



Ground Doctor Pty Ltd

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24 September 2020

Hy-tec Industries Pty Ltd
Austen Quarry
391 Jenolan Caves Road
Hartley NSW 2790
Craig.Mcdonald@adbri.com.au

Attention: Mr Craig McDonald

Dear Craig,

**RE: AUGUST 2020 WATER MONITORING RESULTS,
AUSTEN QUARRY, HARTLEY, NSW**

Ground Doctor was engaged by Hy-tec Industries Pty Ltd (Hy-tec) to collect water data at the Austen Quarry, 391 Jenolan Caves Road, Hartley, NSW (the site).

1 Monitoring Objectives

The objective of the monitoring round was to collect water data to comply with monitoring programme outlined in the Water Management Plan (Groundwork Plus, 2017).

The Water Management Plan (Groundwork Plus, 2017) stipulates that Hy-tec will monitor water quality within the quarry excavation on a six monthly basis for the life of the quarry. The Water Management Plan also outlines triggers for groundwater level changes at four existing monitoring bores.

2 Scope of Work

Ground Doctor conducted the following work.

- Gauged four existing groundwater monitoring wells to measure the depth to groundwater.
- Downloaded groundwater level data from data loggers within three bores in which groundwater was encountered (MB01S, MB01D and MB02).
- Downloaded atmospheric pressure data from a barologger installed within MB03.
- Measured water quality parameters within accumulated water at the base of the quarry excavation.
- Collected samples of water within the base of the quarry excavation for laboratory analysis.
- Prepared this report outlining methodology and results of the monitoring round.

3 Monitoring Bore Locations

The monitoring bore locations are shown on *Figure 1 of Attachment A*. Monitoring bore coordinates and details are summarised in *Table 1*. *Table 1* also presents a summary of the monitoring bore construction details.

Table 1: Monitoring Bore Construction Details

| Bore ID | Easting | Northing | Approx. Surface Elevation (AHD) | Depth to Bottom (btc) | Screened Intervals (bgl) | Stickup (agl) |
|---------|---------|----------|---------------------------------|-----------------------|--------------------------|---------------|
| MB01S | 235245 | 6281077 | 700m | 7.42m | 3.7-6.7m | 0.8m |
| MB01D | 235259 | 6281098 | 700m | 29.30m | 20-23m 26-28.5m | 0.8m |
| MB02 | 235915 | 6280398 | 710m | 29.10m | 10.5-13.5m 22.5-28.5m | 0.6m |
| MB03 | 236419 | 6281786 | 690m | 25.31m | 18.5-24.5m | 0.4m |

Eastings and northings are MGA Zone 56.

btc = below top of casing

bgl = below ground level

agl = above ground level

4 Water Monitoring Methodology

Each monitoring bore was gauged using an electronic dip meter prior to any disturbance of the water column. Bores were gauged on the morning of 27 August 2020. The depth to water was measured from the top of casing at each bore. MB03 was installed into a dry hole and the hole was found to be dry at the time of gauging.

The water level logger was removed from each borehole following gauging. Data stored within the water level loggers were downloaded on 27 August 2020. The water level loggers were reinstated in each monitoring bore after download.

A water sample was collected from standing water in the quarry excavation on 27 August 2020. An unpreserved sample bottle was filled directly from ponded water in the pit sump. This bottle was then used to fill preserved sample bottles and samples requiring field filtering. Once sampling was complete field water quality parameters were measured. The water quality meter was placed in the pond and allowed to equilibrate for a period of approximately 10 minutes. The field water quality parameters were then recorded.

Water quality measurements were made using a YSI water quality meter hired from Airmet Scientific. The meter was calibrated prior to dispatch.

Water samples were collected into laboratory supplied bottles, each marked with the appropriate identification. Sample bottles were appropriately preserved where necessary. The sample for dissolved metals analysis were filtered in the field using disposable 45µm filters. The sampler wore disposable nitrile gloves at all times during sampling to minimise potential for cross contamination. Samples were placed into an esky with ice immediately after collection. Ice was replenished as required to ensure samples remained cool whilst in storage.

Water samples were dispatched to Envirolab (Sydney) on the afternoon of 27 August 2020. An overnight courier service was used to minimise transit time. Samples were received by Envirolab on the morning of 28 August 2020.

Water samples collected from the base of the quarry excavation were analysed for major cations, major anions, nutrients, dissolved metals, total recoverable hydrocarbons (TRH), benzene, toluene,

ethylbenzene, xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs) as specified in Table 37 of the Water Management Plan (Groundwork Plus, 2017).

5 Field Observations

Water quality data measured within water in the base of the quarry excavation is presented with all previous monitoring data in *Table 2*.

Table 2: Water Quality Parameters for Pit Water – All Monitoring Rounds

| Date | Temp (°C) | DO (ppm) | EC (uS/cm) | pH | Field ORP (mV) |
|--------|-----------|----------|------------|------|----------------|
| Jan-18 | 21.9 | 4.30 | 820 | 7.00 | 8 |
| Jun-18 | 7.6 | 6.97 | 357 | 7.01 | 119 |
| Jan-19 | 25.2 | 5.30 | 794 | 8.20 | 91 |
| Jul-19 | 7.9 | 9.50 | 536 | 8.33 | 129 |
| Jan-20 | 19.4 | 3.17 | 1015 | 7.82 | 110 |
| Aug-20 | 9.2 | 8.74 | 494 | 7.94 | 146 |

6 Analytical Results

A summary of analytical data is presented in *Table B1* of *Attachment B*. The summary table presents August 2020 against preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017) and analytical data from previous monitoring rounds spanning January 2018 to January 2020.

The certificate of analysis for water samples is presented as *Attachment C*.

Reported concentrations of all analytes were less than the preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017). Where analytes were detected above the laboratory reporting limits, the analyte concentrations were within the range of previous results.

7 Water Level Logger Data

All water level loggers were set to record water level at 6 hour intervals commencing 12am on 12 January 2018. The water level data loggers were not vented. A barologger was deployed to record air pressure at the same recording interval to allow water level logger readings to be corrected to account for changes in air pressure.

Water level data loggers installed in MB01S, MB01D and MB02, and the barometric pressure logger installed at MB03, were downloaded on 27 August 2020.

The raw data was corrected for changes in air pressure using the barometric pressure data. The manual water level measurement collected at the time the loggers were removed from each borehole were used to convert the water level logger data to a depth to water relative to the top of the PVC bore casing.

At the completion of the monitoring round the water level loggers were redeployed in their respective boreholes.

Corrected water level data is presented graphically as *Attachment D*. The presented data is for the period spanning January 2018 to August 2020.

Observed groundwater level changes did not exceed the adopted trigger, which is a drop in water levels more than 10m below baseline water levels.

7.1 MB01S

The water level in MB01S rose by as much as 2m between January 2020 and August 2020. The observed rising water table was most likely the result of return of relatively wet period from February 2020 to August 2020, which resulted in return of surface water flow in nearby Yorkeys Creek.

7.2 MB01D

The water level within MB01D stayed below the water level logger for a period of approximately 1 week after each groundwater monitoring event and took approximately 3 weeks to return to the pre-sampling level following the January 2020 monitoring round. The slow recovery was due to the relatively low permeability of the fractured rock aquifer.

Once groundwater levels had re-established in MB01D post January 2020 sampling the depth to water varied between 1.8m to 4.5m below top of casing, with a spike in mid-April 2020 and another mid-August 2020.

7.3 MB02

Water levels within MB02 rose a small amount in the period January 2020 to August 2020. The observed rising water table was most likely the result of return of relatively wet period from February 2020 to August 2020.

8 Estimated Groundwater Inflow to Pit

The WMP specifies that water inflow to the pit should be estimated on a quarterly basis by measuring changes to water levels within the pit during a period of fine weather and no water extraction. Hy-tec monitored water level changes in the base of the quarry excavation on four occasions in the period July 2019 to June 2020.

At the time of each monitoring event, water had not been removed from the pit for several days prior to monitoring. There had been no significant rainfall in the days leading up to the monitoring period and there was no obvious overland flow of water into the pit floor during the monitoring period.

A measuring benchmark was established at the waterline in the base of the pit. The height of standing water was noted to the nearest millimetre at the commencement of the monitoring period. The height of water at the benchmark was noted 24 hours later.

At the time of the monitoring events the pit floor was covered with water. The pit floor at the time of monitoring was estimated to be approximately 230m long with an average width of 30m, giving an estimated area of approximately 6900m².

Ground Doctor estimated evaporation from the pit using evaporation data from the nearest BOM gauging station that measures evaporation (Bathurst Agricultural Station). Ground Doctor used an evaporation rate of one third of the BOM reading at Bathurst. This was justified on the basis that the Quarry floor is surrounded by walls that are 50m or more high, which protects ponded water from wind and reduces the amount of solar radiation reaching the bottom of the pit. In addition, the quarry is situated further east of Bathurst and evaporation typically decreases as you move closer to the east coast of Australia due to topographical effects and average humidity of the airmass.

The daily change in water level within the quarry excavation was used to estimate the annual groundwater inflow. Estimates varied from 7.6ML/yr on 11-12 December 2019 to 15.1ML/yr on 23-24 March 2019. The average estimate of groundwater inflow across the monitoring period was 11.0ML/yr. Hy-tec's licensed groundwater use is 20ML/yr.

Table 3: Summary of Pit Inflow Estimates July 2019 to June 2020

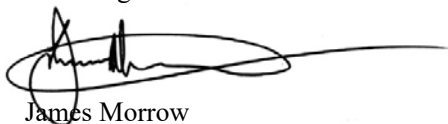
| Monitoring Event | Change in Water Level | Description of Pit Conditions | Estimate of Groundwater Inflow |
|-------------------------------|--------------------------------------|---|--------------------------------|
| 30 September – 1 October 2019 | 4mm rise. 1mm evaporation loss. | Pit floor approximately 6900m ² . Pit floor covered by water. | 12.6ML/yr |
| 11-12 December 2019 | 0mm rise. 3mm evaporation loss. | Pit floor approximately 6900m ² . Pit floor covered by water. | 7.6ML/yr |
| 23-24 March 2020 | 3mm rise. 3mm evaporation loss. | Pit floor approximately 6900m ² . Pit floor covered by water. | 15.1ML/yr |
| 29-30 June 2020 | 3mm rise. 0.5mm evaporation loss. | Pit floor approximately 6900m ² . Pit floor covered by water. | 8.8ML/yr |
| | | Average Inflow Estimate For 2019-20 | 11.0ML/yr |

9 Conclusions

Groundwater level monitoring, quarry excavation water quality monitoring and quarry excavation inflow monitoring was undertaken as specified by the Water Management Plan (Groundwork Plus, 2017). The data collected during the August 2020 did not exceed any of the relevant triggers outlined in the Water Management Plan (Groundwork Plus, 2017). Estimated inflow to the quarry excavation did not exceed Hy-tec's licensed use of groundwater (20ML/yr).

If you have any questions regarding the works outlined in this report please contact the undersigned on 0407 875 302.

Kind Regards



James Morrow
Environmental Engineer
Ground Doctor Pty Ltd

Attachments:

Attachment A – Figure

Attachment B – Analytical Results Summary Table

Attachment C – Laboratory Certificate of Analysis

Attachment D – Groundwater Level Chart

10 References

- ANZECC/ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Trigger values for 95% protection of fresh water ecosystems.
- Groundwork Plus (2017), “*Austen Quarry Water Management Plan*”, Report Number 1517_610_002_RPTO_Water Management Plan_V8, 10 October 2017.
- National Health and Medical Research Council (NHMRC) (2011) *Australian Drinking Water Guidelines*.

Attachment A

Figure



1:9,028
0 100 200m



Ground Doctor Pty Ltd

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Project Name: Groundwater Monitoring Bore Installation and July 2019 Groundwater Monitoring Round

Project Number: 2018-GD001

Figure 1

Groundwater Monitoring Bore Locations

Attachment **B**

Analytical Results Summary Table

Table B1

Analytical Data Summary - Pit Water - January 2018 to August 2020

| Sampling Date | | ANZECC | Aust. Drinking Water | 10/01/2018 | 22/06/2018 | 03/01/19 | 03/07/19 | 07/01/20 | 27/08/20 | Units |
|---------------------------------|----------------------|------------------|----------------------|------------|------------|----------|----------|----------|----------|-------|
| Sample Location | | DGV 2018 (Fresh) | 2011 | PIT | PIT | PIT | PIT | PIT | PIT | |
| Major Cations (mg/L) | Calcium | - | - | 71 | 49 | 64 | 62 | 92 | 58 | mg/L |
| | Magnesium | - | - | 45 | 26 | 44 | 51 | 60 | 43 | mg/L |
| | Sodium | - | - | 26 | 25 | 20 | 24 | 35 | 28 | mg/L |
| | Potassium | - | - | 4 | 3 | 4.7 | 4.6 | 6.2 | 4 | mg/L |
| Major Anions (mg/L) | Sulphate | - | - | 183 | 98 | 220 | 210 | 230 | 170 | mg/L |
| | Chloride | - | - | 9 | 10 | 13 | 18 | 25 | 9 | mg/L |
| | Hydroxide as CaCO3 | - | - | <1 | <1 | <5 | <5 | <5 | <5 | mg/L |
| | Carbonate as CaCO3 | - | - | <1 | <1 | <5 | <5 | <5 | <5 | mg/L |
| | Bicarbonate as CaCO3 | - | - | 181 | 201 | 170 | 170 | 300 | 180 | mg/L |
| Heavy Metals (Dissolved) (mg/L) | Aluminium | 0.055 | - | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 | <0.01 | mg/L |
| | Arsenic | 0.013 | 0.01 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L |
| | Barium | - | 2 | 0.032 | 0.029 | 0.071 | 0.029 | 0.046 | 0.039 | mg/L |
| | Beryllium | - | 0.06 | <0.001 | <0.001 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | mg/L |
| | Boron | 0.37 | 4 | <0.05 | <0.05 | <0.02 | <0.02 | <0.02 | <0.02 | mg/L |
| | Cadmium | 0.0002 | 0.002 | 0.0088 | 0.0019 | 0.0001 | <0.0001 | 0.0003 | 0.0001 | mg/L |
| | Chromium | 0.001 | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L |
| | Cobalt | - | - | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L |
| | Copper | 0.0014 | 2 | <0.001 | <0.001 | <0.001 | <0.001 | 0.002 | <0.001 | mg/L |
| | Iron | - | - | <0.05 | <0.05 | <0.01 | <0.01 | <0.01 | <0.01 | mg/L |
| | Lead | 0.0034 | 0.01 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L |
| | Manganese | 1.9 | 0.5 | 2 | 0.188 | <0.005 | <0.005 | 0.12 | 0.15 | mg/L |
| | Mercury | 0.6 | 0.001 | <0.0001 | <0.0001 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | mg/L |
| | Molybdenum | - | 0.05 | 0.004 | <0.001 | 0.011 | 0.009 | 0.015 | 0.005 | mg/L |
| | Nickel | 0.011 | 0.02 | 0.008 | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L |
| | Selenium | 0.005 | 0.01 | <0.01 | <0.01 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L |
| | Silver | 0.00005 | 0.01 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L |
| | Strontium | - | - | 0.298 | 0.231 | 0.330 | 0.260 | 0.440 | 0.260 | mg/L |
| | Titanium | - | - | <0.01 | <0.01 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L |
| Vanadium | - | - | <0.01 | <0.01 | <0.001 | <0.001 | <0.001 | <0.001 | mg/L | |
| Zinc | 0.008 | - | 0.443 | 0.16 | 0.006 | 0.006 | 0.023 | 0.007 | mg/L | |
| Silicon (mg/L) | Silicon | - | - | 15.2 | 19.4 | 5.1 | 3.8 | 8.6 | 3.6 | mg/L |
| Nutrients (mg/L) | Nitrate* | 10 (as N) | 50 (as NO3) | 4.45 | 0.48 | 1.4 | 0.3 | 0.14 | 2.2 | mg/L |
| | Nitrite | None | - | 0.01 | <0.01 | 0.012 | <0.005 | <0.005 | 0.008 | mg/L |
| | Ammonia | 0.9 | - | 0.4 | 0.05 | <0.005 | <0.005 | 0.087 | <0.005 | mg/L |
| Hydrocarbons (ug/L) | TRH | - | - | <EQL | <EQL | <EQL | <EQL | <EQL | <EQL | ug/L |
| | Benzene | 950 | 1 | <1 | <1 | <1 | <1 | <1 | <1 | ug/L |
| | Toluene | - | 800 | <2 | <2 | <1 | <1 | <1 | <1 | ug/L |
| | Ethylbenzene | - | 300 | <2 | <2 | <1 | <1 | <1 | <1 | ug/L |
| | Xylene | 200 | 600 | <2 | <2 | <3 | <3 | <3 | <3 | ug/L |
| | Naphthalene | 16 | - | <5 | <5 | <1 | <1 | <1 | <1 | ug/L |
| Benzo(a)pyrene | - | 0.01 | <0.5 | <0.5 | <1 | <1 | <1 | <1 | ug/L | |

Attachment **C**

Laboratory Certificate of Analysis

SAMPLE RECEIPT ADVICE

Client Details

| | |
|------------------|-----------------------|
| Client | Ground Doctor Pty Ltd |
| Attention | James Morrow |

Sample Login Details

| | |
|---|--|
| Your reference | Hytec Austen Quarry Groundwater Monitoring |
| Envirolab Reference | 249996 |
| Date Sample Received | 28/08/2020 |
| Date Instructions Received | 28/08/2020 |
| Date Results Expected to be Reported | 04/09/2020 |

Sample Condition

| | |
|---|----------|
| Samples received in appropriate condition for analysis | Yes |
| No. of Samples Provided | 1 Water |
| Turnaround Time Requested | Standard |
| Temperature on Receipt (°C) | 4 |
| Cooling Method | Ice |
| Sampling Date Provided | YES |

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



| Sample ID | VTRH(C6-C10)/BTEXN in Water | svTRH (C10-C40) in Water | PAHsin Water | HM in water - dissolved | Metals in Water - Dissolved | Nitrate as N in water | Nitrite as N in water | Ammonia as N in water | Total Dissolved Solids(grav) | Calcium - Dissolved | Potassium - Dissolved | Sodium - Dissolved | Magnesium - Dissolved | Hydroxide Alkalinity (OH-) as CaCO3 | Bicarbonate Alkalinity as CaCO3 | Carbonate Alkalinity as CaCO3 | Total Alkalinity as CaCO3 | Sulphate, SO4 | Chloride, Cl | Ionic Balance | |
|------------|-----------------------------|--------------------------|--------------|-------------------------|-----------------------------|-----------------------|-----------------------|-----------------------|------------------------------|---------------------|-----------------------|--------------------|-----------------------|-------------------------------------|---------------------------------|-------------------------------|---------------------------|---------------|--------------|---------------|---|
| Pit | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.



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CERTIFICATE OF ANALYSIS 249996

Client Details

| | |
|------------------|-------------------------------|
| Client | Ground Doctor Pty Ltd |
| Attention | James Morrow |
| Address | PO Box 6278, Dubbo, NSW, 2830 |

Sample Details

| | |
|---|---|
| Your Reference | <u>Hytec Austen Quarry Groundwater Monitoring</u> |
| Number of Samples | 1 Water |
| Date samples received | 28/08/2020 |
| Date completed instructions received | 28/08/2020 |

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

| | |
|---|------------|
| Date results requested by | 04/09/2020 |
| Date of Issue | 03/09/2020 |
| NATA Accreditation Number 2901. This document shall not be reproduced except in full. | |
| Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with * | |

Results Approved By

Dragana Tomas, Senior Chemist
Hannah Nguyen, Senior Chemist
Jaimie Loa-Kum-Cheung, Metals Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

| vTRH(C6-C10)/BTEXN in Water | | |
|---|-------|------------|
| Our Reference | | 249996-1 |
| Your Reference | UNITS | Pit |
| Date Sampled | | 27/08/2020 |
| Type of sample | | Water |
| Date extracted | - | 31/08/2020 |
| Date analysed | - | 31/08/2020 |
| TRH C ₆ - C ₉ | µg/L | <10 |
| TRH C ₆ - C ₁₀ | µg/L | <10 |
| TRH C ₆ - C ₁₀ less BTEX (F1) | µg/L | <10 |
| Benzene | µg/L | <1 |
| Toluene | µg/L | <1 |
| Ethylbenzene | µg/L | <1 |
| m+p-xylene | µg/L | <2 |
| o-xylene | µg/L | <1 |
| Naphthalene | µg/L | <1 |
| Surrogate Dibromofluoromethane | % | 103 |
| Surrogate toluene-d8 | % | 98 |
| Surrogate 4-BFB | % | 105 |

| svTRH (C10-C40) in Water | | |
|--|-------|------------|
| Our Reference | | 249996-1 |
| Your Reference | UNITS | Pit |
| Date Sampled | | 27/08/2020 |
| Type of sample | | Water |
| Date extracted | - | 02/09/2020 |
| Date analysed | - | 03/09/2020 |
| TRH C ₁₀ - C ₁₄ | µg/L | <50 |
| TRH C ₁₅ - C ₂₈ | µg/L | <100 |
| TRH C ₂₉ - C ₃₆ | µg/L | <100 |
| TRH >C ₁₀ - C ₁₆ | µg/L | <50 |
| TRH >C ₁₀ - C ₁₆ less Naphthalene (F2) | µg/L | <50 |
| TRH >C ₁₆ - C ₃₄ | µg/L | <100 |
| TRH >C ₃₄ - C ₄₀ | µg/L | <100 |
| Surrogate o-Terphenyl | % | 93 |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| PAHs in Water | | |
|-----------------------------------|-------|------------|
| Our Reference | | 249996-1 |
| Your Reference | UNITS | Pit |
| Date Sampled | | 27/08/2020 |
| Type of sample | | Water |
| Date extracted | - | 02/09/2020 |
| Date analysed | - | 02/09/2020 |
| Naphthalene | µg/L | <1 |
| Acenaphthylene | µg/L | <1 |
| Acenaphthene | µg/L | <1 |
| Fluorene | µg/L | <1 |
| Phenanthrene | µg/L | <1 |
| Anthracene | µg/L | <1 |
| Fluoranthene | µg/L | <1 |
| Pyrene | µg/L | <1 |
| Benzo(a)anthracene | µg/L | <1 |
| Chrysene | µg/L | <1 |
| Benzo(b,j+k)fluoranthene | µg/L | <2 |
| Benzo(a)pyrene | µg/L | <1 |
| Indeno(1,2,3-c,d)pyrene | µg/L | <1 |
| Dibenzo(a,h)anthracene | µg/L | <1 |
| Benzo(g,h,i)perylene | µg/L | <1 |
| Benzo(a)pyrene TEQ | µg/L | <5 |
| Total +ve PAH's | µg/L | NIL (+)VE |
| Surrogate <i>p</i> -Terphenyl-d14 | % | 109 |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| HM in water - dissolved | | |
|--------------------------------|-------|------------|
| Our Reference | | 249996-1 |
| Your Reference | UNITS | Pit |
| Date Sampled | | 27/08/2020 |
| Type of sample | | Water |
| Date prepared | - | 31/08/2020 |
| Date analysed | - | 31/08/2020 |
| Aluminium-Dissolved | µg/L | <10 |
| Arsenic-Dissolved | µg/L | <1 |
| Boron-Dissolved | µg/L | <20 |
| Barium-Dissolved | µg/L | 39 |
| Beryllium-Dissolved | µg/L | <0.5 |
| Cadmium-Dissolved | µg/L | 0.1 |
| Chromium-Dissolved | µg/L | <1 |
| Cobalt-Dissolved | µg/L | <1 |
| Copper-Dissolved | µg/L | <1 |
| Iron-Dissolved | µg/L | <10 |
| Lead-Dissolved | µg/L | <1 |
| Manganese-Dissolved | µg/L | 15 |
| Mercury-Dissolved | µg/L | <0.05 |
| Molybdenum-Dissolved | µg/L | 5 |
| Nickel-Dissolved | µg/L | <1 |
| Selenium-Dissolved | µg/L | <1 |
| Silver-Dissolved | µg/L | <1 |
| Strontium-Dissolved | µg/L | 260 |
| Titanium-Dissolved | µg/L | <1 |
| Vanadium-Dissolved | µg/L | <1 |
| Zinc-Dissolved | µg/L | 7 |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| Metals in Water - Dissolved | | |
|-----------------------------|-------|------------|
| Our Reference | | 249996-1 |
| Your Reference | UNITS | Pit |
| Date Sampled | | 27/08/2020 |
| Type of sample | | Water |
| Date digested | - | 01/09/2020 |
| Date analysed | - | 01/09/2020 |
| Silicon*- Dissolved | mg/L | 3.6 |

| Miscellaneous Inorganics | | |
|-------------------------------|-------|------------|
| Our Reference | | 249996-1 |
| Your Reference | UNITS | Pit |
| Date Sampled | | 27/08/2020 |
| Type of sample | | Water |
| Date prepared | - | 28/08/2020 |
| Date analysed | - | 28/08/2020 |
| Nitrate as N in water | mg/L | 2.2 |
| Nitrite as N in water | mg/L | 0.008 |
| Ammonia as N in water | mg/L | <0.005 |
| Total Dissolved Solids (grav) | mg/L | 440 |

| Ion Balance | | |
|--|-------|------------|
| Our Reference | | 249996-1 |
| Your Reference | UNITS | Pit |
| Date Sampled | | 27/08/2020 |
| Type of sample | | Water |
| Date prepared | - | 28/08/2020 |
| Date analysed | - | 28/08/2020 |
| Calcium - Dissolved | mg/L | 58 |
| Potassium - Dissolved | mg/L | 4.0 |
| Sodium - Dissolved | mg/L | 28 |
| Magnesium - Dissolved | mg/L | 43 |
| Hydroxide Alkalinity (OH ⁻) as CaCO ₃ | mg/L | <5 |
| Bicarbonate Alkalinity as CaCO ₃ | mg/L | 180 |
| Carbonate Alkalinity as CaCO ₃ | mg/L | <5 |
| Total Alkalinity as CaCO ₃ | mg/L | 180 |
| Sulphate, SO ₄ | mg/L | 170 |
| Chloride, Cl | mg/L | 9 |
| Ionic Balance | % | 3.0 |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| Method ID | Methodology Summary |
|--------------------|---|
| Inorg-006 | Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B. |
| Inorg-018 | Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. |
| Inorg-040 | The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 10% ie total anions = total cations +/-10%. |
| Inorg-055 | Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction. |
| Inorg-055 | Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction. |
| Inorg-057 | Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction. |
| Inorg-081 | Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser. |
| Metals-020 | Determination of various metals by ICP-AES. |
| Metals-021 | Determination of Mercury by Cold Vapour AAS. |
| Metals-022 | Determination of various metals by ICP-MS. |
| Org-020 | Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. |
| Org-022/025 | Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. |
| Org-023 | Water samples are analysed directly by purge and trap GC-MS. |
| Org-023 | Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water | | | | | Duplicate | | | Spike Recovery % | | |
|--|-------|-----|---------|------------|-----------|------|------|------------------|------------|------|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W2 | [NT] |
| Date extracted | - | | | 31/08/2020 | [NT] | [NT] | [NT] | [NT] | 31/08/2020 | [NT] |
| Date analysed | - | | | 31/08/2020 | [NT] | [NT] | [NT] | [NT] | 31/08/2020 | [NT] |
| TRH C ₆ - C ₉ | µg/L | 10 | Org-023 | <10 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| TRH C ₆ - C ₁₀ | µg/L | 10 | Org-023 | <10 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| Benzene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 99 | [NT] |
| Toluene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Ethylbenzene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 97 | [NT] |
| m+p-xylene | µg/L | 2 | Org-023 | <2 | [NT] | [NT] | [NT] | [NT] | 103 | [NT] |
| o-xylene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 102 | [NT] |
| Naphthalene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Surrogate Dibromofluoromethane | % | | Org-023 | 100 | [NT] | [NT] | [NT] | [NT] | 99 | [NT] |
| Surrogate toluene-d8 | % | | Org-023 | 100 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| Surrogate 4-BFB | % | | Org-023 | 104 | [NT] | [NT] | [NT] | [NT] | 101 | [NT] |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| QUALITY CONTROL: svTRH (C10-C40) in Water | | | | | Duplicate | | | Spike Recovery % | | |
|---|-------|-----|---------|------------|-----------|------|------|------------------|------------|------|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W2 | [NT] |
| Date extracted | - | | | 02/09/2020 | [NT] | [NT] | [NT] | [NT] | 02/09/2020 | [NT] |
| Date analysed | - | | | 03/09/2020 | [NT] | [NT] | [NT] | [NT] | 03/09/2020 | [NT] |
| TRH C ₁₀ - C ₁₄ | µg/L | 50 | Org-020 | <50 | [NT] | [NT] | [NT] | [NT] | 108 | [NT] |
| TRH C ₁₅ - C ₂₈ | µg/L | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| TRH C ₂₉ - C ₃₆ | µg/L | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 92 | [NT] |
| TRH >C ₁₀ - C ₁₆ | µg/L | 50 | Org-020 | <50 | [NT] | [NT] | [NT] | [NT] | 108 | [NT] |
| TRH >C ₁₆ - C ₃₄ | µg/L | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| TRH >C ₃₄ - C ₄₀ | µg/L | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 92 | [NT] |
| Surrogate o-Terphenyl | % | | Org-020 | 108 | [NT] | [NT] | [NT] | [NT] | 72 | [NT] |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| QUALITY CONTROL: PAHs in Water | | | | Duplicate | | | | Spike Recovery % | | |
|--------------------------------|-------|-----|-------------|------------|------|------|------|------------------|------------|------|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W3 | [NT] |
| Date extracted | - | | | 02/09/2020 | [NT] | [NT] | [NT] | [NT] | 02/09/2020 | [NT] |
| Date analysed | - | | | 02/09/2020 | [NT] | [NT] | [NT] | [NT] | 02/09/2020 | [NT] |
| Naphthalene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 83 | [NT] |
| Acenaphthylene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Acenaphthene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| Fluorene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 95 | [NT] |
| Phenanthrene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 92 | [NT] |
| Anthracene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Fluoranthene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 93 | [NT] |
| Pyrene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 93 | [NT] |
| Benzo(a)anthracene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chrysene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| Benzo(b,j+k)fluoranthene | µg/L | 2 | Org-022/025 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzo(a)pyrene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 88 | [NT] |
| Indeno(1,2,3-c,d)pyrene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Dibenzo(a,h)anthracene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzo(g,h,i)perylene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Surrogate p-Terphenyl-d14 | % | | Org-022/025 | 104 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| QUALITY CONTROL: HM in water - dissolved | | | | Duplicate | | | | Spike Recovery % | | |
|--|-------|------|------------|------------|------|------|------|------------------|------------|------|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W1 | [NT] |
| Date prepared | - | | | 31/08/2020 | [NT] | [NT] | [NT] | [NT] | 31/08/2020 | [NT] |
| Date analysed | - | | | 31/08/2020 | [NT] | [NT] | [NT] | [NT] | 31/08/2020 | [NT] |
| Aluminium-Dissolved | µg/L | 10 | Metals-022 | <10 | [NT] | [NT] | [NT] | [NT] | 113 | [NT] |
| Arsenic-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| Boron-Dissolved | µg/L | 20 | Metals-022 | <20 | [NT] | [NT] | [NT] | [NT] | 105 | [NT] |
| Barium-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 104 | [NT] |
| Beryllium-Dissolved | µg/L | 0.5 | Metals-022 | <0.5 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| Cadmium-Dissolved | µg/L | 0.1 | Metals-022 | <0.1 | [NT] | [NT] | [NT] | [NT] | 95 | [NT] |
| Chromium-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 103 | [NT] |
| Cobalt-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 102 | [NT] |
| Copper-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 104 | [NT] |
| Iron-Dissolved | µg/L | 10 | Metals-022 | <10 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| Lead-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 103 | [NT] |
| Manganese-Dissolved | µg/L | 5 | Metals-022 | <5 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| Mercury-Dissolved | µg/L | 0.05 | Metals-021 | <0.05 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| Molybdenum-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| Nickel-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Selenium-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| Silver-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 109 | [NT] |
| Strontium-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| Titanium-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 102 | [NT] |
| Vanadium-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 95 | [NT] |
| Zinc-Dissolved | µg/L | 1 | Metals-022 | <1 | [NT] | [NT] | [NT] | [NT] | 99 | [NT] |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| QUALITY CONTROL: Metals in Water - Dissolved | | | | Duplicate | | | | Spike Recovery % | | |
|--|-------|-----|------------|------------|------|------|------|------------------|------------|------|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W1 | [NT] |
| Date digested | - | | | 01/09/2020 | [NT] | [NT] | [NT] | [NT] | 01/09/2020 | [NT] |
| Date analysed | - | | | 01/09/2020 | [NT] | [NT] | [NT] | [NT] | 01/09/2020 | [NT] |
| Silicon*- Dissolved | mg/L | 0.2 | Metals-020 | <0.2 | [NT] | [NT] | [NT] | [NT] | 99 | [NT] |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| QUALITY CONTROL: Miscellaneous Inorganics | | | | Duplicate | | | | Spike Recovery % | | |
|---|-------|-------|-----------|------------|------|------|------|------------------|------------|------|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W1 | [NT] |
| Date prepared | - | | | 28/08/2020 | [NT] | [NT] | [NT] | [NT] | 28/08/2020 | [NT] |
| Date analysed | - | | | 28/08/2020 | [NT] | [NT] | [NT] | [NT] | 28/08/2020 | [NT] |
| Nitrate as N in water | mg/L | 0.005 | Inorg-055 | <0.005 | [NT] | [NT] | [NT] | [NT] | 112 | [NT] |
| Nitrite as N in water | mg/L | 0.005 | Inorg-055 | <0.005 | [NT] | [NT] | [NT] | [NT] | 108 | [NT] |
| Ammonia as N in water | mg/L | 0.005 | Inorg-057 | <0.005 | [NT] | [NT] | [NT] | [NT] | 95 | [NT] |
| Total Dissolved Solids (grav) | mg/L | 5 | Inorg-018 | <5 | [NT] | [NT] | [NT] | [NT] | 95 | [NT] |

Client Reference: Hytec Austen Quarry Groundwater Monitoring

| QUALITY CONTROL: Ion Balance | | | | Duplicate | | | | Spike Recovery % | | |
|--|-------|-----|------------|------------|------|------|------|------------------|------------|------|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W1 | [NT] |
| Date prepared | - | | | 28/08/2020 | [NT] | [NT] | [NT] | [NT] | 28/08/2020 | [NT] |
| Date analysed | - | | | 28/08/2020 | [NT] | [NT] | [NT] | [NT] | 28/08/2020 | [NT] |
| Calcium - Dissolved | mg/L | 0.5 | Metals-020 | <0.5 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Potassium - Dissolved | mg/L | 0.5 | Metals-020 | <0.5 | [NT] | [NT] | [NT] | [NT] | 96 | [NT] |
| Sodium - Dissolved | mg/L | 0.5 | Metals-020 | <0.5 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| Magnesium - Dissolved | mg/L | 0.5 | Metals-020 | <0.5 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Hydroxide Alkalinity (OH ⁻) as CaCO ₃ | mg/L | 5 | Inorg-006 | <5 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Bicarbonate Alkalinity as CaCO ₃ | mg/L | 5 | Inorg-006 | <5 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Carbonate Alkalinity as CaCO ₃ | mg/L | 5 | Inorg-006 | <5 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Total Alkalinity as CaCO ₃ | mg/L | 5 | Inorg-006 | <5 | [NT] | [NT] | [NT] | [NT] | 119 | [NT] |
| Sulphate, SO ₄ | mg/L | 1 | Inorg-081 | <1 | [NT] | [NT] | [NT] | [NT] | 107 | [NT] |
| Chloride, Cl | mg/L | 1 | Inorg-081 | <1 | [NT] | [NT] | [NT] | [NT] | 88 | [NT] |

Result Definitions

| | |
|-------------|---|
| NT | Not tested |
| NA | Test not required |
| INS | Insufficient sample for this test |
| PQL | Practical Quantitation Limit |
| < | Less than |
| > | Greater than |
| RPD | Relative Percent Difference |
| LCS | Laboratory Control Sample |
| NS | Not specified |
| NEPM | National Environmental Protection Measure |
| NR | Not Reported |

Quality Control Definitions

| | |
|--|--|
| Blank | This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. |
| Duplicate | This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable. |
| Matrix Spike | A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist. |
| LCS (Laboratory Control Sample) | This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample. |
| Surrogate Spike | Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples. |
| Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011. | |
| The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016. | |
| Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2 | |

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

CHAIN OF CUSTODY - Client

| | | |
|---|---|--|
| Client: Ground Doctor Pty Ltd Contact person: James Morrow ph: 0407 875 302 Project Mgr: James Morrow Sampler: James Morrow Address: Austen Quarry, 391 Jenolan Caves Road, Hartley, NSW | Client Project Name / Number / Site etc (ie report title): Hytec Austen Quarry Groundwater Monitoring PO No.: Envirolab Quote No.: Standard TAT Or choose: standard / same day / 1 day / 2 day / 3 day <i>Note: Inform lab in advance if urgent turnaround is required - surcharge applies</i> Lab comments: | Phone: E-mail: Contact: |
| Phone: -- Mob: 0407875302 Fax: -- Email: | | |

| Sample information | | | | | Tests Required | | | | | | | | | | | | Comments | | | | | | | | | | |
|---------------------|---------------------------------|-------|--------------|----------------|--------------------------------|-----------------|--|--|--|--|--|--|--|--|--|--|----------|--|---|--|--|--|--|--|--|--|--|
| Envirolab Sample ID | Client Sample ID or information | Depth | Date sampled | Type of sample | Hy-tec Suite (see table below) | TRH, BTEX, PAHs | | | | | | | | | | | | | Provide as much information about the sample as you can | | | | | | | | |
| 1 | Pit | - | 27-Aug-20 | Water | x | x | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | |
|--|---|---|
| Relinquished by (company): James Morrow Print Name: James Morrow Date & Time: 27/8/20 1400 Signature: JRM | Received by (company): <u>GES</u> Print Name: <u>Geoff W</u> Date & Time: <u>28-8-20 11:15</u> Signature: <u>[Signature]</u> | Lab use only: Samples Received: <u>Cool</u> or Ambient (circle one) Temperature Received at: <u>4</u> (if applicable) Transported by: Hand delivered <u> courier</u> |
|--|---|---|

White - Lab copy / Blue - Client copy / Pink - Retain in Book Page No: 1 of 1

Envirolab
 12 Ashley St
 Chatswood NSW 2067
 Ph: (02) 9910 6200

Job No: 249996
Date Received: 28-8-20
Time Received: 11:15
Received by: [Signature]
 Temp: Cool / Ambient
 Cooling: Ice / Icepack
 Security: Intact / Broken / None

HYTEC Groundwater Suite

| | |
|---------------|---------|
| Analyte Group | Analyte |
|---------------|---------|

Attachment D

Groundwater Level Chart

Depth to Water vs Time

