovery.aqt

Date: 12/21/18

Time: 11:03:05

PROJECT INFORMATION

Company: EMM Consulting

Project: J17188

Location: Snowy

Test Well: PB06

Test Date: 20/11/2018 - 10/12/2018

AQUIFER DATA

Saturated Thickness: 300. m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
PB06	0	0

Observation Wells

Well Name	X (m)	Y (m)
□ PB06	0	0

SOLUTION

Aquifer Model: Confined

$T = 0.0001928 \text{ m}^2/\text{day}$

Solution Method: Theis (Recovery)

$S/S' = 0.8278$

Memorandum

21 January 2019

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St Leonards NSW 2065
PO Box 21
St Leonards NSW 1590

T 02 9493 9500

E info@emmconsulting.com.au

www.emmconsulting.com.au

To: Glynn Price
From: EMM Consulting Pty Limited
Subject: Pumping test analysis report - PB09

Dear Glynn,

Please find below a brief technical report, prepared by EMM Consulting Pty Limited, summarising the constant rate pumping test undertaken at the PB09 (BH5102 & BH5115) site, located on Marica Track East, Snowy Mountains, NSW (Figure 1).

1 Summary

The pumping test was undertaken by AquaMann Irrigation and supervised by EMM Consulting Pty Limited (EMM).

A constant head test (pumping test) was performed over a period of four days between 8 and 11 January 2019. The pumping test took place over a period of 74 hours, including 71 hours of constant rate pumping and 3 hours of manual recovery data collection. Further recovery data was collected using an automatic logger for 72 hours after cessation of manual measurements.

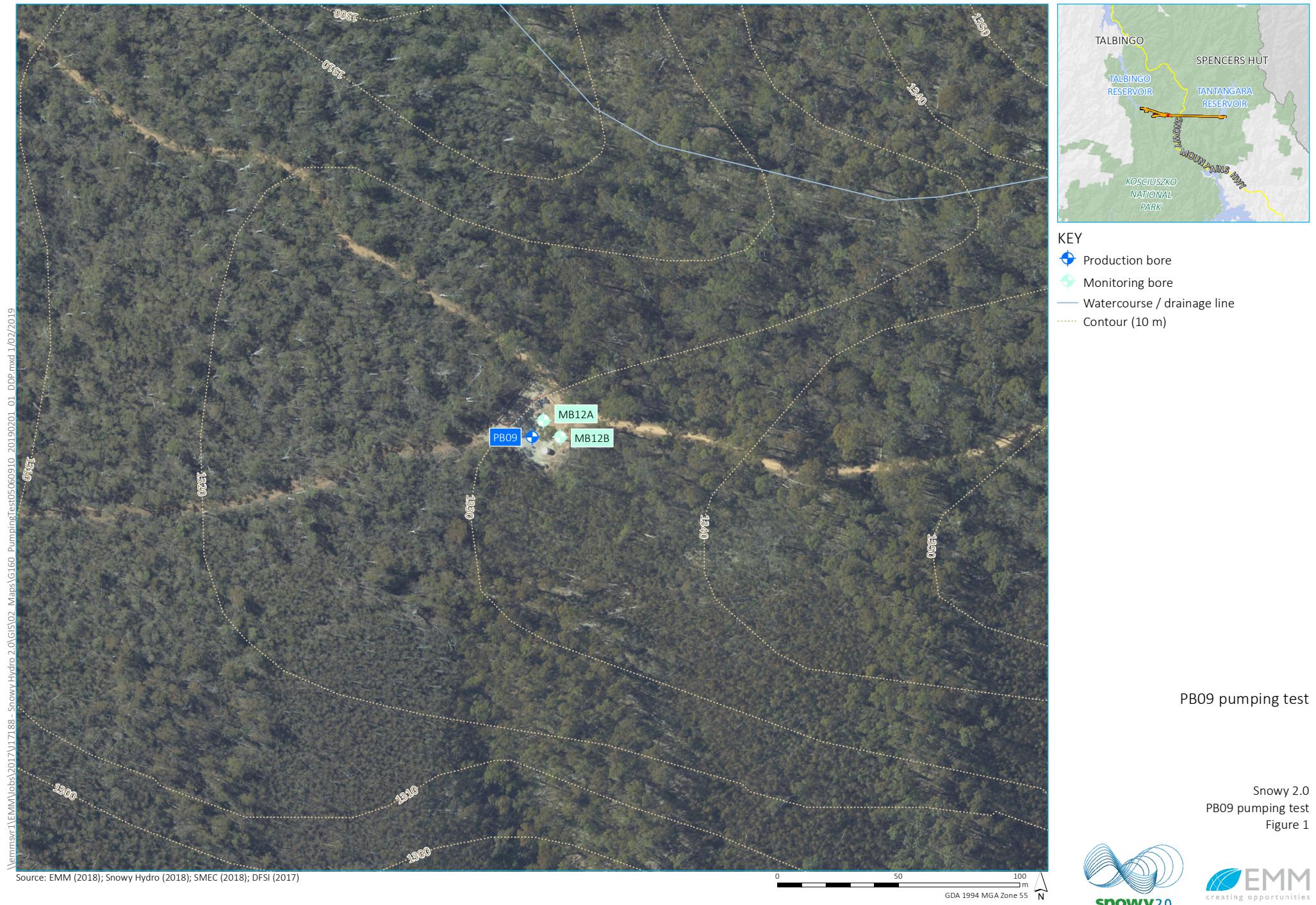
Details of the test summary are provided in Table 1.1.

Table 1.1 PB09 constant head test summary

Description	Detail
Test type	Constant rate and recovery test
Date	8 January to 11 January 2019
Discharge rate	0.15 to 0.185 L/sec ¹
Site location	Marica Track East
Duration	74 hours
Production bore	PB09 – open hole from 200 – 300 mBGL ²
Observation bores	MB12A – distance of 8.86 m from PB09, screened from 26 – 35 mBGL MB12B – distance of 11.65 m from PB09, screened from 149 – 179 mBGL
Initial water levels	PB09 – 64.63 mBGL measured on 8 January 2019 MB12A – 27.61 mBGL measured on 8 January 2019 MB12B – 34.61 mBGL measured on 8 January 2019

Notes: 1. L/sec = litres per second; and

2. mBGL = metres below ground level.



2 Conceptualisation and assumptions

A 2-dimensional conceptualised cross-section model for the PB09 site is shown in Figure 2 with the following details:

- the groundwater pumping/monitoring set-up at the PB09 site consisted of one production bore (PB09) and two monitoring bores (MB12A and MB12B);
- the monitoring bores were located approximately 8.86 and 11.65 m away from PB09 respectively;
- the production bore, PB09, is open hole from 200 to 300 mBGL; and
- monitoring bores, MB12A and MB12B were screened from 26 to 35 mBGL and 149 to 179 mBGL respectively.

AqteSolv was used to estimate aquifer properties. AqteSolv is industry leading software for analysing aquifer tests using a variety of aquifer types and solutions.

The following additional assumptions were used to facilitate analysis:

- aquifers and aquitards are infinite in extent;
- aquifers are homogeneous and uniform in thickness;
- aquitards have a uniform vertical hydraulic conductivity;
- flow in aquitards are vertical;
- flow to the well is horizontal;
- for the AqteSolv solution, the aquifer is conceptualised as one thick aquifer only;
- the initial water table at PB09 was approximately measured at 64.63 mBGL; and
- the aquifer thickness assumed when modelling was 272 m (ie the water table minus the base of the open hole for PB09).

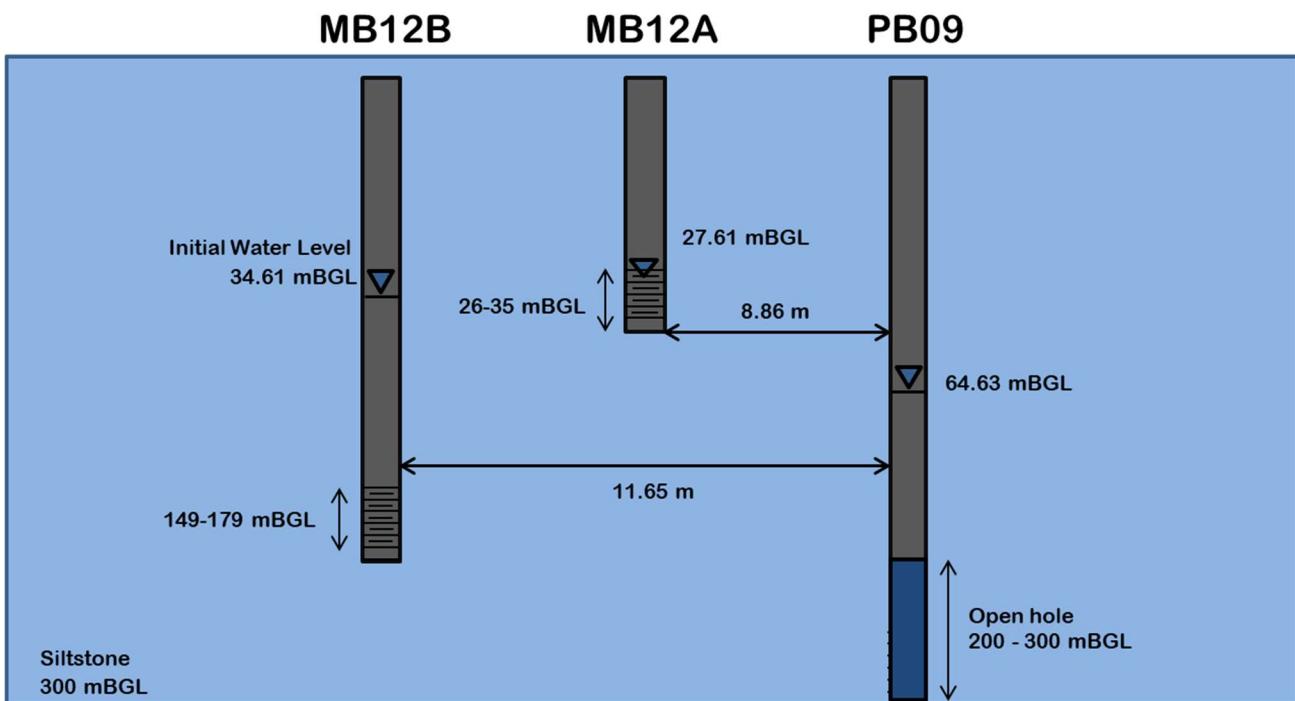


Figure 2 Cross-section of the PB09 pumping test set-up on Marica Track East

3 Analysis

The water level data obtained from PB09 and MB12B was analysed using AqteSolv. No change in water level was seen in the shallow monitoring bore (MB12A) throughout the test.

The data was analysed in two components: the manually measured drawdown and recovery data that was collected over the 74-hour test period, and the logger data which recorded an additional 72 hours of recovery from each bore. These two datasets were analysed separately because the well continued to develop throughout the test; although the pump was working at a constant speed, the flow rate increased from 0.15 to 0.185 L/sec over the 72-hour period.

A summary of the results is shown in Table 3.1. A brief discussion of these results is provided in Section 4.

Table 3.1 PB09 pumping test AqteSolv analysis

Dataset	Solution Type	Aquifer Type	K (m/d) ¹	K' (m/d) ²	S (m ⁻¹) ³	S' (m ⁻¹) ⁴
Manual drawdown data	Moench (double porosity)	Fractured	6.07e-4	1.44e-7	1.0e-9	2.94e-10
Logger recovery data	Moench (double porosity)	Fractured	6.96e-4	3.51e-6	1.23e-8	6.31e-5

Notes: 1. K = fracture hydraulic conductivity & m/d = metres per day;

2. K' = matrix (non-fracture) hydraulic conductivity;

3. S = fracture specific storage; and

4. S' = matrix (non-fracture) specific storage.

4 Discussion

The AqteSolv analysis of the manually collected water level data from PB09 and MB12B is shown in Figure 3, while the analysis of the logged recovery data is shown in Figure 4. The model fit to the manually collected data matches the mid- to late-time measurements for PB09 closely but overestimates the initial rate of drawdown. The slow rate of drawdown initially seen may be due to stored water in the fractures being removed. The general trend of the MB12B data is replicated in the model, but the model predicts that the drawdown would have taken much longer to start occurring, suggesting that the model is overestimating the specific storage of the material between MB12B and PB09.

The model fit to the logged recovery data matches both wells closely, suggesting that this model is more accurate. The increase in accuracy in this model is likely due to the static conditions; PB09 continued to develop throughout the pump test, causing parameters to change and hence making it difficult to fit a model to the data collected during this time.

The fracture hydraulic conductivities found were similar in both models, with 6.07×10^{-4} and 6.96×10^{-4} m/d calculated from the manually collected and logged data models, respectively. This was also reflected in the matrix hydraulic conductivity values, with the manual data and logged data models providing values of 1.44×10^{-7} and 3.51×10^{-6} m/d, respectively. Both calculated hydraulic properties are consistent with the textbook ranges provided in Domenico & Schwartz (1990) for siltstone: 8.64×10^{-7} to 0.0012 m/d.

The fracture storativity values from both the manually collected and logged data models were similar, with values of 1.0×10^{-9} and 1.23×10^{-8} m⁻¹, respectively. The matrix storativities differed significantly between the models, with the manual data model finding a storativity of 2.94×10^{-10} m⁻¹ and the logged recovery model finding 6.31×10^{-5} m⁻¹.

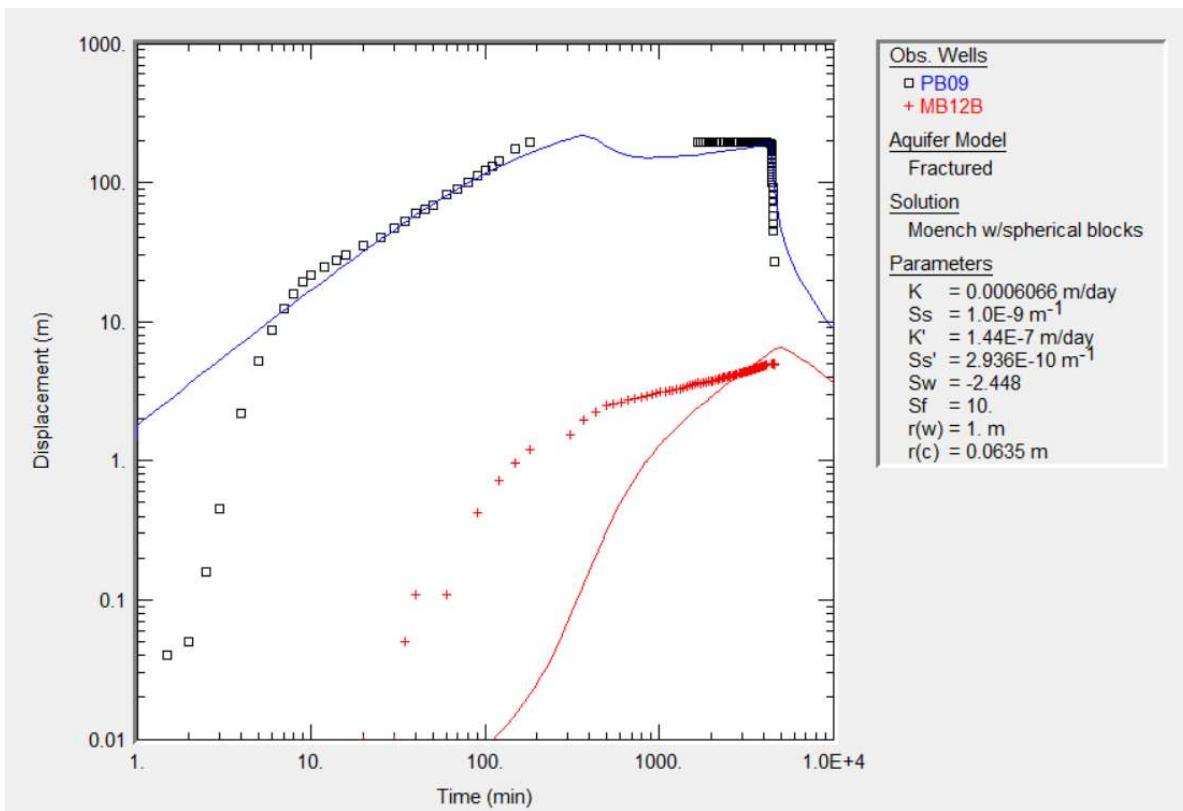


Figure 3 Pumping test analysis of manually collected PB09 and MB12B data using the AqteSolv Moench fractured aquifer model

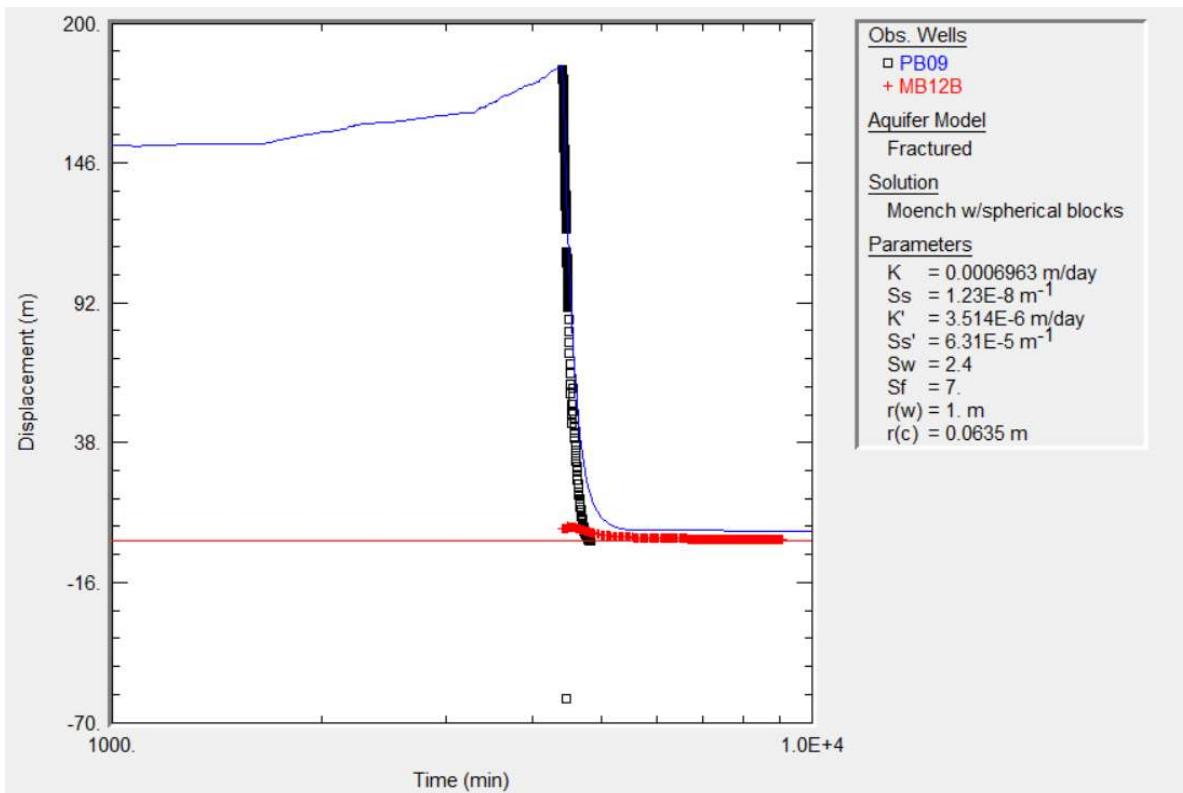


Figure 4 Pumping test analysis of PB09 and MB12B logger recovery data using the AqteSolv Moench fractured aquifer model

Yours sincerely,



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Environmental Engineer

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Sean Cassidy – Review

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References

Domenico, P.A. and F.W. Schwartz, 1990. Physical and Chemical Hydrogeology, John Wiley & Sons, New York, 824 p.

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Memorandum

18 January 2019

To: Glynn Price
From: EMM Consulting Pty Limited
Subject: Pumping test analysis report - PB10 site

Dear Glynn,

Please find below a brief technical report summarising the pumping test analysis undertaken at the PB10 site, located near Bullocks Hill Laydown, Snowy Mountains, NSW (Figure 1).

1 Summary

The PB10 pumping test was undertaken by AquaMann Irrigation and supervised by EMM Consulting Pty Limited (EMM).

A constant head test (pumping test) was performed over a period of two days between 10 and 13 December 2018, including 44 hours of intermittent pumping, designed to maintain a constant head, and 21 hours of recovery.

A summary of the test is provided in Table 1.1.

Table 1.1 PB10 constant head test summary

Description	Detail
Test type	Constant head and recovery test
Date	10 December to 13 December 2018
Discharge rate	0.073 L/min ¹
Site location	Bullocks Hill Laydown
Duration	65 hours
Production bore	PB10 – screened from 210 – 230 mBGL ²
Observation bores	MB13A – distance of 11.8 m from PB10, screened from 50 – 59 mBGL MB13B – distance of 12.5 m from PB10, screened from 180 – 189 mBGL BH3102 – distance of 18 m from PB10, screened from 82 – 88 mBGL
Initial water levels	PB10 – 3.64 mBGL measured on 10 December 2018 MB13A – 6.75 mBGL measured on 10 December 2018 MB13B – 3.79 mBGL measured on 10 December 2018 BH3102 – 23.78 mBGL measured on 10 December 2018

Notes:

1. L/min = litres per minute; and
2. mBGL = metres below ground level.



KEY

- Production bore
- Monitoring bore
- Contour (10 m)

PB10 pumping test

Snowy 2.0
PB10 pumping test
Figure 1



2 Conceptualisation and assumptions

A 2-dimensional conceptualised cross-section model for the PB10 site is shown in Figure 2 with the following details:

- The groundwater pumping/monitoring set-up at the PB10 site consisted of one production bore (PB10) and three monitoring bores (MB13A, MB13B and BH3102).
- The monitoring bores were located approximately 11.8 to 18 m away from PB10.
- The production bore, PB10, is open hole from 210 to 230 mBGL; and
- The monitoring bores, MB13A, MB13B and BH3102 were screened from 50 to 59 mBGL, 180 to 189 mBGL and 82 to 88 mBGL respectively.

Two analytical methods were used to estimate aquifer properties including:

1. AqteSolv: industry leading software for analysing aquifer tests using a variety of aquifer types and solutions.
2. MLU: a multi-layered model used to analyse aquifer test data and design wellfields based on the Stehfest's numerical method, superposition principles, and the Levenberg-Marquardt algorithm for parameter optimisation.

The following additional assumptions were used to facilitate analysis:

- aquifers and aquitards are infinite in extent;
- aquifers are homogeneous and uniform in thickness;
- aquitards have a uniform vertical hydraulic conductivity;
- flow in aquitards are vertical;
- flow to the well is horizontal;
- for the AqteSolv and MLU solutions, the aquifer is conceptualised as one thick aquifer only;
- the initial water table at PB10 was approximately measured at 3.64 mBGL; and
- the aquifer thickness assumed when modelling was 185 m (ie the water table minus the base of the screened interval for PB10).

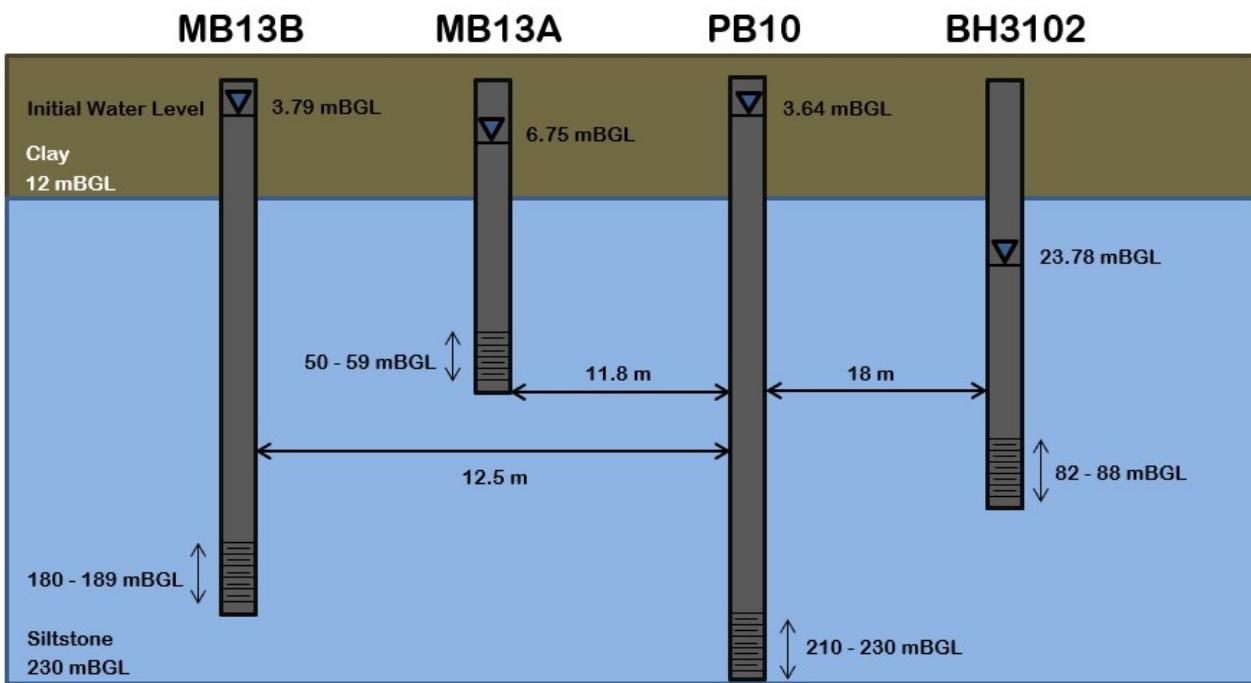


Figure 2 Cross-section of the PB10 pumping test setup near Bullocks and Zinc Ridge

3 Analysis

Figure 3 summarises water level data obtained from each bore throughout the pumping test and shows that while the water level in PB10 and MB13B decreases, the water level in MB13A and BH3102 increases. This suggests that either recharge due to rainfall is occurring in MB13A and BH3102, or they are recovering from prior drawdown effects. Nearby weather stations in Cabramurra and Adaminaby show rainfall of 10-20 mm occurred on most days throughout the pumping test. As no previous data is available to allow these results to be adjusted, only data collected from PB10 and MB13B was considered in the analysis.

The water level data obtained from PB10 and MB13B was analysed using both MLU and AqteSolv. A summary of the results found from these analyses is shown in Table 3.1. A brief discussion of these results is provided in Section 4.

Table 3.1 PB10 pumping test AqteSolv and MLU analysis

Analysis Method	Solution Type	Aquifer Type	K_h (m/d) ¹	S [-]
MLU	Hybrid	Confined	8.0e-6	5.0e-5
AqteSolv	Barker	Confined	6.4e-6	1.1e-6

Notes: 1. m/d = metres per day.

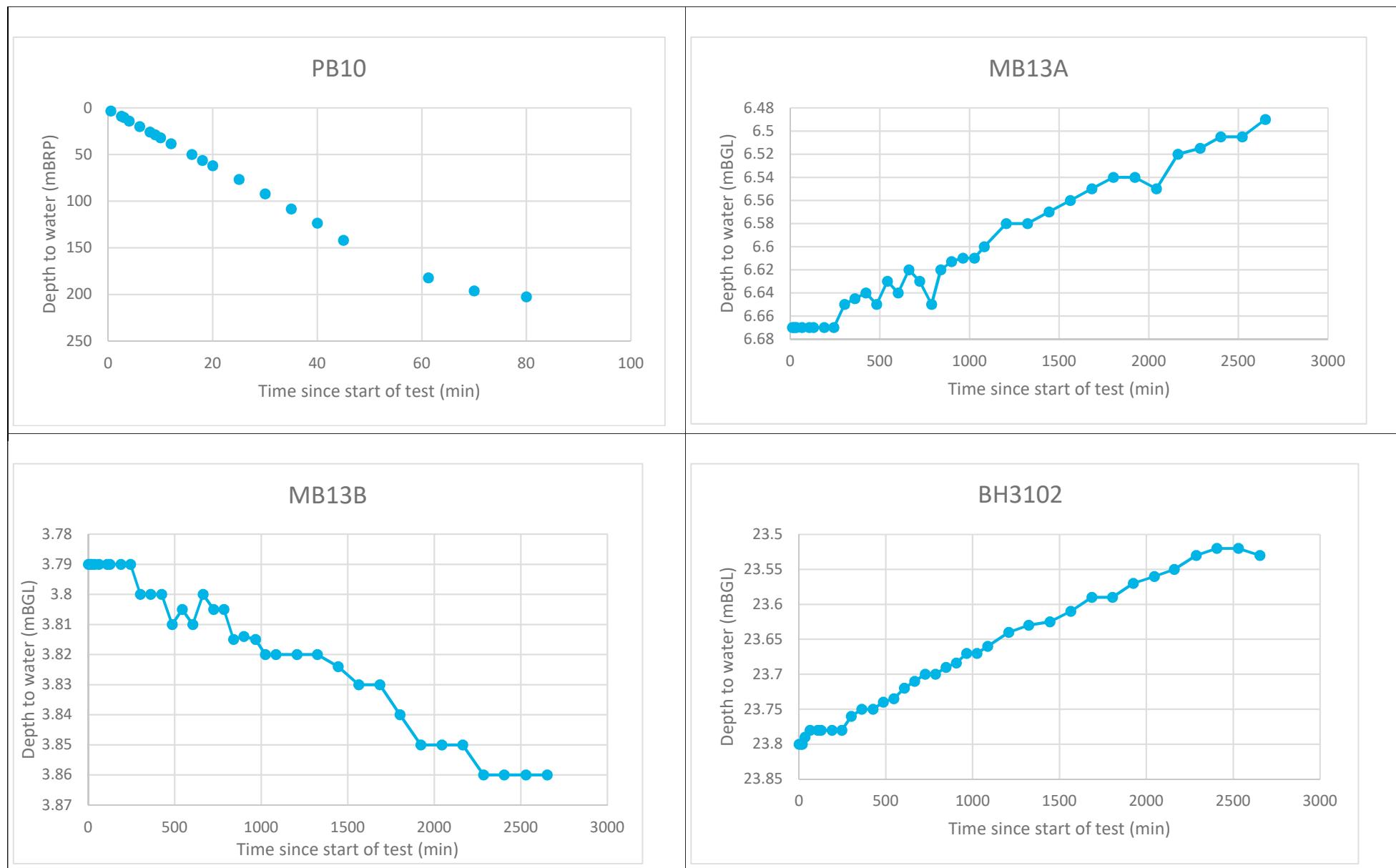


Figure 3 Manually collected water level data obtained from each bore

4 Discussion

The AqteSolv analysis of the water level data collected from PB10 and MB13B is shown in Figure 4, while the MLU analysis is shown in Figure 5. These models match the trend of the early PB10 data well, but slightly overestimate the amount of displacement. Both models underestimate the recharge rate, suggesting that the modelled hydraulic conductivity values may be lower than actual values. The MB13B data is roughly matched in both solutions, with a better fit being seen from the AqteSolv model.

The horizontal hydraulic conductivity was found to be similar in both the MLU and AqteSolv analyses, with values of 8×10^{-6} and 6.4×10^{-6} m/d modelled respectively. This falls within the hydraulic conductivity range suggested by Domenico & Schwartz (1990) for siltstone: 8.64×10^{-7} to 0.0012 m/d. The storativity values estimated from both models were quite different. A storativity of $5.0\text{e-}5$ was found using the MLU model, while the AqteSolv model found a value of 1.1×10^{-6} .

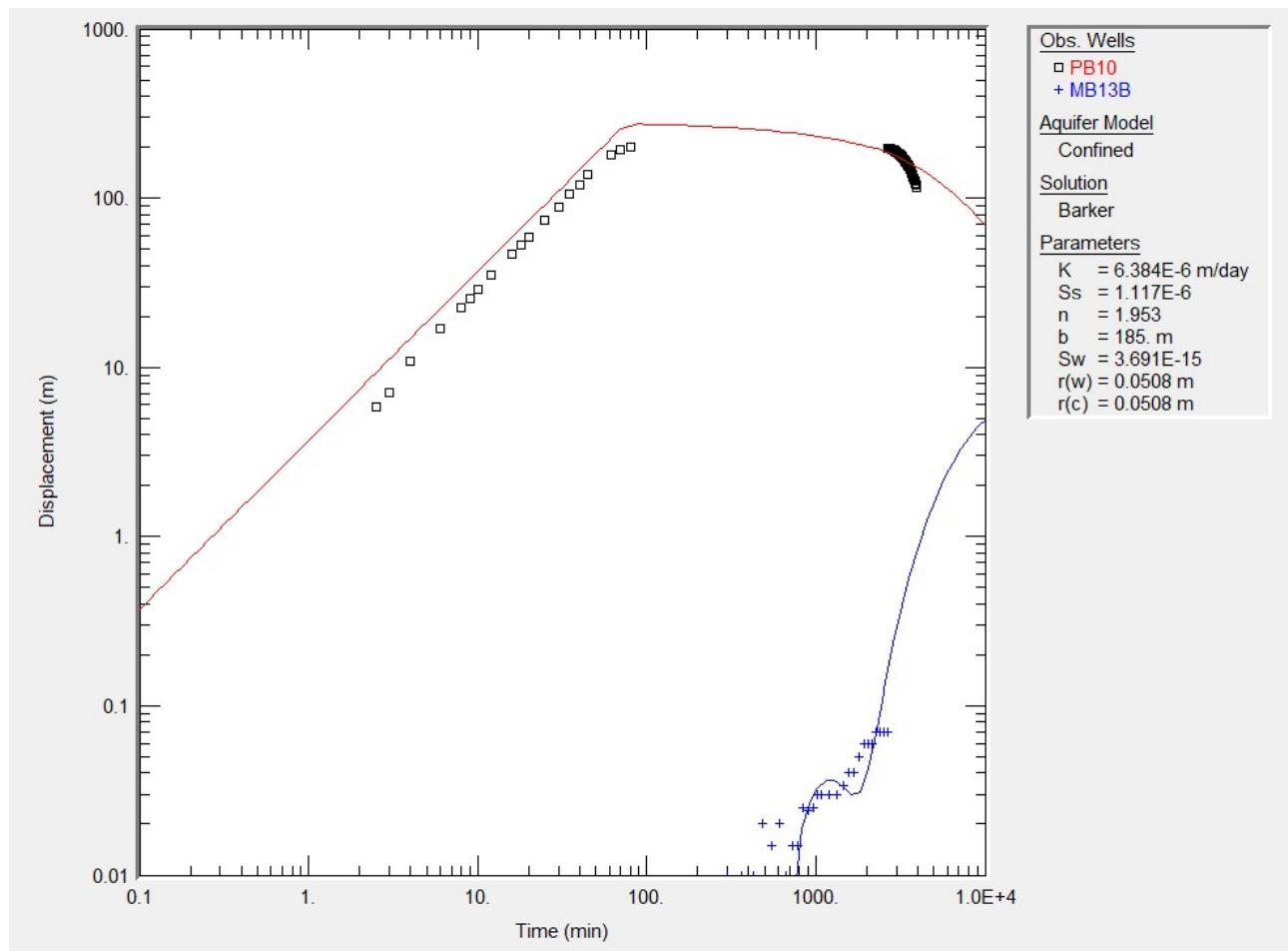


Figure 4 Pumping test analysis of PB10 and MB13B data using the AqteSolv Barker confined aquifer model

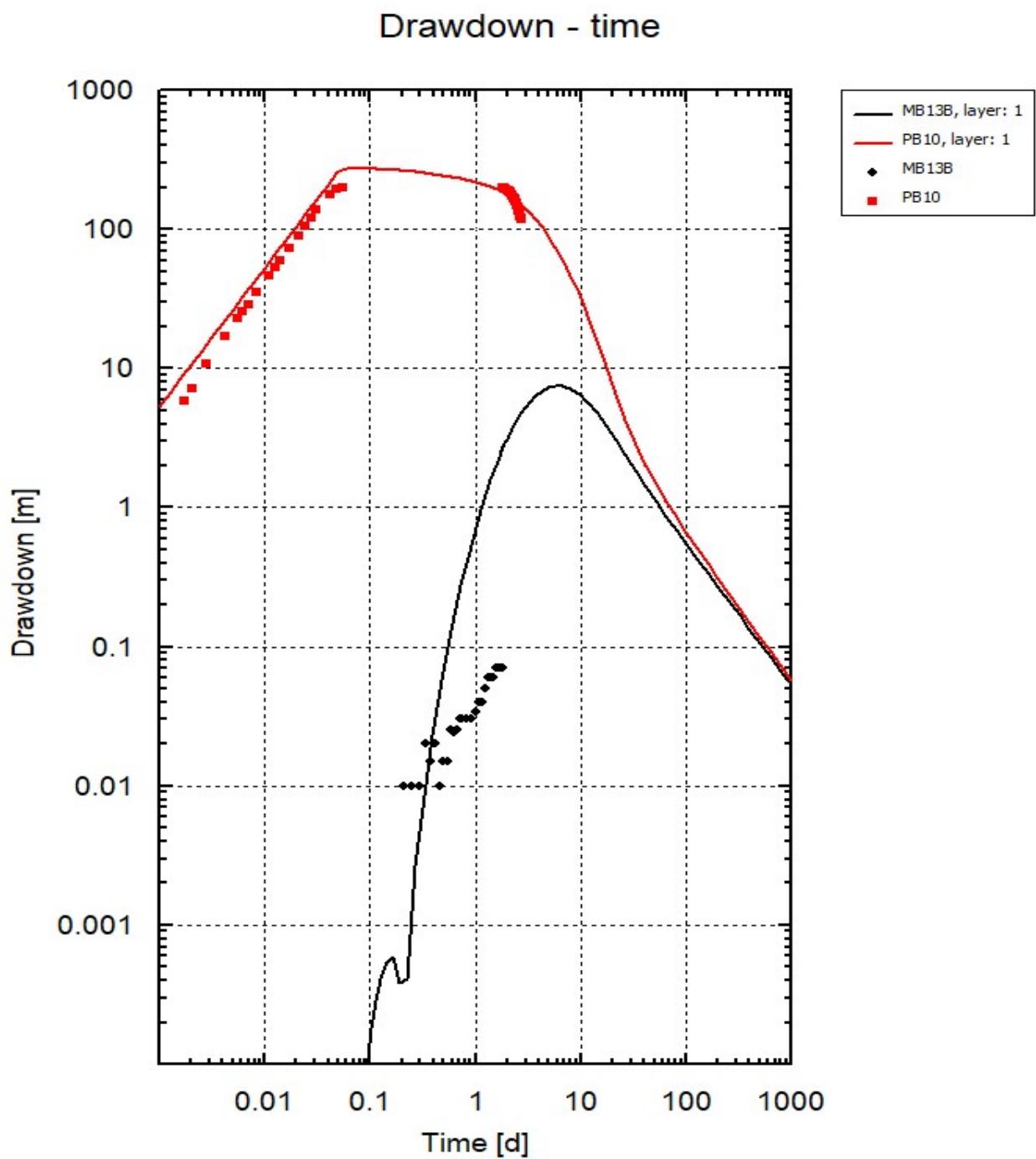


Figure 5 Pumping test analysis of PB10 and MB13B data using MLU

Yours sincerely,



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Sean Cassidy – Review

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References

Domenico, P.A. and F.W. Schwartz, 1990. *Physical and Chemical Hydrogeology*, John Wiley & Sons, New York, 824 p.

Appendix E

Hydrographs

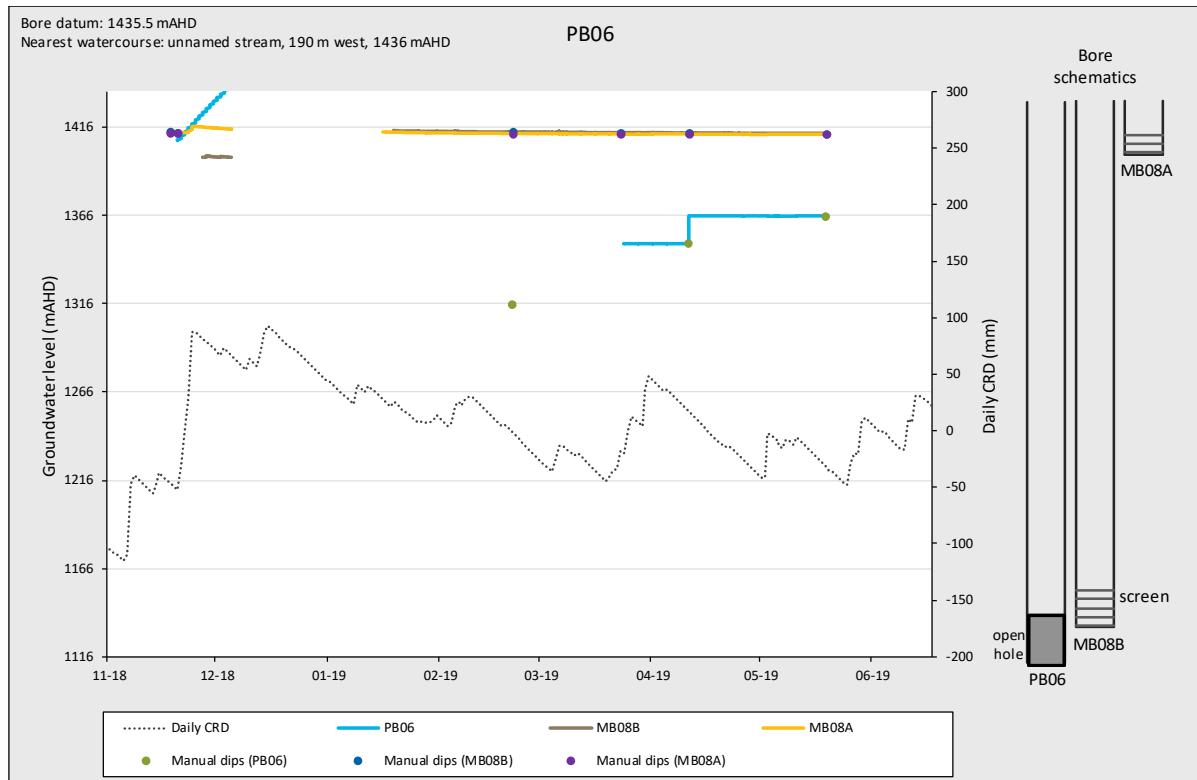


Figure E.1 Zinc Ridge test production and monitoring bore hydrographs

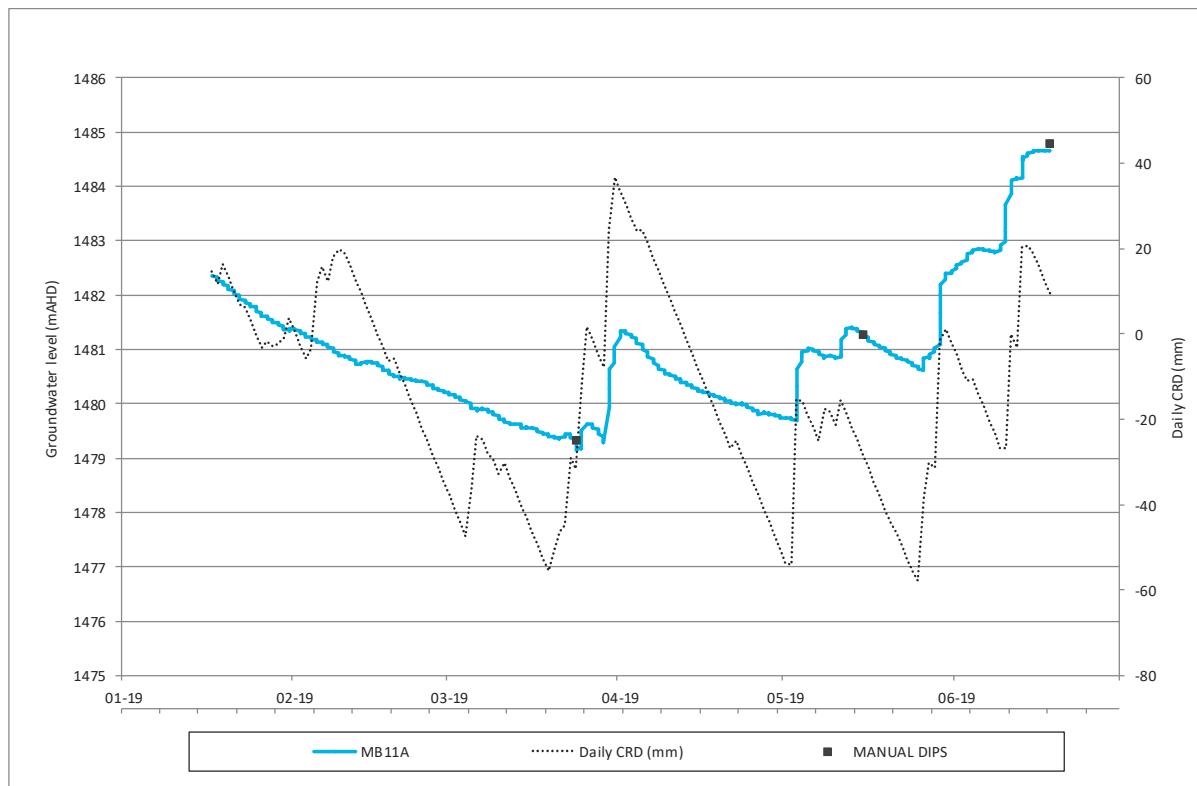


Figure E.2 Shallow monitoring bore MB11A hydrograph

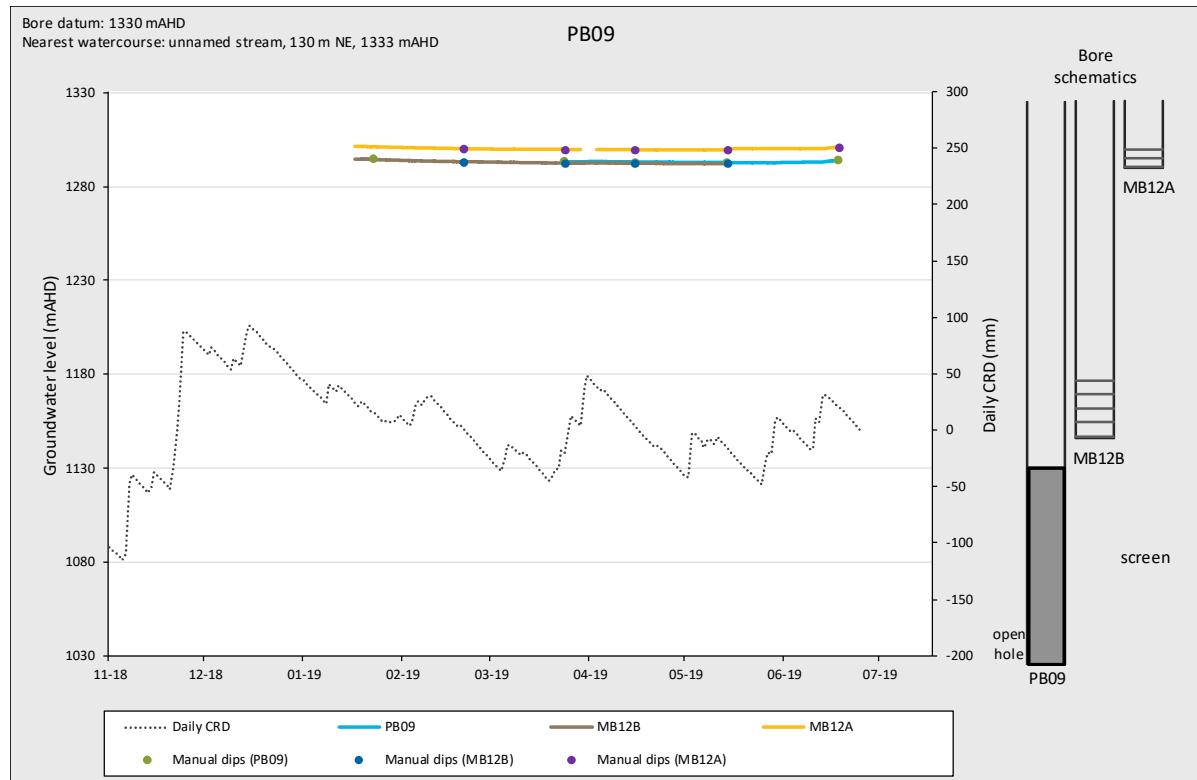


Figure E.3 Ravine East test production and monitoring bore hydrographs

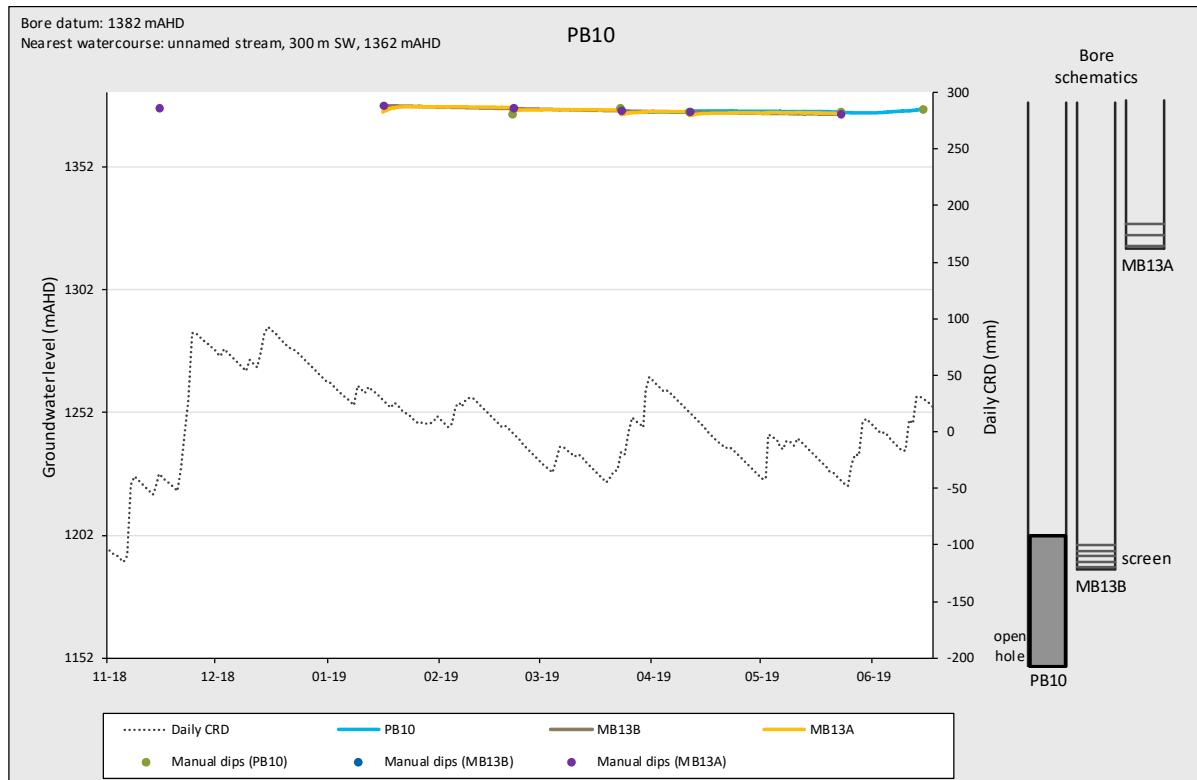


Figure E.4 Bullocks Hill test production and monitoring bore hydrographs

Appendix F

Groundwater sampling laboratory certificates

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		MB01C	MB07A	MB08A	MB12A	MB13B
Compound	CAS Number	LOR	Unit	24-Mar-2019 17:35	22-Mar-2019 08:20	23-Mar-2019 12:15	24-Mar-2019 13:20	23-Mar-2019 15:20
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	146	74	1500	93	1610
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	69	16	52	80	166
Total Alkalinity as CaCO ₃	----	1	mg/L	69	16	52	80	166
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	5	11	5	<1	798
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	<1	<1	<1	49
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	16	6	10	14	54
Magnesium	7439-95-4	1	mg/L	6	3	4	8	7
Sodium	7440-23-5	1	mg/L	8	3	8	2	348
Potassium	7440-09-7	1	mg/L	1	<1	3	<1	4
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	----	1	mg/L	65	27	41	68	164
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.04	<0.01	0.06
Arsenic	7440-38-2	0.001	mg/L	0.008	<0.001	0.001	<0.001	0.043
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	0.13
Barium	7440-39-3	0.001	mg/L	0.008	0.002	0.147	0.038	0.116
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	0.002	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.005	0.006	0.004	0.042	0.003
Manganese	7439-96-5	0.001	mg/L	0.053	<0.001	0.372	0.228	0.167
Nickel	7440-02-0	0.001	mg/L	0.002	<0.001	0.001	0.016	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.007	<0.005	0.006	0.018	<0.005
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		MB01C	MB07A	MB08A	MB12A	MB13B
Compound	CAS Number	LOR	Unit	24-Mar-2019 17:35	22-Mar-2019 08:20	23-Mar-2019 12:15	24-Mar-2019 13:20	23-Mar-2019 15:20
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	0.09	1.55
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.1	<0.1	0.4
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	<0.01	<0.01	0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.15	<0.01	0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.02	0.15	<0.01	0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	<0.1	<0.1	6.4	0.2	0.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	<0.1	0.2	6.4	0.2	0.2
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	0.02	0.04	13.8	0.06	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	0.02	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	1.48	0.55	1.14	1.60	21.3
Total Cations	---	0.01	meq/L	1.66	0.68	1.25	1.44	18.5
Ionic Balance	---	0.01	%	----	----	----	----	7.04
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	<1	<1	<10	2	70

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		TMB02A	TMB04	PB09	QA2	---
		Client sampling date / time		24-Mar-2019 15:55	24-Mar-2019 11:20	24-Mar-2019 14:30	22-Mar-2019 08:20	---
Compound	CAS Number	LOR	Unit	ES1909271-019	ES1909271-020	ES1909271-021	ES1909271-023	-----
				Result	Result	Result	Result	---
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	---	10	mg/L	46	56	130	75	---
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	---
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	---
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	15	28	70	16	---
Total Alkalinity as CaCO ₃	---	1	mg/L	15	28	70	16	---
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	2	2	<1	14	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	<1	<1	<1	---
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	5	10	14	6	---
Magnesium	7439-95-4	1	mg/L	<1	<1	7	3	---
Sodium	7440-23-5	1	mg/L	2	3	6	3	---
Potassium	7440-09-7	1	mg/L	<1	<1	2	<1	---
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	---	1	mg/L	12	25	64	27	---
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.02	<0.01	<0.01	---
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	---
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.09	<0.05	---
Barium	7440-39-3	0.001	mg/L	0.014	0.004	0.029	0.002	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	---
Chromium	7440-47-3	0.001	mg/L	<0.001	0.002	<0.001	<0.001	---
Copper	7440-50-8	0.001	mg/L	0.013	0.003	<0.001	0.006	---
Manganese	7439-96-5	0.001	mg/L	0.002	<0.001	0.433	0.001	---
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.006	<0.001	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	---
Zinc	7440-66-6	0.005	mg/L	<0.005	0.006	<0.005	<0.005	---
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	---

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		TMB02A	TMB04	PB09	QA2	---
		Client sampling date / time		24-Mar-2019 15:55	24-Mar-2019 11:20	24-Mar-2019 14:30	22-Mar-2019 08:20	---
Compound	CAS Number	LOR	Unit	ES1909271-019	ES1909271-020	ES1909271-021	ES1909271-023	-----
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	25.8	<0.05	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	---
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	---
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	---
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.07	0.02	0.16	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.02	0.07	0.02	0.16	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	<0.1	<0.1	<0.1	0.2	---
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	0.06	0.02	<0.01	0.04	---
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	0.02	---
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	0.34	0.60	1.40	0.61	---
Total Cations	---	0.01	meq/L	0.34	0.63	1.59	0.68	---
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	1	<1	2	<1	---

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MB11A	MB07B	MB08B	TanN_SW_001	MB12B
Compound	CAS Number	LOR	Unit	Client sampling date / time	24-Mar-2019 00:00	22-Mar-2019 00:00	23-Mar-2019 00:00	25-Mar-2019 11:57	24-Mar-2019 00:00
					Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	---	10	mg/L	---	373	---	---	---	---
Total Dissolved Solids @180°C	---	10	mg/L	72	---	193	34	414	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	---	5	mg/L	---	---	---	77	---	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	---	---	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	---	---	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	25	51	98	---	---	183
Total Alkalinity as CaCO ₃	---	1	mg/L	25	51	98	---	---	183
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA									
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	14	206	32	---	---	86
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	<1	3	<1	---	---	6
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	2	67	18	---	---	46
Magnesium	7439-95-4	1	mg/L	2	8	10	---	---	9
Sodium	7440-23-5	1	mg/L	16	33	36	---	---	73
Potassium	7440-09-7	1	mg/L	<1	3	4	---	---	<1
ED093F: SAR and Hardness Calculations									
Total Hardness as CaCO ₃	---	1	mg/L	13	200	86	<1	---	152
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.01	0.02	0.38	---	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.002	<0.001	0.008	<0.001	---	0.004
Boron	7440-42-8	0.05	mg/L	0.18	0.06	<0.05	<0.05	---	<0.05
Barium	7440-39-3	0.001	mg/L	0.008	0.100	0.508	0.027	---	0.053
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	---	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	---	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	0.001	---	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	---	<0.001
Copper	7440-50-8	0.001	mg/L	0.001	<0.001	<0.001	0.381	---	<0.001
Manganese	7439-96-5	0.001	mg/L	0.314	0.179	0.145	0.065	---	0.065
Nickel	7440-02-0	0.001	mg/L	0.003	<0.001	<0.001	0.001	---	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	---	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	---	<0.01

Analytical Results

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	MB11A	MB07B	MB08B	TanN_SW_001	MB12B
			Client sampling date / time	24-Mar-2019 00:00	22-Mar-2019 00:00	23-Mar-2019 00:00	25-Mar-2019 11:57	24-Mar-2019 00:00
Compound	CAS Number	LOR	Unit	ES1909670-001	ES1909670-003	ES1909670-004	ES1909670-005	ES1909670-007
EP005: Total Organic Carbon (TOC) - Continued								
Total Organic Carbon	---	1	mg/L	2	3	3	7	8

Analytical Results

Client sample ID				MB13A	MB01B	---	---	---	---
Compound	CAS Number	LOR	Unit	23-Mar-2019 00:00	24-Mar-2019 00:00	----	----	----	----
				Result	Result	---	---	---	---
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	---	10	mg/L	176	100	---	---	---	---
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	---	---	---	---
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	---	---	---	---
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	110	53	---	---	---	---
Total Alkalinity as CaCO ₃	---	1	mg/L	110	53	---	---	---	---
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA									
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	<1	13	---	---	---	---
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	<1	<1	---	---	---	---
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	25	20	---	---	---	---
Magnesium	7439-95-4	1	mg/L	6	2	---	---	---	---
Sodium	7440-23-5	1	mg/L	20	2	---	---	---	---
Potassium	7440-09-7	1	mg/L	9	3	---	---	---	---
ED093F: SAR and Hardness Calculations									
Total Hardness as CaCO ₃	---	1	mg/L	87	58	---	---	---	---
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.03	0.01	---	---	---	---
Arsenic	7440-38-2	0.001	mg/L	0.030	<0.001	---	---	---	---
Boron	7440-42-8	0.05	mg/L	0.06	<0.05	---	---	---	---
Barium	7440-39-3	0.001	mg/L	0.147	0.040	---	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	---	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	---	---	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	---	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	---	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	0.013	---	---	---	---
Manganese	7439-96-5	0.001	mg/L	0.032	0.014	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	---	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	---	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	---	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	---	---	---	---
Zinc	7440-66-6	0.005	mg/L	0.006	<0.005	---	---	---	---
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	---	---	---	---

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		MB13A	MB01B	---	---	---
Compound	CAS Number	LOR	Unit	23-Mar-2019 00:00	24-Mar-2019 00:00	---	---	---
				Result	Result	---	---	---
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	0.13	<0.05	---	---	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	---	---	---
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	---	---	---
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	<0.1	---	---	---
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.01	---	---	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	---	---	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.24	---	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.02	0.24	---	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	0.2	0.2	---	---	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	0.2	0.4	---	---	---
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	0.03	0.51	---	---	---
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.01	---	---	---
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	2.20	1.33	---	---	---
Total Cations	---	0.01	meq/L	2.84	1.33	---	---	---
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	18	4	---	---	---

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		MB08A	MB08B	MB13A	MB13B	TMB04
Compound	CAS Number	LOR	Unit	11-Apr-2019 11:00	11-Apr-2019 10:20	11-Apr-2019 13:45	11-Apr-2019 14:40	11-Apr-2019 16:50
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	2540	186	217	1540	38
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	52	107	114	176	30
Total Alkalinity as CaCO ₃	----	1	mg/L	52	107	114	176	30
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	<1	37	<1	721	2
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	3	4	51	<1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	10	18	26	62	10
Magnesium	7439-95-4	1	mg/L	5	10	6	5	<1
Sodium	7440-23-5	1	mg/L	8	34	20	398	3
Potassium	7440-09-7	1	mg/L	3	4	9	4	<1
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	----	1	mg/L	46	86	90	175	25
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.58	0.01	0.02	0.01	0.03
Arsenic	7440-38-2	0.001	mg/L	0.001	0.007	0.030	0.049	<0.001
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	0.10	<0.05
Barium	7440-39-3	0.001	mg/L	0.175	0.533	0.151	0.026	0.004
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	0.001	<0.001	0.001	<0.001	0.002
Copper	7440-50-8	0.001	mg/L	0.005	<0.001	0.001	0.001	0.003
Manganese	7439-96-5	0.001	mg/L	0.388	0.156	0.032	0.166	0.002
Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	0.002	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.008	<0.005	0.005	0.008	0.007
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		MB08A	MB08B	MB13A	MB13B	TMB04
Compound	CAS Number	LOR	Unit	11-Apr-2019 11:00	11-Apr-2019 10:20	11-Apr-2019 13:45	11-Apr-2019 14:40	11-Apr-2019 16:50
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	0.57	0.11	0.22	1.60	<0.05
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.4	0.4	0.4	<0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.01	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.02
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.01	<0.01	<0.01	0.05
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.02	0.01	<0.01	<0.01	0.07
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	6.0	<0.1	0.2	0.2	<0.1
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	6.0	<0.1	0.2	0.2	<0.1
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	15.2	0.02	0.07	<0.01	0.01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.02	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	1.04	2.99	2.39	20.0	0.64
Total Cations	---	0.01	meq/L	1.34	3.30	2.89	20.9	0.63
Ionic Balance	---	0.01	%	----	4.92	----	2.33	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	<1	2	18	56	<1

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		PB10	QA2	---	---	---
		Client sampling date / time		11-Apr-2019 14:30	11-Apr-2019 13:45	---	---	---
Compound	CAS Number	LOR	Unit	ES1911549-025	ES1911549-027	-----	-----	-----
				Result	Result	---	---	---
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	---	10	mg/L	946	220	---	---	---
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	516	<1	---	---	---
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	98	<1	---	---	---
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	<1	113	---	---	---
Total Alkalinity as CaCO ₃	---	1	mg/L	615	113	---	---	---
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	46	<1	---	---	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	4	---	---	---
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	220	26	---	---	---
Magnesium	7439-95-4	1	mg/L	<1	6	---	---	---
Sodium	7440-23-5	1	mg/L	98	20	---	---	---
Potassium	7440-09-7	1	mg/L	27	9	---	---	---
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	---	1	mg/L	549	90	---	---	---
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.31	0.02	---	---	---
Arsenic	7440-38-2	0.001	mg/L	0.002	0.030	---	---	---
Boron	7440-42-8	0.05	mg/L	0.09	<0.05	---	---	---
Barium	7440-39-3	0.001	mg/L	0.684	0.149	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	---	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	---	---	---
Copper	7440-50-8	0.001	mg/L	0.003	<0.001	---	---	---
Manganese	7439-96-5	0.001	mg/L	<0.001	0.033	---	---	---
Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	---	---	---
Zinc	7440-66-6	0.005	mg/L	0.006	<0.005	---	---	---
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	---	---	---

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		PB10	QA2	---	---	---	---
		Client sampling date / time		11-Apr-2019 14:30	11-Apr-2019 13:45	---	---	---	---
Compound	CAS Number	LOR	Unit	ES1911549-025	ES1911549-027	-----	-----	-----	-----
				Result		---	---	---	---
EG020F: Dissolved Metals by ICP-MS - Continued									
Iron	7439-89-6	0.05	mg/L	0.24	0.21	---	---	---	---
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	---	---	---	---
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	---	---	---	---
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	---	---	---	---
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.07	<0.01	---	---	---	---
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	---	---	---	---
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.03	0.05	---	---	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	---	0.01	mg/L	0.03	0.05	---	---	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	0.4	0.2	---	---	---	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	---	0.1	mg/L	0.4	0.2	---	---	---	---
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	---	0.01	mg/L	<0.01	0.08	---	---	---	---
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	---	---	---	---
EN055: Ionic Balance									
Total Anions	---	0.01	meq/L	13.4	2.37	---	---	---	---
Total Cations	---	0.01	meq/L	15.9	2.89	---	---	---	---
Ionic Balance	---	0.01	%	8.78	---	---	---	---	---
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	---	1	mg/L	69	18	---	---	---	---

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		MB11A	MB12A	MB12B	TMB01A	TMB01B
Compound	CAS Number	LOR	Unit	15-Apr-2019 13:10	15-Apr-2019 09:15	15-Apr-2019 11:00	13-Apr-2019 13:30	13-Apr-2019 14:18
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	60	70	396	104	1510
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	26	63	188	65	1010
Total Alkalinity as CaCO ₃	----	1	mg/L	26	63	188	65	1010
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	19	4	89	7	4
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1	1	9	3	205
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	2	14	46	6	23
Magnesium	7439-95-4	1	mg/L	2	8	10	2	20
Sodium	7440-23-5	1	mg/L	13	2	76	26	559
Potassium	7440-09-7	1	mg/L	<1	<1	<1	1	13
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	----	1	mg/L	13	68	156	23	140
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	0.04	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	0.004	<0.001	0.042
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	0.11	1.59
Barium	7440-39-3	0.001	mg/L	0.004	0.041	0.058	0.546	9.24
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.001	<0.001	<0.001	0.002
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.008	0.091	<0.001	0.002	<0.001
Manganese	7439-96-5	0.001	mg/L	0.244	0.156	0.074	0.019	0.153
Nickel	7440-02-0	0.001	mg/L	0.003	0.016	<0.001	<0.001	0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	0.006	0.027	<0.005	<0.005	0.006
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		MB11A	MB12A	MB12B	TMB01A	TMB01B
Compound	CAS Number	LOR	Unit	15-Apr-2019 13:10	15-Apr-2019 09:15	15-Apr-2019 11:00	13-Apr-2019 13:30	13-Apr-2019 14:18
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	0.12	0.11	<0.05	<0.05	0.22
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.1	1.2	4.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.21
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.02	<0.01	<0.01	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	0.1	0.1	<0.1	<0.1	0.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	0.1	0.1	<0.1	<0.1	0.2
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	0.03	0.15	<0.01	0.05	0.06
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.06
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	0.94	1.37	5.86	1.53	26.0
Total Cations	---	0.01	meq/L	0.83	1.44	6.42	1.62	27.4
Ionic Balance	---	0.01	%	----	----	4.57	----	2.61
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	1	<1	6	<1	<1

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		TMB05A	TMB05B	PB09	QA6	EWPB3
Compound	CAS Number	LOR	Unit	13-Apr-2019 11:30	13-Apr-2019 11:00	15-Apr-2019 10:45	16-Apr-2019 12:50	16-Apr-2019 15:30
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	300	434	112	95	876
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	43	<1	<1	43
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	238	280	78	63	399
Total Alkalinity as CaCO ₃	----	1	mg/L	238	323	78	63	443
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	9	7	4	6	4
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	6	13	1	2	191
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	22	4	16	18	32
Magnesium	7439-95-4	1	mg/L	12	4	9	4	22
Sodium	7440-23-5	1	mg/L	75	154	6	6	261
Potassium	7440-09-7	1	mg/L	5	5	2	2	7
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	----	1	mg/L	104	26	77	61	170
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.04	<0.01	0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	<0.001	0.003	0.007
Boron	7440-42-8	0.05	mg/L	0.33	0.80	<0.05	<0.05	0.88
Barium	7440-39-3	0.001	mg/L	0.458	0.289	0.034	0.023	6.42
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.075	0.006	0.411	0.197	0.094
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	0.003
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.005	<0.005	0.007
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)		Client sample ID		TMB05A	TMB05B	PB09	QA6	EWPB3
Compound	CAS Number	LOR	Unit	13-Apr-2019 11:30	13-Apr-2019 11:00	15-Apr-2019 10:45	16-Apr-2019 12:50	16-Apr-2019 15:30
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	0.22	<0.05	30.0	0.55	<0.05
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.2	1.9	<0.1	0.2	2.6
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.23	0.22	<0.01	<0.01	0.08
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.02	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	<0.01	<0.01	<0.01	0.02	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	0.2	0.2	<0.1	<0.1	<0.1
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	0.2	0.2	<0.1	<0.1	<0.1
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	<0.01	0.02	<0.01	<0.01	0.04
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.02	<0.01	<0.01	0.02
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	5.11	6.97	1.67	1.44	14.3
Total Cations	---	0.01	meq/L	5.48	7.36	1.85	1.54	14.9
Ionic Balance	---	0.01	%	3.44	2.72	----	----	2.11
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	<1	<1	1	<1	<1

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		TMB02B	PL_SW_006	MB11A	MB12A	MB12B
Compound	CAS Number	LOR	Unit	20-Feb-2019 09:20	20-Feb-2019 09:30	20-Feb-2019 10:30	20-Feb-2019 11:30	20-Feb-2019 12:30
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	---	10	mg/L	93	49	80	98	452
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	---	5	mg/L	---	<5	---	---	---
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	---	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	---	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	73	---	27	64	200
Total Alkalinity as CaCO ₃	---	1	mg/L	73	---	27	64	200
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	<1	---	22	<1	139
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	---	<1	<1	13
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	18	---	2	14	47
Magnesium	7439-95-4	1	mg/L	2	---	2	8	9
Sodium	7440-23-5	1	mg/L	8	---	16	2	87
Potassium	7440-09-7	1	mg/L	<1	---	<1	<1	<1
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	---	1	mg/L	53	12	13	68	154
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.02	<0.01	0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.002	<0.001	<0.001	<0.001	0.005
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	7440-39-3	0.001	mg/L	0.024	0.003	0.002	0.045	0.054
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	0.004	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.002	<0.001	0.004	0.002	<0.001
Manganese	7439-96-5	0.001	mg/L	<0.001	0.004	0.284	0.668	0.131
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.003	0.034	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		TMB02B	PL_SW_006	MB11A	MB12A	MB12B
Compound	CAS Number	LOR	Unit	20-Feb-2019 09:20	20-Feb-2019 09:30	20-Feb-2019 10:30	20-Feb-2019 11:30	20-Feb-2019 12:30
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.007	0.028	<0.005
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	0.06	<0.05
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	---	<0.1	<0.1	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	<0.01	<0.01	0.03	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.01	0.01	0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.01	0.01	0.01	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	<0.1	<0.1	<0.1	1.8	0.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	<0.1	<0.1	<0.1	1.8	0.2
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	<0.01	<0.01	0.02	0.62	0.02
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.01
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	1.46	---	1.00	1.28	7.26
Total Cations	---	0.01	meq/L	1.41	---	0.96	1.44	6.87
Ionic Balance	---	0.01	%	---	---	---	---	2.74
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	---	1	mg/L	---	<1	---	---	---
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	<1	<1	1	1	7

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		TMB04	PL_SW_001	PL_SW_008	PL_SW_009	MB08B
Compound	CAS Number	LOR	Unit	21-Feb-2019 08:45	21-Feb-2019 09:30	21-Feb-2019 12:15	21-Feb-2019 10:30	21-Feb-2019 14:30
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	---	10	mg/L	60	42	45	60	216
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	---	5	mg/L	---	<5	25	<5	---
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	---	---	---	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	---	---	---	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	34	---	---	---	108
Total Alkalinity as CaCO ₃	---	1	mg/L	34	---	---	---	108
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	3	---	---	---	33
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	---	---	---	3
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	10	---	---	---	17
Magnesium	7439-95-4	1	mg/L	<1	---	---	---	10
Sodium	7440-23-5	1	mg/L	3	---	---	---	34
Potassium	7440-09-7	1	mg/L	<1	---	---	---	5
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	---	1	mg/L	25	12	5	12	84
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.02	0.01	0.04	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	0.012
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	7440-39-3	0.001	mg/L	0.001	0.004	0.002	0.005	0.448
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.001	0.002	0.002	0.003	0.121
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		TMB04	PL_SW_001	PL_SW_008	PL_SW_009	MB08B
Compound	CAS Number	LOR	Unit	21-Feb-2019 08:45	21-Feb-2019 09:30	21-Feb-2019 12:15	21-Feb-2019 10:30	21-Feb-2019 14:30
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	0.008
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	0.10	0.18
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	---	---	---	0.4
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.02	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.04	0.01	0.04	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.04	0.01	0.04	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	<0.1	<0.1	0.3	<0.1	<0.1
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	<0.1	<0.1	0.3	<0.1	<0.1
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	0.06	<0.01	0.06	<0.01	0.02
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	<0.01	<0.01	<0.01	0.02
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	0.74	---	---	---	2.93
Total Cations	---	0.01	meq/L	0.63	---	---	---	3.28
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	---	1	mg/L	---	<1	<1	1	---
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	<1	<1	2	1	2

Analytical Results

Client sample ID				MB13A	MB13B	---	---	---
Compound	CAS Number	LOR	Unit	21-Feb-2019 16:30	21-Feb-2019 16:30	----	----	----
				Result	Result	---	---	---
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	---	10	mg/L	174	1350	---	---	---
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	---	---	---
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	---	---	---
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	123	148	---	---	---
Total Alkalinity as CaCO ₃	---	1	mg/L	123	148	---	---	---
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	<1	720	---	---	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	49	---	---	---
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	24	58	---	---	---
Magnesium	7439-95-4	1	mg/L	5	5	---	---	---
Sodium	7440-23-5	1	mg/L	19	372	---	---	---
Potassium	7440-09-7	1	mg/L	10	4	---	---	---
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	---	1	mg/L	80	165	---	---	---
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.03	0.07	---	---	---
Arsenic	7440-38-2	0.001	mg/L	0.026	0.046	---	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	0.08	---	---	---
Barium	7440-39-3	0.001	mg/L	0.092	0.025	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	---	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	---	---	---
Copper	7440-50-8	0.001	mg/L	<0.001	0.001	---	---	---
Manganese	7439-96-5	0.001	mg/L	0.029	0.221	---	---	---
Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	---	---	---
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	---	---	---
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	---	---	---

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		MB13A	MB13B	---	---	---
		Client sampling date / time		21-Feb-2019 16:30	21-Feb-2019 16:30	---	---	---
Compound	CAS Number	LOR	Unit	ES1905837-031	ES1905837-032	-----	-----	-----
				Result	Result	---	---	---
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	0.07	4.34	---	---	---
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	---	---	---
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	---	---	---
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.5	0.5	---	---	---
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.06	---	---	---
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	---	---	---
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	---	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	<0.01	<0.01	---	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	0.4	0.2	---	---	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	0.4	0.2	---	---	---
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	0.19	0.03	---	---	---
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	---	---	---
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	2.57	19.3	---	---	---
Total Cations	---	0.01	meq/L	2.69	19.6	---	---	---
Ionic Balance	---	0.01	%	---	0.66	---	---	---
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	13	59	---	---	---

Analytical Results

Client sample ID				MB04B	PN_SW_002	PN_SW_001	QA3	PB09
Compound	CAS Number	LOR	Unit	ES1902875-031	ES1902875-032	ES1902875-033	ES1902875-034	ES1902875-035
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	---	10	mg/L	472	20	50	37	109
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	---	5	mg/L	---	<5	<5	<5	---
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	---	---	---	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	---	---	---	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	143	---	---	---	88
Total Alkalinity as CaCO ₃	---	1	mg/L	143	---	---	---	88
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	95	---	---	---	2
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	45	---	---	---	1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	20	---	---	---	17
Magnesium	7439-95-4	1	mg/L	4	---	---	---	8
Sodium	7440-23-5	1	mg/L	112	---	---	---	9
Potassium	7440-09-7	1	mg/L	1	---	---	---	2
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	---	1	mg/L	66	9	22	24	75
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.07	0.08	0.04	0.05	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	7440-39-3	0.001	mg/L	0.036	0.014	0.022	0.022	0.033
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	0.110	0.009	0.004	0.004	0.380
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)	Client sample ID			MB04B	PN_SW_002	PN_SW_001	QA3	PB09
Compound	CAS Number	LOR	Unit	22-Jan-2019 09:30	22-Jan-2019 08:45	22-Jan-2019 08:30	22-Jan-2019 00:00	23-Jan-2019 00:00
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	0.07	0.18	0.09	0.09	4.14
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.5	---	---	---	<0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.01	<0.01	0.05	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.01	<0.01	0.05	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	0.2	0.1	<0.1	0.2	<0.1
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	0.2	0.1	<0.1	0.2	<0.1
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	0.09	0.01	<0.01	0.01	0.02
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	6.10	---	---	---	1.83
Total Cations	---	0.01	meq/L	6.22	---	---	---	1.95
Ionic Balance	---	0.01	%	0.97	---	---	---	---
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	---	1	mg/L	---	2	3	3	---
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	23	2	3	3	2

Analytical Results

Client sample ID				MB04B	PN_SW_002	PN_SW_001	QA3	PB09
Client sampling date / time				22-Jan-2019 09:30	22-Jan-2019 08:45	22-Jan-2019 08:30	22-Jan-2019 00:00	23-Jan-2019 00:00
Compound	CAS Number	LOR	Unit	ES1902875-031	ES1902875-032	ES1902875-033	ES1902875-034	ES1902875-035
EP033: C1 - C4 Hydrocarbon Gases								
Methane	74-82-8	10	µg/L	<10	---	---	---	80

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		MB13A	MB13B	BM08B	MB12A	MB12B
Compound	CAS Number	LOR	Unit	16-Jan-2019 00:00	16-Jan-2019 00:00	16-Jan-2019 00:00	17-Jan-2019 00:00	17-Jan-2019 00:00
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	184	1300	222	64	494
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	104	130	110	34	175
Total Alkalinity as CaCO ₃	----	1	mg/L	104	130	110	34	175
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	20	608	39	1	138
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	3	52	2	<1	18
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	23	56	16	6	49
Magnesium	7439-95-4	1	mg/L	5	5	10	3	8
Sodium	7440-23-5	1	mg/L	15	315	31	3	104
Potassium	7440-09-7	1	mg/L	9	3	6	<1	1
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	----	1	mg/L	78	160	81	27	155
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.06	0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	0.019	0.036	0.016	<0.001	0.008
Boron	7440-42-8	0.05	mg/L	<0.05	0.06	<0.05	<0.05	<0.05
Barium	7440-39-3	0.001	mg/L	0.046	0.026	0.329	0.019	0.065
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	0.003	<0.001
Manganese	7439-96-5	0.001	mg/L	0.030	0.193	0.057	0.272	0.168
Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	0.002	0.006	0.004
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	0.020	<0.005
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		MB13A	MB13B	BM08B	MB12A	MB12B
Compound	CAS Number	LOR	Unit	16-Jan-2019 00:00	16-Jan-2019 00:00	16-Jan-2019 00:00	17-Jan-2019 00:00	17-Jan-2019 00:00
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	0.11	2.13	<0.05	<0.05	0.06
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.4	<0.1	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	<0.01	<0.01	0.03	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.01	0.01	0.02	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	---	0.01	mg/L	0.02	0.01	0.01	0.02	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	<0.1	0.2	<0.1	1.0	0.4
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	---	0.1	mg/L	<0.1	0.2	<0.1	1.0	0.4
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	---	0.01	mg/L	0.34	0.06	0.03	0.42	0.03
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.02	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	2.58	16.7	3.07	0.70	6.88
Total Cations	---	0.01	meq/L	2.44	17.0	3.12	0.68	7.65
Ionic Balance	---	0.01	%	----	0.78	0.92	----	5.34
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	---	1	mg/L	11	68	3	2	11
EP033: C1 - C4 Hydrocarbon Gases								
Methane	74-82-8	10	µg/L	<10	<10	<10	<10	<10

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		MB11A	---	---	---	---	---
Compound	CAS Number	LOR	Unit	Client sampling date / time	17-Jan-2019 00:00	---	---	---	---
				ES1902004-006	Result	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	---	10	mg/L	90	---	---	---	---	---
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	---	---	---	---	---
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	---	---	---	---	---
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	28	---	---	---	---	---
Total Alkalinity as CaCO ₃	---	1	mg/L	28	---	---	---	---	---
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA									
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	18	---	---	---	---	---
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	<1	---	---	---	---	---
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	4	---	---	---	---	---
Magnesium	7439-95-4	1	mg/L	2	---	---	---	---	---
Sodium	7440-23-5	1	mg/L	14	---	---	---	---	---
Potassium	7440-09-7	1	mg/L	<1	---	---	---	---	---
ED093F: SAR and Hardness Calculations									
Total Hardness as CaCO ₃	---	1	mg/L	18	---	---	---	---	---
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.04	---	---	---	---	---
Arsenic	7440-38-2	0.001	mg/L	<0.001	---	---	---	---	---
Boron	7440-42-8	0.05	mg/L	<0.05	---	---	---	---	---
Barium	7440-39-3	0.001	mg/L	0.015	---	---	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	---	---	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	---	---	---	---	---
Cobalt	7440-48-4	0.001	mg/L	<0.001	---	---	---	---	---
Chromium	7440-47-3	0.001	mg/L	<0.001	---	---	---	---	---
Copper	7440-50-8	0.001	mg/L	0.002	---	---	---	---	---
Manganese	7439-96-5	0.001	mg/L	0.195	---	---	---	---	---
Nickel	7440-02-0	0.001	mg/L	0.006	---	---	---	---	---
Lead	7439-92-1	0.001	mg/L	<0.001	---	---	---	---	---
Selenium	7782-49-2	0.01	mg/L	<0.01	---	---	---	---	---
Vanadium	7440-62-2	0.01	mg/L	<0.01	---	---	---	---	---
Zinc	7440-66-6	0.005	mg/L	0.015	---	---	---	---	---
Silver	7440-22-4	0.001	mg/L	<0.001	---	---	---	---	---

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		MB11A	---	---	---	---	---
		Client sampling date / time		17-Jan-2019 00:00	---	---	---	---	---
Compound		CAS Number	LOR	Unit	ES1902004-006	-----	-----	-----	-----
				Result	---	---	---	---	---
EG020F: Dissolved Metals by ICP-MS - Continued									
Iron	7439-89-6	0.05	mg/L	<0.05	---	---	---	---	---
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	---	---	---	---	---
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	0.004	mg/L	<0.004	---	---	---	---	---
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	<0.1	---	---	---	---	---
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.02	---	---	---	---	---
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	0.02	---	---	---	---	---
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.04	---	---	---	---	---
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	---	0.01	mg/L	0.06	---	---	---	---	---
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	---	0.1	mg/L	0.2	---	---	---	---	---
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	---	0.1	mg/L	0.3	---	---	---	---	---
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	---	0.01	mg/L	0.12	---	---	---	---	---
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	---	---	---	---	---
EN055: Ionic Balance									
Total Anions	---	0.01	meq/L	0.93	---	---	---	---	---
Total Cations	---	0.01	meq/L	0.97	---	---	---	---	---
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	---	1	mg/L	2	---	---	---	---	---
EP033: C1 - C4 Hydrocarbon Gases									
Methane	74-82-8	10	µg/L	<10	---	---	---	---	---

Analytical Results

Client sample ID				SMB02	MB13A	MB13B	MB08B	PL-SW-005
Compound	CAS Number	LOR	Unit	18-Nov-2018 11:00	18-Nov-2018 11:30	18-Nov-2018 11:30	18-Nov-2018 12:30	18-Nov-2018 14:15
				Result	Result	Result	Result	Result
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	---	10	mg/L	150	191	52	98	39
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	---	5	mg/L	---	---	---	---	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	---
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	---
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	94	78	35	60	---
Total Alkalinity as CaCO ₃	---	1	mg/L	94	78	35	60	---
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	7	29	2	6	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2	10	1	1	---
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	26	19	8	14	---
Magnesium	7439-95-4	1	mg/L	2	3	1	4	---
Sodium	7440-23-5	1	mg/L	10	16	3	4	---
Potassium	7440-09-7	1	mg/L	<1	10	1	<1	---
ED093F: SAR and Hardness Calculations								
Total Hardness as CaCO ₃	---	1	mg/L	73	60	24	51	9
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.03	0.14	0.18	0.01	0.09
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.004	<0.001	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	7440-39-3	0.001	mg/L	0.013	0.033	0.005	0.033	0.007
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.004	0.005	0.005	0.004	<0.001
Manganese	7439-96-5	0.001	mg/L	0.002	0.029	0.014	0.019	0.002
Nickel	7440-02-0	0.001	mg/L	<0.001	0.006	0.003	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		SMB02	MB13A	MB13B	MB08B	PL-SW-005
Compound	CAS Number	LOR	Unit	18-Nov-2018 11:00	18-Nov-2018 11:30	18-Nov-2018 11:30	18-Nov-2018 12:30	18-Nov-2018 14:15
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	0.047	0.028	0.009	0.104	<0.005
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.35	<0.05	0.12
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	<0.1	<0.1	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.01	0.16	0.08	0.02	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.16	0.08	0.02	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	0.2	0.1	<0.1	0.3
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	0.4	0.2	<0.1	0.3
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.04	0.09	<0.01	0.01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	2.08	2.44	0.77	1.35	----
Total Cations	----	0.01	meq/L	1.90	2.15	0.64	1.20	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	---	---	---	---	2
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	2	6	2	1	2