

+
Intelligent
Ground
Remediation +

Abstraction Licence Report

Enterprise Autos
Newbridge Bypass,
Crumlin,
Newport,
NP11 4QJ

For Ascona


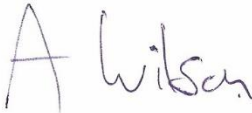
11 September 2025
Report ref. 25/0816.28.1



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Revision log

Issue No.	Date	Description
1	11/09/2025	First Issue of report

Report Prepared By	Signature	Date
Ricardo Delfin Environmental Engineer		11 September 2025
Report Reviewed By	Signature	Date
Adam Wilson Director		11 September 2025

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1.0 Introduction

Geo² Remediation Limited 'Geo²', has prepared the following Abstraction Licence Report to provide details on the groundwater abstraction needed to fulfil the proposed groundwater remediation strategy at the Enterprise Autos site, Newbridge Bypass, Crumlin, Newport, NP11 4QJ. A site location plan is included in Appendix A.

This report has been drawn upon the available data resulting from historical investigation reports, prior the reported fuel loss and data collected by Geo² from existing and newly installed monitoring wells.

This report will be submitted as part of an abstraction licence application to Natural Resources of Wales (NRW) authority.

This application is issued in tandem with the following applications:

- PAN-029991 - Environmental permitting application for Groundwater remediation treatment system at Enterprise Autos
- PAN-029990 – Groundwater Investigation Consent (GIC) application. This application has been withdrawn following conversations with NRW which stated that a GIC was not needed for this activity.

Delivered in conjunction with each other the proposed works will be water balance neutral, pumping water from the hydraulic downgradient boundary and returning treated water at the upgradient end of the site.

2.0 Site background

The site is underlain by Hughes Formation – Sandstone, a sedimentary bedrock proved to depths of 12.0m below ground level, it was noted to be fractured with gravel and sandy lenses. Limited superficial deposits were encountered comprising mudstone gravels to a depth of 3.0m below ground level.

No groundwater abstractions were found within 1,000 meters from site, and the site doesn't lie within a source protection zone. The closest surface water is the River Ebbw approximately 40m to the west of the site and groundwater flow direction has been identified as being towards the River Ebbw.

This site reported a fuel loss earlier in 2024 from an Underground Storage Tanks (USTs) named as Tank 3 which was relined by August 2024. Evidence suggests significant ground contamination and development of a plume of impacted water beneath the site. Although neat floating fuel has not been identified beneath the site, due to the ground water results obtained between May 2024 and August 2025 it's likely that LNAPL remains in the ground and acts as an ongoing source of hydrocarbon contaminants. Therefore, current Conceptual Site Model (CSM) has identified potentially unacceptable risk for leaching of hydrocarbon contaminants to the groundwater followed by migration within the aquifer to the River Ebbw.

Previous small-scale tests were undertaken on site, firstly being a Falling head test in boreholes BH4, BH7 and BH8 which produced consistent results for a fractured sandstone bedrock. Later, limited preliminary tests were undertaken (Step test in borehole S12, constant rate test in borehole S11 and recovery test) using a single 3" borehole pump with pressure transducers installed in the pumping borehole and nearby observation wells.

The preliminary testing demonstrated that cones of depression were established across the treatment area with a strong influence observed 10m from the pumping well at 30 L/min. It should be noted that these tests were of short duration and did not run to completion. Additionally, the rebound monitoring following cessation of pumping did not observe full rebound over a period of 16 hours, which suggest a limiting factor in the availability of groundwater within the site, likely to be associated with the geology of the location within a former quarry. This indicates that faster pumping or pumping without recirculation may substantially dewater the area reducing the effectiveness of the hydraulic barrier treatment beneath Tank 3. The aquifer typology suggests performance as a fractured semi-confined aquifer. Table 1 shows a summary of current aquifer properties based on the information obtained from investigations performed in the piezometers up to the date of the present document.

Aquifer properties	Unit	Estimated value	Comment
Hydraulic conductivity (K)	m/day	8.166	Geomean, obtained from falling head test in BH 4, BH7 and BH8
Transmissivity (T)	m ² /day	43.848	Geomean, obtained from: <ul style="list-style-type: none"> • Step test: S12 at 10 L/min, 20 L/min, 30 L/min and 40 L/min • Constante rate test: S11 at 30 L/min • Recovery test at S12, S13, S3 and BH7
Storativity	-	0.0804	Geomean, obtained from: <ul style="list-style-type: none"> • Step test: S12 at 10 L/min, 20 L/min, 30 L/min and 40 L/min • Constante rate test: S11 at 30 L/min
Hydraulic gradient (i)	-	0.0149	Geomean, obtained from water table measurements between August 2024 and September 2025.
Radius of influence	m	29.165	For a 1m drawdown
Maximum average water table	mAOD	115.0461	Registered in 26/11/2024
Minimum average water table	mAOD	112.1802	Registered in 19/08/2025

Note: Calculations for presented values are shown in Appendix B

Table 1. Site Aquifer properties

3.0 Key Contacts

If you have any questions regarding this document or on site, please contact:

Contact	Email	Phone
Adam Wilson Technical Director	Adan.Wilson@geo2.co.uk	07779 604 026
Geo ² Head Office	info@geo2.co.uk	0113 257 5397

Table 2. Geo² Contact Details

4.0 Document Reliance

This document has been produced for use solely by Ascona and their appointed subcontractors. The client may submit this document to regulatory bodies where appropriate.

This document reflects current guidance and legislation at the time of writing (September 2025). Any printed copy should be considered uncontrolled.

5.0 Objectives

This abstraction licence report aims to:

- Show the means of the abstraction licence application.
- Give a description of the activities which will take place at the Site during the water abstraction for the operation of a hydraulic barrier pumping with recirculation as part of the site remediation strategy.

6.0 Details of abstraction

6.1 Overview

The site is an operational petrol filling station featuring underground storage tanks (USTs) for fuels, and a canopy-covered forecourt, and a store building. Following a fuel loss from one tank (which has since been repaired), a remediation programme is required. The remediation system will comprise a pump-and-treat system designed to achieve hydraulic control preventing offsite migration, recover contamination from beneath the UST, and reinject treated groundwater into the aquifer from which it arose, upstream of the tanks.

It is worth noting that the site will undergo redevelopment during operation of the remediation plant. Accordingly, two layout proposals have been made: one under the current site infrastructure (prior to redevelopment) and another post-redevelopment. The following descriptions are general and will apply to both configurations. Figures 1 and 2 illustrate the layout plans for each proposal, scaled plans are included in Appendix A.

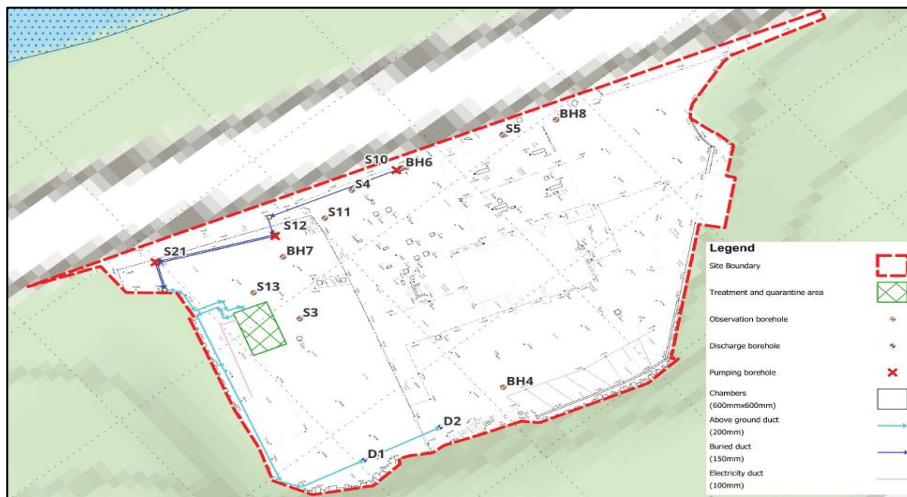


Figure 1: Proposed layout for treatment plant prior site redevelopment

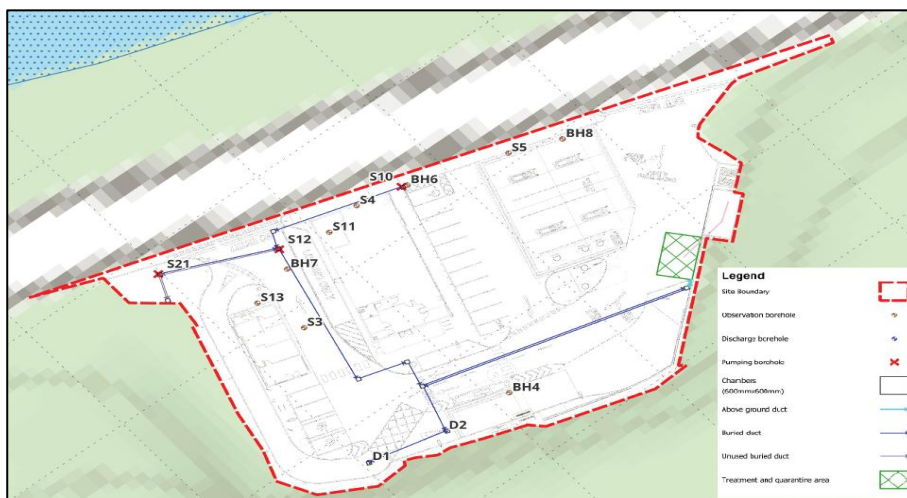


Figure 2: Proposed layout for treatment plant post site redevelopment

6.2 Site space

The site is spatially constrained and remains an active Petrol Filling Station (PFS), the system is proposed to be initially installed in a location to the south of the shop building close to the former car sales area. Post redevelopment the system will be located to the north of the site. In both plans the system will occupy an area of up to two 20ft shipping containers which can be orientated to suit.

6.3 Safety of personnel on site

The container will include First-aid kits, fire-fighting equipment and eye washing kit. Paths between the test wells, the observational wells and the pumped water treatment system will be adopted from the current PFS safety walkways.

6.4 Site accommodation

Latrines, washing facilities and tables for the partaking of meals will be shared with the staff room inside the Service station shop.

6.5 Utility services

The presented work plan has the following utility requirements:

- **Electricity:** 63 amp, 1-phase electricity connection, 10Kwh peak
- **Water supply:** a 10mm water supply will be needed.
- **Drainage:** treated pumping water will be discharged into the site using two dedicated discharge boreholes.

6.6 Equipment

The following equipment will be needed:

- Three (03) electrically driven submersible borehole pumps.
- Three (03) control valves and pressure gauges per borehole pump.
- Four (04) water level loggers for ground water monitoring.
- One (01) atmospheric pressure logger for barometric monitoring.
- One (01) 20 ft soundproofed container to house plant.
- One (01) oil/water separator tank.
- One (01) pump for water transfer from oil /water separator to the carbon units and discharge boreholes.
- Up to three (03) 2m³ capacity Granular Activated Carbon (GAC) vessels for liquid-phase adsorption.
- One (01) 30m interface probe meter.

6.7 Meteorological parameters

Barometric pressure will be measured to barometrically compensate water level logger readings to increase the accuracy of water level measurements. A barometric pressure logger will be set at the top of one of the pumping wells at a 30-minute recording interval.

Rainfall will be obtained from Ty Fry rain gauge station located 4km north-west to the site. This data will be used to assess the influence of rainfall during the water abstraction. Table 5 summarizes the characteristics of the station.

Station name	Station NGR	Station status	Station Location	Distance to site
Ty Fry	ST1662699652	Online	51.68941, -3.20752	5 km

Table 3. Rain gauge station details

6.8 Pumping details

The proposed pumping boreholes, S10, S12 and S21 are vertical piezometers. Boreholes S10 and S12 are currently installed and used for groundwater monitoring, while S21 will be installed before the treatment plant begins operation. The technical specifications for these boreholes are presented in Table 3. Figures 1 and 2 illustrates the locations of proposed pumping boreholes, with the layouts plan included in Appendix A.

Pumping borehole	Well diameter (mm)	Well base (m)	Easting	Northing	mAOD	Response Zone (m)
S10	100	7.275	321393.5	198053.6	116.671	2-8
S12	100	9.255	321391.1	198034.5	116.702	2-10
S21	100	10.00*	321383.9*	198019.6*	116.740*	2-10

*: Could vary upon drilling

Table 4. Proposed pumping boreholes technical specifications.

A permanently multiple-well constant rate system will be established with two (S12 and S21) pumps with a fixed flow rate of 20L/min and one (S10) pump at 30L/min. All will operate simultaneously accounting for a maximum water abstraction of 100.80 m³/day based on 24 hours of abstraction per day for the multiple-well system.

Borehole names	Flow (L/sec)	Flow (L/min)	Flow (m ³ /hourly)	Number of hours of abstraction daily	Flow (m ³ /day)	Number of days of abstraction yearly	Flow (m ³ /year)
S10	0.50	30	1.80	24	43.20	365	15,768
S12	0.33	20	1.20	24	28.80	365	10,512
S21	0.33	20	1.20	24	28.80	365	10,512
	1.16	70	4.2		100.8		36,792

Table 5. Maximum water abstraction for the treatment system.

6.9 Discharge details

It must be noted that the purpose of this groundwater abstraction is remediation only, and not for any additional use of the water resource. Accordingly, the pumped water will be treated using a system comprised by an oil-water and silt separator unit, followed by two to three granular activated carbon (GAC) filters. These filters are sized to provide adequate empty bed contact time to ensure removal of contaminants to levels that are below the Remedial Targets Values.

The treated water output will be discharged back to the site via dedicated discharge boreholes as the site has no connection to the foul sewer. The proposed discharge boreholes, D1 and D2, will be located at the back of the rear of the site, as shown in Figure 1 and 2 and both will discharge water at a rate of 35 L/min.

Pumping borehole	Well diameter (mm)	Well base (m)	Easting	Northing	mAOD
D1	100	8.00	321425.8	198020.9	116.760
D2	100	8.00	321428.3	198032.1	116.770

Note: Could vary upon drilling

Table 6. Proposed discharge boreholes technical specifications.

Borehole names	Flow (L/sec)	Flow (L/min)	Flow (m ³ /hourly)	Number of hours of discharge daily	Flow (m ³ /day)	Number of days of abstraction yearly	Flow (m ³ /year)
D1	0.58	35	2.10	24	50.40	365	18,396
D2	05.8	35	2.10	24	50.40	365	18,396
	1.16	70	4.2		100.8		36,792

Table 7. Maximum water discharge for the treatment system.

Distance between boreholes, abstraction and discharge rates were established based on a multiple-well drawdown estimations using aquifer parameters from Table 1. Figure 3 and 4 shown estimated water table after a 24-hour operation, scaled plans are included in Appendix A.

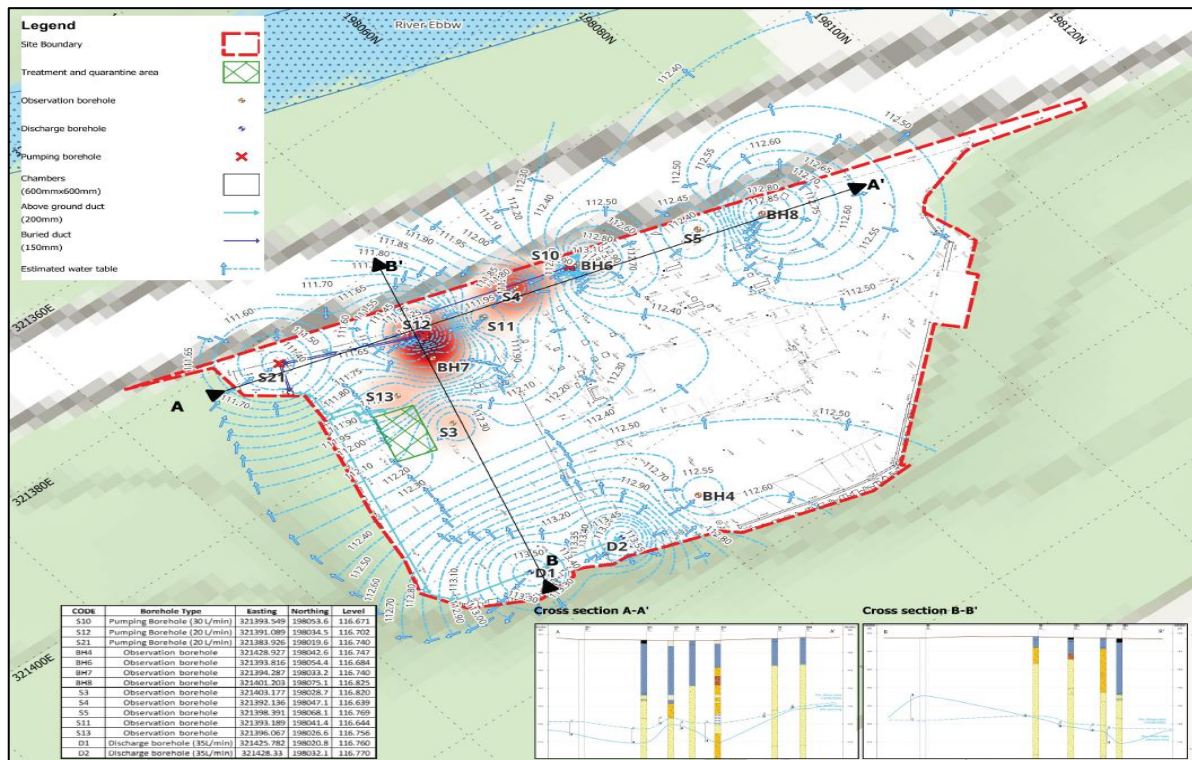


Figure 3: Estimated water tables after 24-hour operation considering minimum water table register

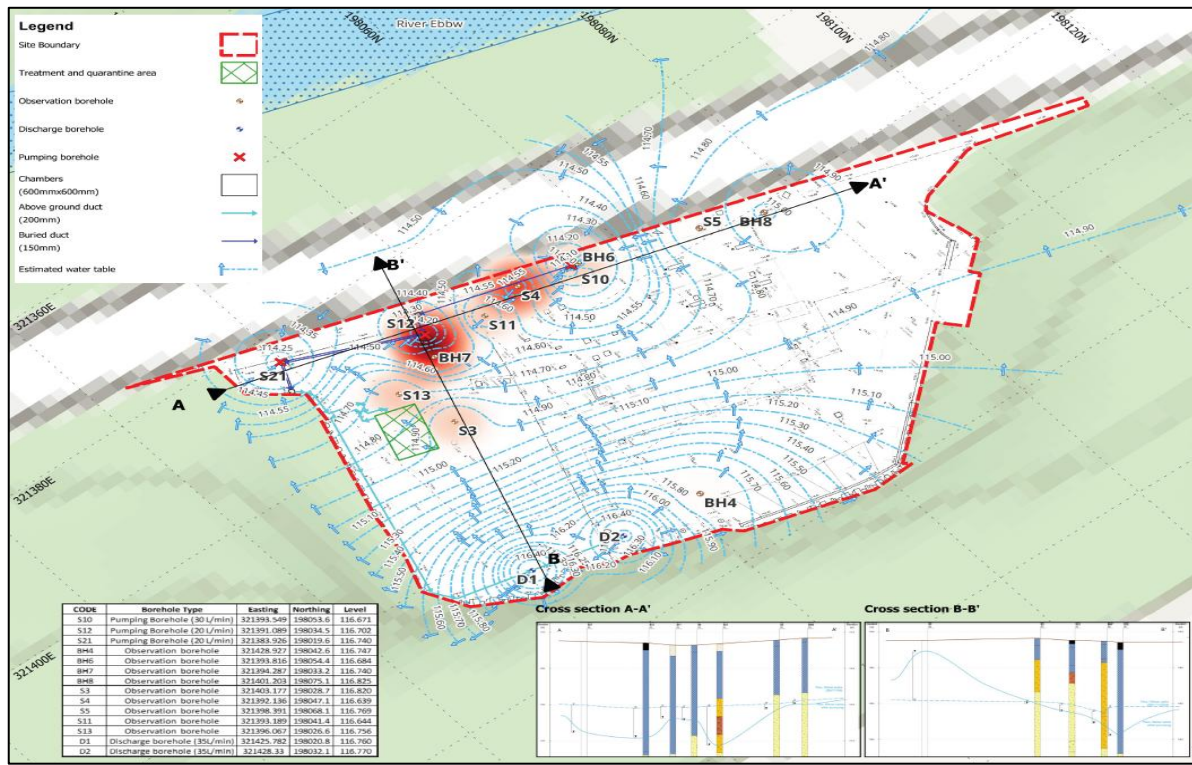


Figure 4: Estimated water tables after 24-hour operation considering maximum water table register

Geo² have undertaken fate transport modelling using the EA RTM worksheets to determine maximum safe concentrations which will pose no risk to the River Ebbw. Discussion with the local NRW geoscience team considers that the goal of the treatment should be to restore the environment to a pre-spill condition (given that the release is a “new pollution” incident) and as such a second set of more stringent targets has been agreed. These values are shown in table 6.

Contaminant	Groundwater concentrations based on ensuring no impact to the River Ebbw (ug/L)	Maximum acceptable concentration for reinjection of groundwater (ug/L)
Aliphatic C8-C10	531	1,900
Aliphatic C10-C12	531	1,500
Aliphatic C12-C16	No impact	57
Aromatics C5-C7	14	37
Aromatics C7-C8	234	10
Aromatic C8-C10 (Ethylbenzene)	45	74
Aromatic C10-C12	142	20
Aromatic C12-C16	147	100
Aromatic C16-C21	128	100
Aromatic C21-C35	Not a risk driver	90

Contaminant	Groundwater concentrations based on ensuring no impact to the River Ebbw (ug/L)	Maximum acceptable concentration for reinjection of groundwater (ug/L)
Benzene	14	10
Toluene	234	74
Xylenes (total)	45	30

Table 6. Adopted remedial Target Values

6.10 Waste management

Quarantined wastes, which might include separated oil and silts, or exhausted granular activated carbon will be controlled and disposed of by a licenced waster carrier and facility. The maximum storage for oils will be 400 litres, and the maximum storage of spent carbon will be 2 m³ within the carbon vessel.

6.11 System maintenance

The treatment system plant will operate 24/7 automatically using a PLC control system with a series of level sensors and feedback measures, including high level shutoffs. In addition, Geo² will attend the site fortnightly to undertake planned preventative maintenance.

Maintenance will include a visual inspection of all the elements of the plant and verification of its operation. Worn or defective consumable items will be replaced. Once a month an inspection under a WAMITAB accredited engineer will take place in accordance with the requirements of the Environmental Permit deployment.

6.12 Monitoring plan

Water quality parameters will be monitored regularly. Groundwater samples will be collected before and after treatment for analysis of Total Petroleum Hydrocarbons (TPH-CWG), BTEX and MTBE. Sampling, chain of custody procedures and analysis will be conducted in accordance with the protocols from a UKAS-accredited laboratory.

Additionally, drawdown, groundwater levels and discharge volumes will be monitored during operations to assess the performance of the treatment system.

7.0 Water features survey

A water survey was conducted through desk studies using resources as Envirocheck reports, Ordnance survey, DataMapWales and British Geological Survey (BGS) mapping and BGS water well records with a survey radius of 1km. In addition, field surveys were carried out in July and August 2025, up to 1,000 meters from the site in compliance with NRW minimum radius of water features survey criteria: 500 from the abstraction well for an abstraction between 100 and 500 m³/day.

7.1 Surface water features

Closest water body is the River Ebbw 40m west from site which belongs to the South East Valleys Catchment within the broader Severn River Basin district. The Ebbw Fawr River and the Ebbw Fach River converge near Aberbeeg, forming the main River Ebbw flowing southward through urban and semi-urban areas until it reaches Maes-glas, Newport, where it becomes tidal and discharges into the Severn Estuary

A tributary (Crumlin Arm) to the river was located 525m northeast from site, and a minor stream was found near Central Avenue at 1,000m south of the site.

Ordnance Survey maps suggest the presence of small streams south of the site within the 500m radius, however these minor streams could not be located at the time of the field survey, suggesting seasonal flow. Photographs of the water feature survey that could be accessed are shown in Appendix B

7.2 Protected rights abstractions

No water abstractions were found in a 500m radius from site.

7.3 Designated sites

- No Sites of Special Scientific Interest (SSSIs) were identified in a 500m radius.
- No Special Areas of Conservation (SACs) were identified in a 500m radius.
- No Special Protection Areas (SPAs) were identified in a 500m radius.
- No Ramsar sites were identified in a 500m radius.
- No National Nature Reserves (NNRs) were identified in a 500m radius.
- No Local Nature Reserves (LNRs) were identified in a 500m radius.
- No Source Protection Zones (SPZ) were identified in a 500m radius.

8.0 Possible environmental effects and mitigation

The closest water body is the River Ebbw, located 40m west of the site which belongs to the “South East Valleys Catchment”. The relevant segment, designated under the Water Framework Directive (WFD), is the “Ebbw River – confluence with Ebbw Fach River to Maes-glas”. This covers a specific reach of the River Ebbw from its confluence with the Ebbw Fach River to Maes-glas.

The site’s area within this operational catchment is estimated to be 0.0018 km², compared to a total catchment area of 75.468 km², (Water watch Wales Cycle 3– NRW, 2024). Given the site’s small proportion of the catchment and the recirculation of all abstracted groundwater (net-zero water balance), any impacts from baseflow diversion to the River Ebbw are expected to be negligible.

Additionally, as noted earlier in this report, the primary purpose of the abstraction is groundwater remediation. Reducing TPH concentrations to the Remedial Target Values will ensure no impacts on the water bodies involved; therefore, reinjection of the treated groundwater is expected to cause no deterioration in their WFD chemical or ecological status.

9.0 Health and Safety Considerations

The Principal Contractor is required to have appropriate risk assessments and method statements in place under the Construction (Design and Management) Regulations, 2015.

Health and safety factors that should be considered for the proposed works include:

- **Welfare:** Washing facilities will be assumed to be in the shop building, however, disposable PPE and overalls will be removed prior to entering the shop building.
- **Oily waste:** Should any leaks or spillages occur from the pumping test then oil absorbents shall be used to soak up any oil liquids. Used sorbents will be placed in a sealed and labelled container and storage for further disposal.

10.0 References

Natural Resources Wales

Water watch Wales Cycle 3 online mapping tool - <https://waterwatchwales-nrw.hub.arcgis.com/>

Data Map Wales online mapping tool - <https://datamap.gov.wales/>

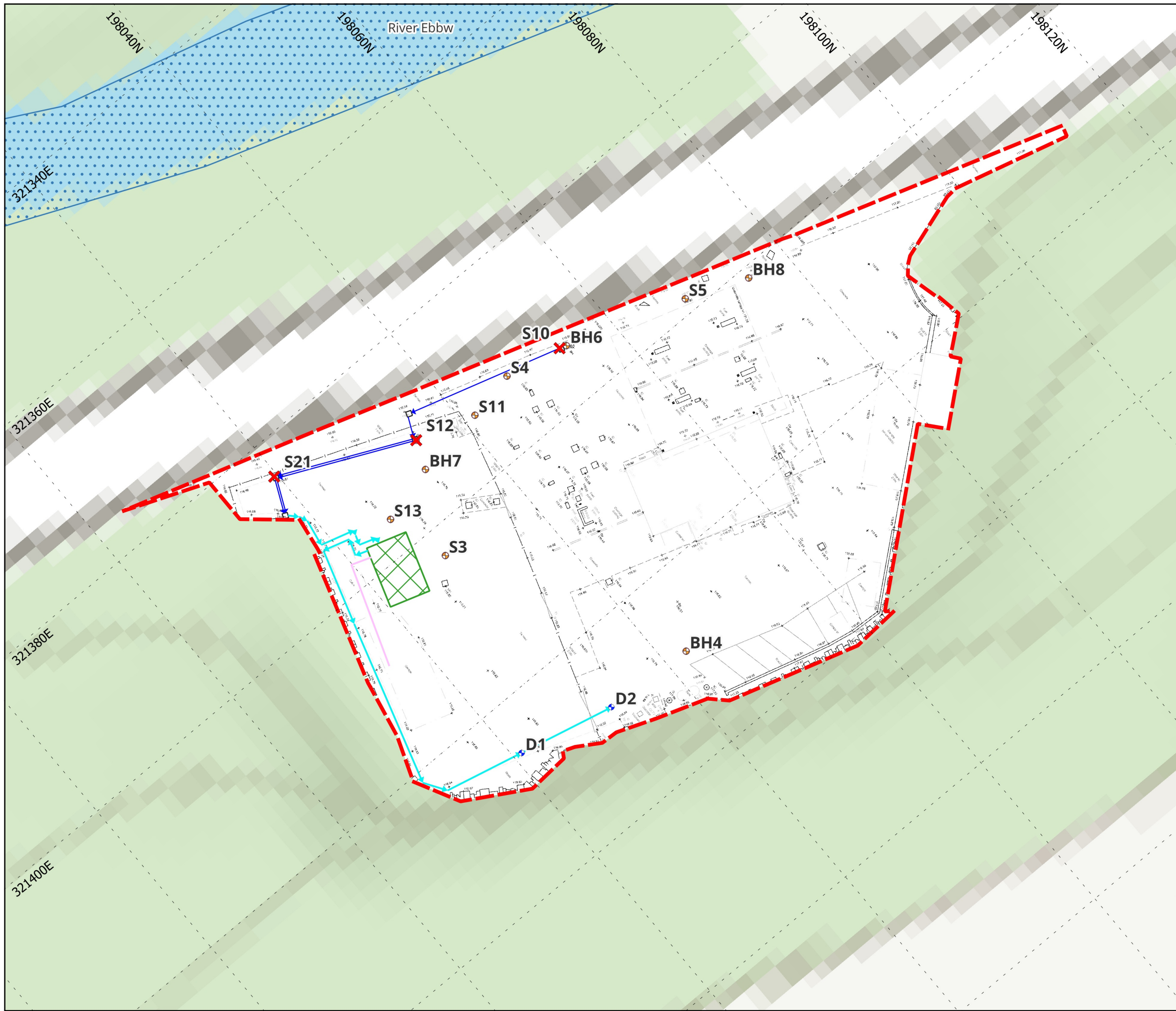
South East Valleys Abstraction Licensing Strategy. - <https://cdn.cyfoethnaturiol.cymru/683371/sev-licensing-strategy-final-nov-17.pdf>

Geo² Remediation Ltd

- Geo2, Detailed Quantitative Risk Assessment, ref. 24.0816.12.1, November 2024
- Geo2, Remediation Strategy, ref. 25/0816.18.2, June 2025



Appendix A – Figures



Legend

- Site Boundary
- Treatment and quarantine area
- Observation borehole
- Discharge borehole
- Pumping borehole
- Chambers (600mmx600mm)
- Above ground duct (200mm)
- Buried duct (150mm)
- Electricity duct (100mm)

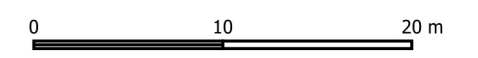


Figure
Proposed layout for treatment plant prior site redevelopment.

Job
 0816

Client
 Ascona

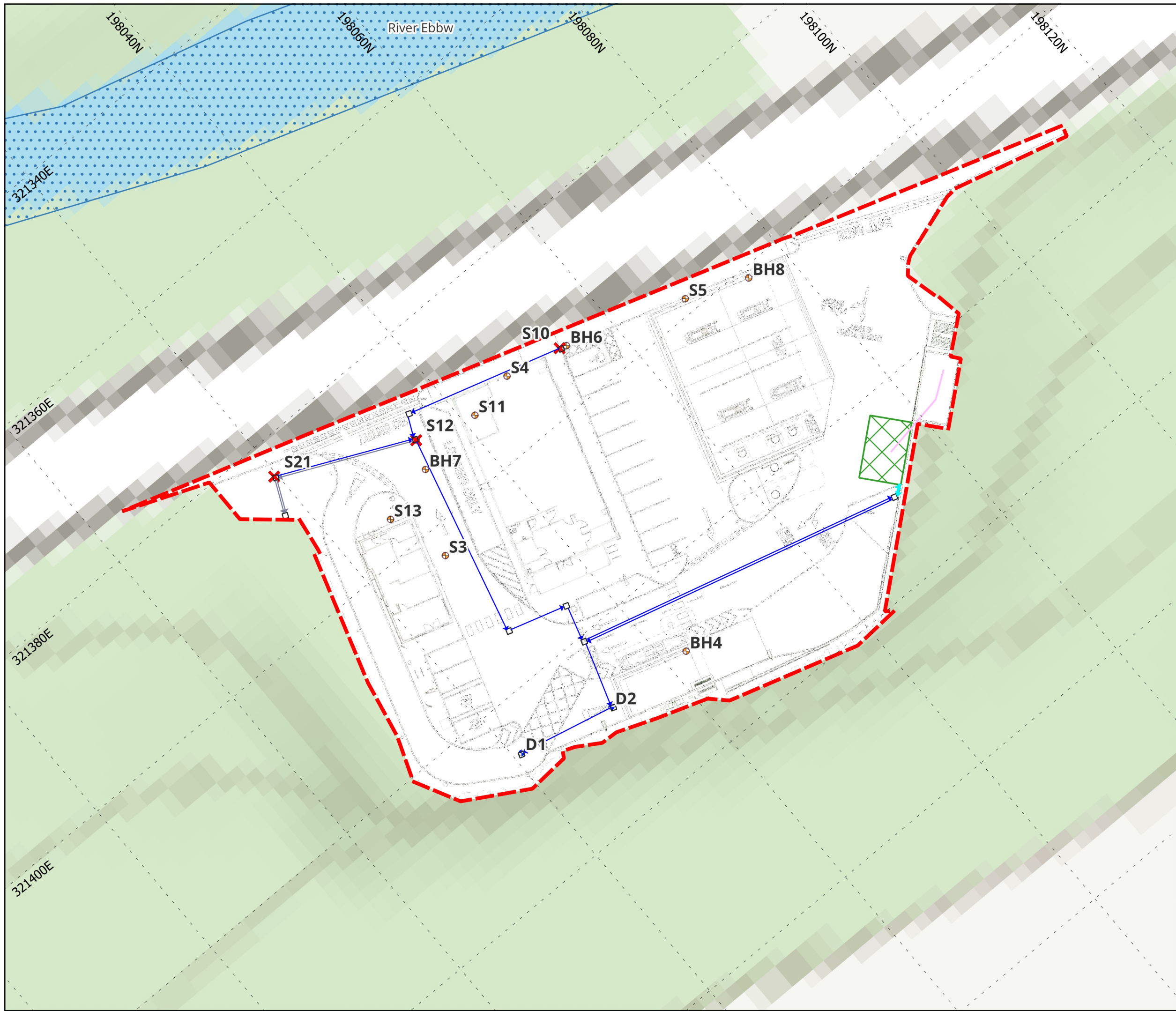
Figure No. 33	Revision 1	Date 10 September 2025
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Job No.
 J-0861. En



DO NOT SCALE. NOT FOR CONSTRUCTION



Legend

- Site Boundary
- Observation borehole
- Discharge borehole
- Pumping borehole
- Chambers (600mmx600mm)
- Above ground duct
- Buried duct
- Unused buried duct
- Treatment and quarantine area

Figure
Proposed layout for treatment plant post site redevelopment.

Job
 0816

Client
 Ascona

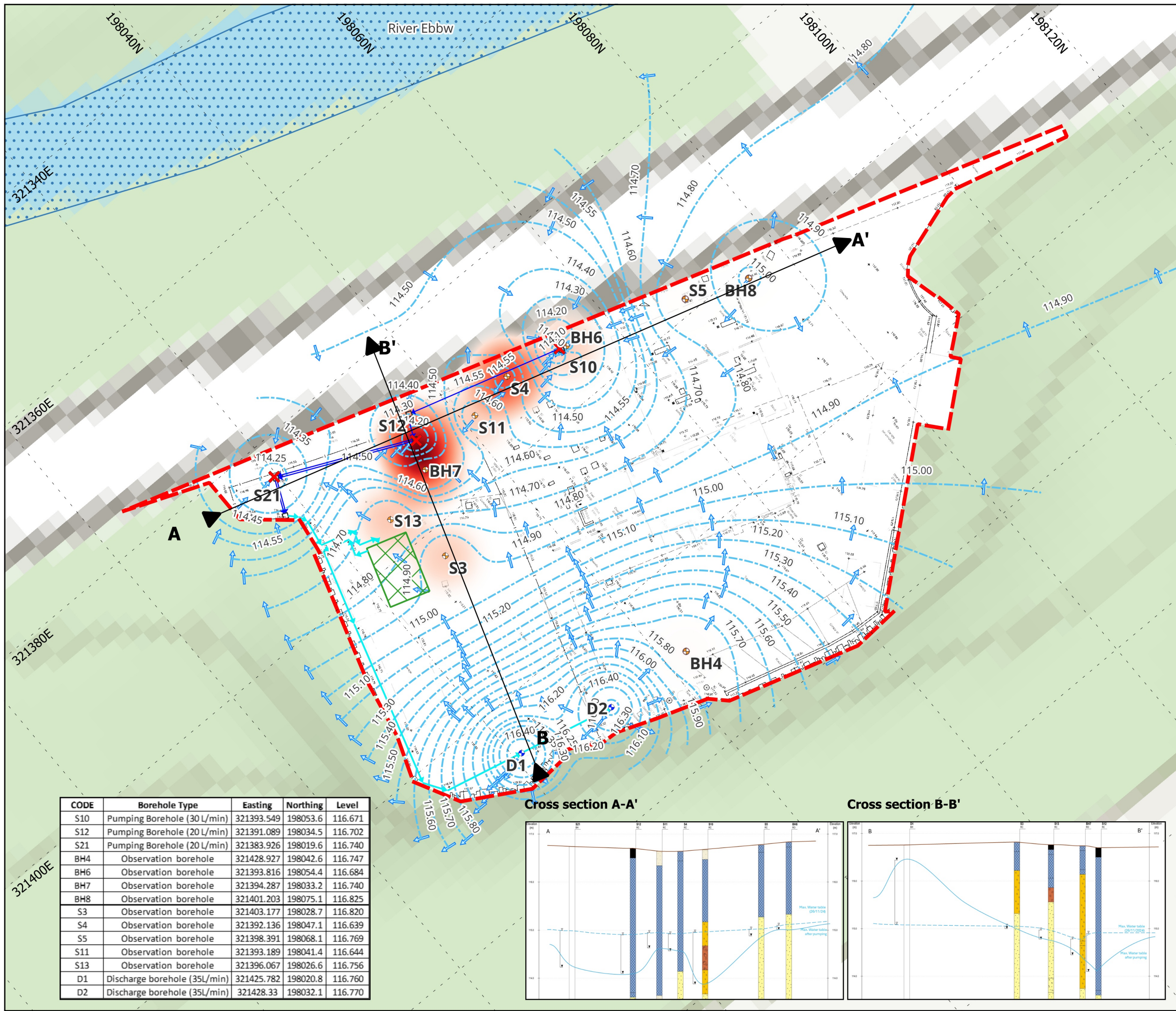
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Legend

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- Buried duct (150mm)
- Estimated water table

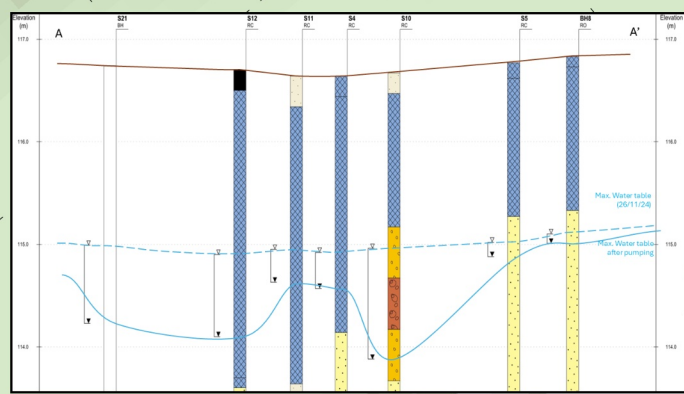
Figure Estimated water table after 24-hour pumping considering maximum water table register

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Client			Ascona
Figure No.	Revision	Date	11 September 2025
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Job No.			J-0861. En

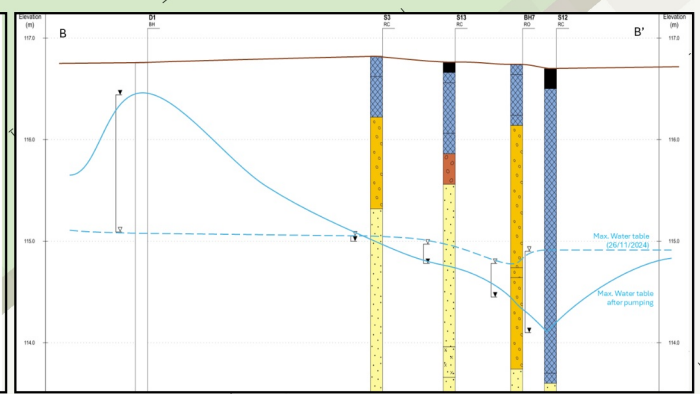


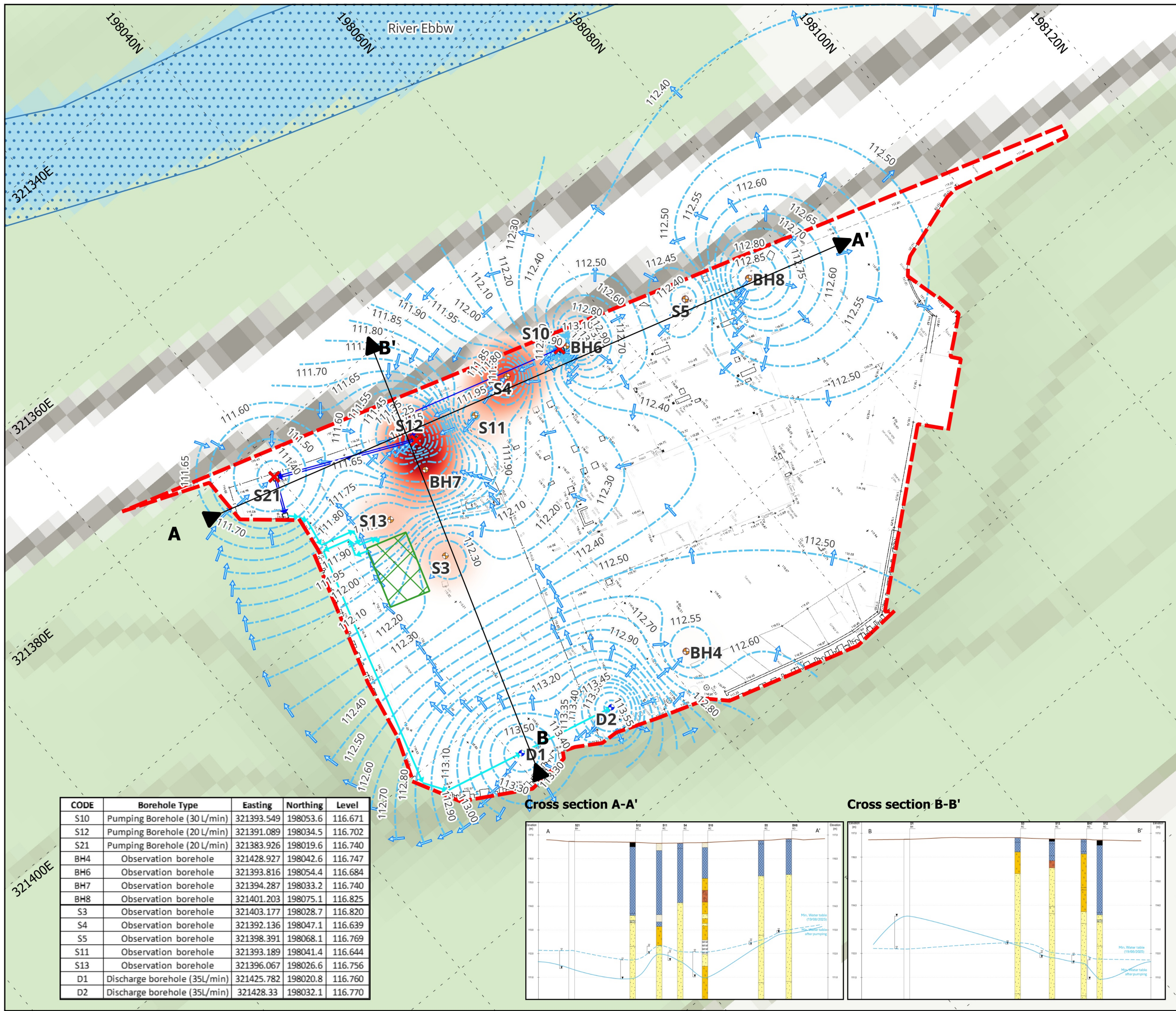
CODE	Borehole Type	Easting	Northing	Level
S10	Pumping Borehole (30 L/min)	321393.549	198053.6	116.671
S12	Pumping Borehole (20 L/min)	321391.089	198034.5	116.702
S21	Pumping Borehole (20 L/min)	321383.926	198019.6	116.740
BH4	Observation borehole	321428.927	198042.6	116.747
BH6	Observation borehole	321393.816	198054.4	116.684
BH7	Observation borehole	321394.287	198033.2	116.740
BH8	Observation borehole	321401.203	198075.1	116.825
S3	Observation borehole	321403.177	198028.7	116.820
S4	Observation borehole	321392.136	198047.1	116.639
S5	Observation borehole	321398.391	198068.1	116.769
S11	Observation borehole	321393.189	198041.4	116.644
S13	Observation borehole	321396.067	198026.6	116.756
D1	Discharge borehole (35L/min)	321425.782	198020.8	116.760
D2	Discharge borehole (35L/min)	321428.33	198032.1	116.770

Cross section A-A'



Cross section B-B'





Legend

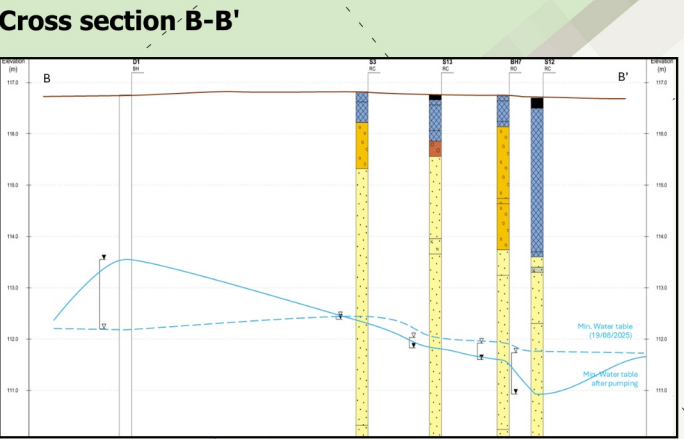
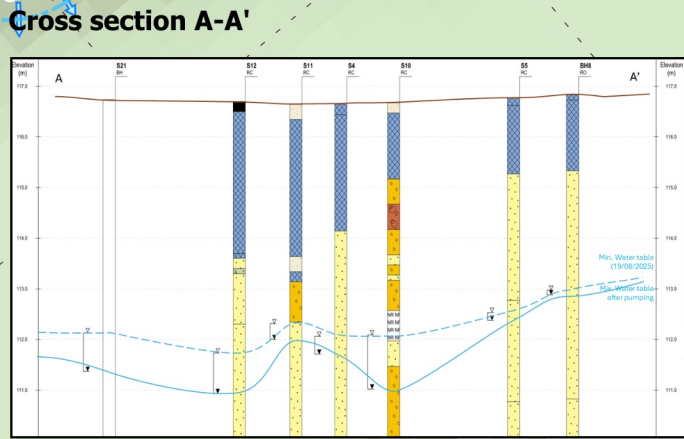
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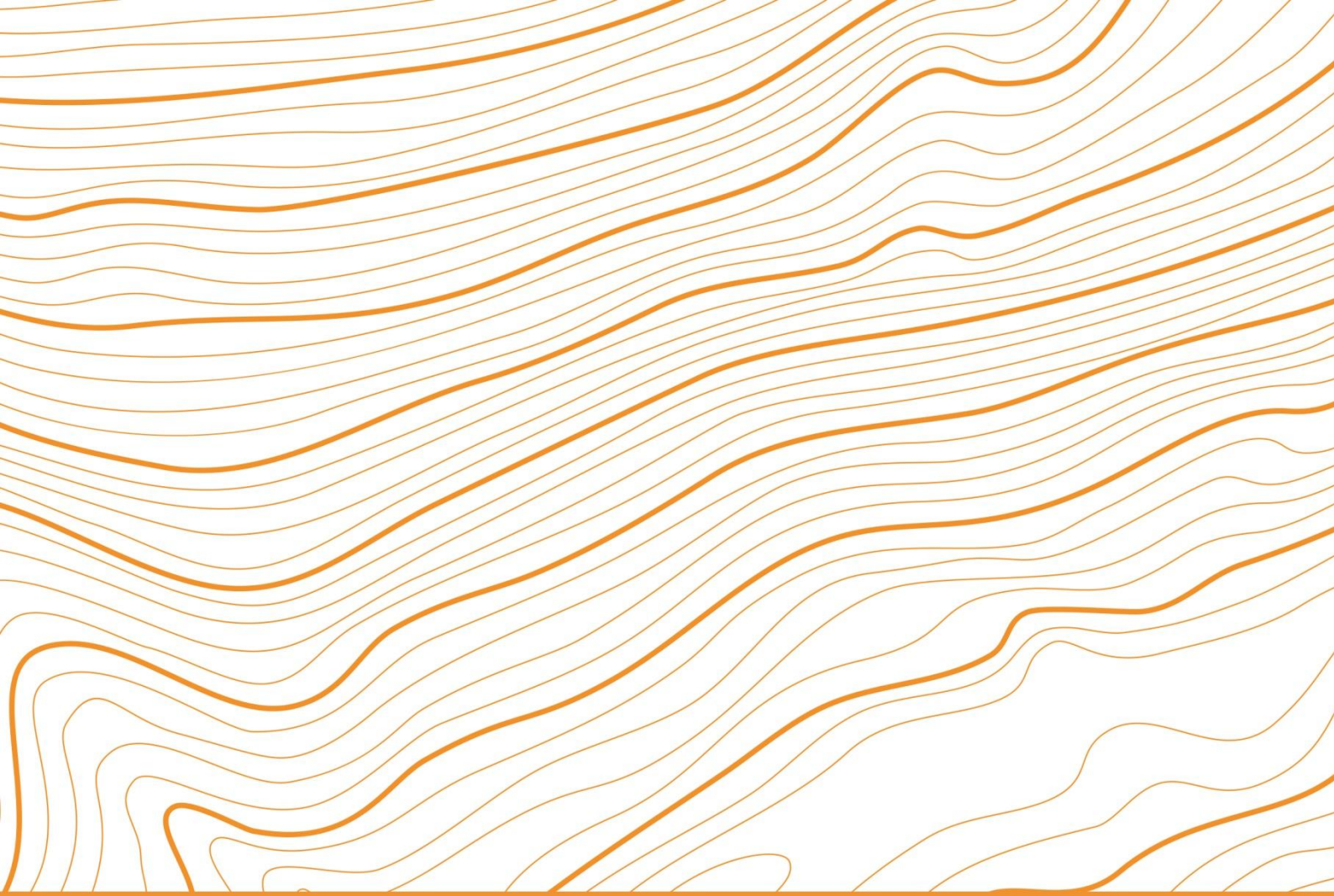
Figure Estimated water table after 24-hour pumping considering minimum water table register

Job			0816
Client			Ascona
Figure No.	Revision	Date	11 September 2025
31	2		
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D1	Discharge borehole (35L/min)	321425.782	198020.8	116.760
D2	Discharge borehole (35L/min)	321428.33	198032.1	116.770





Appendix B – Calculations



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Date: 10.09.2025

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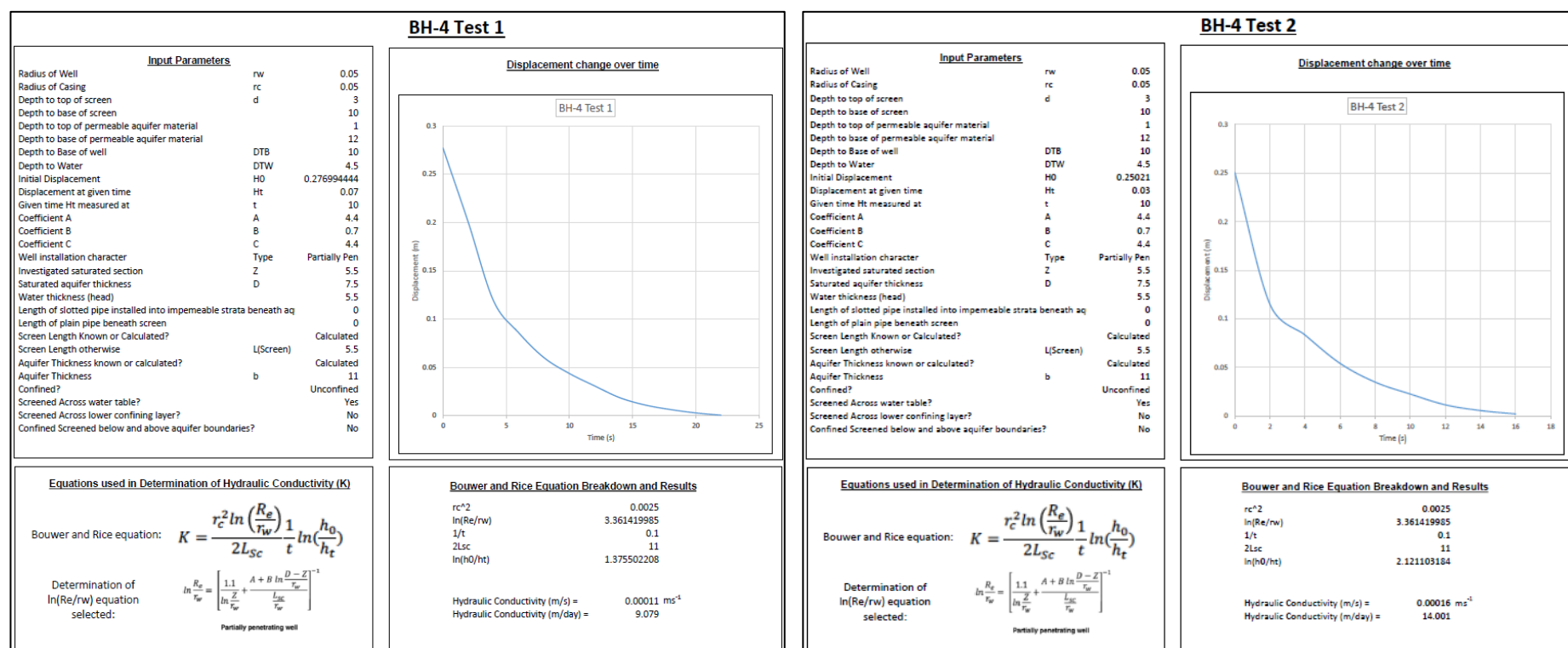
0816 / Enterprise Autos / Abstraction licence application

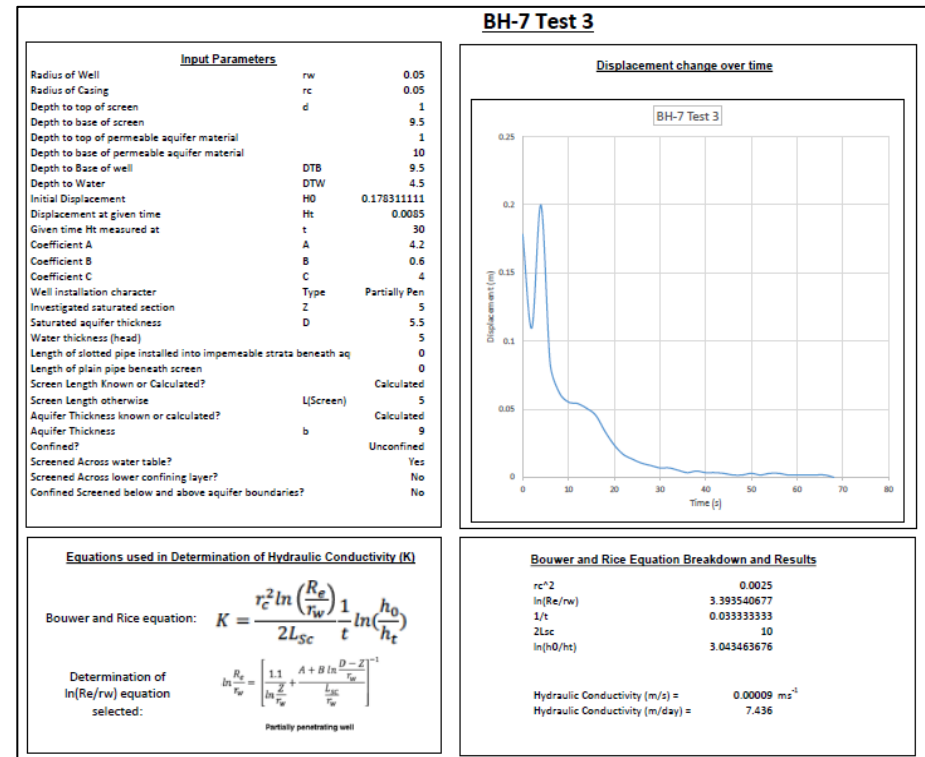
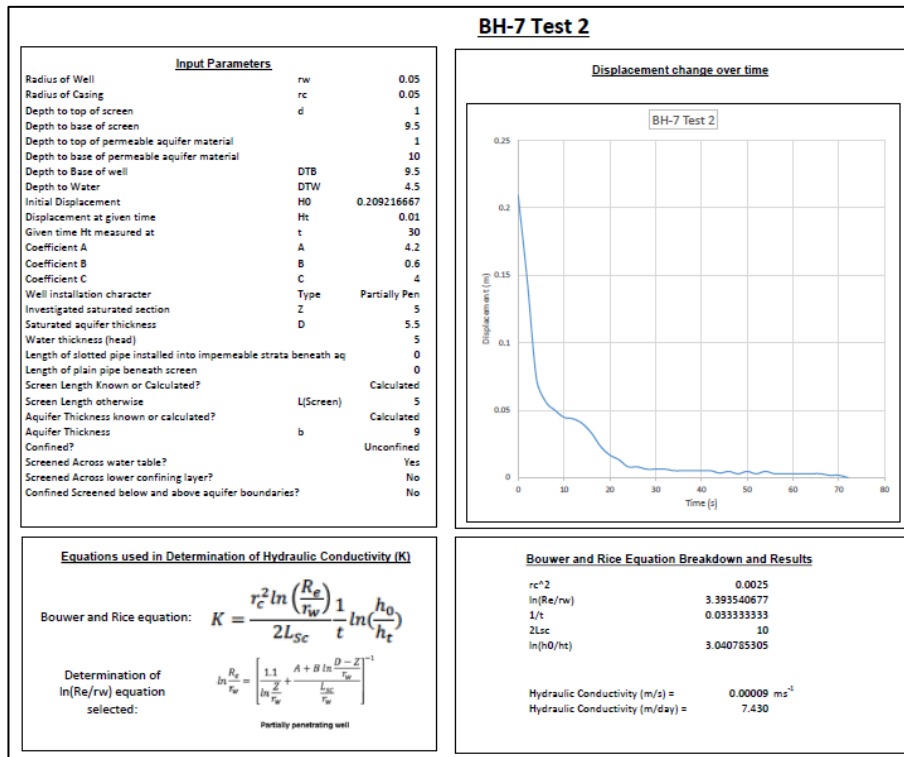
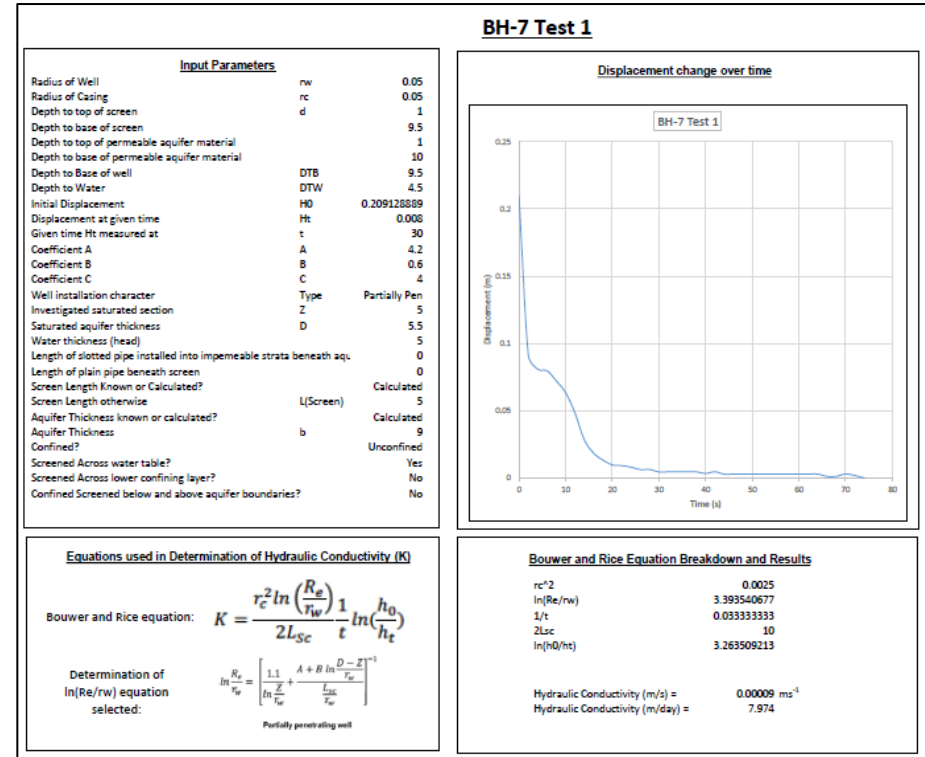
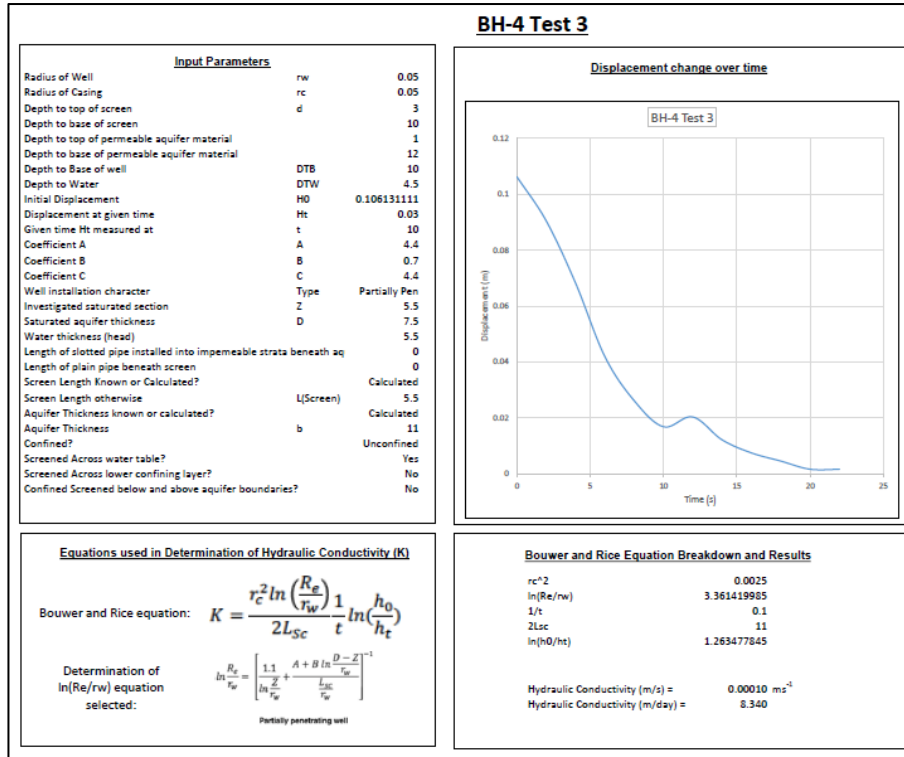
Summary of Calculations

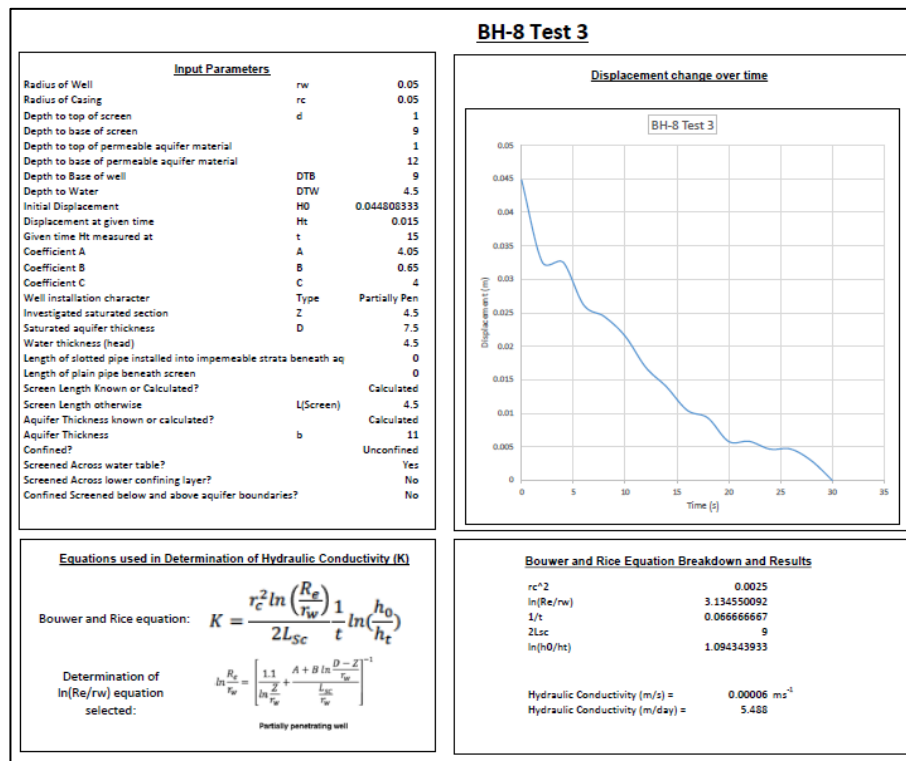
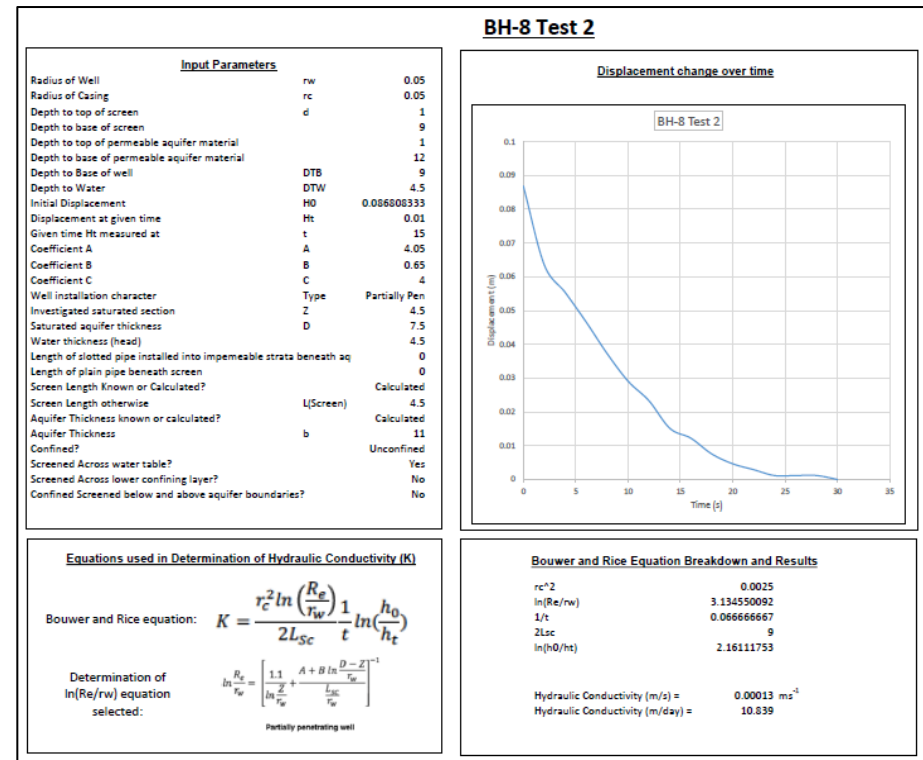
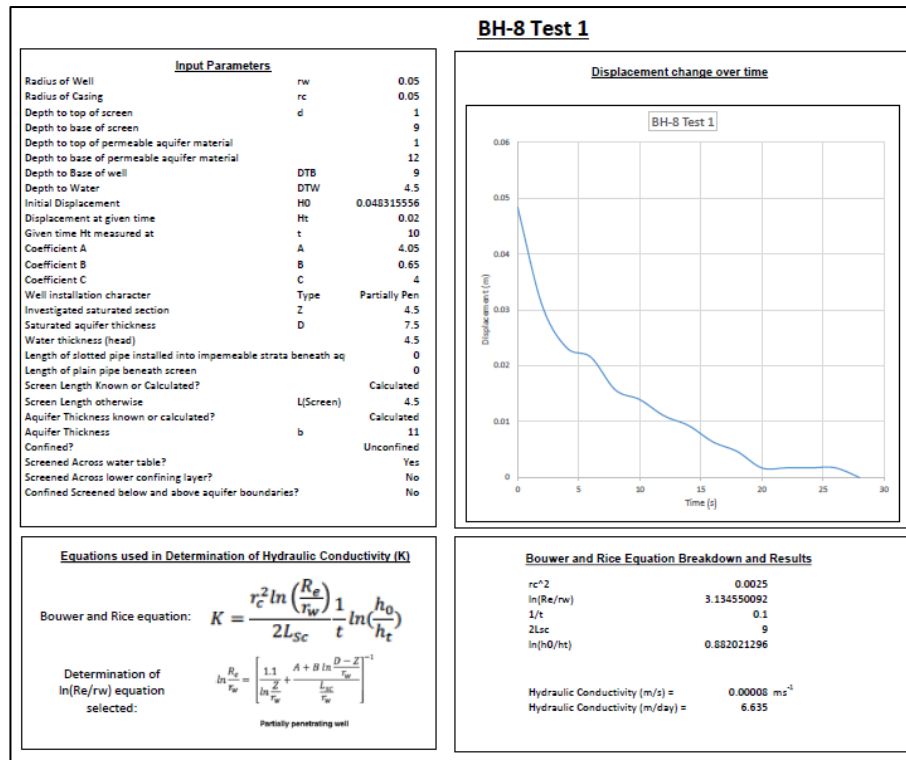
The document is a summary of the calculations conducted to derive aquifer parameters presented in the abstraction licence report and to predict piezometric levels after a 24-hour operation. Methods follow standard protocols (Bouwer-Rice for K; Cooper-Jacob/Theis for T and S) based on field tests.

1. Falling Head Test

Three (03) tests were performed for BH4, BH7 and BH8. Obtained displacements were used to calculate Hydraulic conductivity (K) at m/day using Bouwer and Rice method, for partially penetrating wells. These boreholes form a triangle covering a significant portion of the site, suggesting good spatial coverage for K estimates.







Test	Hydraulic Conductivity (m/day)
BH4-Test 1	7.9528
BH4-Test 2	14.0006
BH4-Test 3	8.3397
BH7-Test 1	7.9739
BH7-Test 2	7.4297
BH7-Test 3	7.4362
BH8-Test 1	6.6354
BH8-Test 2	10.8386
BH8-Test 3	5.4884
Geomean	8.1660

$$K_{geo} = (K_1 * K_2 * \dots * K_{n-1} * K_n)^{\frac{1}{n}}$$

2. Step test

A preliminary step-drawdown test was performed in June 10th, 2025, using submersible deep well pumps (placed in S12) and water level loggers (Placed in BH7, S11 and S13) for groundwater monitoring. Steps were 10 L/min, 20 L/min, 30 L/min and 50 L/min.

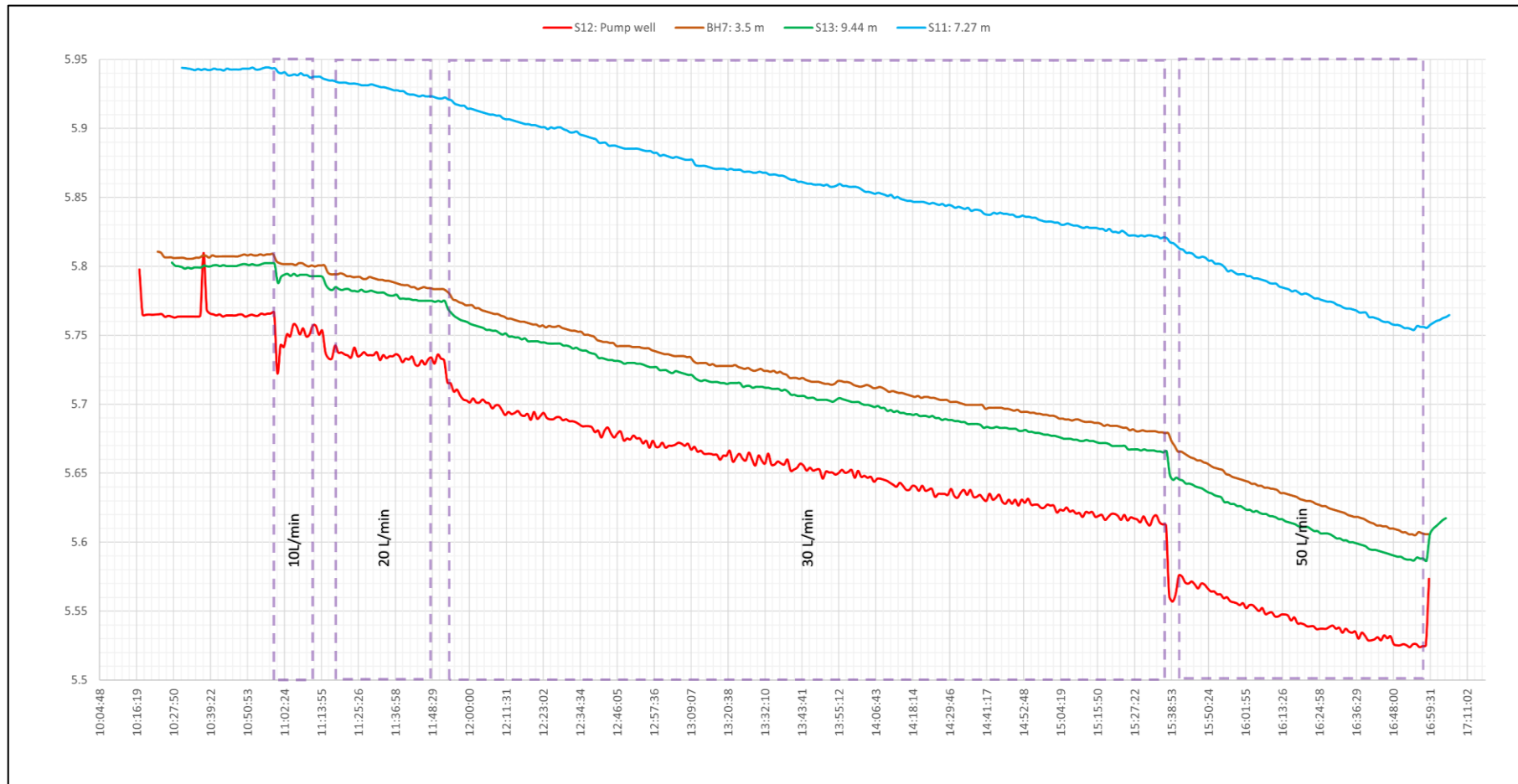


Figure A: Hydraulic head levels register from water level loggers during step test.

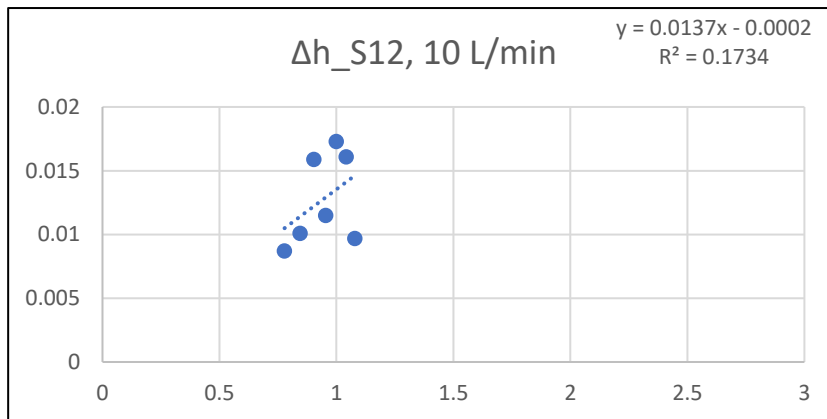
Drawdowns (Δh) were obtained from the hydraulic head levels records, then Transmissivity (T) and Storativity (S) were calculated using The Semilog method of pump-test interpretation which considers that the curve of Drawdown vs Log [time] plots as a straight line during late-time data, where transmissivity (T) and Storativity (S) are obtained by the below equations. Borehole surveyed data is also shown as these will be used for further calculations.

$$T = \frac{2.3 * Q}{4 * \pi * \Delta h}; \quad S = \frac{2.25 * T * t_0}{r^2}$$

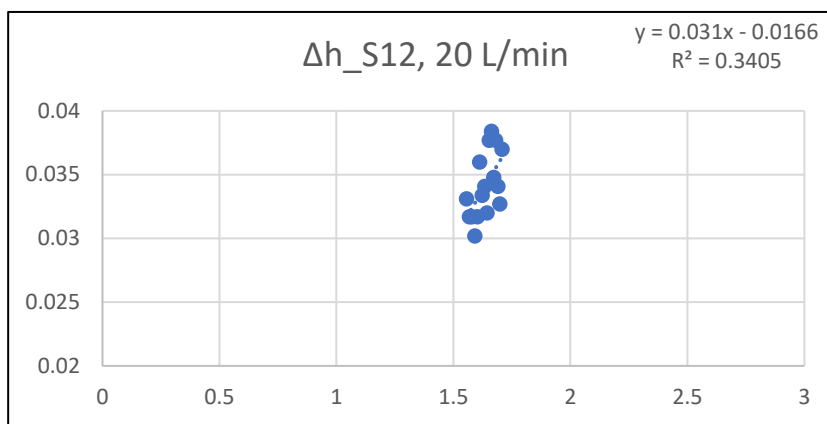
- Q : Pumping flowrate ($\frac{m^3}{min}$)
- T : Transmissivity ($\frac{m^2}{min}$)
- S : Storativity (dimension – less)
- r : distance from pumping well (m)
- t_0 : time intercept where the drawdown line intercepts the zero – drawdown axis min
- Δh : drawdown for one log cycle of time

BH code	Easting	Northing	Level
BH4	321428.927	198042.603	116.747
BH6	321393.816	198054.404	116.684
BH7	321394.287	198033.229	116.740
BH8	321401.203	198075.093	116.825
S3	321403.177	198028.704	116.820
S4	321392.136	198047.055	116.639
S5	321398.391	198068.096	116.769
S10	321393.549	198053.629	116.671
S11	321393.189	198041.443	116.644
S12	321391.089	198034.547	116.702
S13	321396.067	198026.586	116.756
S21	321383.926	198019.617	116.740

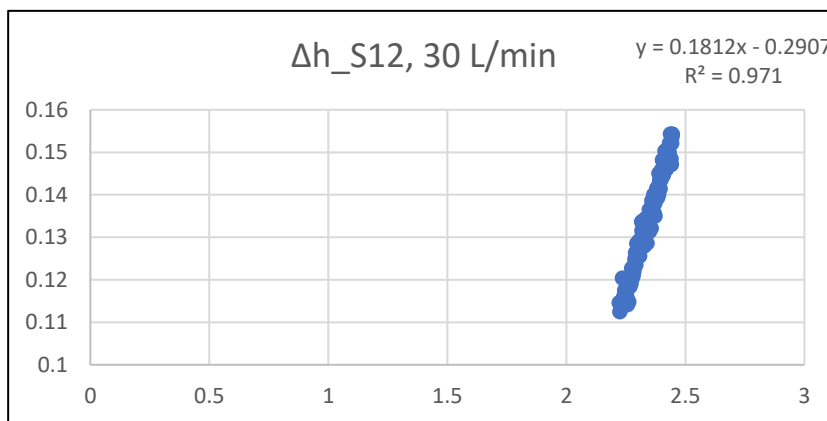
Therefore, with the late-time drawdowns (last half) obtained from the 04 wells, semilog graphs (Drawdown vs Log [time]) were plotted for each well and “lines of best fit” with their respective regression equations were defined.



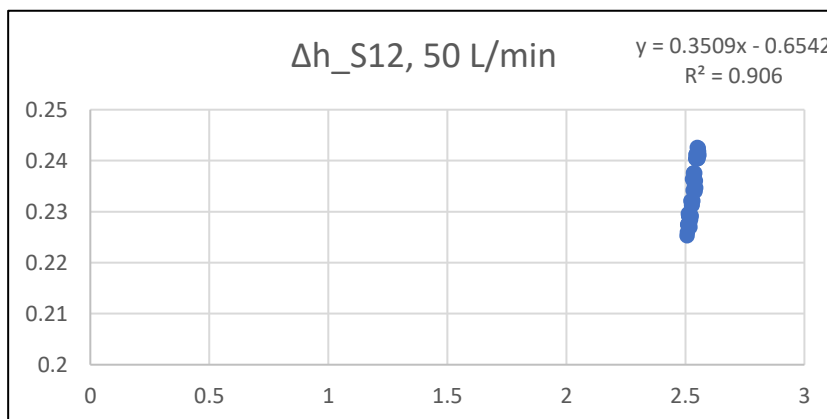
Parameter	Unit	Value
Flow “Q”	L/min	10
	m ³ /min	0.01
Distance to pumping well “r”	m	0.05
Slope “Δh ”	m/log	0.0137
R ²	-	0.1734
Transmissivity	m ² /min	0.1336
	m ² /day	192.38
Storativity	-	31.087



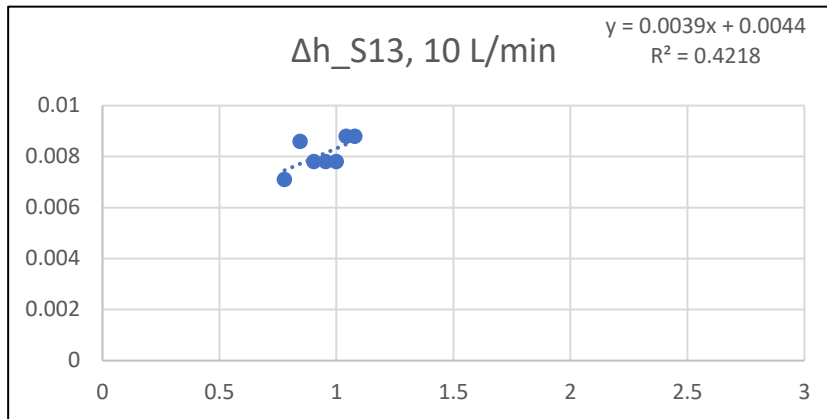
Parameter	Unit	Value
Flow “Q”	L/min	20
	m ³ /min	0.02
Distance to pumping well “r”	m	0.05
Slope “Δh ”	m/log	0.031
R ²	-	0.3405
Transmissivity	m ² /min	0.1181
	m ² /day	170.04
Storativity	-	91.17



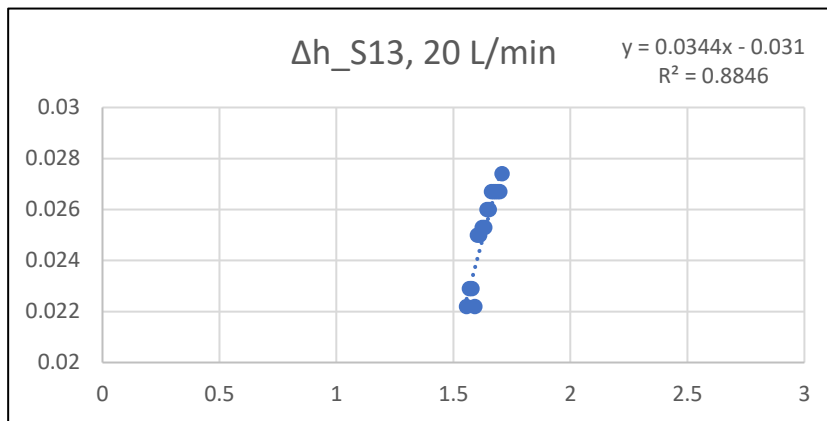
Parameter	Unit	Value
Flow “Q”	L/min	30
	m ³ /min	0.03
Distance to pumping well “r”	m	0.05
Slope “Δh ”	m/log	0.1812
R ²	-	0.971
Transmissivity	m ² /min	0.0303
	m ² /day	43.636
Storativity	-	274.14



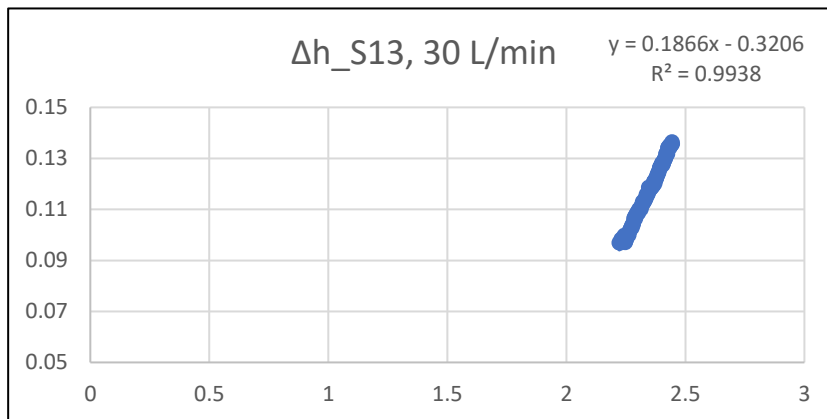
Parameter	Unit	Value
Flow “Q”	L/min	50
	m ³ /min	0.05
Distance to pumping well “r”	m	0.05
Slope “Δh ”	m/log	0.3509
R ²	-	0.906
Transmissivity	m ² /min	0.0261
	m ² /day	37.555
Storativity	-	429.37



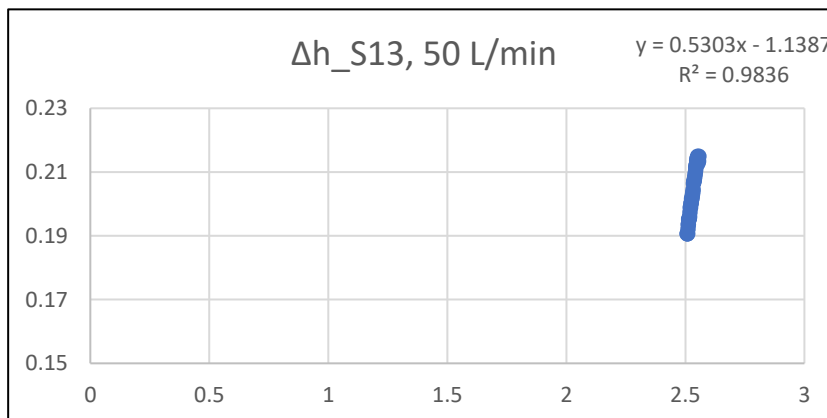
Parameter	Unit	Value
Flow "Q"	L/min	10
	m ³ /min	0.01
Distance to pumping well "r"	m	9.3892
Slope " Δh "	m/log	0.0039
R ²	-	0.4218
Transmissivity	m ² /min	0.4693
	m ² /day	675.8
Storativity	-	0.0009



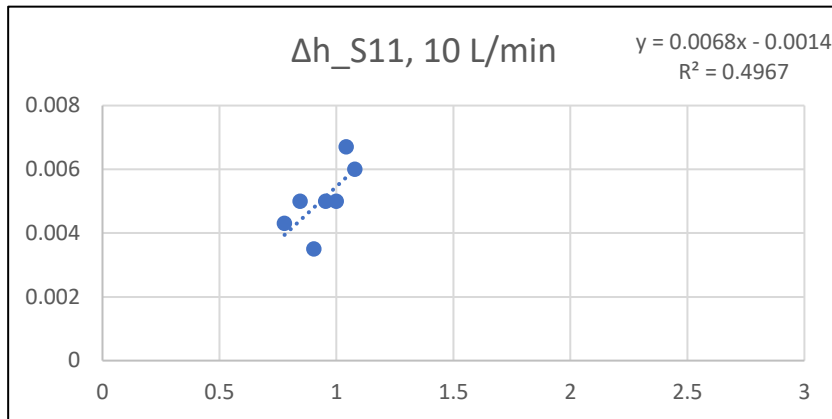
Parameter	Unit	Value
Flow "Q"	L/min	20
	m ³ /min	0.02
Distance to pumping well "r"	m	9.3892
Slope " Δh "	m/log	0.0344
R ²	-	0.8846
Transmissivity	m ² /min	0.1064
	m ² /day	153.23
Storativity	-	0.0216



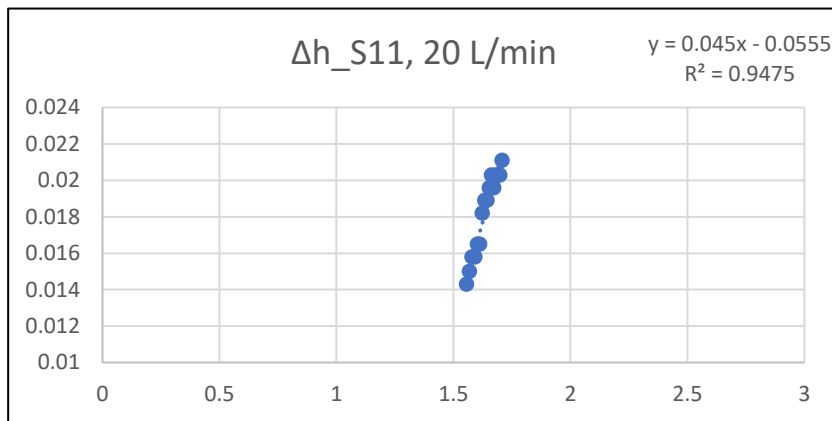
Parameter	Unit	Value
Flow "Q"	L/min	30
	m ³ /min	0.03
Distance to pumping well "r"	m	9.3892
Slope " Δh "	m/log	0.1866
R ²	-	0.9938
Transmissivity	m ² /min	0.0294
	m ² /day	42.373
Storativity	-	0.0392



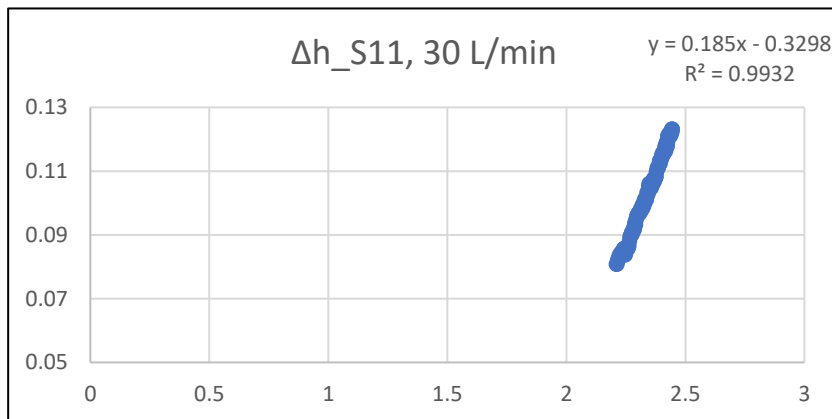
Parameter	Unit	Value
Flow "Q"	L/min	50
	m ³ /min	0.05
Distance to pumping well "r"	m	9.3892
Slope " Δh "	m/log	0.5303
R ²	-	0.9836
Transmissivity	m ² /min	0.0173
	m ² /day	24.85
Storativity	-	0.0618



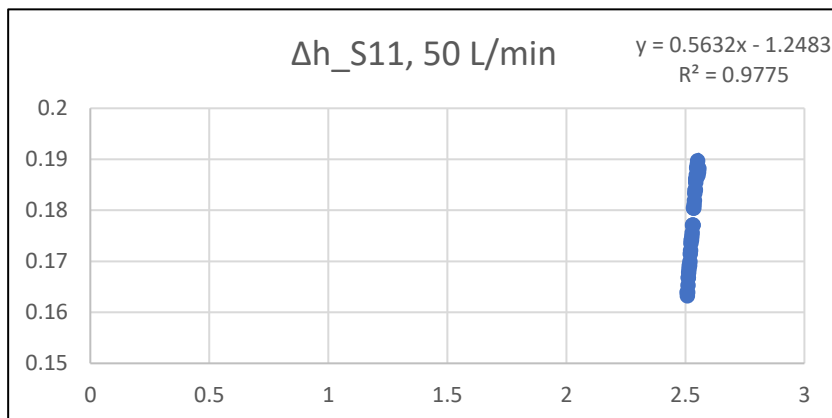
Parameter	Unit	Value
Flow "Q"	L/min	10
	m ³ /min	0.01
Distance to pumping well "r"	m	7.2087
Slope " Δh "	m/log	0.0068
R ²	-	0.4967
Transmissivity	m ² /min	0.2692
	m ² /day	387.59
Storativity	-	0.0187



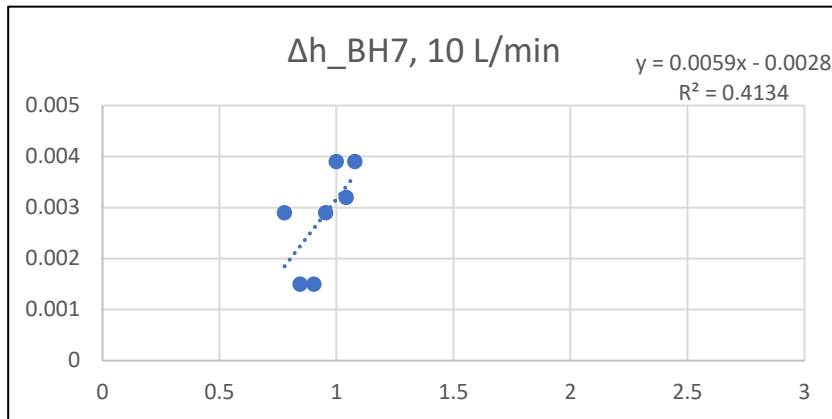
Parameter	Unit	Value
Flow "Q"	L/min	20
	m ³ /min	0.02
Distance to pumping well "r"	m	7.2087
Slope " Δh "	m/log	0.045
R ²	-	0.9475
Transmissivity	m ² /min	0.0813
	m ² /day	117.14
Storativity	-	0.0603



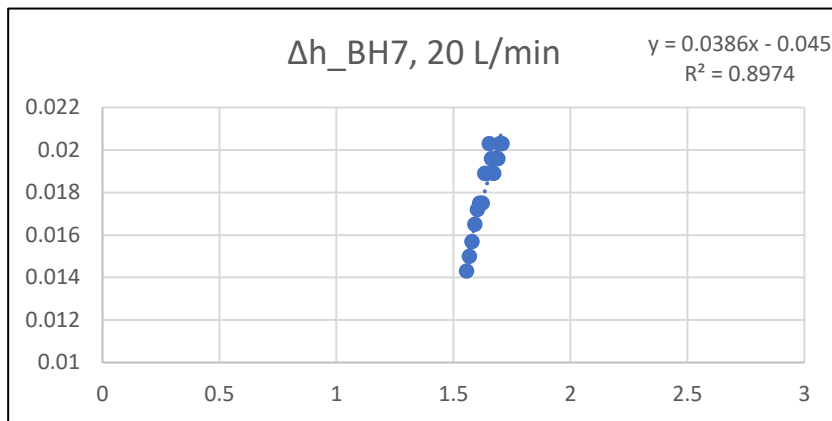
Parameter	Unit	Value
Flow "Q"	L/min	30
	m ³ /min	0.03
Distance to pumping well "r"	m	7.2087
Slope " Δh "	m/log	0.185
R ²	-	0.9932
Transmissivity	m ² /min	0.0297
	m ² /day	42.74
Storativity	-	0.0779



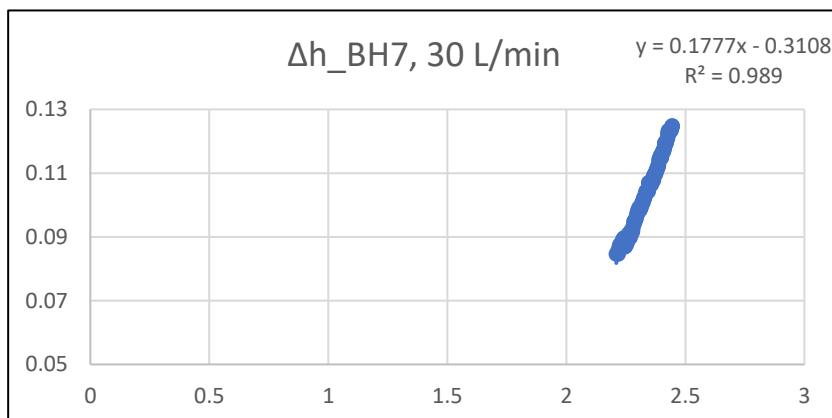
Parameter	Unit	Value
Flow "Q"	L/min	50
	m ³ /min	0.05
Distance to pumping well "r"	m	7.2087
Slope " Δh "	m/log	0.5632
R ²	-	0.9775
Transmissivity	m ² /min	0.0162
	m ² /day	23.398
Storativity	-	0.1158



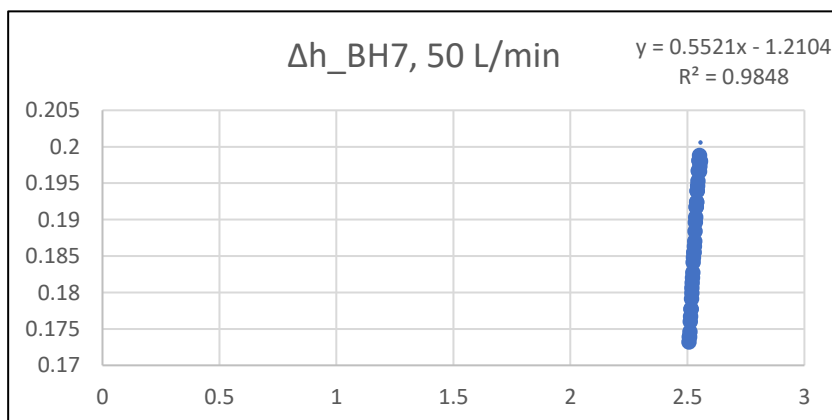
Parameter	Unit	Value
Flow "Q"	L/min	10
	m ³ /min	0.01
Distance to pumping well "r"	m	3.4589
Slope " Δh "	m/log	0.0059
R ²	-	0.4134
Transmissivity	m ² /min	0.3102
	m ² /day	446.71
Storativity	-	0.174



Parameter	Unit	Value
Flow "Q"	L/min	20
	m ³ /min	0.02
Distance to pumping well "r"	m	3.4589
Slope " Δh "	m/log	0.0386
R ²	-	0.8974
Transmissivity	m ² /min	0.0948
	m ² /day	136.56
Storativity	-	0.2613



Parameter	Unit	Value
Flow "Q"	L/min	30
	m ³ /min	0.03
Distance to pumping well "r"	m	3.4589
Slope " Δh "	m/log	0.1777
R ²	-	0.989
Transmissivity	m ² /min	0.0309
	m ² /day	44.495
Storativity	-	0.326



Parameter	Unit	Value
Flow "Q"	L/min	50
	m ³ /min	0.05
Distance to pumping well "r"	m	3.4589
Slope " Δh "	m/log	0.5521
R ²	-	0.9848
Transmissivity	m ² /min	0.0166
	m ² /day	23.869
Storativity	-	0.4854

Transmissivity and Storativity values obtained were discriminated according to the following criteria:

- Storativity values calculated for S12 (pumping well) were disregarded because the analytical solution used, such as Cooper-Jacob, assumes an infinitesimal well radius, leading to a mathematical singularity when radius is near zero, giving high unrealistic results. This approach is standard practice in pumping tests, as stated by Kruseman and de Ridder in 1994, data obtained from the pumping well are typically dominated by local effects and don't reflect aquifer-wide properties.

$$S = \frac{2.25 * T * t_0}{r^2}, \quad \lim_{r \rightarrow 0} S = \infty$$

- Storativity and transmissivity values that reported poor linear fit ($r^2 < 0.9$). As a low r^2 indicates that the data deviates significantly from the Cooper-Jacob model, due to potential non-ideal conditions such as aquifer heterogeneity, boundary effects, or well inefficiencies.

A summary of the Transmissivity and Storativity calculated from the step test are shown in the below table.

Step test results	Transmissivity (m ² /day)				Storativity			
	10	20	30	50	10	20	30	50
S12	192.3800	170.0391	43.6359	37.5549	31.0870	91.1701	274.1373	429.3742
S13	675.7964	153.2329	42.3731	24.8501	0.0009	0.0216	0.0392	0.0618
S11	387.5891	117.1380	42.7396	23.3985	0.0187	0.0603	0.0779	0.1158
BH7	446.7129	136.5599	44.4953	23.8689	0.1740	0.2613	0.3260	0.4854

3. Constant-rate test

A preliminary constant-rate test was performed on June 11th, 2025, using a submersible deep well pumps (placed in S11) and water level loggers (Placed in S3, S10 and BH7) for groundwater monitoring. Pumping rate was established at 30 L/min.

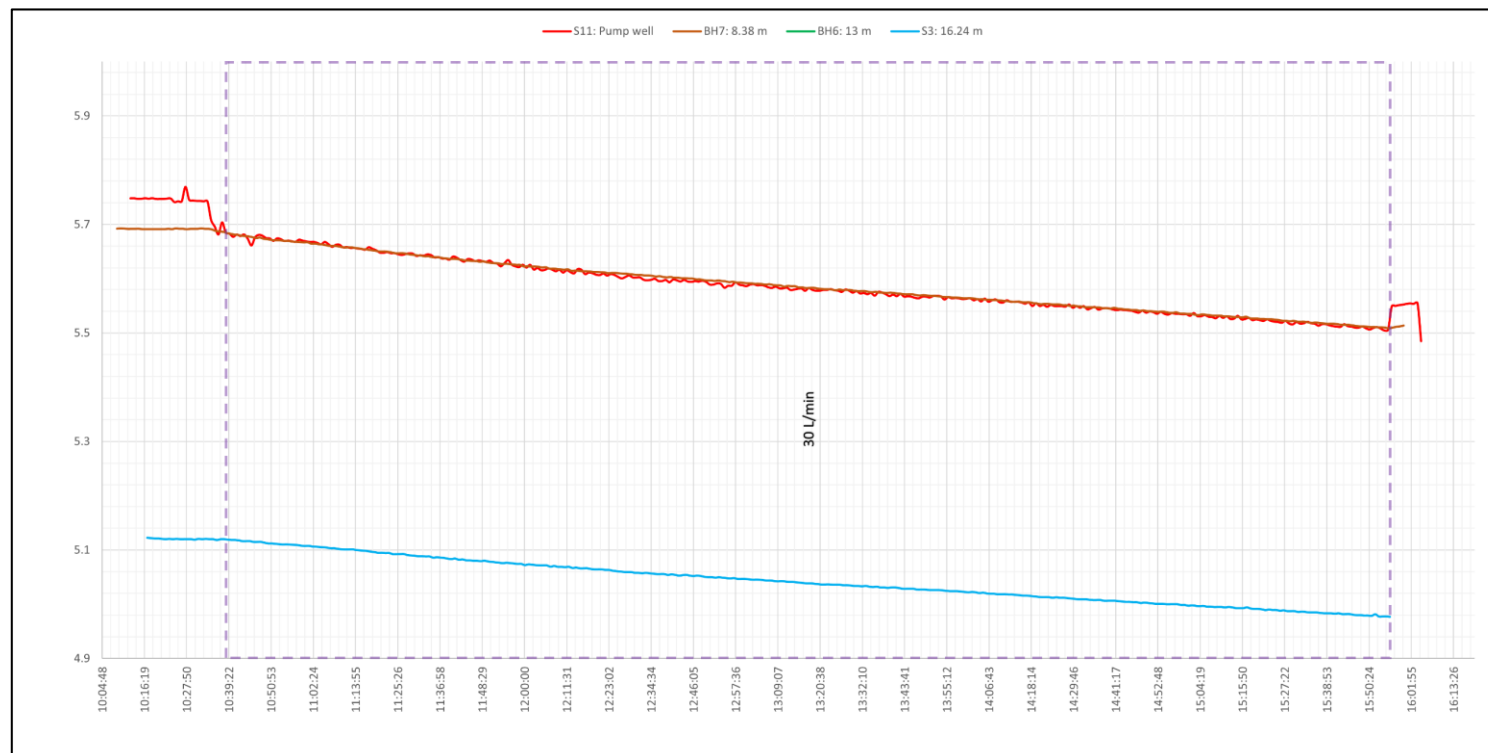
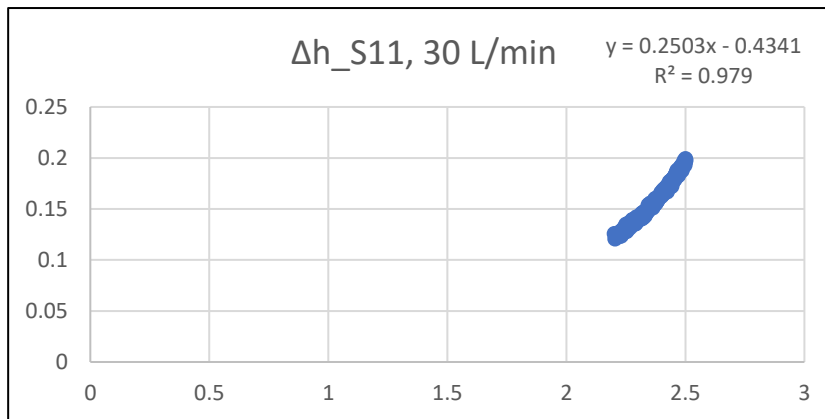
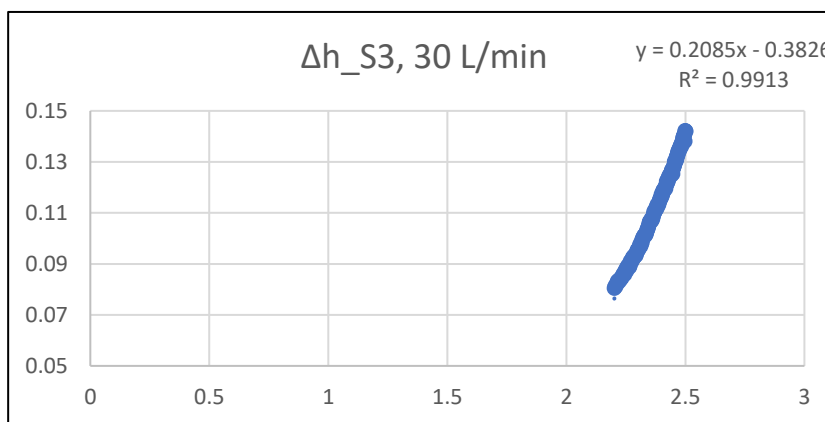


Figure B: Hydraulic head levels register from water level loggers during constant test

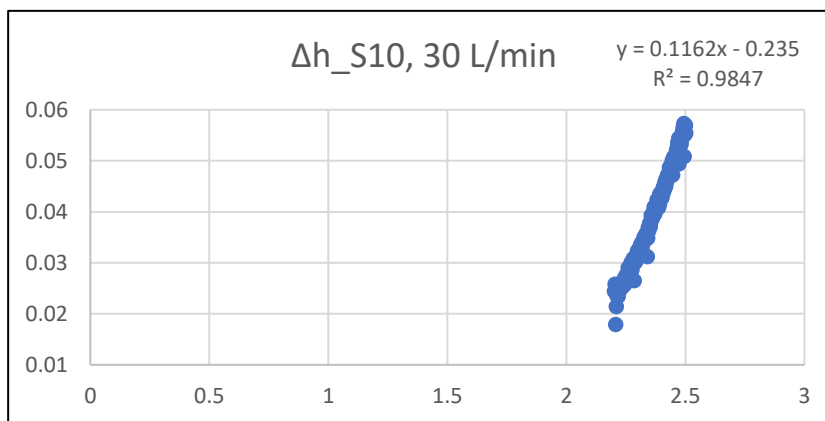
Similarly, Transmissivity (T) and Storativity (S) were calculated using The Semilog method of pump-test interpretation, Cooper-Jacob model, with the late-time drawdowns (last half) and “lines of best fit” with their respective regression equations were defined.



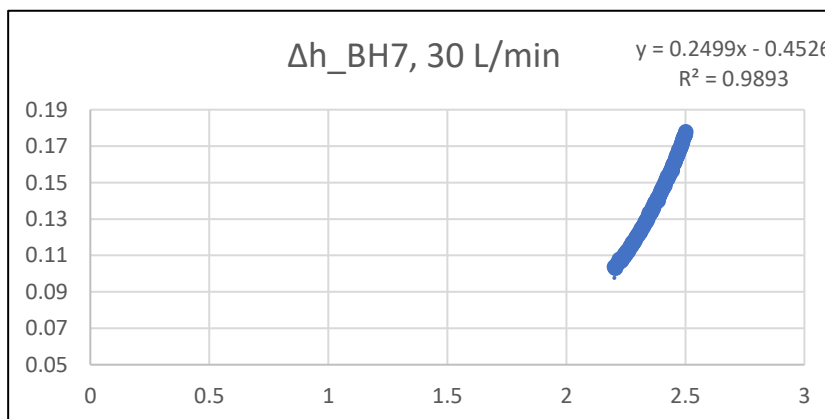
Parameter	Unit	Value
Flow "Q"	L/min	30
	m ³ /min	0.03
Distance to pumping well "r"	m	0.05
Slope "Δh "	m/log	0.2503
R ²	-	0.979
Transmissivity	m ² /min	0.021937
	m ² /day	31.589
Storativity	-	267.72



Parameter	Unit	Value
Flow "Q"	L/min	30
	m ³ /min	0.03
Distance to pumping well "r"	m	16.188
Slope "Δh "	m/log	0.2085
R ²	-	0.9913
Transmissivity	m ² /min	0.026335
	m ² /day	37.922
Storativity	-	0.015465



Parameter	Unit	Value
Flow "Q"	L/min	30
	m ³ /min	0.03
Distance to pumping well "r"	m	12.191
Slope "Δh "	m/log	0.1162
R ²	-	0.9847
Transmissivity	m ² /min	0.047253
	m ² /day	68.045
Storativity	-	0.075316



Parameter	Unit	Value
Flow "Q"	L/min	30
	m ³ /min	0.03
Distance to pumping well "r"	m	8.287
Slope "Δh "	m/log	0.2499
R ²	-	0.9893
Transmissivity	m ² /min	0.021972
	m ² /day	31.640
Storativity	-	0.046599

Same criteria to assess the results from the step test was used for the constant rate test. A summary of the Transmissivity and Storativity calculated from the constant rate test are shown in the below table.

Borehole	Transmissivity (m ² /day)	Storativity
S11	31.5894	267.7193
S3	37.9224	0.0155
S10	68.0449	0.0753
BH7	31.6399	0.0466

4. Recovery test

A preliminary recovery test was conducted overnight from June 10th to 11th, 2025, following the completion of the step test was finished. Water level loggers were installed in wells S12, S13, S3 and BH7 to monitor hydraulic head recovery.

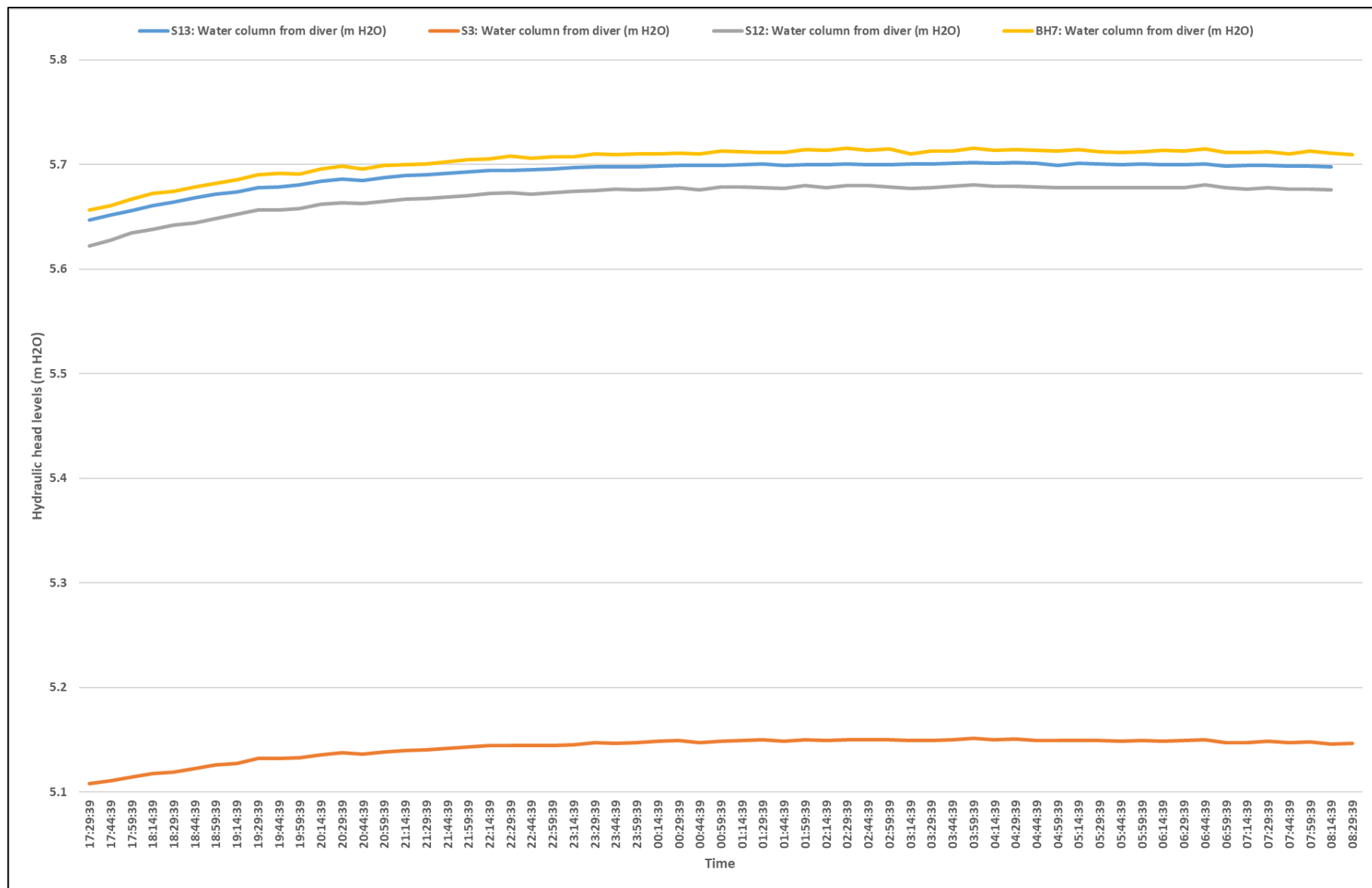


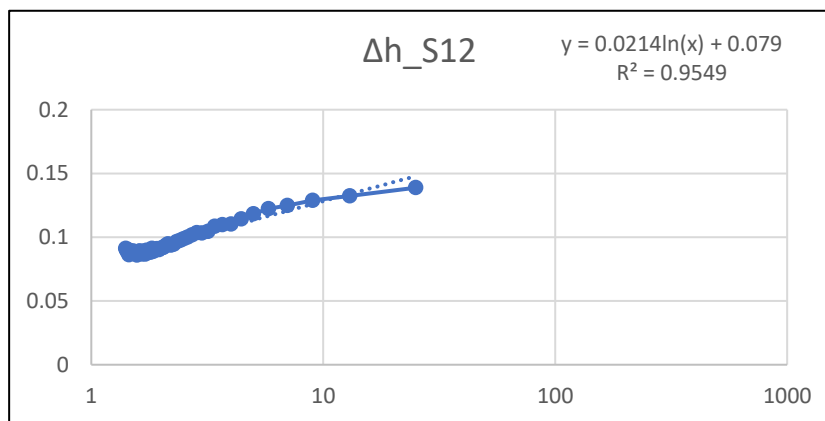
Figure C: Hydraulic heads recorded by water level dataloggers overnight between pump tests. Aquifer recharges tendency is shown.

Residual drawdowns (s') were derived from the hydraulic head levels records, and Transmissivity (T) values were calculated using the Theis recovery method applying the Cooper-Jacob approximation for late-time data ($u < 0.01$).

$$T = \frac{2.303 * Q}{4 * \pi * s'} \log(t^*); \quad u = \frac{r^2 S}{4Tt}; \quad t^* = \frac{t + t_p}{t}$$

- Q : Pumping flowrate ($\frac{m^3}{day}$), Equivalent Q was obtained with a time – weigthen average mean
- T : Transmissivity ($\frac{m^2}{day}$)
- s' : Residual drawdown (m)
- t^* : Equivalent time
- t : Elapsed time since pumping stopped (day)
- t_p : Pumping time (day)
- r^2 : Distance from pumping well (m)
- S : storativity

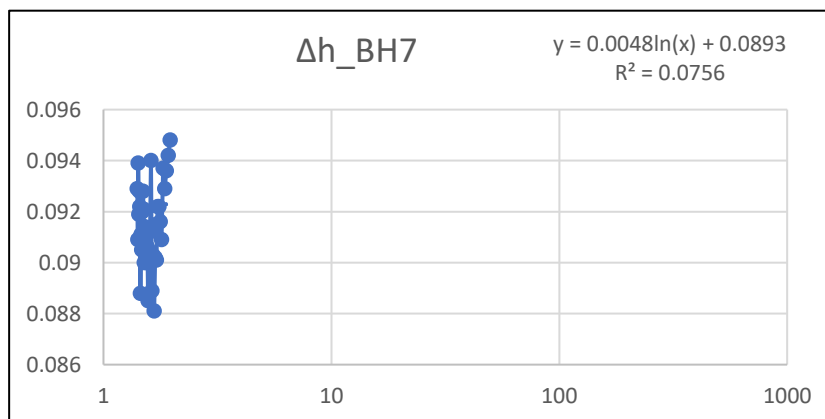
Therefore, semilog graphs (residual drawdown vs Log [Equivalent time]) were plotted for each well with late-time data that comprised with $u < 0.01$ and “lines of best fit” with their respective regression equations were defined.



Full set of values presented linear behaviour, $u < 0.01$ for all recovery data.

Parameter	Unit	Value
Flow “Q”	L/min	32.75
	m ³ /day	47.16
Slope “s’ ”	m/log	0.049275*
R ²	-	0.9549
Transmissivity	m ² /day	175.3995

* Calculated from multiplying (slope*ln10)



After 360 minutes, recovery data presented linear behaviour, $u < 0.01$ for post 360 minutes data.

Parameter	Unit	Value
Flow “Q”	L/min	32.75
	m ³ /day	47.16
Slope “s’ ”	m/log	0.0011052
R ²	-	0.0756
Transmissivity	m ² /day	781.9895

* Calculated from multiplying (slope*ln10)

A summary of the Transmissivity and Storativity calculated from the recovery test are shown in the below table.

Borehole	Transmissivity (m ² /day)	Commentary
S12	175.3995	Accepted value
S13	Not calculated	T was not calculated as “u” never reached the u<0.01 condition. Longer times are needed for recovery to achieve linear behaviour
S3	Not calculated	T was not calculated as diver data prior pumping test was not available
BH7	781.9895	T disregarded due to poor linear fit r ² <0.90

5. Transmissivity and Storativity values

T and S valid values obtained from previous test were used to calculate geomeans as a representative value for the aquifer, geomean was picked to incorporate the heterogeneity of the data.

ID	Transmissivity (m ² /day)	Storativity
1	117.1380	0.0603
2	43.6359	0.0392
3	42.3731	0.0779
4	42.7396	0.3260
5	44.4953	0.0618
6	37.5549	0.1158
7	24.8501	0.4854
8	23.3985	0.0155
9	23.8689	0.0753
10	31.5894	0.0466
11	37.9224	
12	68.0449	
13	31.6399	
14	175.3995	
Geomean	43.8479	0.080435

6. Hydraulic gradient calculations

Water tables were obtained from manually dip measurements from August 2024 to September 2025, water heads were calculated and a hydraulic gradient geomean was calculated.

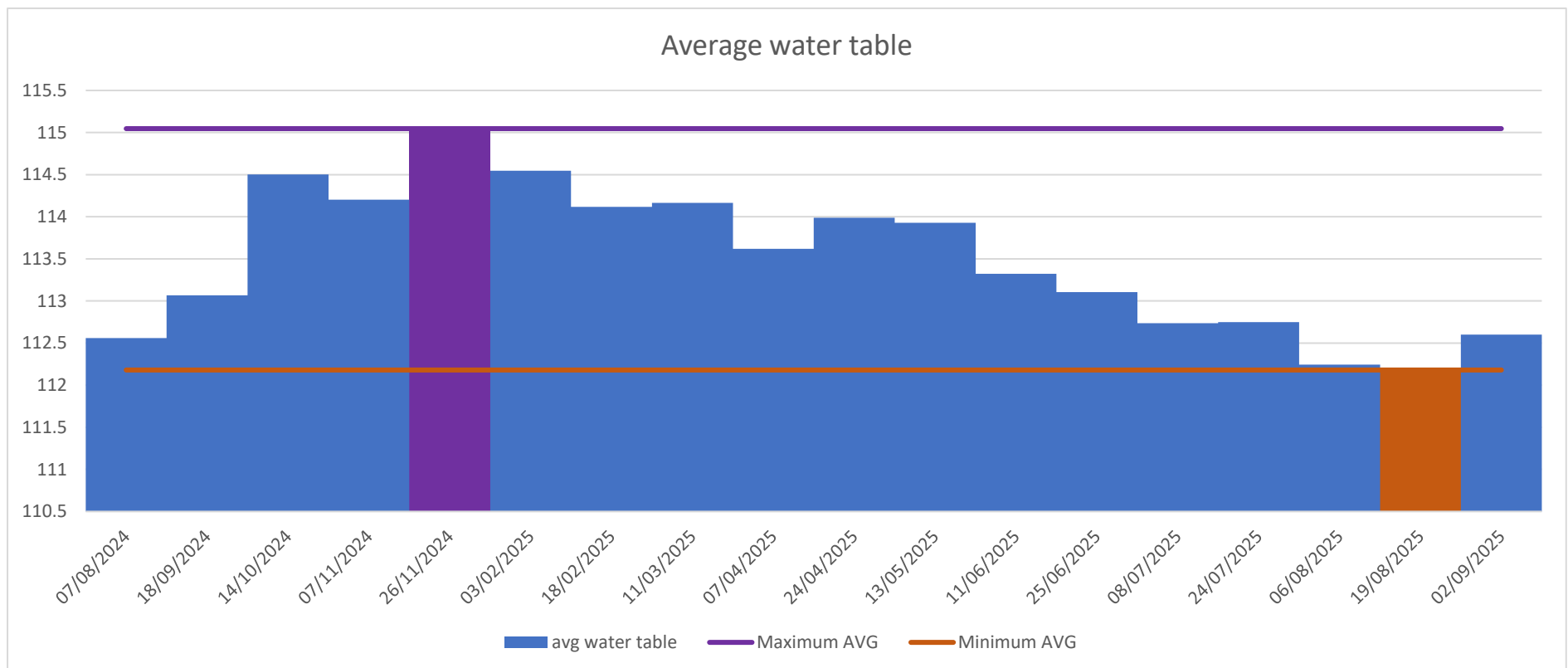
$$i = \frac{h_1 - h_2}{d}$$

Borehole	07/08/2024	18/09/2024	14/10/2024	07/11/2024	26/11/2024	03/02/2025	18/02/2025	11/03/2025	07/04/2025	24/04/2025	13/05/2025	11/06/2025	25/06/2025	08/07/2025	24/07/2025	06/08/2025	19/08/2025	02/09/2025
BH4	-	113.102	114.843	114.393	115.512	115.017	114.354	114.489	113.896	114.382	114.295	113.422	113.307	112.902	112.842	112.444	112.252	112.692
BH6	112.398	112.706	114.436	114.169	114.948	114.470	114.096	114.139	113.843	113.944	113.902	113.469	113.159	112.759	112.741	112.139	112.039	112.732
BH7	111.996	-	114.372	114.162	114.776	114.425	114.015	114.139	113.749	113.871	113.815	113.322	113.112	113.015	112.611	112.024	111.924	112.421
BH8	113.285	113.390	114.489	114.224	115.094	114.540	114.145	113.986	113.878	113.933	113.894	113.470	113.248	113.100	113.183	112.985	112.960	113.330
S3	-	-	114.464	114.145	115.054	114.536	114.148	114.185	113.278	113.915	113.837	113.340	113.120	112.667	112.570	112.485	112.443	112.527
S4	-	-	114.429	114.111	114.915	114.409	114.028	114.099	113.797	113.919	113.826	113.440	113.156	112.664	112.597	112.094	112.054	112.544
S5	-	-	114.479	114.211	115.024	114.425	114.041	114.107	112.883	113.948	113.918	113.459	113.167	112.771	112.854	112.584	112.526	112.816
S11	-	-	-	-	-	-	-	-	-	-	-	113.272	113.118	112.703	112.561	112.325	112.319	112.542
S10	-	-	-	-	-	-	-	-	-	-	-	112.745	112.544	112.226	113.246	111.808	111.716	112.136
S12	-	-	-	-	-	-	-	-	-	-	-	113.323	113.102	112.649	112.487	111.874	111.728	112.427
S13	-	-	-	-	-	-	-	-	-	-	-	113.302	113.108	112.641	112.527	111.921	112.021	112.424
AVG	112.560	113.066	114.502	114.202	115.046	114.546	114.118	114.163	113.618	113.987	113.927	113.324	113.104	112.736	112.747	112.244	112.180	112.599

Maximum average water table (mAOD) on 26/11/2024	115.046
Minimum water table (mAOD) on 19/08/2025	112.180

i	0.030378	0.031136	0.013125	0.007609	0.020509	0.016943	0.009147	0.011777	0.025466	0.014240	0.013376	0.005724	0.005299	0.009410	0.016655	0.026586	0.029482	0.021423
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Hydraulic gradient "i" geomean	0.01493642
Maximum Hydraulic gradient "i-max"	0.03113589
Minimum Hydraulic gradient "i-max"	0.00529906



7. Radius of influence calculation

The radius of influence of the abstraction was estimated using the Sichardt formula

$$R_0 = C * s * \sqrt{K}$$

- R_0 : Radius of influence (m)
- C : Empirical factor
- s : drawdown (m)
- K : Hydraulic conductivity ($\frac{m}{s}$)

For radial flow, a C value of 3,000 is typically used (EA, 2007)

Drawdown (m)	0.5	1	1.5	2	2.5
Radius of influence (m)	14.58277	29.16555	43.74832	58.33109	72.91386

8. Drawdown estimates calculation

Estimated drawdowns at any point from a multiple-well system were calculated following the Theis solution for multiple wells and different rates, and considering the infinite series approximation for the well function $W(u)$.

$$\Delta h = \frac{Q_1}{4\pi * T} * W(u_1) + \frac{Q_2}{4\pi * T} * W(u_2) + \dots + \frac{Q_n}{4\pi * T} * W(u_n); \quad u_i = \frac{r_i^2 * S}{4 * T * t_i}$$

$$W(u) = -0.5772 - \ln(u) + u - \frac{u^2}{2 * 2!} + \frac{u^3}{3 * 3!} - \frac{u^4}{4 * 4!} + \dots; \text{ when } u < 1$$

Input considered were:

Pumping borehole	S10	S12	S21
Pumping Flow (Q_n)	30 L/min	20 L/min	20 L/min
	43.2 m ³ /day	28.8 m ³ /day	28.8 m ³ /day
Pumping time (t_i)	1 day	1 day	1 day

Discharge borehole	D1	D2
Discharge Flow (Q_n)	50.4 m ³ /day	50.4 m ³ /day
Discharge time (t_i)	1 day	1 day

Transmissivity (m ² /day)	43.8479
Storativity	0.080435

1-day estimated drawdowns due to abstraction for the multiple-well system were calculated.

BH code	Distance to S10 (m)	u_s10	W(u_s10)	Δ due to S10(m)	Distance to S12 (m)	u_s12	W(u_s12)	Δ due to S12(m)	Distance to S21 (m)	u_s21	W(u_s21)	Δ due to S21(m)	Total Δ (m)
BH4	37.05638353	0.629741848	0.42808	0.033562	38.68609	0.686351	0.383399	0.020039	50.53164	1.171017	0.162747	0.008506	0.062108
BH6	0.819703605	0.000308141	7.50806	0.588644	20.04338	0.184238	1.290416	0.067447	36.16556	0.599828	0.454433	0.023752	0.679843
BH7	20.41334475	0.191101823	1.260095	0.098793	3.458949	0.005487	4.633676	0.242192	17.10663	0.134204	1.561026	0.081591	0.422576
BH8	22.78786984	0.238146361	1.082355	0.084858	41.78841	0.800844	0.309645	0.016184	58.10406	1.54828	0.080978	0.004233	0.105275
S3	26.71991783	0.327421147	0.841758	0.065995	13.42611	0.082668	1.996714	0.104364	21.2879	0.207827	1.191357	0.06227	0.232628
S4	6.724138978	0.020735277	3.319347	0.260242	12.55174	0.072251	2.121374	0.110879	28.63997	0.376168	0.744061	0.03889	0.410012
S5	15.25578752	0.106734729	1.764162	0.138313	34.33445	0.540626	0.513273	0.026828	50.591	1.17377	0.161984	0.008467	0.173607
S10	0.05	1.14651E-06	13.10159	1.027185	19.23991	0.169763	1.358974	0.07103	35.34711	0.572986	0.47993	0.025085	1.123301
S11	12.19131642	0.068161273	2.175696	0.170578	7.208663	0.023831	3.18325	0.166381	23.71028	0.257816	1.020414	0.053335	0.390294
S12	19.23991486	0.169762898	1.358974	0.106546	0.05	1.15E-06	13.10159	0.68479	16.55939	0.125755	1.618129	0.084576	0.875912
S13	27.15997373	0.338294689	0.818336	0.064159	9.389249	0.040429	2.67102	0.139608	13.99896	0.089873	1.920054	0.100357	0.304124
S21	35.34711124	0.572986437	0.47993	0.037627	16.55939	0.125755	1.618129	0.084576	0.05	1.15E-06	13.10159	0.68479	0.806993
D1	46.02412621	0.971421235	0.228953	0.01795	37.32582	0.638933	0.420385	0.021973	41.87207	0.804054	0.307842	0.01609	0.056013
D2	40.91707058	0.767795487	0.328976	0.025792	37.32282	0.63883	0.42047	0.021977	46.11905	0.975432	0.22737	0.011884	0.059653

Additionally, 1-day estimated mounds due to discharge for the multiple-well system were calculated.

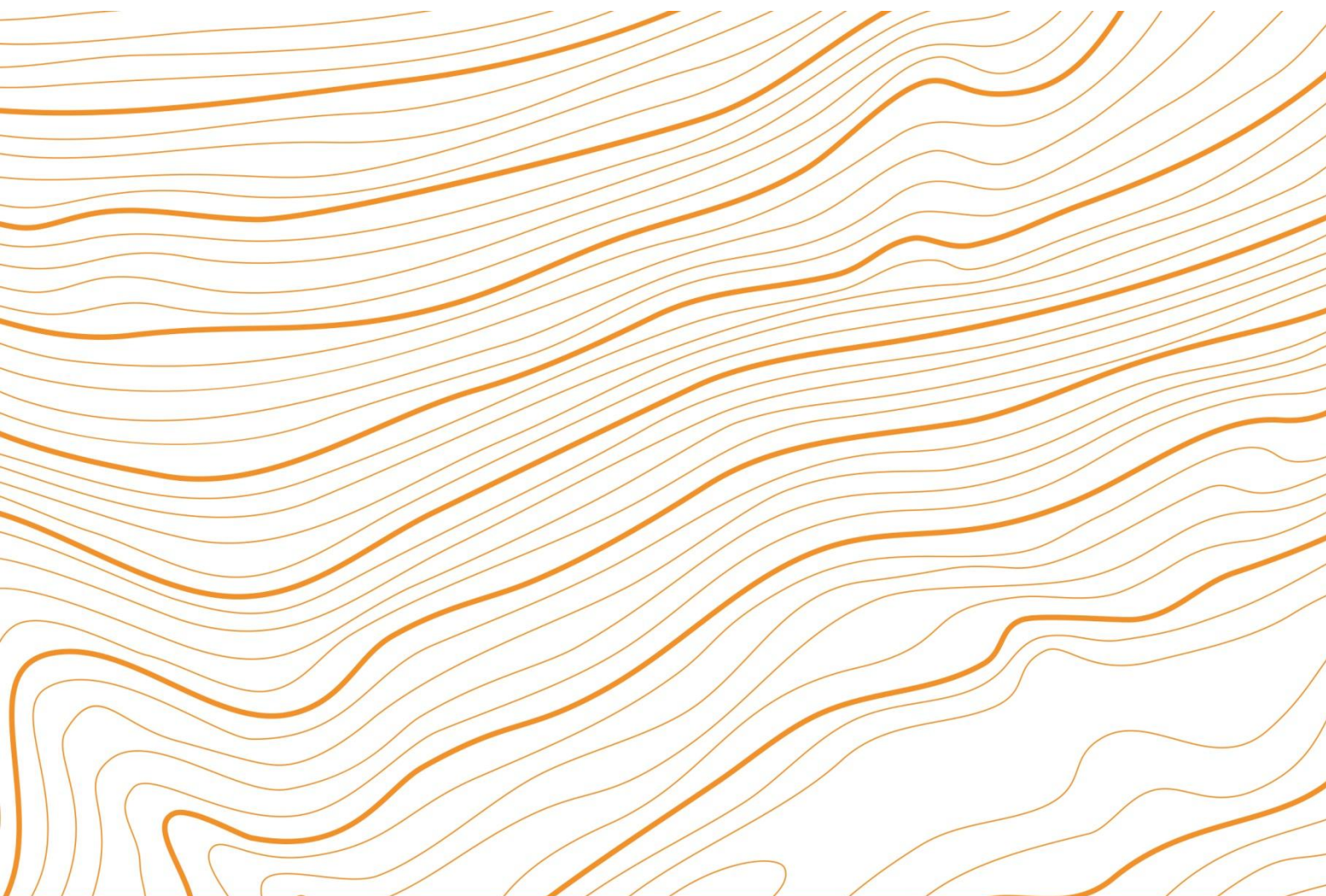
BH code	Distance to D1 (m)	u_D1	W(u_D1)	Δ due to D1(m)	Distance to D2 (m)	u_D2	W(u_D2)	Δ due to D2(m)	Total Δ (m)
BH4	22.05142	0.223003	1.134533	0.103774	10.54292	0.050975	2.449551	0.224057	0.327831
BH6	46.39612	0.987188	0.222802	0.020379	41.1061	0.774906	0.324695	0.029699	0.050079
BH7	33.8672	0.526011	0.52936	0.04842	34.06249	0.532095	0.522581	0.0478	0.096219
BH8	59.61841	1.630036	0.067054	0.006133	50.85519	1.186061	0.158618	0.014509	0.020642
S3	23.95461	0.263157	1.004611	0.09189	25.37815	0.295363	0.917255	0.0839	0.17579
S4	42.69176	0.835843	0.290656	0.026586	39.17073	0.703655	0.370941	0.033929	0.060515
S5	54.67499	1.370926	0.114728	0.010494	46.83708	1.006042	0.215686	0.019728	0.030222
S10	46.02413	0.971421	0.228953	0.020942	40.91707	0.767795	0.328976	0.030091	0.051033
S11	38.59258	0.683037	0.385845	0.035293	36.36773	0.606553	0.448327	0.041008	0.0763
S12	37.32582	0.638933	0.420385	0.038452	37.32282	0.63883	0.42047	0.03846	0.076912
S13	30.27748	0.420413	0.669347	0.061224	32.72693	0.491187	0.570578	0.05219	0.113414
S21	41.87207	0.804054	0.307842	0.028158	46.11905	0.975432	0.22737	0.020797	0.048955
D1	0.05	1.15E-06	13.10159	1.198383	11.58371	0.061536	2.27153	0.207773	1.406156
D2	11.58371	0.061536	2.27153	0.207773	0.05	1.15E-06	13.10159	1.198383	1.406156

Then total drawdowns and mounds were applied to each borehole at their respective maximum and minimum average water tables.

BH code	Ground level	Maximum average water level 26/11/2024	Minimum average water level 19/08/2025	Drawdown due to pumping	Mound due to discharging	Effective drawdown	Estimated water table after 1-day operation during maximum average water level register (26/11/2024)	Estimated water table after 1-day operation during minimum average water level register (26/11/2024)
BH4	116.747	115.512	112.252	0.062108	0.327831	-0.26572	115.7777	112.5177
BH6	116.684	114.948	112.039	0.679843	0.050079	0.629764	114.3182	111.4092
BH7	116.740	114.776	111.924	0.422576	0.096219	0.326357	114.4496	111.5976
BH8	116.825	115.094	112.96	0.105275	0.020642	0.084633	115.0094	112.8754
D1	116.760*	115.090*	112.203*	0.056013	1.406156	-1.35014	116.4401	113.5531
D2	116.770*	115.170*	112.217*	0.059653	1.406156	-1.3465	116.5165	113.5635
S10	116.671	114.958*	112.095	1.123301	0.051033	1.072268	113.8857	111.0227
S11	116.644	114.950*	112.319	0.390294	0.0763	0.313993	114.636	112.005
S12	116.702	114.905*	111.728	0.875912	0.076912	0.799	114.106	110.929
S13	116.756	114.965*	112.021	0.304124	0.113414	0.19071	114.7743	111.8303
S21	116.740*	114.988*	112.125*	0.806993	0.048955	0.758038	114.230	111.367
S3	116.820	115.054	112.443	0.232628	0.17579	0.056838	114.9972	112.3862
S4	116.639	114.915	112.054	0.410012	0.060515	0.349496	114.5655	111.7045
S5	116.769	115.024	112.526	0.173607	0.030222	0.143385	114.8806	112.3826

Note: * these values were obtained from interpolation

Finally, ground water levels and cross-sections were drawn to illustrate the cones of depression that each multiple-well system would create after 1-day operation. These figures are shown in Appendix A.



Appendix C: Water Feature Surveys



Geo2 Remediation Ltd Coniston House
Louisa Street, Idle, BD10 8NE

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Date: 12.08.2025

Contact Email: adam.wilson@geo2.co.uk

0816 / Enterprise Autos / Investigate Groundwater App

Water Features Survey

A water features survey was undertaken by Peter Phillips on behalf of Geo2 on 25.06.2025 and by Gayathry Vinod on 07.08.2025.

Based on guidance provided in support of both an abstraction and discharge application we have surveyed the area within 500m of the site for water features (based on an abstraction of 100.8 m³/day).

It should be noted that the proposed abstraction works in conjunction with a proposed discharge and as such, the water balance for the site will remain neutral as a result of these works. No impact to any resource is anticipated as a result of these works.

As the site is located in a valley, the local hydrology is dominated by the River Ebbw, located 40m west of the site and running in a southerly direction.

Prior to the visit the Envirocheck database, OS maps and OS Open mapping were reviewed, and the following water features were observed.

1. River Ebbw, 40m west, flowing south past the site.
2. Crumlin Arm, a tributary entering into the River Ebbw 310m north (upstream) of the site. Confluence located at ST 21354 98409.
3. Envirocheck plan (snippet shown overleaf showing 250m and 500m buffers around the site) also identifies evidence of minor streams (approx 200m south) running downslope and crossing below the A467 road before entering the River Ebbw approximately 350m south of the site. The survey undertaken was not able to identify these features, it is assumed that this feature is ephemeral and likely to be a seasonal flow. These features are downgradient from the site, and it is not feasible that these will be influenced by the proposed abstraction and discharge onsite.

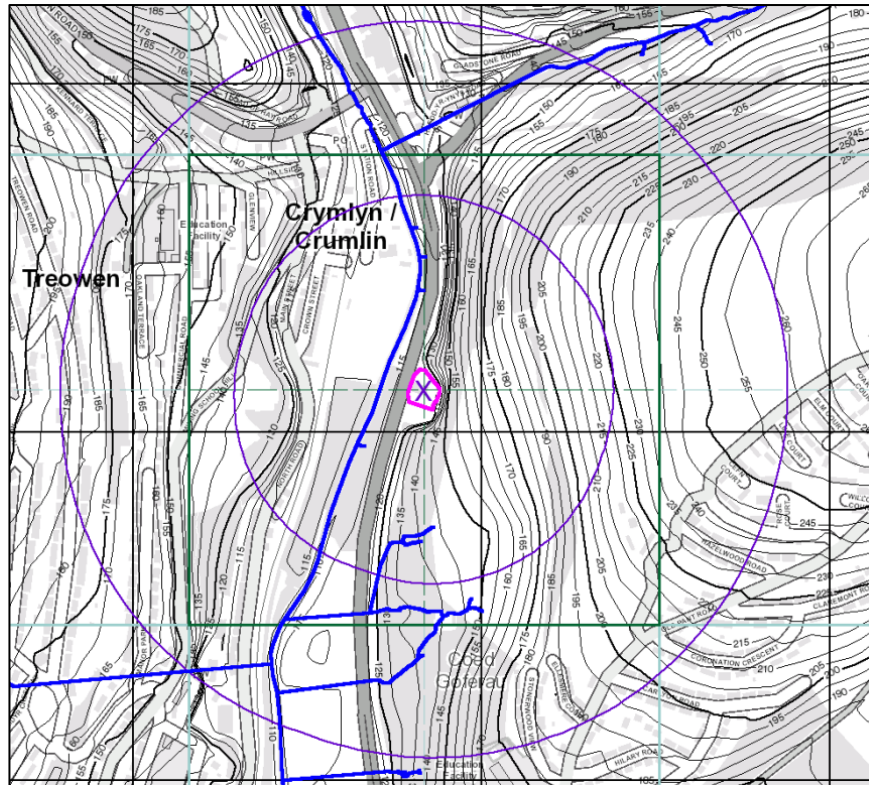


Figure 1: Site Location Plan. Extract from Google Maps.

The Envirocheck database does not identify any abstractions from groundwater within 1000m of the site. Whilst this does not preclude there being small scale unrecorded abstractions of domestic abstraction not included in the Envirocheck search, given the location of the site (the nearest property in the base of the valley to the east of the River Ebbw is 388m away from the site) Geo² consider that the presence of other users of the groundwater or surface water resource within the area of influence in negligible.

4. A search was also conducted via Central Avenue where a minor stream (321416, 196860) was located approximately 1km south from site.

The following photographs and comments arise from the visual inspection.

River Ebbw: 500 m upstream of site



River Ebbw: 200 m upstream of site



River Ebbw: 40m east from site



River Ebbw: 200 m downstream from site



River Ebbw: 500 m downstream from site

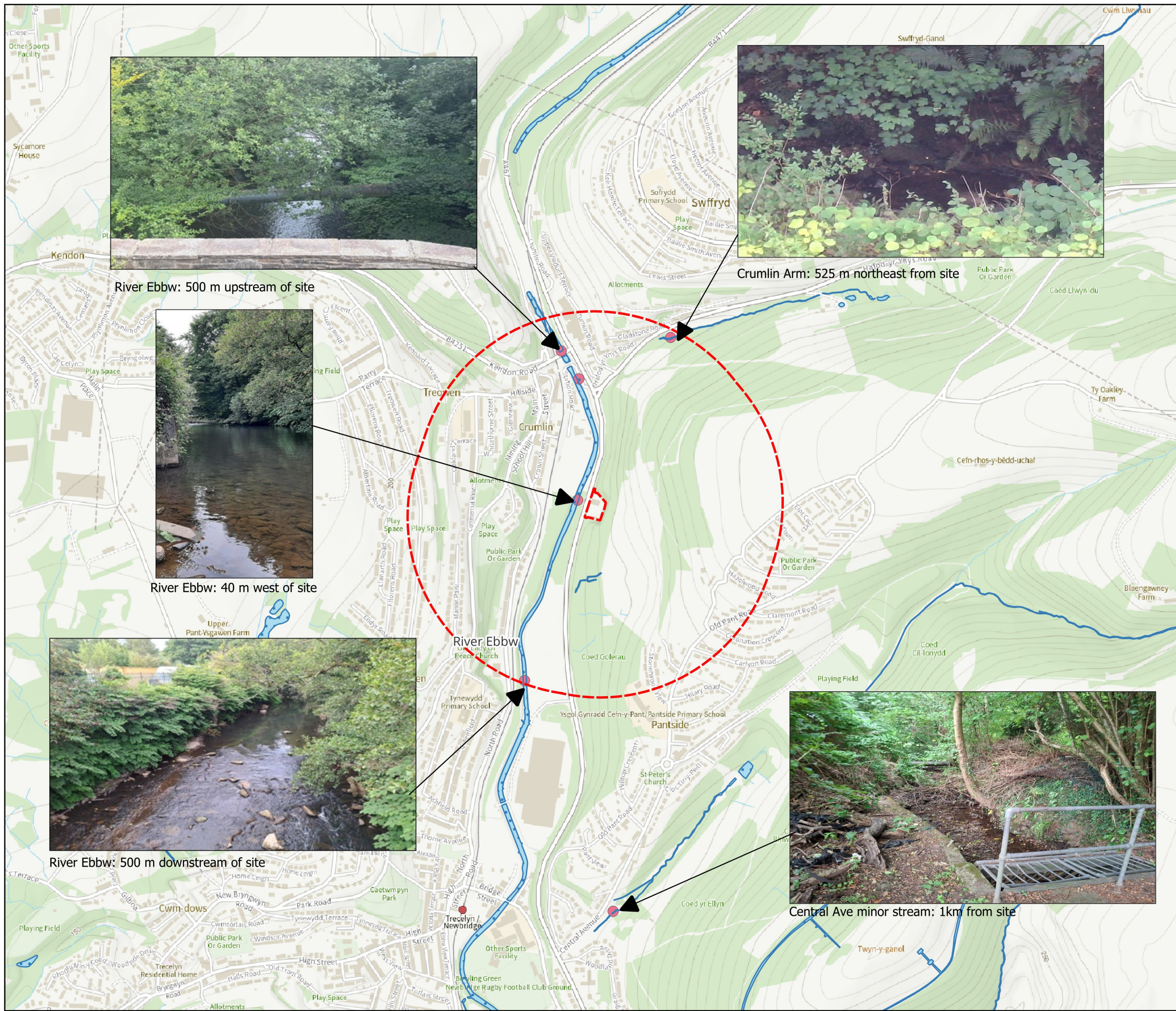


Crumlin Arm: 525m northeast from site



Minor stream in central Ave, 1km south from site





Legend

Site Boundary



Photos

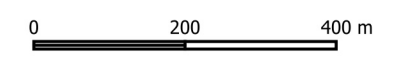


Figure Water features survey
June- August, 2025

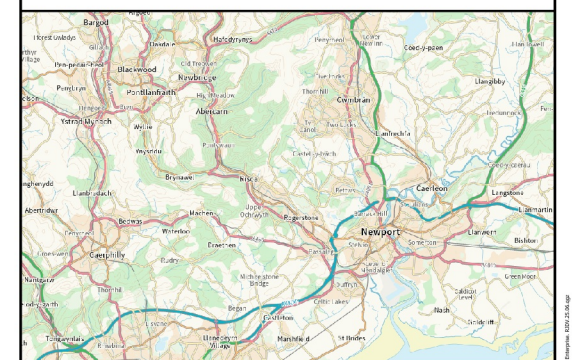
Job 0816

Client Ascona

Figure No.	Revision	Date
12.16	3	12 August 2025

Drawn by	Checked by	Scale
R.D.	A.W	1:10,000

Job No. J-0861. En



DO NOT SCALE. NOT FOR CONSTRUCTION



Site Plan Provided by Client, 2025.

Microsoft Bing