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DARACON Group

SITE WATER MANAGEMENT PLAN

Ardglen Quarry

REV 4

May 2023

SITE WATER MANAGEMENT PLAN

Ardglen Quarry

REV 4

Prepared by
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on behalf of
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1.0 Introduction

1.1 Background

Ardglen Quarry (the Quarry) is located on Lot 218 DP 751028, Lot 1 DP 1001734, Lot 187 DP 751028, Lot 39 DP 751028 and Lot 49 DP 751028, adjacent to the small rural community of Ardglen. Ardglen is approximately 5 kilometres (km) northwest of Murrurundi and 60 km southwest of Tamworth (refer to **Figure 1.1**). The Quarry is owned and operated by Buttai Gravel Pty Ltd (trading as Daracon Quarries).

NSW Railways owned and operated the Quarry for over 100 years prior to the purchase by Daracon. In 2008 Daracon was granted approval under Part 3A of the Environmental Planning & Assessment Act 1979, to extend quarrying activities into the adjacent lot west of the existing operation, Lot 218 DP 751028. In December 2010 Daracon was granted approval for a modification to the Consent (Mod 1) and most recently in March 2021 approval was granted for a modification to the Consent (Mod 2).

The Consent permits:

- the extraction and processing of up to 500,000 (tpa)of material
- transport of a combined total 500,000 tonnes/year of quarrying products from the site by road and/or rail by either:
    - transport of 250,000 (tpa)of quarrying products from the site by rail
    - transport of 500,000 (tpa) of quarrying products from the site by road.
- Installation of noise management measures including barriers/bunds
- Modify the sediment basin, in pit sump and water treatment measures
- import of up to 80,000 tonnes/year for blending with quarried materials.

Figure 1.1 Locality

1.2 Purpose and Scope

The purpose of this Site Water Management Plan (SWMP) is to describe the water management strategies, procedures, controls and monitoring programs to be implemented at the Quarry for the management of surface water and groundwater potential impacts.

This SWMP addresses the relevant requirements of the Consent (06_0264) and Environment Protection Licence (EPL) 1115. The Consent conditions and environmental management commitments relevant to this plan are provided in **Section 1.4**. EPL conditions relevant to this plan are also provided in **Section 1.4**.

In addition to meeting the specific performance measures and criteria in the Consent, all reasonable and feasible measures must be implemented to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the development, and any rehabilitation under the Consent.

1.3 Plan Implementation

Prior to DPE approval of this plan, existing management strategies, plans or programs approved prior to the approval of MOD 2 will continue to be implemented.

1.3.1 Responsibilities

Environmental management at the Quarry is the responsibility of all employees with the Quarry Manager having overall responsibility for environmental management of the operations. Roles and responsibilities for implementation of this SWMP for key personnel at the Quarry are outlined in **Table 1.1**.

Table 1.1 Roles and Responsibilities

Role	Responsibility
Daracon Divisional Manager – Construction Materials	Provide sufficient resources for the implementation of this plan.
Daracon Quarries Manager	• Oversee the implementation of this plan. • Have working knowledge of this plan. • Coordinate the implementation of water management measures and strategies in accordance with this plan. • Ensure all monitoring is undertaken in accordance with the requirements of this plan. • Ensure that the mine has sufficient water for all stages of the development, and if necessary, adjust the operations to match available water supply. • Ensure the mine is managed within the capacity of the mine water management system. • Be aware of the environmental legislative requirements associated with the mine and take measures to ensure compliance. • Ensure employees are competent through training and awareness programs.

Role	Responsibility
Environmental Officer / Systems Manager	• Coordinate the review of this plan in accordance with the requirements of the Consent. • Coordinate the water monitoring program described in this plan. • Evaluate and report monitoring results as required by the Consent and Environment Protection Licence (EPL). • Coordinate water related incident investigations and reporting as required by legislation. • Initiate investigations of complaints as received from the public or government agency. • Provide primary contact for complaints and supply follow-up information to any complainant. • Prepare a report to government agencies or neighbours following incidents/ non-compliances.
All employees and contractors	• Comply with all requirements in this plan. • Report all potential environmental incidents to the Environmental Officer/Quarry Manager immediately. • Operate in a manner that minimises risks of incidents to themselves, fellow workers or the surrounding environment. • Follow any instructions provided by the Quarry Manager.

1.3.2 Hold Points

Hold points relating to water management at the Quarry are:

- Under condition 18E of Schedule 3 of the Consent, Daracon cannot commence quarrying operations in the Extension Area until groundwater monitoring bore with a minimum depth equivalent to the finished depth of the in-pit sump is installed in consultation with the Department of Planning, Industry and Environment (DPIE) – Water (or other timeframe as agreed by the Planning Secretary). This bore (bore P3) as well as three additional monitoring bores were installed and registered as of 26 November 2021.

- Under condition 23D (c) of Schedule 3 of the Consent, Daracon cannot commence infilling of the Southern Void until the Dewatering Management Plan (refer to **Section 6.0**) has been approved by the Planning Secretary.

- Under condition 18B of Schedule 3 of the Consent, Daracon cannot carry out any works on Crown Land or allow controlled discharges of water to Doughboy Hollow Creek until the necessary licences and/or approvals from DPIE Crown Lands (Crown Lands) have been obtained.

- Under condition 18C of Schedule 3 of the Consent, Daracon cannot carry out any works described in the MOD 2 EA within the Right of Carriageway which burdens Lot 1 DP 1001734 until the necessary licences and/or approvals from the Australian Rail Track Corporation (ARTC) prior have been obtained.

- Under condition 18D of Schedule 3 of the Consent, Daracon cannot undertake any excavation exceeding 2 m in depth within 25 m of the Main Northern Railway corridor unless otherwise approved in writing by ARTC.

- A licence from ARTC approving the of construction of water management infrastructure in the vicinity of the Main Northern Railway as presented in **Appendix A** must be obtained prior to the commencement of construction of works adjacent to the rail corridor.

- A Water Access Licence (WAL) in the Liverpool Ranges Basalt MDB Water Source with sufficient share entitlement to account for the maximum predicted groundwater take must be obtained within 12 months of submission of the Groundwater Monitoring Program (**Section 7.0)**. ~~commencement of quarry operations.~~

1.4 Water Management System Upgrade Schedule

New water management infrastructure, including the expanded Tertiary Basin and water treatment facility will be constructed and commissioned prior to commencement of quarrying in the new extraction area. Although the exact timeframes associated with entering the extension area are unknown at this time, we expect quarrying in the extension area to commence sometime in late 2023.

1.5 Compliance Requirements

1.5.1 Consent Conditions

Table 1.2 presents the Consent conditions relevant to water management at the Quarry.

Table 1.2 Consent Conditions

Condition	Requirement	Section(s) Addressed
Schedule 2 – Administrative Condition		
Obligation to Minimise Harm to the Environment		
1	In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.	**Sections 1.2**
Operation of Plant and Equipment		
13	The Applicant must ensure that all plant and equipment used at the site is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner	**Sections 3.4.3** and **5.4**
15	Within three months of: (a) the submission of an incident report under condition 3 of Schedule 5; (b) the submission of an Annual Review under condition 4 of Schedule 5; (c) the submission of an Independent Environmental Audit under condition 5 of Schedule 5; (d) the approval of any modification of the conditions of this consent (unless the conditions require otherwise), the suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.	**Section 9.0**
16	The Applicant must continue to apply existing management strategies, plans or programs approved prior to the approval of MOD 2, until the approval of a similar plan, strategy or program following the determination of MOD 2.	**Section 1.3**

Condition	Requirement	Section(s) Addressed
17	If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary and submitted to the Planning Secretary for approval within six weeks of the review. ***Note:*** *This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.*	**Section 9.0**
Schedule 3 – Specific Environmental Conditions		
Surface and Ground Water		
18A.	The Applicant must ensure that the sediment basin described in EA MOD 2 and any associated drainage structures required for the carrying out of the development are located wholly within the site, except as authorised in writing by ARTC and/or DPIE Crown Lands (as relevant).	**Section 1.5.5**
18B.	The Applicant must obtain any necessary licences and/or approvals from DPIE Crown Lands under the Crown Lands Management Act 2016 prior to: (a) carrying out any works on Crown Land; or (b) allowing the controlled discharge of water from the site to Doughboy Hollow Creek.	**Section 1.5.5**
18C.	The Applicant must obtain any necessary licences and/or approvals from the ARTC prior to carrying out any works described in the MOD 2 EA within the Right of Carriageway which burdens Lot 1 DP 1001734.	**Section 1.5.5**
18D.	The Applicant must not undertake any excavation exceeding 2 m in depth within 25 m of the Main Northern Railway corridor unless otherwise approved in writing by ARTC.[a] [a] *The 25 m setback is to be measured from the site boundary adjacent to the Main Northern Railway.*	**Section 1.5.5**
18E.	Prior to commencing quarrying operations in the Extension Area (or other timeframe as agreed by the Planning Secretary), the Applicant must install a groundwater monitoring bore with a minimum depth equivalent to the finished depth of the in-pit sump, in consultation with DPIE Water. *Notes:* • *The in-pit sump is shown in Appendix 1* • *The purpose of the groundwater monitoring bore is to inform the development of the Groundwater Monitoring Program*	**Sections 1.5.5, 2.2 and 7.0 and Appendix C**
18F.	The Applicant must ensure that any works to be conducted on waterfront land are carried out in accordance with Guidelines for Controlled Activities on Waterfront Land (2018) and in consultation with DPIE Water.	**Section 5.3**
Surface Water Discharges		
19.	The Applicant must only discharge water from the site in accordance with the provisions of an EPL.	**Section 3.4**
Site Water Management Plan		
20.	The Applicant must prepare a Site Water Management Plan for the development,[a] in consultation with EPA, DPIE Water, DPIE Crown Lands and ARTC, and to the satisfaction of the Planning Secretary. This plan must be prepared by suitably qualified expert/s whose appointment/s have been approved by the Planning Secretary, and must include: (c) a Site Water Balance;	**Section 1.5.5** and **Appendix D** **Section 4.0**

Condition	Requirement	Section(s) Addressed
	(d) an Erosion and Sediment Control Plan;	**Section 5.0**
	(e) a Surface Water Management Plan;	**Section 3.0**
	(f) a Groundwater Monitoring Program; and	**Section 7.0 and Appendix C**
	(g) a Dewatering Management Plan.[b]	**Section 6.0**
	[a] *The Site Water Management Plan must incorporate the existing quarry operations and operations within the extension area* [b] *In accordance with condition 23D of this Schedule, the Planning Secretary may waive the requirement for a Dewatering Management Plan if no pit dewatering is required*	
Site Water Balance		
21.	The Site Water Balance must include details of: (a) sources and reliability of water supply; (a1) predicted annual inflows to and outflows from the site; (b) water storage capacity; (a2) water use and management on the site; (a3) licensed discharge points and limits; and (a4) reporting procedures, including the annual preparation of an updated site water balance during quarrying operations.	**Section 4.0**
Erosion and Sediment Control Plan		
22.	The Erosion and Sediment Control Plan must: (a) be consistent with the requirements of the Managing Urban Stormwater: Soils and Construction Manual (Landcom 2004, or its latest version); (b) identify activities that could cause soil erosion and generate sediment; (c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters; (d) describe the location, function, and capacity of erosion and sediment control structures; and (e) describe what measures would be implemented to maintain the structures over time.	**Section 5.0**
Surface Water Management Plan		
23.	The Surface Water Management Plan must include:	**Section 3.0**
	(a) detailed baseline data on surface water quality in Doughboy Hollow Creek;	**Section 3.1**
	(b) flow modelling of Doughboy Hollow Creek;	**Section 3.2**
	(c) surface water impact assessment criteria, including trigger levels for investigating any potentially adverse impacts, and surface water management performance measures;	**Section 3.3**
	(d) a detailed description of the surface water management system on the site, including the: (i) clean water diversion system; (ii) erosion and sediment controls; (iii) dirty water management system; and (iv) water storages;	**Section 3.4**

Condition	Requirement	Section(s) Addressed
	(e) a program to monitor and evaluate: (i) any surface water discharges; (ii) the effectiveness of the water management system, particularly in minimising the risk of uncontrolled discharges from the site; and (iii) surface water flows and quality in watercourses and/or waterbodies that could potentially be impacted by the development;	**Section 3.5**
	(f) a protocol for identifying and investigating any exceedances of the surface water impact assessment criteria and for notifying the Department and relevant stakeholders of these events; and	**Section 3.6**
	(g) a trigger action response plan to respond to any exceedances of the relevant performance measures or performance criteria.	**Section 3.6**
23A.	The Applicant must submit the Site Water Balance, Erosion and Sediment Control Plan and Surface Water Management Plan to the Planning Secretary for approval within three months of the determination of MOD 2 (or other timeframe as agreed by the Planning Secretary).	

Condition	Requirement	Section(s) Addressed
Groundwater Monitoring Program		
23B.	The Groundwater Monitoring Program must: (a) incorporate at least 12 months of baseline data on groundwater levels obtained from the monitoring bore required under condition 18E of this Schedule; (b) include groundwater performance criteria, including trigger levels for identifying and investigating any potentially adverse groundwater impacts (or trends) associated with the development; (c) include a program to identify, report on and respond to any unauthorised groundwater interference, including inflows into extraction areas or interaction between on-site water storages and the groundwater system; and (d) include a protocol to obtain appropriate water licence(s) for any groundwater take; and (e) be submitted to the Planning Secretary for approval within 12 months of commencing quarrying operations in the Extension Area (or other timeframe as agreed by the Planning Secretary).	**Section 7.0 and Appendix C**
Dewatering Management Plan		
23D	Unless otherwise agreed by the Planning Secretary[a], the Applicant must prepare a Dewatering Management Plan for the overburden infill area[b] to the satisfaction of the Planning Secretary. This plan must: (a) include details of: (i) any pumping or pipeline infrastructure to be used for dewatering activities; (ii) proposed water transfer and discharge arrangements; and (b) include a program to monitor and report on any dewatering activities that involves any discharges from the site; and (c) be submitted to the Planning Secretary for approval prior to carrying out emplacement activities in the overburden infill area. *[a] The Planning Secretary may waive the requirement for a Dewatering Management Plan if no pit dewatering is required* *[b] The overburden infill area is shown in Appendix 2*	**Section 6.0** **Sections 1.3.2 and 6.0**
23E	The Applicant must implement the Site Water Management Plan as approved by the Planning Secretary.	**Section 1.3**
Schedule 4 Additional Procedures		
Notification of Landowners		
1	If the results of monitoring required in Schedule 3 identify those impacts generated by the development are greater than the relevant impact assessment criteria, then the Applicant must notify the Planning Secretary and the affected landowners and/or existing or future tenants (including tenants of quarry owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the relevant criteria.	**Section 8.1**

Condition	Requirement	Section(s) Addressed
Independent Review		
2.	If a landowner (excluding quarry owned properties) considers that the operations of the development are exceeding the impact assessment criteria in Schedule 3 then he/she may ask the Planning Secretary in writing for an independent review of the impacts of the development on his/her land.	**Section 8.2**
3.	If the Planning Secretary is not satisfied that an independent review is warranted, the Planning Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.	**Section 8.2**
4.	If the Planning Secretary is satisfied that an independent review is warranted, within 3 months, or as otherwise agreed by the Planning Secretary and the landowner, of the Planning Secretary's decision, the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Planning Secretary, to: (i) consult with the landowner to determine their concerns; (ii) conduct monitoring to determine whether the development is complying with the relevant criteria in Schedule 3 of this consent; and (iii) if the development is not complying with that criteria, identify measures that could be implemented to ensure compliance with the relevant criteria; and (b) give the Planning Secretary and landowner a copy of the independent review; and (c) comply with any written requests made by the Planning Secretary to implement any findings of the review.	**Section 8.2**
Schedule 5 Environmental Management, Monitoring, Auditing & Reporting		
Reporting		
3.	Incident Notification The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing to compliance@planning.nsw.gov.au and identify the development (including the development application number and name) and set out the location and nature of the incident.	**Section 8.3**
3A.	Non-Compliance Notification Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing to compliance@planning.nsw.gov.au and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. **Note:** A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	**Section 8.4**

Condition	Requirement	Section(s) Addressed
4	By the end of March in each year after the granting of the development consent, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must: (a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current financial/calendar year; (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the: (i) relevant statutory requirements, limits or performance measures/criteria; (ii) requirements of any plan or program required under this consent; (iii) monitoring results of previous years; and (iv) relevant predictions in the documents listed condition 2(a)-(c) of Schedule 2. (c) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence. (d) evaluate and report on: (i) the effectiveness of the noise and air quality management systems; and (ii) compliance with the performance measures, criteria and operating conditions of this consent; (e) identify any trends in the monitoring data over the life of the development; (f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and (g) describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.	**Section 8.5**

Condition	Requirement	Section(s) Addressed
5	Prior to 31 December 2012, and every 5 years thereafter, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must: (a) be led by a suitably qualified, experienced and independent auditor whose appointment has been endorsed by the Planning Secretary; (b) be conducted by a suitably qualified, experienced and independent team of experts (including any expert in field/s specified by the Planning Secretary) whose appointment has been endorsed by the Planning Secretary; (c) be carried out in consultation with the relevant agencies and the CCC; (d) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent, water licences and mining leases for the development (including any assessment, strategy, plan or program required under these approvals); (e) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals and this consent; (f) recommend appropriate measures or actions to improve the environmental performance of the development and any assessment, strategy, plan or program required under the abovementioned approvals and this consent; and (g) be conducted and reported to the satisfaction of the Planning Secretary.	**Section 8.6**
6	Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Planning Secretary.	**Section 8.6**
8	Within 3 months of the approval of any plan/strategy/program required under this consent (or any subsequent revision of these plans/strategies/programs), or the completion of the audits or Annual Reviews required under this consent, the Applicant must: (a) provide a copy of the relevant document/s to the relevant agencies and CCC; and (b) put a copy of the relevant document/s on its website.	**Section 8.7**

Condition	Requirement	Section(s) Addressed
9	During the development, the Applicant must: (a) include a copy of this consent, as may be modified from time to time, on its website; (b) provide a full summary of monitoring results required under this consent on its website; and (c) update these results on a regular basis (at least every 6 months).	**Section 8.7**

1.5.2 Environmental Management Commitments

Table 1.3 presents the environmental commitments relating to water management at the Quarry.

Table 1.3 Statement of Commitments

Item No.	Item	Commitment	Section(s) addressed
2	Statutory Requirements	All necessary licences, permits and approvals will be obtained and maintained for the project.	**Sections 1.5.3, 1.4.4, 1.5.5 and 3.4**
5	Water Management	The proponent will prepare and implement a Surface Water Management Plan for the project that will include: an Erosion and Sediment Control Plan (including procedures to minimise erosion, capture of sediment on-site, and maintenance of control structures); a Site Water Balance; and A Water Quality Monitoring Program	**Section 3.0** **Section 5.0** **Section 4.0** **Section 3.5.1**
23	Annual Reporting	The proponent will prepare and submit to the Director-General and Annual Environmental Management Report (AEMR). The AEMR will: • include a summary of the environmental monitoring results for the project for the past year; • include an analysis of the monitoring results against relevant limits/criteria and monitoring results from previous years; and • identify and discuss any non-compliances during the past year and detail any actions taken to ensure compliance.	**Section 8.5**

1.5.3 Environment Protection Licence

The Quarry operates under Environmental Protection Licence (EPL) 1115 issued under the *Protection of the Environment Operations Act 1997* (NSW Government). EPL 1115 includes the following conditions relating to water resources:

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
5	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Outlet of sediment basin to Doughboy Hollow Creek. Exact coordinates and map to be provided upon completion of sediment basin expansion works.

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the *Protection of the Environment Operations Act 1997*

L2.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

L2.4 Water and/or Land Concentration Limits

POINT 5

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	milligrams per litre	-	-	-	10 and none visible
pH	pH	-	-	-	6.5-8.5
Total suspended solids	milligrams per litre	20	35	-	50

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Water and/ or Land Monitoring Requirements

POINT 5

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	milligrams per litre	Weekly during any discharge	Representative sample
pH	pH	Continuous during discharge	Representative sample
Total suspended solids	milligrams per litre	Continuous during discharge	Representative sample

1.5.4 Water Licences

A Water Supply Works Approval and two associated Water Access Licences (WALs) for extraction of surface water from Doughboy Hollow Creek (refer to **Table 1.4**) apply to the Quarry land holding. However, surface water extraction has not been undertaken for at least 10 years as water captured within the WMS has been sufficient to meet operational demands.

Additionally, and subject to the findings of the ongoing Groundwater Study, the need for a Water Access Licence to cover any interception of groundwater will be determined and obtained if necessary.

Table 1.4 Water Access Licences and Works Approvals

Licence/Approval	Type	Entitlement (ML)	Status
WAL 6242	Domestic and Stock	1	Current
WAL 6243	Unregulated River	4	Current
90WA804256	Water Supply Works Approval for WALs 6242 & 6243	-	Expires 18 January 2031

1.5.5 Stakeholder Consultation

Daracon has undertaken consultation with Crown Lands, ARTC, the EPA and DPE Water as required by the Consent. Table 1.5 provides a summary of the consultation undertaken up to 9 May 2023 including the outcomes of consultation, matters resolved and unresolved and actions to be undertaken by Daracon to resolve any remaining disagreements.

Table 1.5 Agency Consultation

Agency	Description	Outcomes	Daracon Actions
Crown Lands	• Provision of draft SWMP for comment • Application for licence to construct, operate (including controlled discharges of surplus water to Doughboy Hollow Creek) and maintain water management structures (e.g. drains, sediment basin) that are proposed to be located on Crown Land	• No comments on SWMP provided by Crown Lands other than confirmation of the requirement for licence to undertake works located on Crown Land. • Application for Crown Lands licence submitted 18 November 2022. • Crown Lands licence offer (licence number RN 638192) provided to Daracon 17 March 2023. • Licence offer accepted by Daracon 3 April 2023. • Daracon received formal execution of the licence by the Minister on the 8th May 2023 as shown in Appendix D.	No works on Crown Lands to be undertaken prior to granting of Crown Lands licence as per hold point in **Section 1.3.2**.

Agency	Description	Outcomes	Daracon Actions
ARTC	• Provision of draft SWMP for comment • Request approval to excavate to a depth greater than 2 m within 25 m of the Main Northern Railway to enable construction of water management structures	• No comments on SWMP provided by ARTC. • 'Agreement in Principle' ('AIP') for construction of water management structures as presented in **Appendix A** of this SWMP provided by ARTC on 21 April 2020 ('AIP' presented in **Appendix D** of this SWMP). • Extension of 'AIP' to 30 September 2021 and again until 31 March 2022 provided by ARTC. • Daracon requested further extension to 'AIP' in March 2022 and February 2023, and currently awaiting response from ARTC. • In accordance with the 'AIP', ARTC require Daracon to provide further information for review (including final design plans) prior to issue of a licence for construction of the water management infrastructure.	• Follow up request for extension of 'AIP'. • Provide ARTC with information required for review as listed in the 'AIP' when requesting a licence to construct water management infrastructure. • No water management infrastructure construction works to be undertaken prior to receipt of ARTC licence as per hold point in **Section 1.3.2**.
EPA	Provision of draft SWMP for comment	EPA response in 5 August 2021 indicated that the EPA does not provide advice on or endorsement of management plans prepared for planning assessments and would not be providing further comment.	-

Agency	Description	Outcomes	Daracon Actions
DPE Water	Provision of draft SWMP for comment	• Comments on SWMP received from DPE Water on 28 April 2022 relating to requirement to install monitoring bore, development of a groundwater monitoring program and requirement to obtain a water access licence (WAL) and sufficient entitlement in groundwater source. • Issues raised by DPE Water resolved as detailed in correspondence contained in **Appendix D** of this SWMP.	Obtain a WAL and sufficient entitlement to cover the maximum predicted groundwater take within 12 months of submission of the Groundwater Monitoring Program (refer to **Section 7.0**) as per hold point in **Section 1.3.2**.

1.6 Guidelines and Policies

The following guidelines have been referenced and applied as required for the preparation of this SWMP:

- The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) (Australian and New Zealand Governments and Australian state and territory governments, 2018).
- Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004).
- Managing Urban Stormwater – Soils and Construction, Volume 2E: Mines and Quarries (DECC, 2008).
- Best Practice Erosion and Sediment Control (International Erosion Control Association (Australasia), 2008).

2.0 Context

2.1 Surface Water

2.1.1 Catchment and Hydrology

The Quarry is located in the immediate catchment of Doughboy Hollow Creek and an unnamed tributary of Borambil Creek which are within the broader Namoi River catchment. Doughboy Hollow Creek drains north to Chilcotts Creek which drains north west to Borambil Creek. From confluence with Chilcotts Creek, Borambil drains north west to Warrah Creek which flows north west to the Mooki River. The Mooki River drains north to the Namoi River at Gunnedah

Doughboy Hollow Creek and Borambil Creek are within the area regulated by the *Water Sharing Plan for the Namoi Unregulated Rivers and Peel Unregulated River Water Sources*. There are 26 unregulated surface water sources and four alluvial groundwater sources covered by the *Water Sharing Plan for the Namoi Unregulated Rivers and Peel Unregulated River Water Sources* and the Quarry is located within the Warrah Creek surface water source.

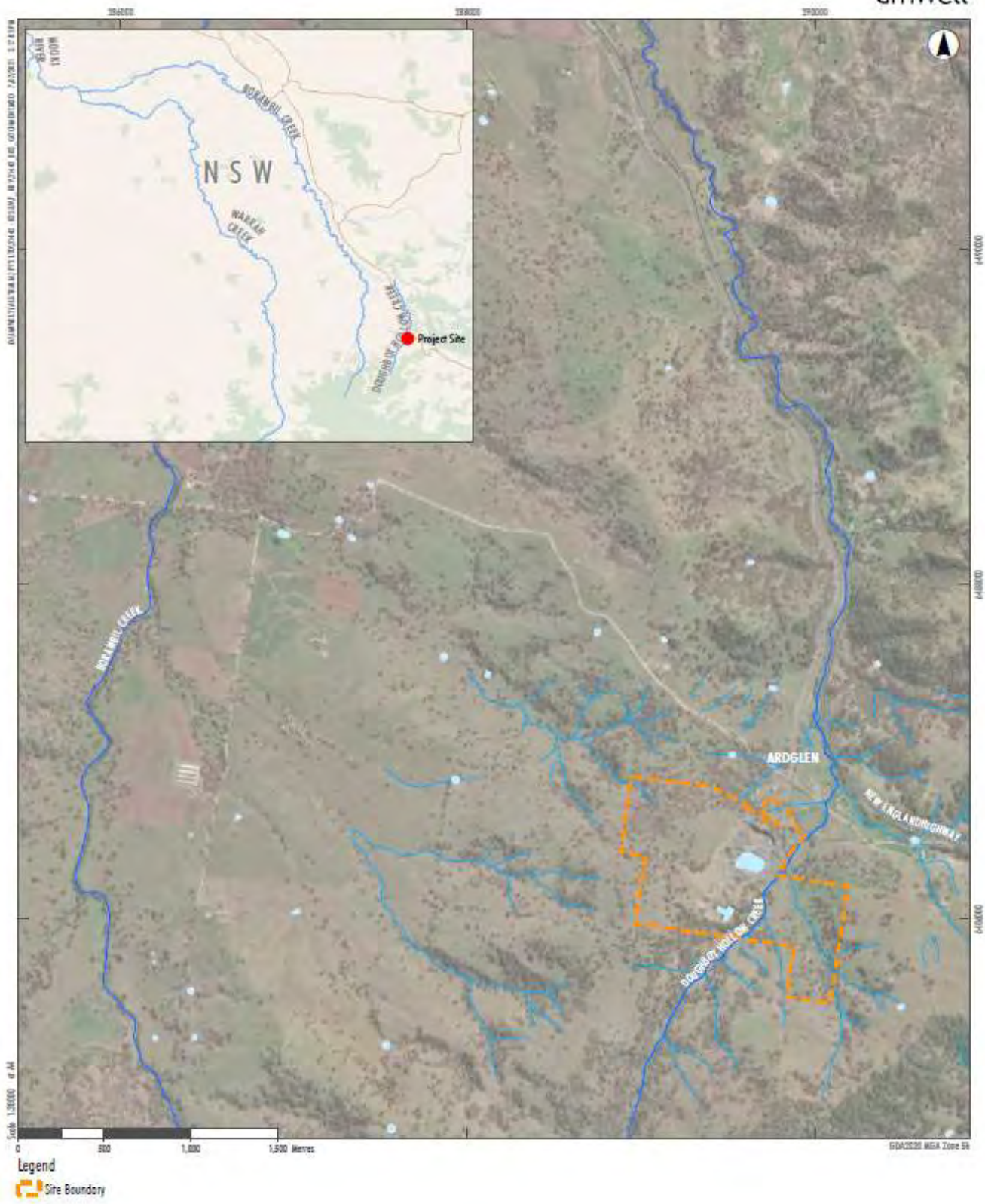


Figure 2.1 Surface Water Catchment Context

2.1.2 Soils

The NSW Office of Environment and Heritage (OEH) online mapping tool eSpade shows that the Quarry site occupies areas mapped as the Moan (mnz) and Glen Oak (gkz) soil landscapes.

Soils on the upper to mid slops of the Moan soil landscapes are typically shallow (25 - <50 cm), moderately well-drained Haplic Eutrophic Red, Brown and occasionally Black Chromosols and Dermosols (Chocolate Soils and Euchrozems). Localised gully erosion hazard and widespread sheet erosion hazard have been observed on the Moan soil landscape.

Soils on the upper slopes of the Glen Oak soil landscapes are typically moderately deep (50 - <100 cm), moderately well-drained Haplic Eutrophic Red Ferrosols (Euchrozems). Localised gully erosion hazard and localised sheet erosion hazard have been observed on the Glen Oak soil landscape.

Table 2.1 presents relevant modelled soil properties sourced from eSpade (OEH, 2021).

Table 2.1 Quarry Site Modelled Soil Properties

Parameter	Value
Soil Erodibility (as used in the Revised Universal Soil Loss Equation (RUSLE))	0.05 to 0.06
Exchangeable Sodium Percentage (ESP)	<4% (0 – 100 cm depth)
Clay Percentage	>40% (0 – 100 cm depth)
Silt Percentage	>20 - 25% (0 – 100 cm depth)
Sand Percentage	<30% (0 – 100 cm depth)
Electrical Conductivity (EC)	<0.3 dS/m (0 – 100 cm depth)
pH ($CaCl_2$)	>5.5 – 6.5 (0 – 100 cm depth)
Cation Exchange Capacity (CEC)	>20 – 40 $cmol_c/kg$ (0 – 100 cm depth)
Soil Organic Carbon	>2 – 3% (0 – 30 cm depth) >0.5 – 1% (30 – 100 cm depth)

Based on the data in **Table 2.1** the Quarry site soils are considered to:

- be non-dispersive (as the ESP is less than 6%) but fine, i.e. Type F (as the percentage of clay and silt is >30%)
- be non saline (EC <2 dS/m)
- have a slightly acidic to neutral pH
- have fertile top soils (i.e. medium to high CEC and organic carbon)
- be highly erodible which is consistent with the information contained in the soil landscape documents

2.1.3 Climate

The Quarry is located in the north west slopes region of NSW and has a warm and temperate climate. Rainfall and evaporation statistics based on data sourced from the SILO climate data base (from 1 January 1900 to 31 December 2020, SILO grid point -31.75 latitude, 150.8 longitude) are presented in **Table 2.2** and **Chart 2.1**.

Table 2.2 Rainfall and Evaporation Statistics

Statistic	Rainfall (mm)	Evaporation (mm)
10th Percentile	581	1,365
50th Percentile	859	1,459
90th Percentile	1,113	1,565
Average	860	1,461

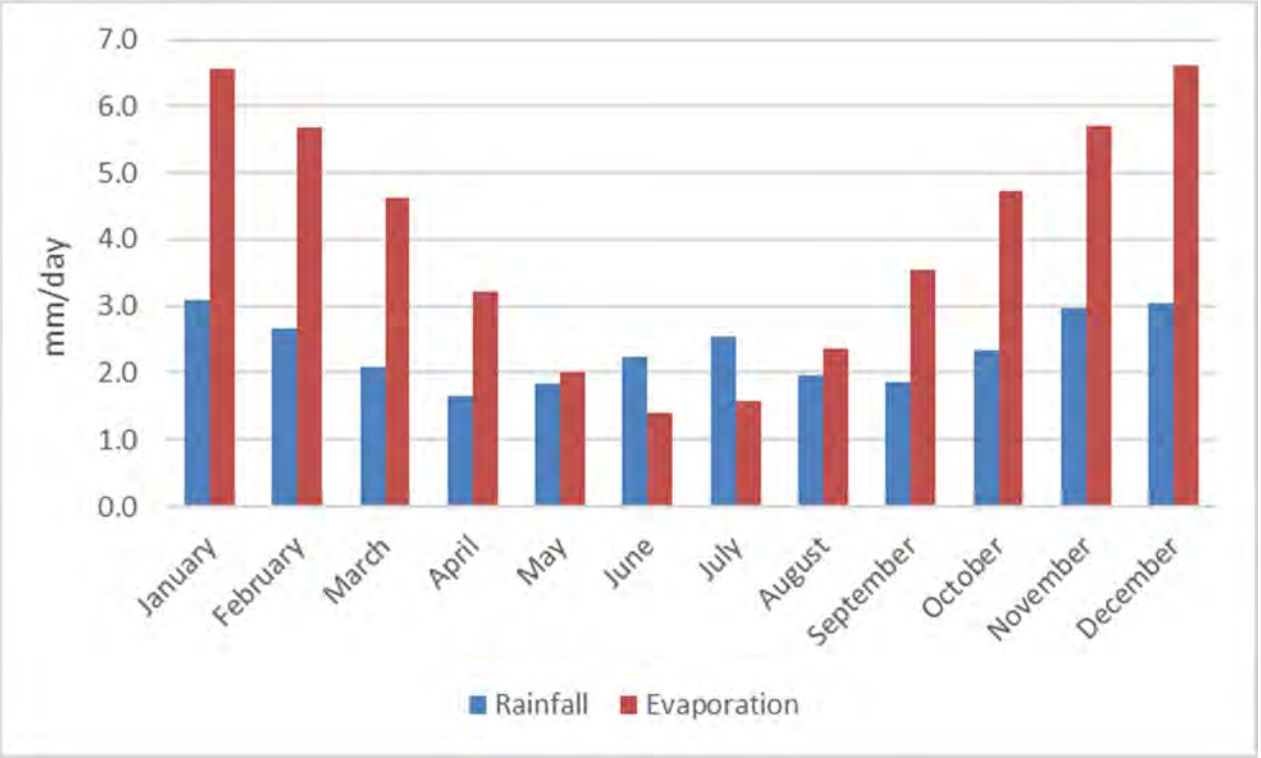


Chart 2.1 Average Daily Rainfall and Evaporation (1900 – 2020)

Table 2.3 presents the 1987 Australian Rainfall and Runoff Intensity Frequency Duration (IFD) rainfall intensities sourced from the BoM website for the Quarry site.

Table 2.3 Quarry Site Rainfall Intensities (mm/h)

Duration	1 Year	2 years	5 years	10 years	20 years	50 years	100 years	Duration
5 min	67.60	88.30	116.00	134.00	157.00	191.00	218.00	67.60
6 min	63.00	82.30	108.00	125.00	147.00	178.00	203.00	63.00
10 min	51.40	67.10	87.50	101.00	119.00	143.00	163.00	51.40
20 min	37.60	48.80	63.00	72.00	84.30	101.00	115.00	37.60
30 min	30.50	39.50	50.70	57.80	67.50	80.80	91.40	30.50
1 h	20.40	26.30	33.70	38.30	44.70	53.40	60.30	20.40
2 h	13.00	16.80	21.60	24.60	28.70	34.40	38.90	13.00
3 h	9.85	12.80	16.50	18.80	22.00	26.40	29.90	9.85
6 h	6.10	7.95	10.30	11.90	13.90	16.80	19.10	6.10
12 h	3.80	4.97	6.53	7.54	8.89	10.80	12.30	3.80
24 h	2.38	3.13	4.16	4.83	5.73	6.98	8.00	2.38
48 h	1.46	1.94	2.60	3.04	3.63	4.45	5.12	1.46
72 h	1.06	1.41	1.91	2.25	2.69	3.32	3.83	1.06

2.1.4 Baseline Surface Water Quality

Daracon monitors site water sources for pH, electrical conductivity (EC), total suspended solids (TSS) and oil and grease (O&G) on a monthly basis. Site water quality statistics for the period March 2017 to May 2021 and relevant ANZG default guideline values are presented in **Table 2.4** to **Table 2.7** and the monitoring locations are shown in **Figure 2.2**. Water quality results recorded below the laboratory limit of reading (LOR) have been assumed to be at the LOR for the purpose of the statistical analysis of results. It is noted that there was no discharge from the site water storages at the time of monitoring.

Table 2.4 Site Water pH

Monitoring Location	ANZG DGV	Limit of Reading	# Results	# Results >Limit of Reading	Minimum	20th Percentile	80th Percentile	Maximum
In-Pit Sump (SW1)	6.50 – 8.00	0.01	41	41	9.11	9.30	9.65	9.96
Southern Void (SW2)			41	41	8.20	8.65	9.03	9.65
Tertiary Basin (SW3)			6	6	8.25	8.28	8.43	8.59
Rail Siding (SW4)			41	41	7.65	8.12	8.66	8.86

Table 2.5 Site Water EC (µS/cm)

Monitoring Location	ANZG DGV	Limit of Reading	# Results	# Results >Limit of Reading	Minimum	20th Percentile	80th Percentile	Maximum
In-Pit Sump (SW1)	30 - 350	1	41	41	512	560	752	9290
Southern Void (SW2)			41	41	555	565	816	909
Tertiary Basin (SW3)			7	7	483	483	730	833
Rail Siding (SW4)			41	41	387	520	628	846

Table 2.6 Site Water TSS (mg/L)

Monitoring Location	ANZG DGV	Limit of Reading	# Results	# Results >Limit of Reading	Minimum	20th Percentile	80th Percentile	Maximum
In-Pit Sump (SW1)	-	5	41	41	8	18	43	59
Southern Void (SW2)			41	32	5	7	24	48
Tertiary Basin (SW3)			7	6	5	43	93	140
Rail Siding (SW4)			41	31	4	7	17	129

Table 2.7 Site Water O&G (mg/L)

Monitoring Location	ANZG DGV	Limit of Reading	# Results	# Results >Limit of Reading	Minimum	20th Percentile	80th Percentile	Maximum
In-Pit Sump (SW1)	-	5	41	1	5	5	5	7
Southern Void (SW2)			41	1	5	5	5	6
Tertiary Basin (SW3)			7	0	5	5	5	5
Rail Siding (SW4)			41	2	5	5	5	6

Daracon monitors water quality in Doughboy Hollow Creek upstream and downstream of the Quarry for pH, EC, TSS and O&G. Receiving water quality monitoring statistics for the period March 2017 to May 2021 and relevant ANZG default guideline values are presented in **Table 2.8** to **Table 2.10** and the monitoring locations are shown in **Figure 2.2**. A limited number of results are available for Doughboy Hollow creek due to the ephemeral nature of the stream. Water quality results recorded below the laboratory LOR have been assumed to be at the LOR for the purpose of the statistical analysis of results.

Table 2.8 Doughboy Hollow Creek pH

Monitoring Location	ANZG DGV	Limit of Reading	# Results	# Results >Limit of Reading	Minimum	5th Percentile	20th Percentile	80th Percentile	95th Percentile	Maximum
Upstream (RW1)	6.50 – 8.00	0.01	7	7	7.25	7.31	7.45	7.68	7.48	8.15
Downstream (RW2)			11	11	7.33	8.04	7.68	7.95	8.12	8.18

Table 2.9 Doughboy Hollow Creek EC (µS/cm)

Monitoring Location	ANZG DGV	Limit of Reading	# Results	# Results >Limit of Reading	Minimum	5th Percentile	20th Percentile	80th Percentile	95th Percentile	Maximum
Upstream (RW1)	30 - 350	1	7	7	377	447	618	736	565	1006
Downstream (RW2)			11	11	419	975	876	875	1,022	1118

Table 2.10 Doughboy Hollow Creek TSS (mg/L)

Monitoring Location	ANZG DGV	Limit of Reading	# Results	# Results >Limit of Reading	Minimum	5th Percentile	20th Percentile	80th Percentile	95th Percentile	Maximum
Upstream (RW1)	-	5	7	3	5	5	5	6	7	8
Downstream (RW2)			11	2	5	5	5	5	42	79

Table 2.11 Doughboy Hollow Creek O&G (mg/L)

Monitoring Location	ANZG DGV	Limit of Reading	# Results	# Results >Limit of Reading	Minimum	20th Percentile	80th Percentile	Maximum
Upstream (RW1)	-	5	7	0	5	5	5	5
Downstream (RW2)			11	0	5	5	5	5

The historical water quality monitoring results indicate:

- Site water pH exceeds the ANZG upper DGV as well as typical Doughboy Hollow Creek pH results
- EC for both Doughboy Hollow Creek (upstream and downstream) and site water quality exceed the upper ANZG DGV

- Site water typically has higher TSS than Doughboy Hollow Creek and at times would exceed a typical EPL limit condition of 50 mg/L

- All TSS results in Doughboy Hollow Creek upstream and downstream of the Quarry were less than 10 mg/L except for one result of 79 mg/L (1 May 2020) recorded downstream of the Quarry. It is understood that there was no flow in Doughboy Hollow Creek at the time this water quality sample was collected and the elevated TSS concentration may be a result of disturbance of the creek bed when collecting the sample from pooled water. It is noted that the 80th percentile upstream TSS value is greater than the 80th percentile downstream TSS value.

Figure 2.2 Water Quality Monitoring Locations

2.2 Groundwater

The Quarry is located within the eastern extent of the Liverpool Ranges Basalt groundwater management area under the Murray Darling Basin (MDB) Fractured Rock Groundwater Sources (2020). In accordance with the Water Management Act 2000, groundwater intercepted within the Liverpool Ranges Basalt MDB Groundwater Source is required to be licenced, with the long-term average annual extraction limit set at 2,160 ML/year. It is understood that the previous Quarry operations may have experienced groundwater inflows, however, these have never been quantified.

Condition 18E of Schedule 3 of the Consent (refer to **Table 1.2**), requires Daracon to install a groundwater monitoring bore with a minimum depth equivalent to the finished depth of the in-pit sump in consultation with DPE Water. Condition 20 of Schedule 3 of the Consent (refer to **Table 1.2**) requires the preparation of a Site Water Management Plan that includes a Groundwater Monitoring Program and Condition 23B of Schedule 3 of the Consent (refer to **Table 1.2**) requires that the Groundwater Monitoring Program incorporate at least 12 months of baseline data, performance criteria and a protocol for obtaining appropriate water licences for any groundwater take. The Groundwater Monitoring Program is required to be submitted to the Planning Secretary for approval within 12 months of commencing quarrying operations in the extension area. Refer to **Section 7** for additional information regarding the proposed groundwater monitoring regime.

3.0 Surface Water Management Plan

3.1 Doughboy Hollow Creek Baseline Water Quality

Water quality statistics for Doughboy hollow Creek are presented in **Section 2.1.4**.

3.2 Flow Modelling of Doughboy Hollow Creek

Flow modelling of Doughboy Hollow Creek has been undertaken to determine stream to inform the potential requirement to limit the flow rates of controlled discharges of treated water to the creek as well as inform the rehabilitation strategy for Doughboy Hollow Creek (that will include the removal of the weir from the creek) required under Condition 28 of Schedule 3 of the Consent.

The flow modelling includes estimates of stream velocities and tractive stresses and the results will be included as in the Landscape Management Plan required under Condition 27 of Schedule 3 of the Consent. Reference will be made to the flow modelling results during the detailed design of the water treatment and discharge system (refer to **Section 3.4.2** and **Appendix A**) to ensure maximum controlled discharge flow rates are limited, as required, to minimize the risk of erosive flows occurring in Doughboy Hollow Creek.

3.3 Surface Water Impact Assessment Criteria

Table 3.1 presents the surface water quality impact assessment criteria (IAC) for Doughboy Hollow Creek downstream of the Quarry based on either historical Doughboy Hollow Creek monitoring results upstream of the Quarry or ANZG DGVs for upland river aquatic ecosystems. It is important to note that an exceedance of the IAC does not necessarily indicate a Quarry impact on the downstream receiving environment. Rather, the exceedance triggers the requirement to investigate the potential causes of the exceedance which could include natural variations in water quality and/or impacts associated with water draining from the Quarry.

Table 3.1 Impact Assessment Criteria - Doughboy Hollow Creek Downstream

Parameter	IAC[1]	Trigger Level	Basis
pH	7.45 – 8.04	Level 1	20th and 80th percentile of Doughboy Hollow Creek upstream monitoring results
EC (uS/cm)	618 – 876		
Turbidity (NTU)	2 - 25		ANZG DGV for upland river aquatic ecosystems
Total Suspended Solids (mg/L)	6		80th percentile of Doughboy Hollow Creek upstream monitoring results
Oil and Grease (mg/L)	5		
pH	7.31 – 8.13	Level 2	5th and 95th percentile of Doughboy Hollow Creek upstream monitoring results
EC (uS/cm)	447 – 975		
Total Suspended Solids (mg/L)	7		

Note: [1] The IAC only apply when the Quarry is not discharging. During discharge, relevant EPL water quality limit conditions

will apply as the IAC.

It should be noted that the IAC values based on Doughboy Hollow Creek upstream water quality monitoring presented in **Table 3.1** are based on a limited data set of only seven results (for the period March 2017 to May 2021) due to the ephemeral nature of stream. The IAC values will be revised in future SWMP updates when more monitoring results are available.

3.4 Surface Water Management System

3.4.1 Existing Water Management

The existing Quarry water management system (WMS) consists of:

- A Southern Void which has a water storage capacity of approximately 21 ML and captures runoff from the former Southern Void extraction area which has been partially infilled
- A clean water diversion drain directing runoff from upslope undisturbed catchments around the quarry
- A 30ML In-Pit Sump to capture runoff from the extraction area and any overflows from the Southern Void
- A 2.6 ML capacity sediment basin (the Tertiary Basin) which captures runoff from the process plant area, rail siding and any overflows from the In-Pit Sump. Overflows from the Tertiary Basin drain to Doughboy Hollow creek.

Presently the Quarry is in care and maintenance and there is no water usage. The water storages allow for settling of suspended solids entrained in runoff. Runoff captured in the Tertiary Basin may be transferred to the In-Pit Sump and Southern Void to manage basin inventory. Runoff captured in the In-Pit Sump may also be transferred to the Southern Void. Daracon has committed to a significant improvements to site water management in the Mod 2 EIS including the implementation of a water treatment system and management of off-site discharges (refer **Section 3.4.2** and **Appendix A**). A variation to EPL 1115 was recently obtained to accommodate the WMS improvements including allowance of controlled discharges of treated water to Doughboy Hollow Creek, and now, subject to DPE's approval of the SWMP, these improvements will proceed promptly

3.4.2 Project Water Management

Figure 3.1 presents a plan of the Quarry WMS that will be in place at the commencement of quarrying in the extension area (current arrangement) and **Figure 3.2** presents a plan of the WMS when the Quarry pit reaches the maximum extent. The Quarry will operate with the existing WMS until extraction commences in the recently approved extension area. The ongoing Quarry WMS strategy is to:

- Direct clean runoff from undisturbed catchments around the disturbed Quarry catchment
- Capture dirty runoff from the disturbed Quarry catchment within the WMS
- Maximise the use of captured dirty water to meet operational demands and minimise clean water imports

As with the existing Quarry WMS, runoff from the undisturbed catchment to the west of the existing Quarry extraction area in the early stages of the Project will be intercepted by a rock lined drain that flows from south to north along the western edge of the pit. Runoff from the Quarry extraction area will continue to drain to the In-Pit Sump which has an existing capacity of approximately 30 ML. Runoff from the Southern Void section of the Quarry catchment is captured within the Southern Void which is estimated to have a capacity of approximately 21 ML.

As extraction progresses into the approved extension area (refer to **Figure 3.2**), the rock lined drain diverting the undisturbed catchment upslope of the Quarry Pit will be realigned to direct runoff to the west and into the unnamed tributary of Borambil Creek (refer to **Section 2.1.1**). The capacity of the In-Pit Sump will also be progressively increased as the extraction area footprint increases to a maximum capacity of 60 ML when the extraction area footprint as at its maximum. The maximum capacity of the expanded In-Pit Sump (i.e. 60 ML) was selected to provide increased containment capacity to accommodate runoff from the 12 hour 5% AEP while maintaining permanent water storage capacity to manage surplus water inventories. In-Pit Sump water inventories will be managed by dewatering to the Tertiary Basin (refer to Dewatering Management Plan in **Section 6.0**) to ensure sufficient freeboard is maintained to contain pit catchment runoff from a 20 year (i.e. 5% Annual Exceedance Probability) 12 hour duration storm event. Runoff volumes from the 12 hour 5% AEP storm event have previously been estimated by AECOM (2017) for catchment areas of approximately 15 ha (indicated as existing scenario) and 27 ha (indicated as a mid-term scenario with respect to the pit extension) to be 12.7 ML and 22.7 ML respectively based on a conservative runoff coefficient of 0.9. Revised estimates (refer to **Table 3.2**) of existing and future runoff volumes have been prepared based on revised catchment areas, the rainfall depth 2016 Australian Rainfall and Runoff (AR&R) 12 hour 5% AEP storm event (i.e. 95 mm) and a conservative runoff coefficient of 0.9.

Table 3.2 Pit and Southern Void Catchment Runoff Volumes, 12 hour 5% AEP Strom Event

Scenario	Approximate Catchment Area (ha)	Runoff Volume (ML)
Existing pit catchment draining to 30 ML In-Pit Sump	11.56[1]	9.9
Pit extension at maximum extent draining to 60 ML expanded In-Pit Sump	32.33[1]	27.6
Southern Void (existing and future)	3.6[2]	3.1

Notes: [1] Excludes Southern Void catchment

[2] Potential future infilling of Southern Void may result in this catchment draining to the In-Pit Sump and therefore
requiring the In-Pit Sump to be managed with additional freeboard.

A water treatment and licenced discharge system (refer to **Figure 3.3** and preliminary design details in **Appendix A**) will be implemented as part of the Project. A variation to the existing EPL has been obtained to allow discharges to Doughboy Hollow Creek with the inclusion of water quality and quantity limit conditions. The water treatment and licenced discharge system will include:

- increasing the capacity of the existing sediment basin, i.e. the Tertiary Basin, from approximately 2.6 ML to 7.7 ML and incorporation of primary and secondary sediment chambers in the expanded Tertiary Basin

- the installation of a pipe and manual valve arrangement to allow dewatering of the In-Pit Sump to the expanded Tertiary Basin
- installation of a water treatment chemical dosing system to allow chemical dosing of coagulant to aid settling of solids in the expanded Sediment Basin (coagulant to be dosed in the Tertiary Basin inlet channel) and acid for pH correction (hydrochloric acid to be dosed inline to the transfer pipe between the Tertiary Basin and pH Reaction Tank). Note that chemical dosing will be undertaken as required, i.e. when required to adjust the quality of water within the Tertiary Basin to meet the EPL discharge concentration limits
- installation of a pH Reaction Tank with continuous pH monitoring to ensure discharge pH, which will occur via the overflow of the Reaction Tank, is within EPL limits (limits determined as part of EPL variation process)
- appropriate controls and interlocks to ensure optimal chemical dosing and immediately cease discharges should treated water pH deviate outside of EPL limits

Water discharges will be initiated manually following testing of treated water in the Tertiary Basin to ensure the TSS, pH and Oil and Grease concentrations are within EPL limits (refer to Section 1.5.3). A detailed description of the proposed water treatment process is presented in **Appendix A**. Discharges may also occur directly from the Tertiary Basin via perforated riser and manual valve provided water quality within the dam is within EPL limits (limits determined as part of EPL variation process).

Runoff from the process plant catchment and stockpiles will drain to the expanded Tertiary Basin. Runoff from the fuel storage and handling area will pass through a hydrocarbon filter and be collected in a concrete sump that will overflow to the Tertiary Basin.

Infilling of the Southern Void will commence following the start extraction in the extension area subject to the saleability and market demand for overburden materials. Dewatering of the infill area to the In-Pit Sump will be undertaken as required to ensure sufficient freeboard is maintained in the Southern Void to contain runoff from the 12 hour 5% AEP storm event which is estimated to be approximately 3.1 ML. As the Southern Void is infilled and the water storage capacity of the void is reduced more frequent dewatering will be required (refer to Dewatering Management Plan **Section 6.0**). As the Southern Void nears completion of filling, the Southern Void catchment will drain directly to the In-Pit Sump. As such, the In-Pit Sump will need to be managed to accommodate the additional runoff from the Southern Void catchment for the 12 hour 5% AEP storm event.

During high and/or prolonged rainfall events in excess of the 12 hour 5% AEP, Southern Void will spill to the In-Pit Sump and the In-Pit Sump will spill to the Tertiary Basin.

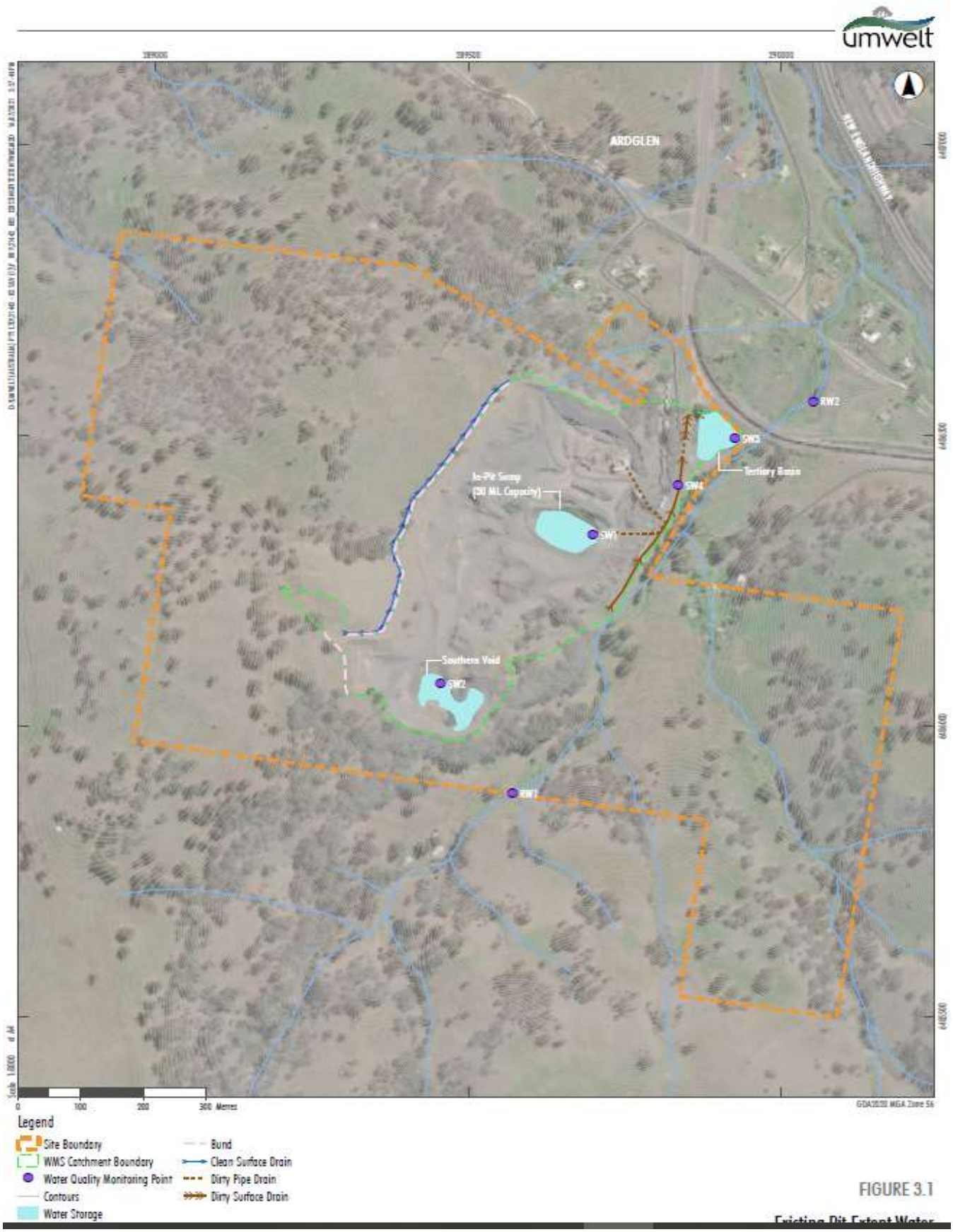


Figure 3.1 Existing Pit Extent Water Management System Plan

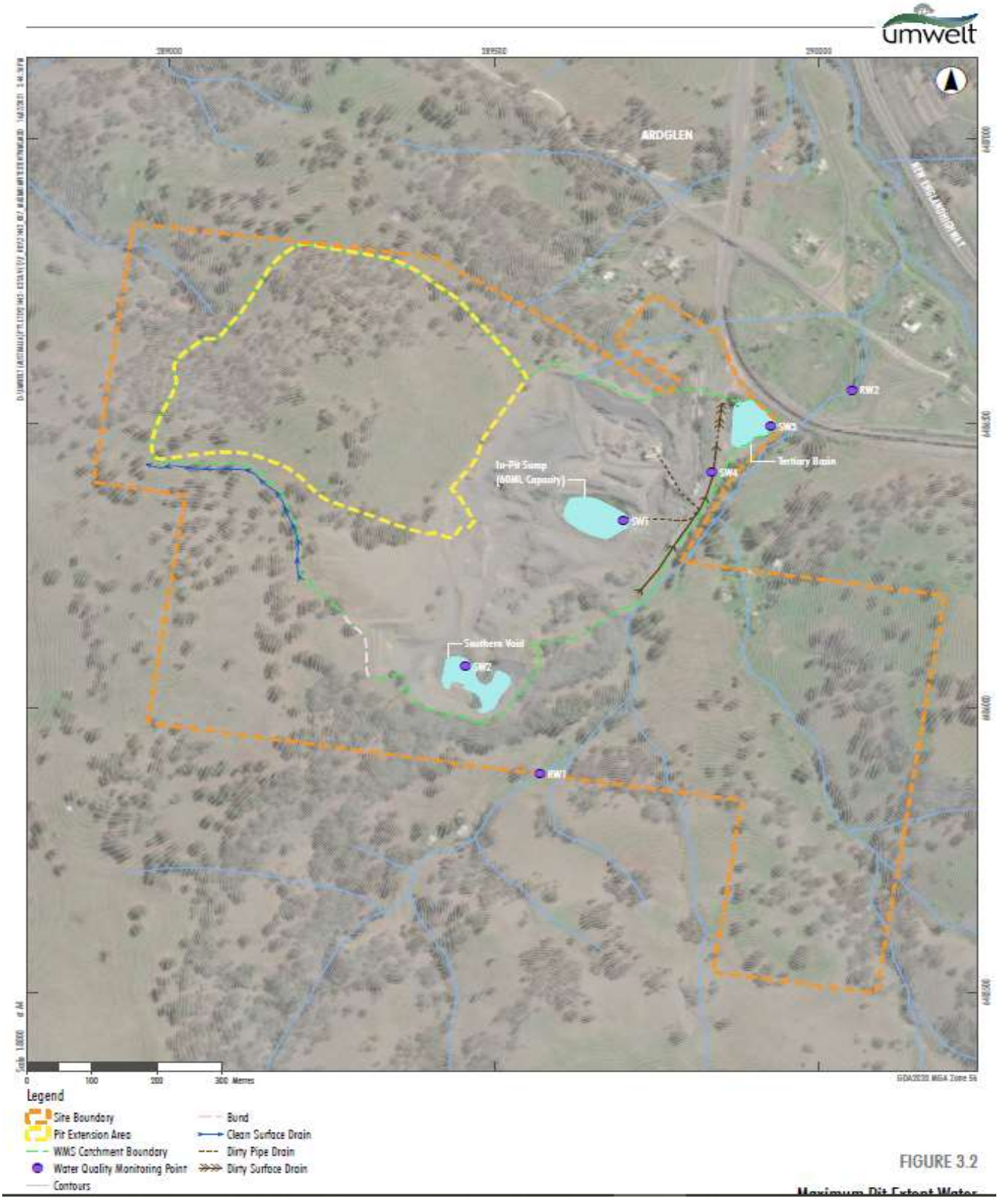


Figure 3.2 Maximum Pit Extent Water Management System Plan

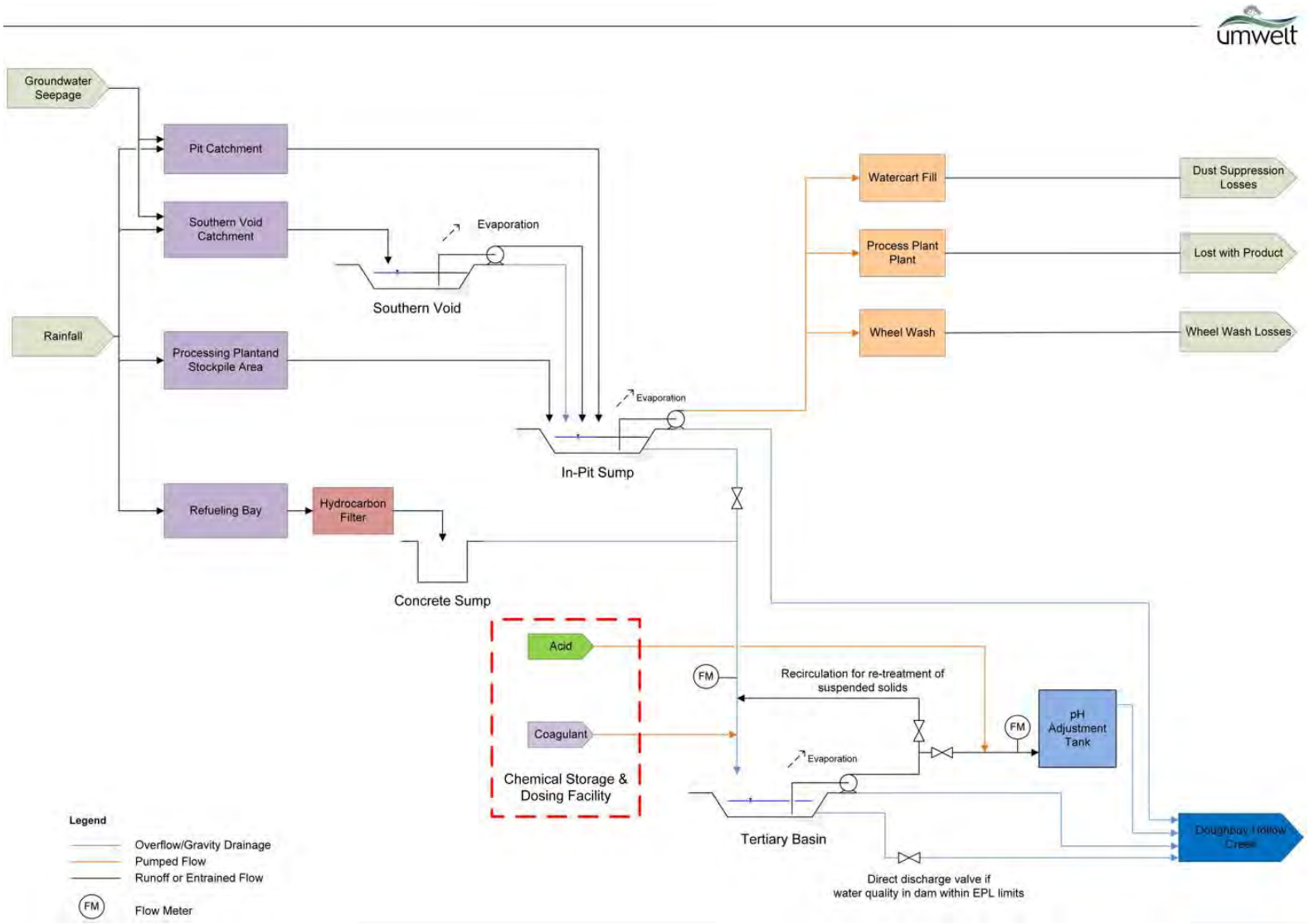


Figure 3.3 Water Management System Schematic

3.4.3 Inspection and Maintenance

All surface water management plant and equipment (including pumps and instrumentation) used on site will be maintained in a proper and efficient condition, operated in a proper and efficient manner and will be inspected and maintained in accordance with manufacturer's instructions.

Transfer pumps, pipes, fittings and valves will be inspected on a monthly basis for general condition and leaks to inform any maintenance required in addition to routine maintenance required under manufacturer's instructions. Key items of water management infrastructure that will be inspected and maintained in accordance with manufacturer's instructions are:

- Water treatment facility instrumentation (calibration and maintenance)
    - pH meter
    - turbidity meter
    - flow meter
    - chemical dosing pumps
- Tertiary Basin Pump
- In-Pit Pump
- Southern Void Pump

Inspection and maintenance requirements for erosion and sediment controls (including the Tertiary Basin) are provided in **Section 5.4**.

3.5 Surface Water Monitoring Program

3.5.1 Water Quality

Table 3.3 presents the water quality monitoring program that will be implemented in full when controlled discharges to Doughboy Hollow Creek are approved.

Table 3.3 Future Water Quality Monitoring Program

Location ID	Description	Frequency of Monitoring	Parameters	Units	Required Limit of Reading
SW1	In-Pit Sump	Monthly	pH	-	0.01
SW2	Southern Void		EC	µS/cm	10
SW3	Tertiary Basin		TSS	mg/L	5
SW4	Rail Siding		Turbidity	NTU	1
			O&G	mg/L	5
LDP1	Treated Water Discharge	Weekly during discharge	O&G	mg/L	5
		Monthly during discharge	pH	-	0.01
			EC	µS/cm	10
			TSS	mg/L	5
			Turbidity	NTU	1
		Continuous during discharge	pH	-	0.1
			Turbidity[1]	NTU	1
RW1	Doughboy Hollow Creek Upstream	Monthly and Monthly during discharge	pH	-	0.01
RW2	Doughboy Hollow Creek Downstream		EC	µS/cm	10
			TSS	mg/L	5
			Turbidity	NTU	1
			O&G	mg/L	5

Note:

[1] EPL1115 indicates that TSS is to be monitored continuously, however, direct continuous measurement of TSS is not possible. As such turbidity will be monitored as a proxy for TSS and a relationship between TSS and turbidity developed based on laboratory analysis of discharged water to enable indirect continuous monitoring of discharge TSS.

3.5.2 Water Quantity

Table 3.4 presents the water quantity monitoring program that will be implemented in full when controlled discharges to Doughboy Hollow Creek are approved.

Table 3.4 Future Water Quantity Monitoring Program

Parameter	Frequency	Methodology
Pit Sump Volume	Monthly	Staff gauge and stage storage curve
Southern Void Volume	Monthly	Survey
Southern Void transfer to In-Pit Sump	Monthly	Calculation based on pump run hours and pump rate
Pit Sump Transfers to Tertiary Basin	Continuous during transfer	Flume equipped with level transmitter

Parameter	Frequency	Methodology
Discharge Flow to Doughboy Hollow Creek	Continuous during discharge	Flow meter

3.6 Impact Assessment Criteria Exceedance Protocol

The following protocol will be implemented on a monthly basis following receipt of water quality monitoring results:

- Compare downstream Doughboy Hollow Creek Water downstream water quality results with the IAC presented in **Table 3.1**.
- If Doughboy Hollow Creek Water downstream water quality results are outside of the IAC range implement Receiving Water Quality Trigger Action Response Plan (TARP) in **Table 3.5**.
- If the investigations undertaken during TARP implementation **indicate the exceedance(s) is non-compliance** (refer to **Section 8.5**), notifications are to be made in accordance with **Section 8.1** and **Section 8.5**.
- If the investigations undertaken during TARP implementation indicate the exceedance(s) is an incident (refer to **Section 8.3**), notifications are to be made in accordance with **Section 8.1** and **Section 8.3**.
- If the investigations undertaken during TARP implementation **do not indicate a Quarry impact** the exceedance and investigation will to be reported in the Annual Review (refer to **Section 8.5**).

Table 3.5 Receiving Water Quality TARP

Trigger Level	Observation	Strategy for Mitigation	Monitoring	Monitoring Action	Response
Level 1	Doughboy Hollow Creek downstream water quality outside of baseline Level 1 trigger value range in **Table 3.1**	Reuse of water captured in WMS for operational demands to reduce off-site spills. Excess surface water from the WMS is treated in a sediment basin (the existing Tertiary Basin).	Site and receiving water monitoring for pH, EC, turbidity, TSS and O&G	Repeat water quality sampling and analysis if result is suspected of being in error and continue monitoring on a monthly basis.	Compare downstream result with corresponding upstream result and the historical range in upstream water quality results (refer to **Section 2.1.4**) If water quality results are not consistent with historical range in upstream water quality, investigate potential contributing factors including: • Determine whether any spills from the Quarry WMS occurred prior to or at the time of monitoring and compare with corresponding site water quality results • Review conditions at the time of monitoring (e.g. rainfall, sample collected from ponded water in stream) If based on the preliminary investigation outlined above a potential Quarry impact has been identified, engage a water quality specialist to undertake a preliminary investigation. If the water quality specialist's investigation indicates a Quarry impact, notifications are to be made in accordance with **Section 8.3**. Otherwise the exceedance and investigation is to be reported in the Annual Review (refer to **Section 8.5**).

Trigger Level	Observation	Strategy for Mitigation	Monitoring	Monitoring Action	Response
Level 2	Doughboy Hollow Creek downstream water quality outside of baseline Level 2 trigger value range (excluding O&G) in **Table 3.1**. Three consecutive Doughboy Hollow Creek downstream water quality outside of baseline trigger value range in **Table 3.1**	Reuse of water captured in WMS for operational demands to reduce off-site spills. Excess surface water from the WMS is treated in a sediment basin (the existing Tertiary Basin).	Site and receiving water monitoring for pH, EC, turbidity, TSS and O&G	Increase monitoring frequency to weekly until: • cause is identified; or • water quality results are confirmed not to be a result of Quarry operations; or • water quality results return to within the trigger value range.	Engage a water quality specialist to undertake a preliminary investigation. If the water quality specialist's investigation indicates a Quarry impact, notifications are to be made in accordance with **Section 8.3**. Otherwise the exceedance and investigation is to be reported in the Annual Review (refer to **Section 8.5**).

4.0 Water Balance

4.1 Model Overview

A daily time step reporting water balance model (the Model) has been developed for the Quarry WMS in the GoldSim software modelling platform. The Model utilises daily rainfall and evaporation data sourced from the SILO climate data base to estimate:

- gross water balance (excludes imports and controlled discharges)
- import water demands
- controlled discharge volumes and frequency
- spill volumes and frequency

Modelling has been undertaken for WMS at the existing pit extent and the maximum pit extent. Catchment runoff is calculated in the Model using the Australian Water Balance Model (AWBM) and daily rainfall and evaporation data sourced from the SILO climate data. The AWBM parameters for undisturbed catchment runoff have been calibrated to the Quarry site average annual regional runoff of 0.8 ML/ha/year (based on Water NSW Maximum Harvestable Rights Dam Capacity calculator) using SILO rainfall and evaporation data for the period January 1900 to December 2021.

Table 4.1 Catchment Types and AWBM Parameters

Catchment	Surface Store Area Split			Surface Store Capacities			BFI[1]	Kb[2]	Ks[2]	Evap%[4]
	A1	A2	A3	C1	C2	C3				
Undisturbed	0.134	0.433	0.433	11.2	114.3	228.6	0.22	0.991	0.5	100
Disturbed	0.185	0.430	0.385	2.7	38.4	85.7	0.05	0.985	0.0	85
Pit/Hardstand	0.185	0.430	0.385	0.6	9.2	20.6	0.05	0.985	0.0	85

Notes:

[1]Base flow index

[2] Baseflow recession constant

[3] Surface runoff recession constant

[4] Pan factor to potential evapotranspiration

4.1.1 Input Data

Input data to the water balance model are:

- SILO climate database daily rainfall and evaporation gridded data (grid point: -31.75° latitude, 150.80° longitude) from January 1900 to December 2020

- Operational water demand data presented in the *Ardglen Quarry Extension – Site Water Management Plan* (AECOM, 2017):
    - Processing Plant – 60 kL/day, 5 days per week
    - Truck Wheel Wash – 10 kL/day, 5 days per week
- Quarry catchment areas based on contours produced from 2011 and 2014 LiDAR data and design pit extension contours
- a Volume – Area stage storage relationship for the Southern Void developed using contours produced the 2014 LiDAR data
- a Volume – Area stage storage relationship for the Tertiary Basin developed using basin design contours
- groundwater inflows for the existing pit extent of 28.5 kL/day based on informal v-notch weir measurements undertaken by Daracon (to be confirmed once groundwater study complete)
- groundwater inflows for the maximum pit extent of 57.0 kL/day assuming groundwater inflows double with the significant increase in pit face area that has the potential to intercept groundwater (to be confirmed once groundwater study complete)

4.1.2 Assumptions

The following bases and assumptions were applied to the water balance model:

- water demands for haul road dust suppression has been estimated based on an evaporation – rainfall deficit, i.e.:
    - if rainfall exceeds evaporation then there is no dust suppression demand; or
    - if evaporation exceeds rainfall, the dust suppression demand is equal to evaporation minus rainfall
- the Tertiary Basin is dewatered at a maximum discharge rate of 20 L/s when the basin inventory exceeds 4.4 ML to ensure sufficient freeboard to accommodate a 5 day 95th percentile rainfall event (refer to **Section 5.1.2**)
- the In-Pit Sump is dewatered to the Tertiary Basin at a maximum discharge rate of 20 L/s from the tertiary when the sump inventory exceeds the maximum inventory to ensure sufficient freeboard to accommodate a 12 hour 5% AEP (refer to **Section 3.4**)
- the Southern Void is dewatered to the In-Pit Sump at a maximum discharge rate of 20 L/s from the tertiary when the Southern Void inventory exceeds the maximum inventory to ensure sufficient freeboard to accommodate a 12 hour 5% AEP (refer to **Section 3.4**)
- water is imported from the Tertiary Basin to the In-Pit Sump to supplement operational water demands when the In-Pit Sump has low water inventory
- a pan evaporation factor of 0.8

4.1.3 Model Results

Water balance modelling results presented in this section are based on the current understanding of the Quarry site (e.g. rainfall runoff response). The water balance will be updated on an annual basis to provide the outputs indicated in **Section 8.5** with ongoing water quantity monitoring (refer to **Section 3.5.2**) informing model inputs.

Table 4.2 presents the gross water balance results (excludes controlled discharges and potable water imports) for the existing and maximum pit extents.

Table 4.2 Gross Water Balance Results

Statistic	Existing Pit Extent Gross Water Balance (ML/year)	Maximum Pit Extent Gross Water Balance (ML/year)
Minimum	-24.6	-21.3
10th Percentile	0.0	10.9
50th Percentile	13.7	76.7
90th Percentile	52.2	141.7
Maximum	111.7	255.7

Table 4.4, **Table 4.4** and **Table 4.5** present the net water balance results for the modelled rainfall year closest to gross water balance 10th percentile, 50th percentile and 90th percentile predictions for the existing and maximum pit extents respectively.

Table 4.3 10th Percentile Net Water Balance Results

Parameter	Existing Pit Extent Result (ML/year)	Maximum Pit Extent Result (ML/year)
Inflows		
Rainfall and Runoff	29.1	55.8
Groundwater	10.4	20.8
Imports	0.0	0.0
Total Inflows	***39.5***	***76.6***
Outflows		
Evaporation	15.2	16.7
Watercart Dust Suppression	20.9	35.9
Material Processing and Wheel Wash	18.2	18.2
Tertiary Basin Spills	0.0	0.0
Controlled Discharges	0.0	10.7
Total Outflows	***54.4***	***81.6***
Change in Storage	-14.9	-5.0
Net Water Balance	**0.0**	**0.0**

Table 4.4 50th Percentile Net Water Balance Results

Parameter	Existing Pit Extent Result (ML/year)	Maximum Pit Extent Result (ML/year)
Inflows		
Rainfall and Runoff	60.8	142.1
Groundwater	10.4	20.8
Imports	0.0	0.0
Total Inflows	***71.2***	***162.9***
Outflows		
Evaporation	16.8	15.2
Watercart Dust Suppression	17.6	30.5
Material Processing and Wheel Wash	18.2	18.2
Tertiary Basin Spills	0.0	1.5
Controlled Discharges	13.7	76.5
Total Outflows	***66.4***	***142.1***
Change in Storage	4.8	20.8
Net Water Balance	**0.0**	**0.0**

Table 4.5 90th Percentile Net Water Balance Results

Parameter	Existing Pit Extent Result (ML/year)	Maximum Pit Extent Result (ML/year)
Inflows		
Rainfall and Runoff	103.9	210.7
Groundwater	10.4	20.8
Imports	0.0	0.0
Total Inflows	***114.3***	***231.5***
Outflows		
Evaporation	16.9	14.3
Watercart Dust Suppression	16.6	27.4
Material Processing and Wheel Wash	18.2	18.2
Tertiary Basin Spills	1.3	4.0
Controlled Discharges	51.9	141.7
Total Outflows	***105.0***	***205.7***
Change in Storage	9.3	25.8
Net Water Balance	**0.0**	**0.0**

Table 4.6 and Table **4.7** present the predicted Tertiary Basin controlled discharge volumes and frequencies respectively for the existing and maximum pit extents.

Table 4.6 Predicted Tertiary Basin Controlled Discharge Volumes

Statistic	Existing Pit Extent Discharge Volumes (ML/year)	Maximum Pit Extent Discharge Volumes (ML/year)
Minimum	0.0	0.0
10th Percentile	0.0	10.9
50th Percentile	14.6	76.7
90th Percentile	51.8	141.7
Maximum	111.7	255.7

Table 4.7 Predicted Tertiary Basin Controlled Discharge Frequency

Statistic	Existing Pit Extent Discharge Frequency (days/year)	Maximum Pit Extent Discharge Frequency (days/year)
Minimum	0	0
10th Percentile	0	37
50th Percentile	87	102
90th Percentile	162	177
Maximum	244	263

Table 4.8 and **Table 4.9** present the predicted Tertiary Basin spill volumes and frequencies respectively for the existing and maximum pit extents.

Table 4.8 Predicted Tertiary Basin Spill Volumes

Statistic	Existing Pit Extent Spill Volumes (ML/year)	Maximum Pit Extent Spill Volumes (ML/year)
Minimum	0.0	0.0
10th Percentile	0.0	0.0
50th Percentile	0.0	0.7
90th Percentile	3.8	15.0
Maximum	29.0	76.5

Table 4.9 Predicted Tertiary Basin Spill Frequency

Statistic	Existing Pit Extent Spill Frequency (events/year)	Maximum Pit Extent Spill Frequency (events/year)
Minimum	0	0
10th Percentile	0	0
50th Percentile	0	1
90th Percentile	1	4
Maximum	5	6

The water balance modelling results indicate:

- The Quarry will have adequate water to meet operational demands without water imports in all but the driest years for existing pit extent and maximum pit extent operational scenarios (refer to **Table 4.2**)
- Controlled discharges will be required for both the existing pit extent and maximum pit extent operational scenarios with a greater frequency of discharge for the extended Quarry Pit catchment due to the significant increase in surface water runoff to the In-Pit Sump (refer to **Table 4.7**)

- Spills from the WMS are predicted for both the existing pit extent and maximum pit extent operational scenarios with a greater frequency of spills for the extended Quarry Pit catchment due to the significant increase in surface water runoff to the In-Pit Sump (refer to **Table 4.9**). Spills will occur during high or prolonged rainfall events when the design water storage capacity and/or water treatment and discharge capacity is exceeded

During extended dry periods when inflows to the Quarry WMS are not sufficient to meet operation demands, Daracon will implement the following measures as required:

- Prioritise water usage for environmental controls (i.e. dust suppression)
- Import water (tanker or source additional surface water or groundwater share entitlement)
- Limit resource extraction and material processing to ensure water is available for environmental controls (i.e. dust suppression)

The water balance model will be updated following 12 months of groundwater monitoring and ongoing surface water inventory monitoring when improved estimates of groundwater inflows to the Quarry pit are available. Ongoing surface water quantity monitoring will also allow further calibration of the AWBM runoff parameters (refer to **Table 4.1**).

5.0 Erosion and Sediment Control Plan

The following activities undertaken at the Quarry have the potential to cause erosion and generate sediment:

- clearing and topsoil stripping ahead of mining operations
- extractive operations, noting that the areas of extraction are internally draining
- stockpiling and handling of extracted materials, imported materials and products
- construction of overburden emplacement areas (i.e. placement of overburden)
- rainfall/runoff on active work areas and overburden areas

The design standard for drainage, erosion and sediment control (DESC) measures and the typical DESC measures that will be applied on-site to minimise the potential for erosion and sedimentation impacts on and off-site are described in the following sections. This Erosion and Sediment Control Plan has been prepared in accordance with the Consent and general accordance with the requirements of *Managing Urban Stormwater Soils and Construction Volume 1* (Landcom, 2004) and *Volume 2e Mines and quarries* (DECC, 2008) (hereafter referred to as the 'Blue Book').

5.1 Drainage, Erosion and Sediment Control Design Standard

5.1.1 Drainage Controls

The 'Blue Book' requires that drains are designed to be non-scouring for a specified storm event based on the duration of soil disturbance and the sensitivity of the receiving environment. The drainage control design standard at the Quarry site for a sensitive receiving environment are presented in Table 5.2.

Table 5.1 Drainage Control Design Standard

Disturbance Duration	Design Standard[1]
< 6 months	5 year ARI
6-12 months	10 year ARI
>1 year	20 year ARI

Note: [1] Designed to be non-scouring in the listed design Average Recurrence Interval (ARI) storm event

5.1.2 Erosion Controls

An erosion hazard assessment has been undertaken in accordance with Chapter 4.4.1 of Volume 1 of the 'Blue Book'. The R-factor (rainfall erosivity) for the site was calculated using Equation (2) in Appendix A of Volume 1 of the 'Blue Book':

$$R = 164.74 \times 1.1177^{S} \times S^{0.6444}$$

where

S	**Is the 2 year 6 hour duration storm event intensity (refer to** Table 2.3**)**	**7.95 mm/h**

$$R = 164.74 \times 1.1177^{7.95} \times 7.95^{0.6444}$$

$$\boldsymbol{R = 1,518}$$

Plotting the extension area site slope, estimated to be on average approximately 13% from Project site contours, and R-factor on Figure 4.6 from Volume 1 of the 'Blue Book' determines whether the site has a high or low erosion hazard. **Figure 5.1** presents the erosion hazard assessment plot which demonstrates that the site has a low erosion hazard. As such, enhanced erosion control measures are not required.

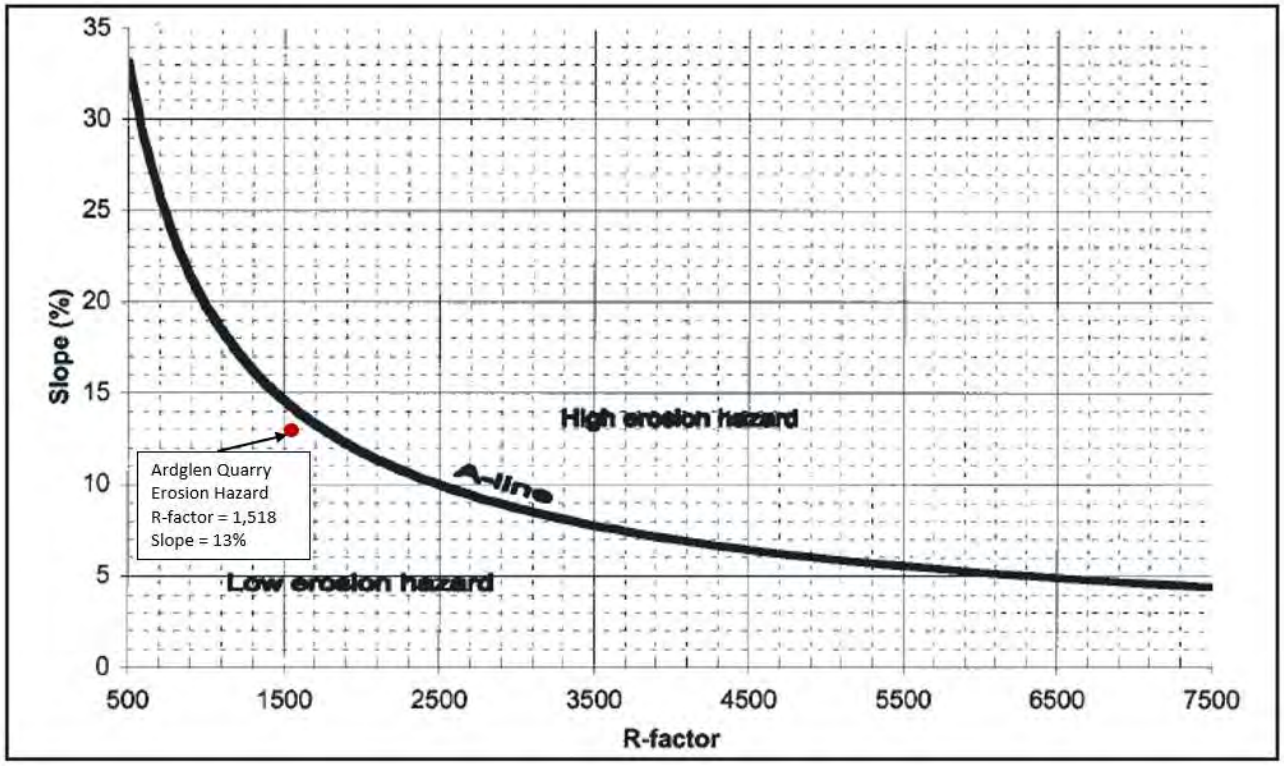


Figure 5.1 Erosion Hazard Assessment

5.1.3 Sediment Controls

The 'Blue Book' requires that sediment basins are used when the soil loss rate exceeds 200 T/year for the total area to be disturbed. The soil loss rate is estimated using the Revised Universal Soil Loss Equation (RUSLE) and Table 4.2 of Volume 1 of the 'Blue Book'. The annual Project site soil loss has been estimated using RUSLE as follows:

$$A = R \times k \times LS \times C \times P$$

where

A	is the annual soil loss rate	to be calculated	tonnes/ha/year
R	is the annual average rainfall erosivity calculated based on the 2 year, 6 hour duration ARI storm event intensity (refer to **Section 5.1.2**)	1,518	-
k	is the soil erodibility (refer to Table 2.1)	0.06	-
LS	is the slope length gradient factor sourced from Table A1 of *Managing Urban Stormwater Volume 1* (Landcom, 2004) and is dependent on the maximum slope length (use 80 m) and average site slope (13%)	4.16	-
C	is the ground cover factor sourced from Figure A5 of *Managing Urban Stormwater Volume 1* (Landcom, 2004) (no ground cover in this case)	1.0	-
P	is the erosion control practise factor sourced from Table A2 of *Managing Urban Stormwater Volume 1* (Landcom, 2004) and is dependent on level of compaction and roughness of the disturbed surface (assume Compacted and smooth)	1.3	-

$$\mathrm{A} = 1{,}518 \times 0.06 \times 4.16 \times 1.0 \times 1.3$$

$$\mathbf{A} = \mathbf{96.5}\,\frac{\boldsymbol{tonnes}}{\boldsymbol{ha.year}}$$

Based on the estimated soil loss rate of 96.5 tonnes/ha/year estimated the Quarry disturbance area would need to be less than approximately 2 ha to not require sediment basins. As such, runoff from externally draining disturbed catchments with areas greater than 2 ha will require management in sediment basins.

The 'Blue Book' requires that sediment basins are designed based on the duration of soil disturbance, soil type and sensitivity of the receiving environment. Temporary sediment controls are required to be designed to be structurally sound for a specified storm event based on the duration of soil disturbance and the sensitivity of the receiving environment. The sediment control design standard for sediment controls at the Quarry site for a sensitive receiving environment are presented in **Table 5.2**.

Table 5.2 Sediment Control Design Standard

Disturbance Duration	Soil Type	Sediment Basin Storm Event to be Contained[1,2]	Sediment Basin Embankment & Spillways[3]	Temporary Sediment Controls[3]
< 6 months	F	5 day 80th percentile	20 year ARI	5 year ARI
6-12 Months	F	5 day 85th percentile	50 year ARI	10 year ARI
1-3 years	F	5 day 85th percentile	100 year ARI	20 year ARI
>3 years	F	5 day 95th percentile	100 year ARI	20 year ARI

Notes:

[1] Designed to achieve required water quality up to the nominated storm event;

[2] Sediment storage zone shall be sized to accommodate a minimum of two months soil loss as calculated with the RUSLE;

[3] Designed to be structurally sound in the listed design storm event

The relevant five day design rainfall depths for the Quarry site are those for Scone published in the 'Blue Book' (Landcom, 2004) and are presented in **Table 5.3**.

Table 5.3 Design Rainfall Depths

Event	Rainfall Depth (mm)
5 day 80th percentile	22.6
5 day 85th percentile	27.7
5 day 95th percentile	51.3

The 7.7 ML Tertiary Basin inventory will be managed to accommodate runoff from its immediate catchment (approximately 5.7 ha) for a five day 95th percentile rainfall event as presented in **Table 5.4**.

Table 5.4 Tertiary Basin Inventory Management

Parameter	Volume (ML)
5 day 95th percentile runoff volume	2.2
12 months sediment storage	1.1

Within five days of runoff generating rainfall or dewatering of the In-Pit Sump via the Tertiary Basin, the Tertiary Basin will be dewatered to ensure there is at least 2.2 ML of freeboard below the spillway invert (i.e. the Tertiary Basin will be managed to have a target maximum inventory of 5.5 ML). A fixed staff gauge will be installed in the Tertiary Basin indicating the minimum freeboard requirement and the need for dewatering for levels above the minimum freeboard requirement.

5.2 Drainage Erosion and Sediment Controls

5.2.1 General Conditions

All ESCs are to be installed, managed and maintained in accordance with the 'Blue Book' (Landcom, 2004) to:

- Prevent sediment moving off-site and sediment laden water entering any watercourse, drainage line, or drain inlet.
- Reduce water velocity and capture sediment on site.
- Minimise the amount of material transported from site to surrounding pavement surfaces.
- Divert clean water around site.

Additional ESC measures must be implemented and a revised in the event that site conditions change significantly, or the implemented controls fail to achieve the desired objective of preventing environmental harm.

The three primary DESCs that will be implemented at the Quarry are:

- a clean water diversion drain upslope of the western pit extension
- an in-pit sump to capture dirty water runoff from the extraction area catchment
- a sediment basin to capture runoff from the Quarry infrastructure area and receive surplus water from the in-pit sump for treatment (to remove suspended solids) and reuse or discharge (subject to EPL variation).

These location and function of these controls are detailed in **Section 3.1**. Other DESCs will be planned, designed and implemented in accordance with the 'Blue Book' where ground disturbing activities occur outside of the primary DESCs described above.

5.2.2 General Site Management

1. No ground disturbance (other than disturbance for the installation of required DESCs) is to occur until the ESCs required are installed and functional.
2. To minimise ground disturbance, activities including vehicle and machinery movements and stockpiling, will be restricted to designated work areas where possible.
3. All fuels, chemicals and liquids are to be stored in an impervious bunded area, a minimum of 50 m away from:
    - rivers, creeks or any areas of concentrated water flow
    - flooded or poorly drained areas.
    - slopes above 10%.

4. Refuelling of plant and equipment that can readily be relocated shall be undertaken remotely from waterfront land. For plant and equipment that requires refuelling on waterfront land appropriate controls are to be implemented including:

    - Placement of filter socks around area that could potentially be impacted by fuel spills.
    - Ensuring spill kits are present during refuelling.
    - Ensuring an appropriate number of trained personnel are available during refuelling to monitor for spills and respond rapidly to contain a spill.

5. Emergency spill kits are to be kept on site at all times. All workers are to be made aware of the location of the spill kits and trained in their use.

6. Ensure a suitable stock of consumable erosion and sediment control products (e.g. geotextile, sediment fence) is available on site to ensure repairs to ESCs can be made promptly and temporary stabilisation measures can be implemented under wet weather provisions.

5.2.3 Soil and Stockpile Management

7. Topsoil should be stripped while in a moist condition to maintain soil structure. If the soil is too dry the soil will be pulverised, if the soil is too wet it may lead to clodding and hardsetting.

8. Avoid mixing topsoil with subsoil during stripping and stockpiling.

9. Topsoil should be preserved on site for reuse during the site stabilisation stage.

10. If possible topsoil is to be stockpiled at heights no greater than 2 m to assist in maintaining seed viability and avoid compaction of topsoil stockpiles to maintain soil structure.

11. Topsoil should ideally be reapplied within 12 months of stripping and as such, the implementation progressive site rehabilitation is of significant importance to successful revegetation.

12. Soils shall be removed from stockpiles in a manner that avoids mobile plant traffic on the stockpile and soils shall be re-spread in the reverse sequence to its removal, i.e. subsoil replaced prior to topsoil replacement.

13. Where practicable stockpiles are to have sediment fencing installed on the downslope side and a clean water diversion bund installed on the upslope side as in accordance with 'Blue Book' standard drawing *SD4-1 Stockpiles* (refer to **Appendix B**) to protect from run-on water.

14. Where soil material is suspected of contamination it will be classified in accordance with the *NSW Environment Protection Authority (EPA) Waste Classification Guidelines Part 1: Classifying Waste* prior to disposal or emplacement. Contaminated material is to be disposed of at an appropriately licensed waste management facility.

5.2.4 Drainage and Erosion Controls

15. Wherever reasonable and practicable, "clean" surface waters must be diverted away from sediment control devices and any untreated, sediment-laden waters.

16. Minimise disturbance and retain as much existing ground cover as practicable. Disturbance boundaries are to be clearly delineated with construction fencing or barrier tape.

17. Disturbed slopes subject to sheet flow are to be limited to a maximum length of 80 m.

18. When utilising rolled erosion control products (RECPs) for stabilisation, they shall be installed in accordance with 'Blue Book' standard drawing *SD 5-2 RECP: Sheet Flow* for areas subject to sheet flow and *SD 5-7 RECP Concentrated Flow* for areas subject to concentrated flow.

5.2.5 Sediment Controls

19. All runoff from disturbed areas is to be passed through a sediment control.

20. Sediment traps should be located as close to the source of the sediment as practicable.

21. Sediment removed from any trapping device is to be disposed of in locations where further erosion and consequent pollution to downslope lands and waterways will not occur.

22. Temporary soil and water management structures are to be removed only after the disturbed area is stabilised appropriately in accordance with the requirements the 'Blue Book' (Landcom, 2004).

23. Sediment control devices must be de-silted and made fully operational as soon as reasonable and practicable after a sediment-producing event.

24. Materials, whether liquid or solid, removed from sediment control devices during maintenance or decommissioning, must be disposed of in a manner that does not cause ongoing soil erosion or environmental harm.

5.3 Works on Waterfront Land

Any works on waterfront land (i.e. works within 40 m of the top of bank of a waterway as defined by DPIE Water at *https://www.industry.nsw.gov.au/water/licensing-trade/approvals/controlled-activities/what-is-a-controlled-activity*) or within Doughboy Hollow Creek will be undertaken in accordance with Guidelines for Controlled Activities on Waterfront Land (2018) and in consultation with DPIE Water. The typical controls for works on waterfront land or within Doughboy Hollow creek include:

25. Detailed site and works specific progressive ESCPs are to be prepared for all works in waters and on waterfront land.

26. Works on waterfront land should be undertaken during periods of low rainfall erosivity wherever practicable.

27. Where scheduling of works on waterfront land during low rainfall erosivity is not possible or is impractical, erosion control measures should be implemented to ensure disturbed lands only have c-factors in excess of 0.1 (i.e. approximately 60% ground cover) when the three day forecast indicates that rain is unlikely. Management regimes should be established to ensure that the site can be stabilised (i.e. c-factor 0.1 or less) within 24 hours if the forecast is incorrect.

28. Geotextile fabric is to be used to isolate the natural bed of the waterway from the fill or other material used to create any work platform within the bed of the waterway.

29. When working near riparian vegetation or waterfront land these areas need to be identified and appropriately delineated as “No Go” areas (with the aim of avoiding harm to these areas). Harm to riparian vegetation or waterfront land outside of the approved disturbance boundary is not permitted and any harm caused is to be documented and any harm caused is to be restored in accordance with directions provided by DPIE Water.

30. Material storage and stockpiling is not to be undertaken on waterfront land or riparian vegetation. Stockpiling must be undertaken in a manner to avoid harm to these types of vegetation or water land. Stockpiles should also be located 10 metres away from adjacent waterfront land. Stockpiles are to be managed as detailed in **Section 5.2.3**.

31. On completion of the works the site is to be rehabilitated and stabilised in accordance with the draft Ardglen Quarry Landscape Management Plan (Umwelt, 2020).

5.4 Inspection and Maintenance

5.4.1 Inspection and Monitoring

32. Regular inspections are to be undertaken by personnel with:

    a. an understanding of the local environmental values that could be impacted by the works;

    b. a good working knowledge of the Project ESCs; and

    c. training in the correct installation, operational and maintenance requirements for the Project ESCs.

33. All ESCs are to be inspected:

    a. daily for works on waterfront land

    b. weekly for all other areas

    c. prior to forecasted rainfall events greater than or equal to 20 mm in a 24-hour period

    d. after rainfall events greater than or equal to 20 mm in a 24-hour period or runoff generating rainfall.

34. All inspections are to be documented on inspection checklists and all actions identified are to be closed out within a reasonable and practical time frame. The Inspection checklist is to include:

    a. recording the condition of every erosion and sediment control employed including any evidence of scouring in drains and the condition of sediment basin walls and spillway

    b. recording maintenance requirements (if any) for each erosion and sediment control

    c. recording the volumes of sediment stored in and removed from sediment retention systems, including all three cells of the Tertiary Basin , where applicable

    d. recording the site where the sediment is disposed

5.4.2 Maintenance

No fixed maintenance schedule for erosion and sediment controls is proposed. The routine inspections indicated in Section 5.4.1 will inform the need for maintenance which will be undertaken on an as needs basis.

All ESCs, including drainage control measures, must be maintained in proper working order at all times during their operational lives. All ESCs shall be maintained in a functioning condition during construction until all ground disturbance activities are completed, and full stabilisation of the site is achieved.

Sediment removal from the Tertiary Basin is expected to be required annually, however, routine monitoring will indicate the requirement for more frequent sediment removal to ensure adequate basin capacity is maintained to accommodate runoff from design rainfall events and maintain water treatment efficiency. Sediment removed from sediment traps and places of sediment deposition must be disposed of in a lawful manner that does not cause ongoing soil erosion or environmental harm.

Required repairs to all controls are to be undertaken immediately where practical. Ensure controls are put back in place if they are moved for any reason (e.g. to mobile equipment access).

6.0 Dewatering Management Plan

Dewatering of the In-Pit Sump will be undertaken to maintain sufficient freeboard to accommodate the 12 hour 5% AEP and periodically when the capacity of the sump is to be increased to service the increasing extraction area catchment. The Southern Void will be dewatered to maintain sufficient freeboard to accommodate the 12 hour 5% AEP. Dewatering will be undertaken as follows:

- Water inventory monitoring indicates In-Pit Sump and/or Southern Void are approaching (within 10%) maximum inventory (i.e. the inventory that allows containment of runoff from the 12 hour 5% AEP, refer to **Table 3.2**)
- The quarry manager will to check forecast to determine whether significant rainfall, i.e. > 70 mm (noting that the In-Pit Sump and Southern Void will be managed with sufficient freeboard to accommodate runoff from 12 hour 5% AEP which is equivalent to 95 mm of rainfall) is predicted in the next seven days
- If significant rainfall is predicted, commence planning to dewater the In-Pit Sump and/or the Southern Void:
    - Check levels in Tertiary Basin
    - Check water treatment chemical stocks are adequate to treat the anticipated volumes to be dewatered (including dewatering of the runoff captured in the Tertiary Basin from the forecast rainfall)
    - Check water treatment equipment (dosing pumps, discharge pump, pH meters) are in proper working order
- If dewatering is required (i.e. In-Pit Sump and/or Southern Void inventories are approaching (within 10%) the maximum inventory), dewater the In-Pit Sump prior to dewatering the Southern Void as the infilling of the Southern Void is likely to result in higher suspended solids concentrations in runoff reporting to the void. The delay in dewatering of the Southern Void will provide additional settling time and reduce sediment loads dewatered to the In-Pit Sump.
- Dewatering of the In-Pit Sump to the Tertiary Basin will occur using the infrastructure and approach as described in **Section 3.4**.
- Following rainfall, dewater storages to restore minimum freeboard requirements as soon as practicable.

No infilling of the Southern Void is to be undertaken until the Dewatering Management Plan has been approved by the Planning Secretary. Dewatering of the Southern Void will be undertaken using a mobile pump and lay flat hose. Monitoring of water transfers, discharges and water quality associated with dewatering is captured in the surface water monitoring program detailed in **Section 3.5**.

7.0 Groundwater Monitoring Program

Condition 23B of Schedule 3 of the Consent (refer to **Table 1.2**) requires that a Groundwater Monitoring Program be prepared and submitted to the Planning Secretary for approval within 12 months of commencing quarrying operations in the extension area.

Daracon have installed the monitoring bore required under Condition 18E of Schedule 3 of the Consent (Refer to **Table 1.2**) as well as three additional bores with an initial monitoring groundwater program to collect at least 12 months of data and inform the ongoing Groundwater Monitoring Program. **Appendix C** contains a letter report (*Ardglen Quarry Desktop Review and Bore Plan*, Umwelt, 2021) detailing the proposed monitoring bore installations, initial groundwater monitoring program and consultation undertaken to date with DPE Water. The four proposed bores (including P3 bore) were installed and registered as of 26 November 2021.

Figure 7.1 below provides additional information regarding the groundwater monitoring Bore P3 that satisfies the requirements of Condition 18E of the Consent.

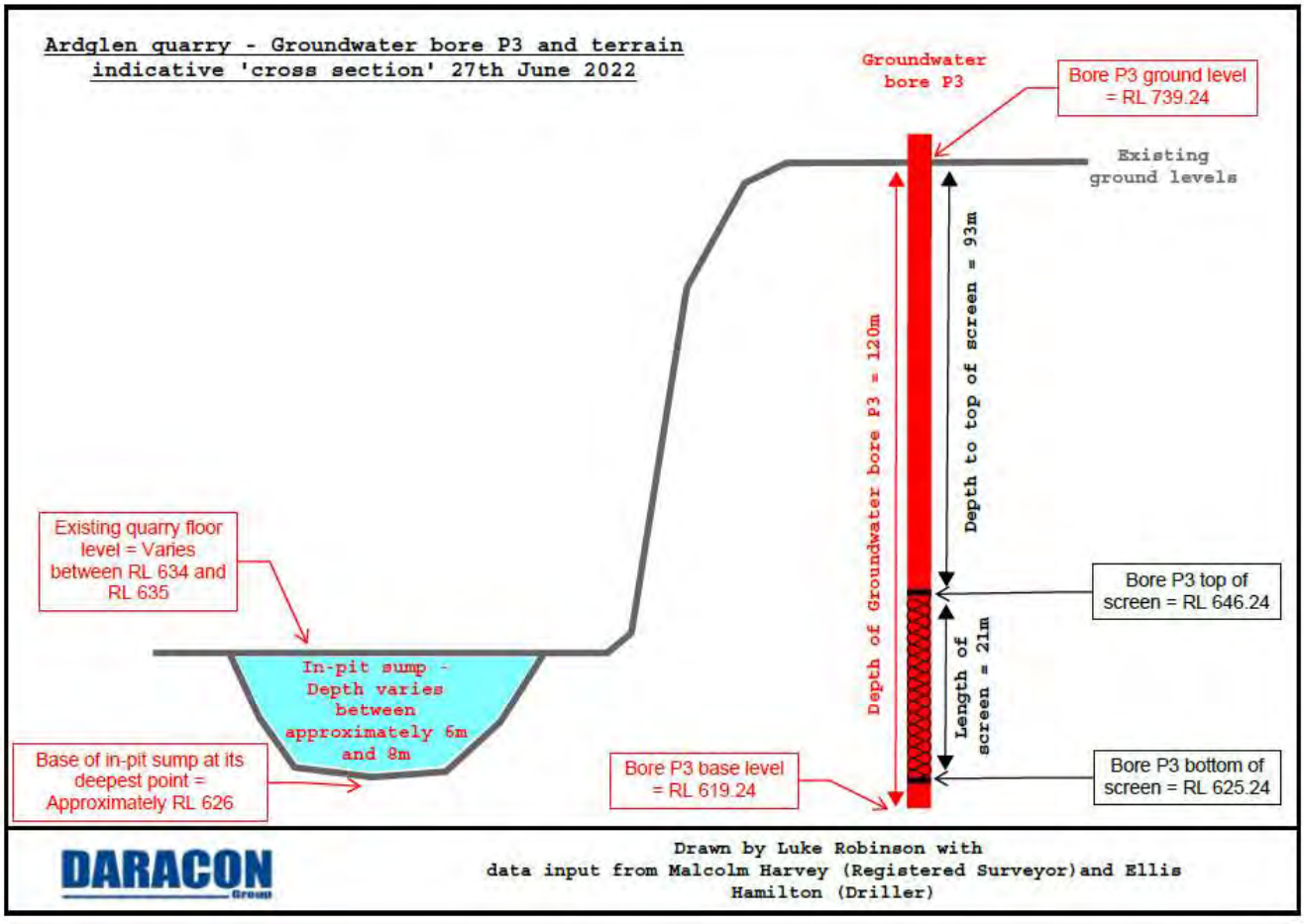


Figure 7.1 Groundwater Bore P3 specific details

This SWMP will be updated to include the Groundwater Monitoring Program within 12 months of commencement of quarrying in the extension area in accordance with the consent.

Additionally, and subject to the findings of the ongoing Groundwater Study, the need for a Water Access Licence to cover any interception of groundwater will be determined and obtained if necessary.

8.0 Reporting

8.1 Notification of Landowners

If the results of water quality monitoring (refer to **Section 3.5.1**) identify that the Quarry is responsible for exceedance of the IAC (refer to **Section 3.3**), Daracon will notify the Planning Secretary and any affected landowners and/or existing or future tenants (including tenants of quarry owned properties), and provide monitoring results to each of these parties until the results show that the Quarry is complying with the relevant IAC.

8.2 Independent Review

If a landowner (excluding Quarry owned properties) considers that Quarry operations are exceeding the IAC (refer to **Section 3.6**) and requests an independent review, and the Planning Secretary is satisfied that an independent review is warranted, within 3 months, or as otherwise agreed by the Planning Secretary and the landowner, of the Planning Secretary's decision, Daracon will:

- commission a suitably qualified, experienced and independent person (approved by the Planning Secretary) to:
    - consult with the landowner to determine their concerns;
    - conduct monitoring to determine whether the Quarry is complying with the relevant IAC; and
    - if the Quarry is not complying with the IAC, identify measures to restore compliance.
- give the Planning Secretary and landowner a copy of the independent review; and
- comply with any written requests made by the Planning Secretary to implement any findings of the review.

If the Planning Secretary is not satisfied that an independent review is warranted, the Planning Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.

8.3 Incidents

Where an incident relating to water management has occurred, Daracon will immediately notify the Department in writing to compliance@planning.nsw.gov.au and any other relevant agencies of any incident.

The notification will identify the development as **Ardglen Quarry (Application Number: 06_0264**) and set out the location and nature of the incident.

An incident is defined in the Definitions of the Consent as:

An occurrence or set of circumstances that causes or threatens to cause material harm which may or may not be or cause a non-compliance.

8.4 Non-Compliances

Within seven days of becoming aware of a non-compliance relating to water management, Daracon will notify the Department in writing to compliance@planning.nsw.gov.au of the non-compliance.

The notification will identify the development as **Ardglen Quarry (Application Number: 06_0264**) and set out:

- the condition of this Consent that the development is non-complaint with;
- why the development does not comply with the condition;
- if known, the reasons for the non-compliance; and
- what actions have been, or will be, undertaken to address the non-compliance.

A non-compliance is defined in the Definitions of the Consent as:

An occurrence, set of circumstances or development that is a breach of this consent.

8.5 Annual Review

By the end of March in each year after the granting of the development consent, or other timeframe agreed by the Planning Secretary, Daracon are required to submit a report to DPE reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. The following content relating to water management is to be provided in the Annual Review:

- a description of the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current financial/calendar year
- a comprehensive review of surface water and groundwater monitoring results for the previous calendar year and comparison of results with:
    - relevant IAC;
    - relevant limit conditions in the site EPL (limit conditions to be determined as part of EPL variation process);
    - historical monitoring results from previous years including the identification of trends in monitoring data over the life of the Project; and
    - water balance predictions;
- a site water balance outlining water source inflows, operational water demands, Quarry water inventory changes and licenced discharges;
- details of any complaints received in relation to surface water or groundwater;

- details of any water related non-compliance or incident which occurred in the previous calendar year, and a description of the actions that were (or are) being taken to rectify the non-compliance and avoid reoccurrence;
- an evaluation of compliance with the IAC and water related operating conditions of this consent;
- evaluation of any discrepancies between the predicted and actual water related impacts of the Project, and analysis of the potential cause of any significant discrepancies; and
- a description of any measures to be implemented over the next calendar year to improve the water management performance of the Project.

8.6 Independent Environmental Audit

Prior to 31 December 2012, and every 5 years thereafter, unless the Planning Secretary directs otherwise, Daracon will commission and pay the full cost of an Independent Environmental Audit (IEA) of the Quarry. This audit will:

- be led by a suitably qualified, experienced and independent auditor whose appointment has been endorsed by the Planning Secretary;
- be conducted by a suitably qualified, experienced and independent team of experts (including any expert in field/s specified by the Planning Secretary) whose appointment has been endorsed by the Planning Secretary;
- be carried out in consultation with the relevant agencies and the CCC;
- assess the environmental performance of the development and whether it is complying with the relevant requirements in the Consent, water licences and mining leases for the development (including any assessment, strategy, plan or program required under these approvals);
- review the adequacy of any approved strategy, plan or program required under the abovementioned approvals and the Consent;
- recommend appropriate measures or actions to improve the environmental performance of the development and any assessment, strategy, plan or program required under the abovementioned approvals and the Consent; and
- be conducted and reported to the satisfaction of the Planning Secretary.
- Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Planning Secretary, Daracon must submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Planning Secretary.

8.7 Access to Information

Within 3 months of the approval of the SWMP (or any subsequent revision of this SWMP), or the completion of the audits or Annual Reviews required under the Consent, Daracon will:

- provide a copy of the relevant document/s to the relevant agencies and CCC; and
- put a copy of the relevant document/s on its website.

During the development, Daracon will:

- include a copy of the Consent, as may be modified from time to time, on the website;
- provide a full summary of monitoring results required under the Consent on the website; and
- update these results on a regular basis (at least every 6 months).

9.0 Plan Review and Update

The suitability of this SWMP will be reviewed within three months of:

e. the submission of an incident report under condition 3 of Schedule 5;

f. the submission of an Annual Review under condition 4 of Schedule 5;

g. the submission of an Independent Environmental Audit under condition 5 of Schedule 5;

h. the approval of any modification of the conditions of Consent (unless the conditions require otherwise),

i. If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the SWMP will be revised, to the satisfaction of the Planning Secretary and submitted to the Planning Secretary for approval within six weeks of the review.

10.0 References

Ardglen Quarry Desktop Review and Bore Plan, Umwelt, 2021

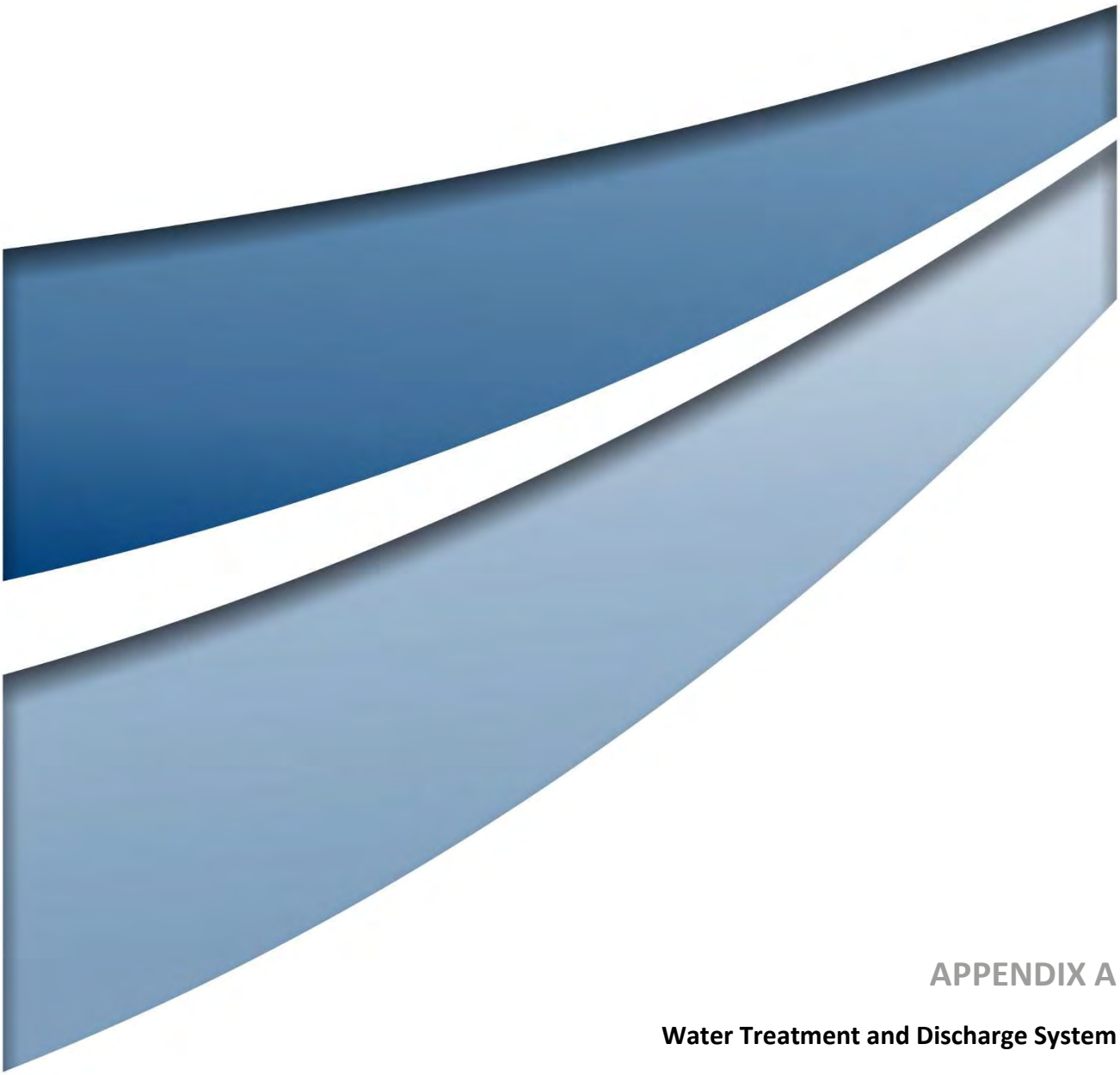
Ardglen Quarry Extension – Site Water Management Plan, AECOM, 2017

Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra, 2018

Managing Urban Stormwater – Soils and Construction Volume 1, Landcom, 2004

Managing Urban Stormwater – Soils and Construction Volume 2e Mines and Quarries, Department of Environment and Climate Change, 2008

Best Practice Erosion and Sediment Control, International Erosion Control Association (Australasia), 2008



APPENDIX A

Water Treatment and Discharge System

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR INFORMATION	RD		DJ	25.09.15

DRAWN: R.DIERCKE DESIGNED: R.DIERCKE JOB MANAGER: D.JARVIS VERIFIER:

CLIENT: DARACON

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PLANS 1:500 0 5 10 15 20 25m

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Email newcastle@northrop.com.au ABN 81 094 433 100

PROJECT: ARDGLEN QUARRY

DRAWING TITLE: SITE PLAN SWALE - SETOUT

JOB NUMBER: NL140154

DRAWING NUMBER: C101

REVISION: 1

DRAWING SHEET SIZE = A1

EXISTING ROAD AND RAILWAY ACCESS TO BE MAINTAINED

UP INV RL.618.70
ϕ600 RCP
22.3m @ 3.32%
DN INV RL.617.96

EXTEND EXISTING ϕ600 RCP TO SUIT HEADWALL OUTLET LOCATION IN BASIN.

UP INV RL.617.96
ϕ600 RCP
6.1m @ 7.54%
DN INV RL.617.5

B2 C20.02

DAM CREST 621m (AHD)

MAINTAIN EXISTING DAM EMBANKMENT. CONDITION TO BE ASSESSED BY GEOTECHNICAL ENGINEER TO CONFIRM FIT FOR PURPOSE

TRIM EXISTING ϕ600 RCP TO SUIT NEW SWALE LOCATION. PROVIDE HEADWALL INLET TO CAPTURE AND ROUTE STORMWATER TO BASIN INLET

A C20.02

HEADWALL TO SUIT ϕ600 RCP

EXISTING BASIN WALL

EXISTING RAILWAY LINE

FILL WITHIN EASEMENT TO ENSURE TOP WATER LEVEL IS LOCATED OUTSIDE OF EASEMENT. THE FILL IS TO BE OF LOW PERMEABILITY.

DE-SILTING PAD

FLOCCULATION TREATMENT AREA

FLUME/WEIR

ROCK LINED PRIMARY SEDIMENT SETTLEMENT BAY. SIZED TO ACCOMMODATE 1min OF STORAGE @ 810L/S. VOLUME: 150m³

TOP OF WALL RL. 620.0m (AHD)
BOTTOM OF WALL RL. 617.5m (AHD)

SECONDARY SEDIMENT SETTLEMENT BAY. SIZED TO ACCOMMODATE 3min OF STORAGE @ 810L/S. VOLUME: 350m³

PROPOSED BASIN

VOLUME: 7,700m3
BASIN INVERT = 617.5m (AHD)
BASIN DAM CREST = 621.0m (AHD)

SECOND PHASE SEDIMENT SETTLEMENT BAY WALL TO HAVE SPILL LEVEL OF RL. 619.0m (AHD). PROVIDE EXTENDED SCOUR PAD AT BASE OF WALL.

DENOTES EXISTING RAILWAY EASEMENT.

DENOTES EXISTING RAILWAY BOUNDARY NO WORKS BEYOND THIS POINT.

EXISTING CULVERT TO BE MAINTAINED UNDER EXISTING RAILWAY LINE.

EXISTING BASIN WALL

DENOTES TOP OF DAM CREST. MINIMUM RL 621.0m (AHD)

MAINTAIN EXISTING DAM EMBANKMENT. CONDITION TO BE ASSESSED BY GEOTECHNICAL ENGINEER TO CONFIRM FIT FOR PURPOSE

ANY MODIFICATIONS TO THE EXISTING BANK SUBJECT TO DETAILED DESIGN AND GEOTECHNICAL CONSIDERATIONS.

DISCHARGE TREATED WATER INTO EXISTING CHANNEL. PROVIDE ADEQUATE SCOUR PROTECTION AT HEADWALL OUTLET.

VEHICULAR ACCESS TRACK

EXISTING RAILWAY

VEHICULAR ACCESS TRACK

UP INV RL.620.25
ϕ2x375 RCP
29.2m @ 1.37%
DN INV RL.619.85

MAINTAIN EXISTING DRIVEWAY ACCESS POINT

COAGULANT AND ACID TREATMENT SYSTEM. 4x4m APPROX.

PUMP (20L/s)

PH TREATMENT

DAM CREST 621m (AHD)

UP INV RL.619
ϕ300 uPVC
7.8m @ 4.10%
DN INV RL.618.68

DAM CREST MIN. R.L. 621m (AHD)

PERFORATED RISER. REFER TO C20.02 FOR DETAILS.

INSTALL EMERGENCY SPILLWAY. WEIR LENGTH = 5m WEIR LEVEL = 620.25m

PH TREATMENT BYPASS OUTLET.

B1 C20.02

25,000 kL RAINWATER TANK TO BE PLACED ON 200mm THICK 5m SQUARE REINFORCED CONCRETE PAD.

LOW FLOW AND HIGH FLOW OUTLET PIPES CONNECTED INTO JUNCTION PIT.

VALVE

EXISTING DOUGHBOY CREEK

TOP OF CREEK

BOTTOM OF CREEK

BOTTOM OF CREEK

TOP OF CREEK

MODIFY EXISTING CREEK BANK FOR PIPE OUTLET

EXISTING LEVEL CREEK CROSSING TO BE MAINTAINED

PROVIDE MASS CONCRETE SEEPAGE COLLAR AROUND OUTLET PIPE

PROVIDE 900X900 JUNCTION PIT. CL 620.75 IL 618.85

UP INV RL.618.65
ϕ375 RCP
23.7m @ 9.49%
DN INV RL.616.4

VEHICULAR ACCESS TRACK

LEGEND

- DENOTES EXISTING RAILWAY BOUNDARY
- DENOTES EXISTING SITE BOUNDARY
- DENOTES RAILWAY EASEMENT LINE
- DENOTES EXISTING (LIDAR) CONTOURS @ 0.25m INTERVALS
- DENOTES PROPOSED DESIGN CONTOURS @ 0.25m INTERVALS
- DENOTES PAD FOR DE-SILTING EXCAVATOR
- DENOTES ROCK GABION PERMEABLE WALL. REFER TO SHEET C20.02 FOR DETAILS
- DENOTES ROCK GABION IMPERMEABLE WALL. REFER TO SHEET C20.02 FOR DETAILS.
- RIP RAP ENERGY DISSIPATER
- FLOW DIRECTION
- FALL — DIRECTION OF GRADE
- PROPOSED PERFORATED RISER
- PROPOSED 900x900 STORMWATER JUNCTION PIT WITH SEALED LID.
- PROPOSED STORMWATER PIPE
- EXISTING STORMWATER PIPE
- DENOTES LOW FLOW AND HIGHFLOW RAINWATER TANK OUTLET PIPES
- DENOTES PROPOSED SWALE

NOTE: WATER QUALITY TREATMENT DEVICES SHOWN ARE BASED ON REPORT BY VICTORY ENGINEERING DATED 18/11/2015 AND ARE SUBJECT TO CHANGE.

VERIFIER:
JOB MANAGER: D.JARVIS
DESIGNED: R.DIERCKE
DRAWN: R.DIERCKE

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CLIENT: DARACON Group

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SCALE 1:200@A1 — 0 2 4 6 8 10m

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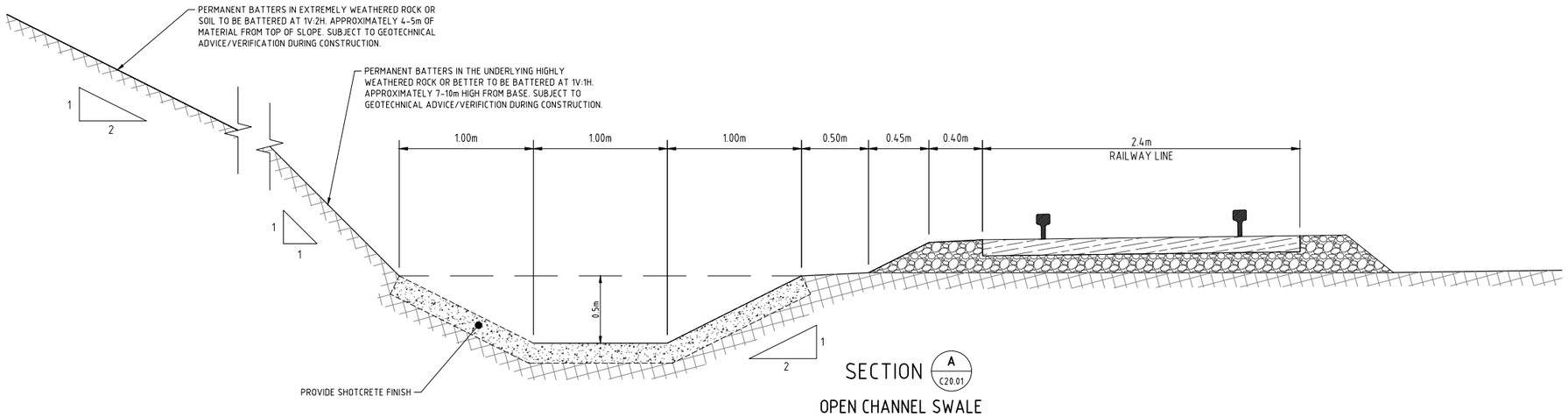
PROJECT: ARDGLEN QUARRY
ARDGLEN, N.S.W. 2338

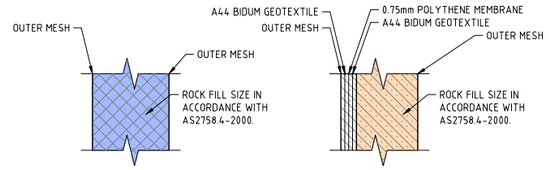
DRAWING TITLE: BASIN DETAIL PLAN
TERTIARY BASIN

JOB NUMBER: NL140154
DRAWING NUMBER: C20.01
REVISION: A
DRAWING SHEET SIZE = A1



SECTION A / C20.01

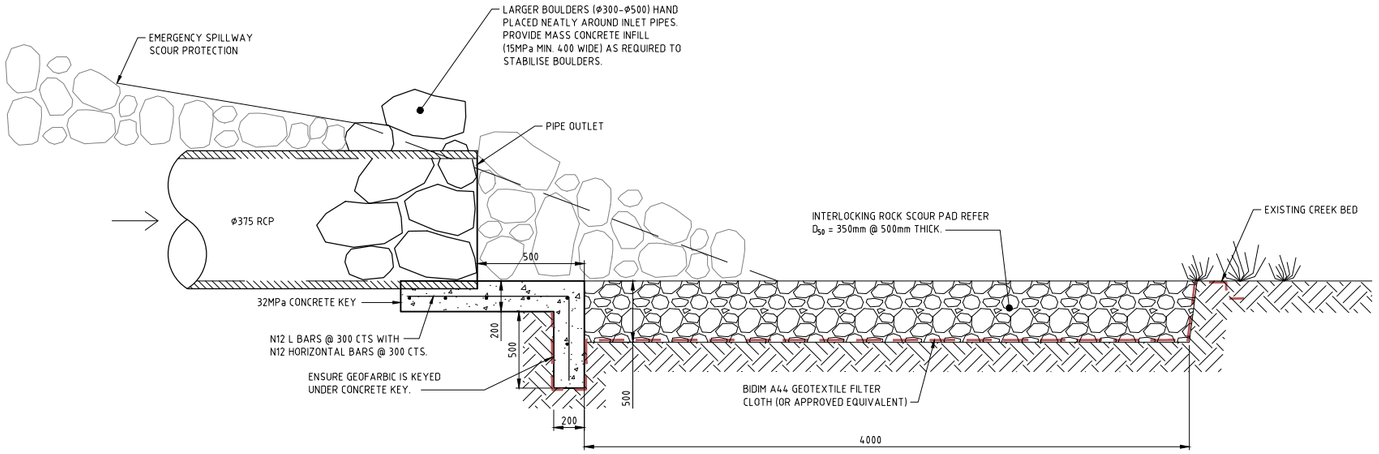
OPEN CHANNEL SWALE



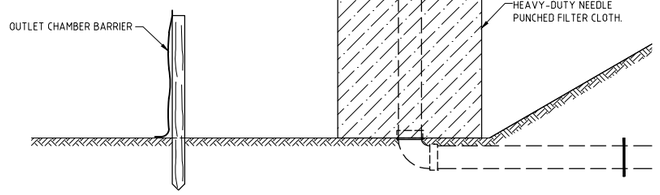
PERMEABLE GABION WALL

IMPERMEABLE GABION WALL

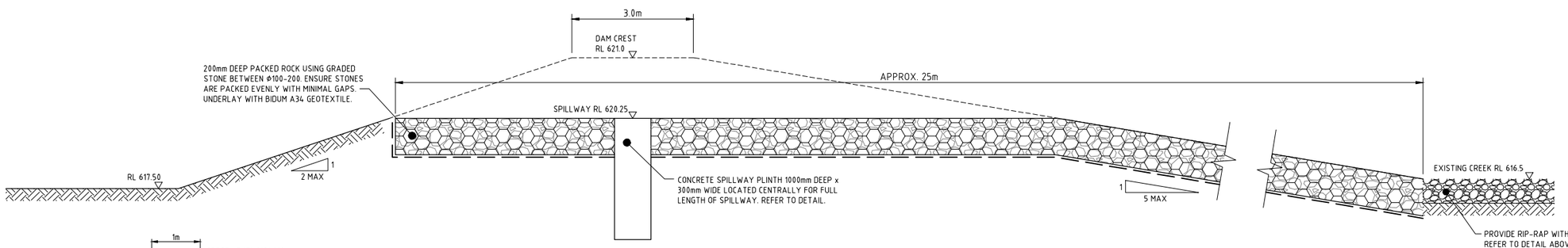
GABION WALL DETAIL



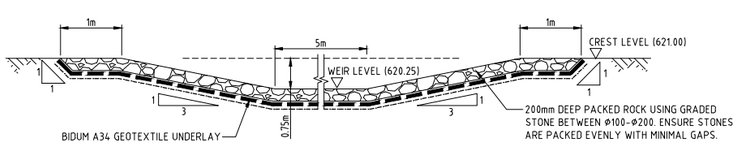
OUTLET PIPE INTERLOCKING ROCK SCOUR PAD (ENERGY DISSIPATER)



RISER PIPE OUTLET DETAIL (TYPICAL)



EMERGENCY SPILLWAY SECTION



EMERGENCY SPILLWAY DETAIL

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PROJECT: ARDGLEN QUARRY
ARDGLEN, N.S.W. 2338

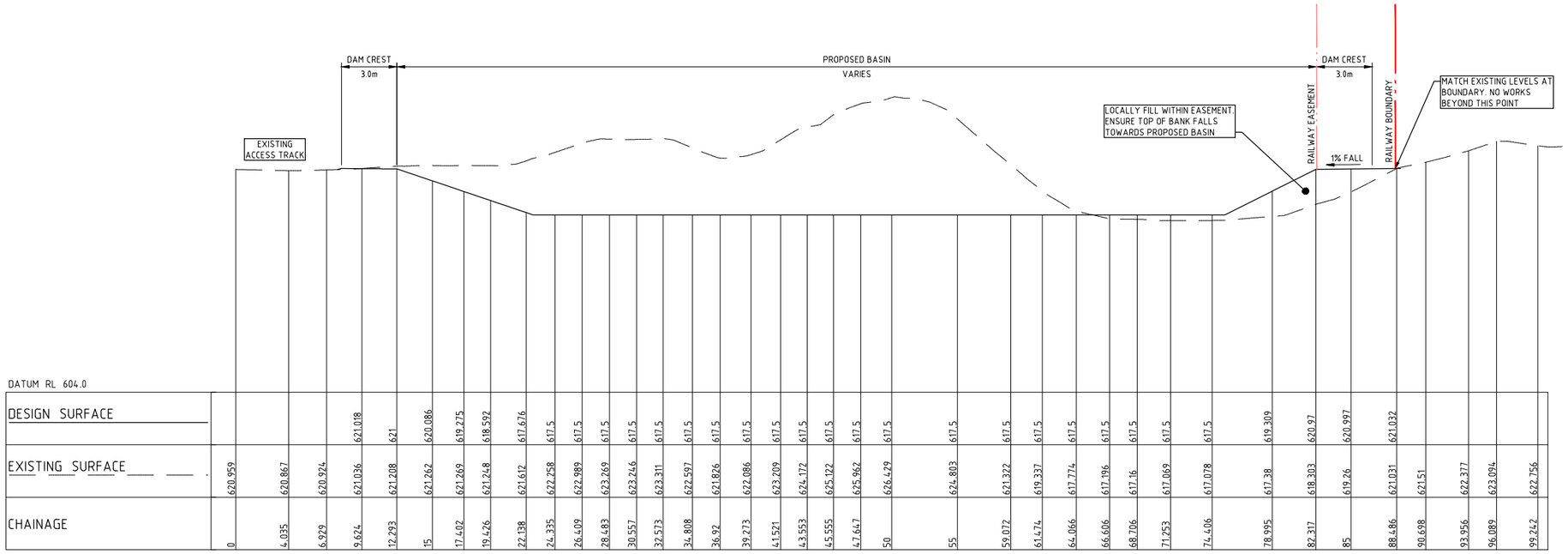
DRAWING TITLE: TYPICAL CROSS SECTION AND STORMWATER DETAILS TERTIARY BASIN

JOB NUMBER: NL140154

DRAWING NUMBER: C20.02

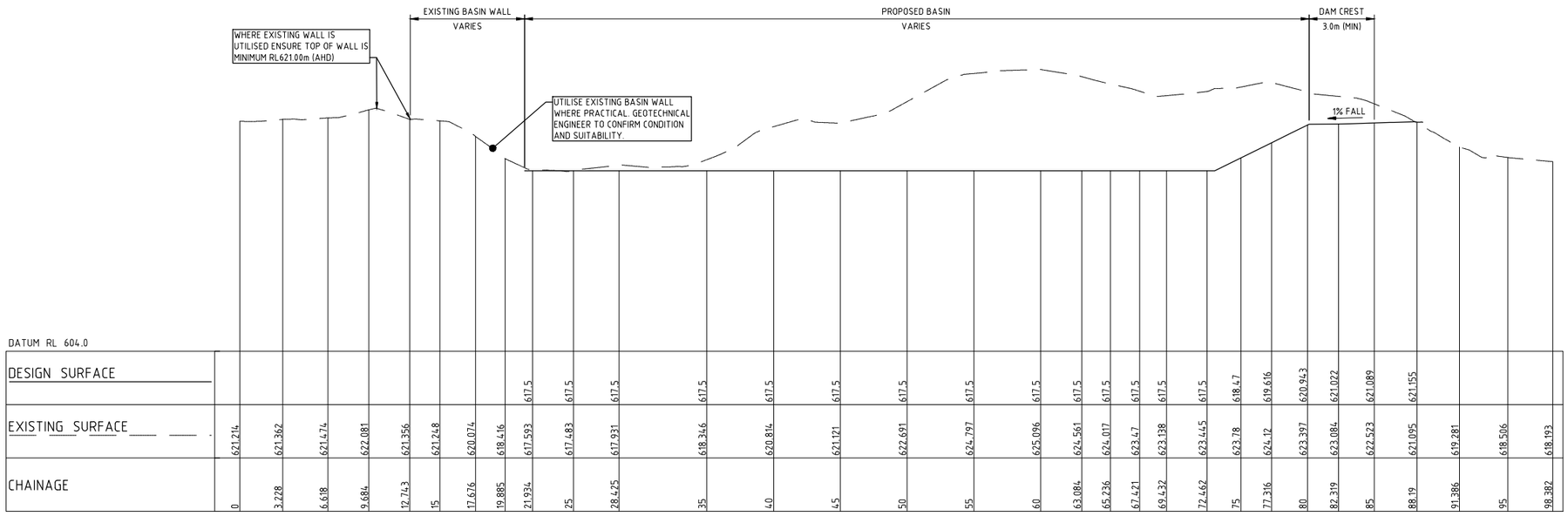
REVISION: A

DRAWING SHEET SIZE = A1



LONGITUDINAL SECTION ALONG B1

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:200@A1



LONGITUDINAL SECTION ALONG B2

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:200@A1

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Email newcastle@northrop.com.au ABN 81 094 433 100

PROJECT: **ARDGLEN QUARRY**
ARDGLEN, N.S.W. 2338

DRAWING TITLE: **BASIN TYPICAL SECTIONS TERTIARY BASIN**

JOB NUMBER: **NL140154**
DRAWING NUMBER: **C20.03**
REVISION: **A**
DRAWING SHEET SIZE = A1

To: Daniel Smith (Daracon)

From: Stewart Reeve (Victory Engineering)

Re: Daracon Ardglen - Detailed Description of the Stormwater Treatment System, and Discussion of Associated Chemical Risks

Date: 18 / 11 / 15

Background and Summary

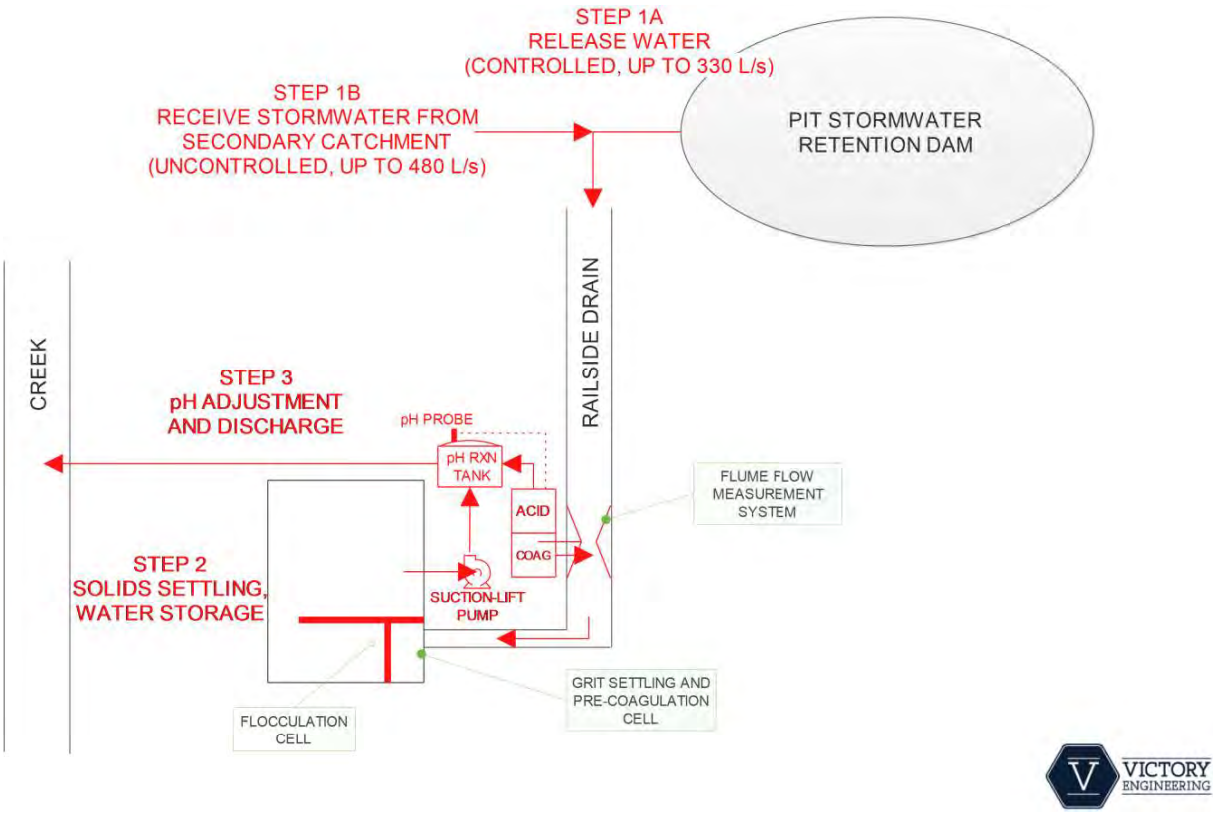
The Daracon Ardglen quarry generally requires treatment of its stormwater runoff prior to discharge, for:

- pH (require 6.5-8.0), and;
- Suspended Solids (require < 50 mg/L TSS – Total Suspended Solids).

Modelling for the peak design storm suggests that the lower/discharge dam needs to cope with up to 480 L/s (direct runoff from catchment area), plus an estimated maximum of 330 L/s coming from release of captured stormwater from the "upper sump". This is a combined estimated maximum design flow of 810 L/s.

Victory Engineering conducted indicative water treatment testwork on synthesised samples of contaminated stormwater. On the basis of other considerations and this testwork, Daracon opted to adopt a dam-based method of dosing and mixing chemicals into the contaminated stormwater to achieve the required pH and TSS specifications prior to discharge. This method is discussed further in the following section.

The adopted general water treatment process is illustrated on the following page:



General Description – High Flow

- All water flowing down the swale drain is measured by the flume.
- A cationic polymer coagulant (polyDADMAC) is dosed into the drain by a metering pump, in proportion to the flow rate; the coagulant begins to react with the suspended solids in the water.
- The grit in the stormwater settles out in the first cell, and possibly some in the second cell.
- The suspended solids in the water flocculate in the first cell, and some settlement occurs.
- Water continues to flow through the permeable wall, and into the second cell.
- Suspended solids continue to flocculate in the second cell, and more of the suspended solids settle in the second cell.
- Water continues to flow through the permeable section of the wall into the third, largest and final cell.
- The remainder of the suspended solids will settle in the final cell; a clear water layer will form at the surface of the dam, predominantly towards the far end of the dam.
- When required (either manually or automatically triggered), the extraction pump will remove clean water from the dam and send it to discharge.
- En route to discharge, acid will be dosed into the water.
- The water will finish mixing and reacting with the acid in a large mixing tank.
- A pH probe appropriately located in the mixing tank will feed a signal back to a pH controller, which will in turn adjust the acid metering pump to achieve the desired discharge pH.
- Stormwater that is now appropriately treated for TSS and pH will overflow the mixing tank and progress to discharge by gravity.

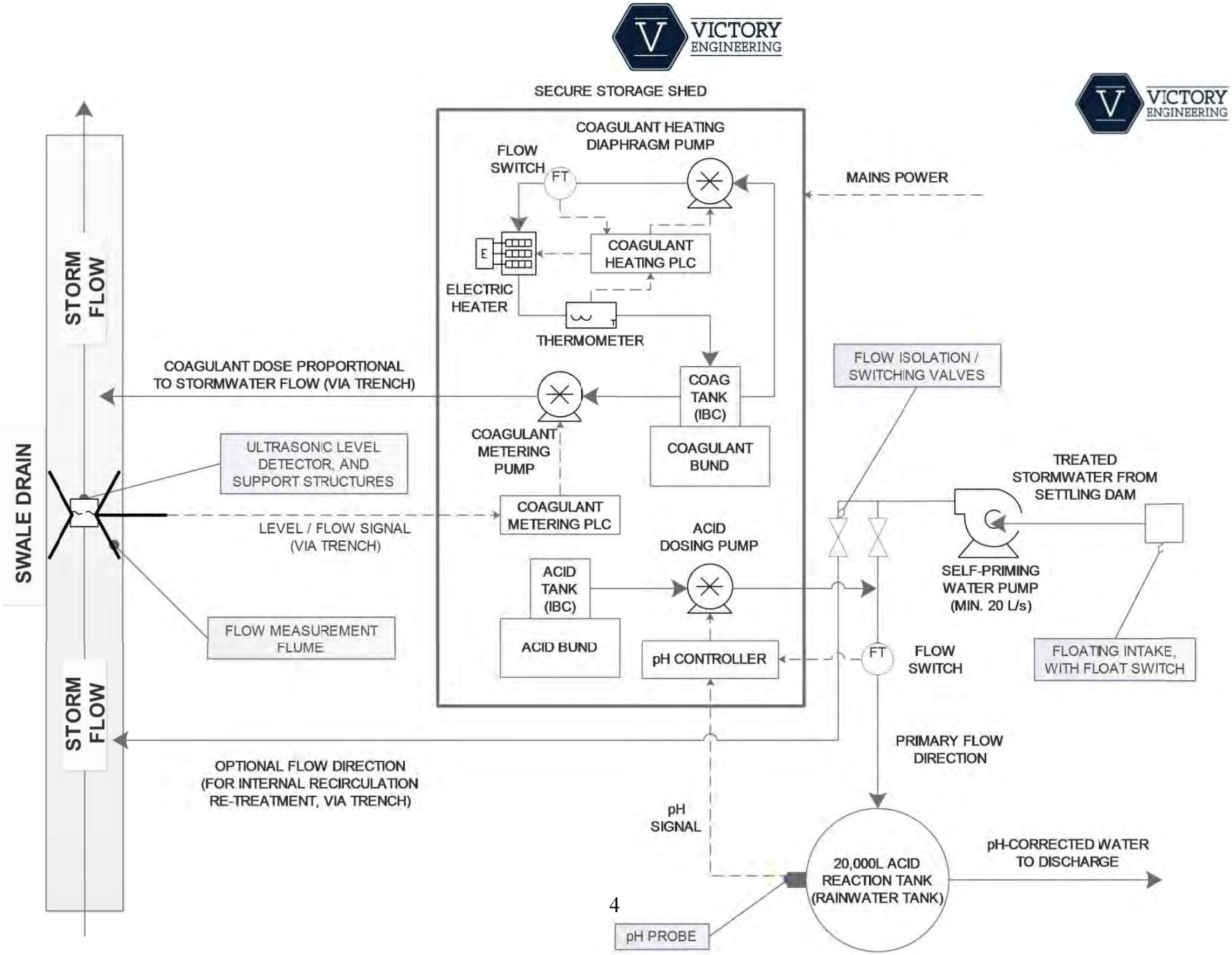
- Once the extraction pumps stops, treated water discharge will cease.
- Water remaining in the mixing tank will drain through the pump, and back into the dam.

Note that the main difference between this “High Flow” description and “lower” flows is that suspended solids will tend to settle more in the first two cells.

The following section provides a more comprehensive description, focusing on the water treatment plant itself.

Detailed Description

The Process Flow Diagram (PFD) on the following page provides a detailed overview of the stormwater treatment system. A detailed description of the process will follow (essentially an expansion of the summary provided in the previous section).


VICTORY ENGINEERING
SECURE STORAGE SHED
COAGULANT HEATING DIAPHRAGM PUMP
FLOW SWITCH
FT
MAINS POWER
COAGULANT HEATING PLC
ELECTRIC HEATER
THERMOMETER
STORM FLOW
COAGULANT DOSE PROPORTIONAL TO STORMWATER FLOW (VIA TRENCH)
FLOW ISOLATION / SWITCHING VALVES
COAG TANK (IBC)
COAGULANT METERING PUMP
COAGULANT BUND
SWALE DRAIN
ULTRASONIC LEVEL DETECTOR, AND SUPPORT STRUCTURES
TREATED STORMWATER FROM SETTLING DAM
COAGULANT METERING PLC
LEVEL / FLOW SIGNAL (VIA TRENCH)
ACID DOSING PUMP
ACID TANK (IBC)
SELF-PRIMING WATER PUMP (MIN. 20 L/s)
FLOW MEASUREMENT FLUME
ACID BUND
pH CONTROLLER
FT
FLOW SWITCH
FLOATING INTAKE, WITH FLOAT SWITCH
STORM FLOW
PRIMARY FLOW DIRECTION
OPTIONAL FLOW DIRECTION (FOR INTERNAL RECIRCULATION RE-TREATMENT, VIA TRENCH)
pH SIGNAL
20,000L ACID REACTION TANK (RAINWATER TANK)
pH-CORRECTED WATER TO DISCHARGE
pH PROBE

Detailed Process Description – All Flows

1. Virtually all stormwater flows will report to the swale drain, and be measured by the flume.
   1.1. An ultrasonic level detector will be mounted and calibrated to return an appropriate level signal via its associated transmitter.
   1.2. The transmitter will process the level signal into a calibrated flow value, and deliver a corresponding flow signal to the coagulant dosing PLC (Programmable Logic Controller).

2. The coagulant PLC will adjust the coagulant metering pump to ensure a pre-determined proportional ratio with the flowing water is satisfied;
   2.1. The preliminary (pre-commissioning) ratio is 2 mg/L (~2L per mega-litre (ML) of stormwater); this may be fine-tuned during commissioning.
      2.1.1. Indicative testwork showed that a dose of 2-3 mg/L was sufficient to produce moderately-large flocs, in conjunction with several minutes of gentle mixing, over a range of different TSS concentrations and pHs.
      2.1.2. This is environmentally beneficial, suggesting that the chosen chemical program is robust to changes in water chemistry, and that relatively small amounts of coagulant are required, with the greatest observable gains (and deficiencies) arising from mixing energy and time. Hence, cell design has focused on promoting appropriate mixing energy and time, to offset coagulant dosage.
   2.2. Dosing will be restricted to minimise the probability of coagulant overdose, due to uncertainties in flow measurement at the lower and upper ends of the flume's capabilities:
      2.2.1. Preliminary figures for dosage restriction are:
         2.2.1.1. Lower bound: 10 L/s (flows below this may not register discernibly to the ultrasonic level detector).
         2.2.1.2. Upper bound: 350 L/s (approximate estimate of maximum controlled release from the upper stormwater sump; flows much above this may overwhelm the physical design of the flume).
         2.2.1.3. These figures may be fine-tuned during commissioning.
      2.2.2. For flows below 10 L/s, which actually register as flows, a small proportional amount of coagulant will be dosed – say, equivalent to approximately 1 mg/L.
      2.2.3. Above 350 L/s, a fixed dose rate (L/hr) will be delivered – the same actual L/hr dose delivered at 350 L/s; this means that increasing flow will receive a diminished dose ratio (mg/L).

2.3. Coagulant will be delivered and stored in 1,000L IBCs (Intermediate Bulk Containers), in a secure shed.

2.4. The coagulant IBCs will be stored over on an appropriate bund – probably of 1,500L volume; the bund is also protected from stormwater ingress by being stored in the secure shed.

2.5. Typical polyDADMAC coagulants have a freezing point of ~5 degrees Celsius; as the temperature at site will frequently drop below this temperature during winter in particular, an automatic heating system is required to keep the temperature of the bulk coagulant above 5 degrees Celsius, and probably in the range of 10-15 degrees Celsius.

2.5.1.1. The preliminary design for a heating system involves a bulk recirculation pump, flow switch, electric heater, electronic thermometer and heating controller; however, this may change at the detailed design stage (such as to a heat pad system, or internal heating coil system, etc).

3. Dosed coagulant will begin mixing and reacting with the contaminated stormwater in the swale drain.

4. Flocculation will begin to occur in the first, smallest cell;

4.1. Testwork showed that several minutes of gentle mixing were required to maximise coagulant dose effiency (economic and environmental benefits), as well as capture more of the ultrafine clays; the suspensions were sensitive to high-shear beyond an initial “flash” mix, and did not reform well without the addition of extra coagulant and further gentle mixing.

4.2. The first cell has been sized to ensure that a minimum of several minutes of appropriately energetic mixing will occur at a peak flow of ~810 L/s;

4.2.1. The second cell will provide even gentler conditions and more time for particle floc-formation at the peak flow.

4.3. Grit will generally settle in the first cell;

4.3.1. The size and geometry of the cell have been designed so that an excavator can safely and efficiently remove grit from the cell, as required.

4.4. During high flow conditions, most of the suspended solids will settle in the second and third cells.

4.5. During low and moderate flow conditions, most of the suspended solids are expected to settle in the first and second cells, with generally clean water reporting to the third cell.

5. The wall between the first and second cells is permeable, allowing easy flow.

6. The wall between the first and third cell is relatively impermeable, minimising undesirable short-circuited flows between these two cells.

7. The section of wall at the end of the second cell farthest from the inlet is permeable; the remainder of the wall between the second and third cells is relatively impermeable;
   7.1. This design maximises mixing times for the coagulant and stormwater, thus minimising the possible residual coagulant in the clean water/supernatant.

8. The clean water extraction/discharge pump is located towards the far end of the third and final cell, and will have a flow of approximately 20 L/s (preliminary figure), depending on the height of the water in the dam;
   8.1. It is still to be determined whether the extraction pump will be located in the secure shed, or just outside the secure shed – this depends on how close the secure shed can be located to the dam.
   8.2. The pump can be operated either automatically (on level control), or manually (with low-level cut-out protection).
   8.3. The pump intake will be fixed to floats, to minimise the uptake of possible settled sludge in the discharge water; the pump will have an appropriate automatic low-level cut-out switch.
   8.4. When the pump starts, and the flow switch in the discharge pipe is triggered, the acid metering pump will begin to dose.
      8.4.1. The flow switch ensures that acid is only dosed when water is flowing, thus minimising the chance of acid overdose.
      8.4.2. From testwork, the preliminary dose rate of acid (30% Hydrochloric acid) is estimated at 50-100 mg/L, to achieve a pH of ~7.5 (which is also the preliminary discharge value to be used for commissioning; this value may change during commissioning and/or later operations).
         8.4.2.1. The actual acid to be used will be either 30% Hydrochloric, or ~35% sulphuric acid.
      8.4.3. A pH probe in the mixing tank will feed a pH signal to the pH controller in the secure shed.
      8.4.4. The pH controller will adjust the acid metering pump to achieve the setpoint.
   8.5. The water and acid will react completely in the upstream tank;
      8.5.1. This water tank will be approximately 20,000L in volume, and will be bottom fed.

8.5.2. The mixing time in the tank will be approximately, 10-15 minutes, depending on the flowrate into the tank; the flowrate compared to the tank volume will also ensure that mixing is adequately turbulent, to ensure full acid reaction with the water.

8.5.3. The residence time also allows the pH controller to have sufficient opportunity to adjust the pH of the water before it is discharged offsite.

8.5.3.1. Testwork showed that such a mixing time is adequate to obtain a stable pH, where the acid appears to have fully reacted with the water, and the pH stops declining.

8.5.4. The tank will be bottom fed, and the tank overflow (to discharge) will be at the top of the tank – this will ensure a maximised residence time, by minimising short-circuiting of the inlet flow to the discharge outlet.

8.5.5. The pH probe will be located low in the tank, at the discharge end of the tank – this is to ensure that the probe can read the pH of water as it first enters the tank and begins filling the tank (sending the pH signal back to the controller), as well as take readings of water that is close to exiting the tank.

8.6. Water leaving the acid mixing tank will report to the discharge outfall via a short pipeline.

8.7. It is possible that between the time of writing this document and the time of final detailed design that the desired extraction rate will change – say, increase to 50-100 L/s, to possibly increase discharge rates. If this does occur, appropriate changes will also be made to the dosing, control and mixing systems to ensure system design integrity is preserved.

9. The system will also have the capacity to internally re-treat water if it has not been adequately treated for suspended solids en route to the dams, such that unsatisfactory levels of suspended solids remain in the final cell:

9.1. Valving on the discharge of the extraction pump will allow switching between:

9.1.1. Discharge, via the acid dosing system; or,

9.1.2. Recirculation, via the swale drain, flow-measurement flume, and the coagulant dosing system.

10. The secure shed will receive mains power; power will be distributed to all water treatment system components via the centralised power distribution panel located inside the secure shed.

Management of Risks Arising from Water Treatment

EPA requirements, and the nature and volumes of stormwater from the Ardglen site mean that the waters typically require treatment prior to discharge from site.

Testwork involving site water samples indicated that the use of a polymer coagulant (polyDADMAC) for suspended solids reduction is highly effective at dose rates of < 3 mg/L, over a wide range of suspended solids levels, and pH values. An example of a common polyDADMAC coagulant is Nalcoag 3268; the MSDS for this chemical has been provided as an attachment with this document.

Testwork indicated that conventional flocculants (polyacrylamide co-polymers) were relatively ineffective for the reduction of suspended solids

pH reduction testwork indicated that the use of 30% hydrochloric acid was effective for the reduction of pH to required levels. 50-100 mg/L of 30% hydrochloric acid was typically required to reduce the pH of tested samples to 7.5.

Experience suggests that a dam-based treatment program involving such chemicals is often the most cost-effective way to treat quarry stormwaters requiring discharge, for suspended solids and pH compliance, where the appropriate standards and hard and soft controls are part of the design and operation of the treatment system.

However, the use of chemicals to treat stormwaters that are to be discharged to the environment is not without risk. These risks have been considered by Victory and Daracon in the selection of an appropriate treatment system, and are further discussed below.

Coagulant Risks

The primary risk when using coagulants to treat stormwater is the issue of coagulant residuals entering environmental waterways and negatively impacting aquatic life, particularly fish; this applies to both polymeric and metallic coagulants. Metallic coagulants carry the added risk that they operate by consuming alkalinity in the water, such that their efficacy is variable, dependent on the alkalinity of the treated water; they can also reduce the pH of the water (this may or may not be beneficial, depending on the situation).

Both polymeric and metallic coagulants are able to harm aquatic life, particularly fish, at residual concentrations of < 1 mg/L – harm thresholds depend on several variables, notably:

- The species of fish;
- The concentration of the coagulant residual;
- The prevailing water chemistry;
- The type and concentration of suspended solids in the water;
- The duration of effect – regarding time for recovery, or not; and,
- The type of coagulant.

The mechanisms of harm is understood in literature to be the blinding of oxygen adsorption sites on the fish gills by the coagulant molecules, effectively causing partial or full asphyxiation, depending on the net concentration of the coagulant in the receiving water.

The causes of unacceptably high coagulant residuals are generally:

- Over-dosing; and/or,
- Under-mixing – insufficient mixing energy and/or time, requiring extra coagulant to achieve the desired outcome; and/or,
- Over-mixing – excessive mixing energy and/or time, leading to floc destruction (which may or may not be reversible), requiring extra coagulant to achieve the desired outcome.
- A technically inappropriate coagulant type – adequate testwork and/or process considerations have not been made; and/or,
- An environmentally inappropriate coagulant type – such as one with a typically high residual ("Alum" is an example of a common culprit).

Treatment systems utilising coagulants that do not consciously and deliberately consider these risks and their causes on a unique site-by-site basis, and mitigate them via the subsequent design, increase their risk profile.

Mitigation of Coagulant Risks

The stormwater treatment system design has mitigated the risks of applying a coagulant by deliberately investigating and considering:

- Storage:
    - The IBC base tank will be stored on a compliant and chemically-compatible plastic bund.
    - The bund will be stored in a secure shed, to minimise the probability of stormwater ingress into the bund, as well as vandalism/sabotage.

- Dose rates:
    - Testwork indicated that waters could be suitably clarified with a dose rate of ~2 mg/L of a common polymer coagulant (polyDADMAC).
    - 2 mg/L was effective over a wide range of suspended solids levels and pHs – this is typically a relatively low dose rate, and increases the safety of using the coagulant.
    - The final clarity during testwork at dose rates of 2 mg/L was acceptable (less than 50 mg/L TSS), but not generally "crystal clear" – ensuring treated and well-mixed (appropriate energy and time) waters still have some suspended solids in the final supernatant greatly increases the probability that there is no significant coagulant residual, and that the water is safe for environmental discharge.

- Coagulant type:
    - Polymer coagulants typically have a higher floc reformation potential than metal coagulants – this means that lower average dose rates are required.
    - Metal coagulants typically have higher residual fractions than polymer coagulants such as polyDADMAC – that is, as a fraction of the applied dose, metal coagulants will have a high % remaining in solution, which may progress to discharge rather than settle with flocculated suspended solids. For example, metal coagulants such as Alum often have residuals in the order of 1-5% (depending on certain chemical and process factors). PolyDADMAC typically has a residual < 0.1%.
    - Polymer coagulants like polyDADMAC typically quickly hydrolyse (react with the water) to form derivatives that are less charged and more bio-available (for bio-degradation) – this begins upon dosing, and is often close to 100% complete within several days to a week, depending on various factors.
    - Hence, the efficacy of polyDADMAC at low dose rates, combined with its low

fractional residual tendency and bio-degradability, make it a good choice for this application.

- Mixing intensity and time:
    - Testwork revealed that the flocs formed with polyDADMAC were shear-sensitive.
    - An initial "flash" mix, with subsequent "gentle" mixing for a minimum of several minutes, provide to provide very good, acceptable results, with some residual turbidity (desired).
    - The treatment system has been designed to provide these energy requirements:
        - Flash mix – by dosing into the swale drain, which will generally be flowing turbulently, even under "low-flow" conditions;
            - Several mixing rocks will be placed downstream of the coagulant dose point, to ensure a short-burst of increased turbulence, even during low-flow conditions.
        - Extended gentle mix – the first and second cells provide the opportunity for gentle mixing conditions, and extended mixing times, before treated water progresses to the third and final cell.

- Coagulant application method:
    - Metering pumps will be used to apply the coagulant – this increases the precision of the operation, as opposed to dry chemical or dam-surface application methods, as well as generally decreasing the amount of chemical required.

- Control philosophy:
    - The coagulant dosing system will be automated:
        - Incoming flows will be measured, and a control system will the coagulant is dosed in proportion to the flow (eg. 2 mg/L).
        - Where measured flows are less accurate, dosing rates will be mitigated:
            - Low-flows: a reduced ratio of coagulant will be applied – say, ~1 mg/L.
            - High-flows: above a certain figure (eg. 350 L/s) a fixed coagulant dose (L/hr) will be applied, such that higher flows will receive a reduced dose ratio.

- Rectification potential:
    - The output from extraction pump for the final dam can be directed to the swale drain for re-treatment, if the suspended solids level of the first-pass supernatant is unacceptable, for whatever reason.

Acid Risks

From an environmental point of view, the risks associated with the application of 30% hydrochloric acid or sulphuric acid at low-moderate dose rates (such as are expected at Ardglen) are much simpler than for coagulants: unacceptably low pHs, arising from overdose of acid.

Mitigation of Acid Risks

The simplest and most effective way to mitigate the risk of acid overdose is the utlisation of automation. pH correction automation systems are generally simple and proven technologies, as well as easy to use, and cost effective.

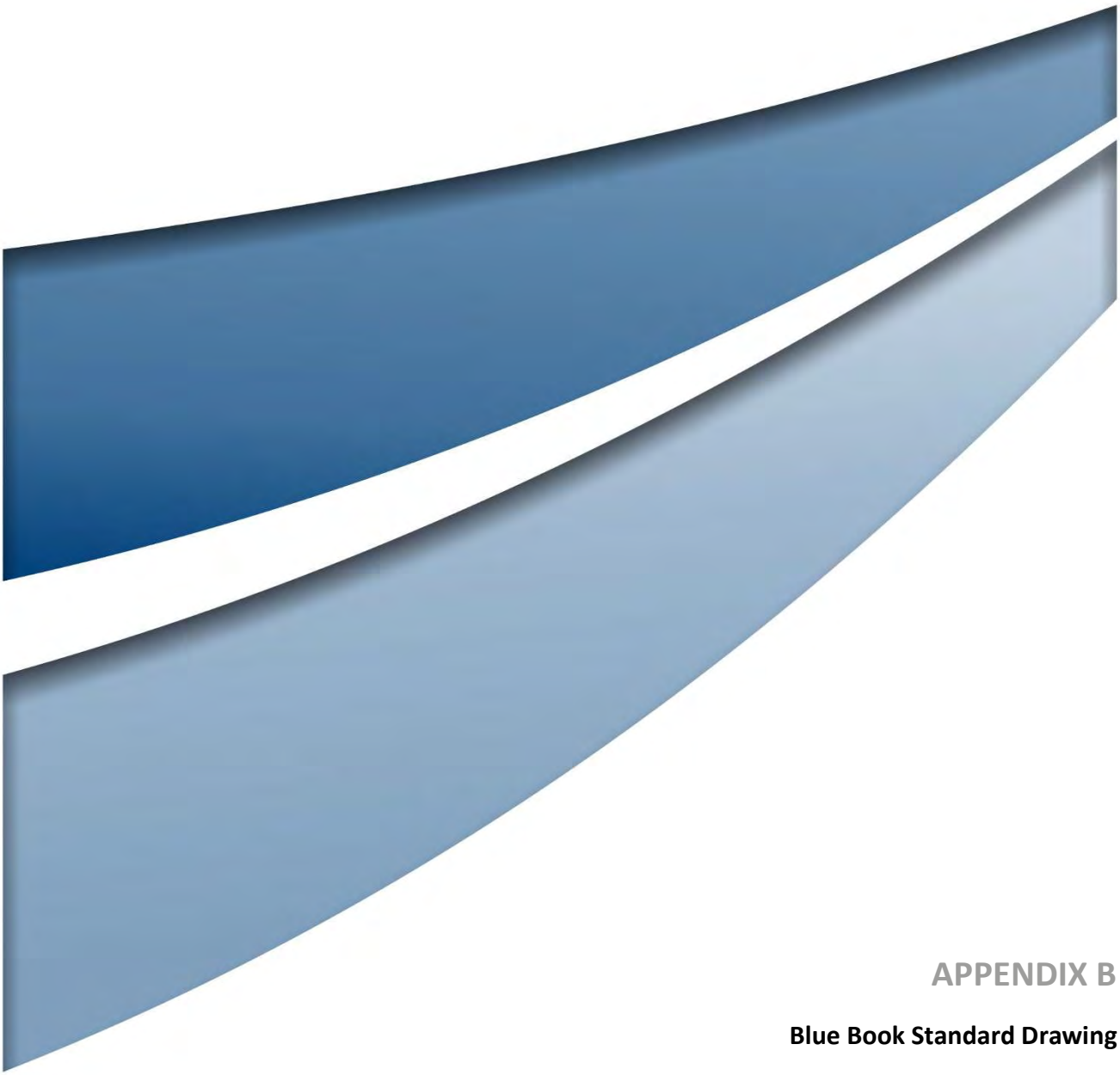
Testwork indicated that 5-10 minutes was generally required for a stable pH to be achieved. Hence, at discharge rates in the order of the proposed 20-100 L/s, pH correction of clarified waters whilst in the process of being discharged is practical, environmentally feasible and cost-effective (less process and/or civil infrastructure required). This is accomplished by installing an acid mixing tank (a common rainwater tank) after the extraction pump but prior to the discharge point. The tank is appropriately specified to provide the appropriate mixing intensity and time for complete acid-water reaction.

Acid is dosed prior to the mixing tank by a metering pump. A pH probe located in the mixing tank for representative, low-lag measurement sends a signal back to the pH controller in the secure shed. The pH controller adjusts the acid metering pump to achieve the desired setpoint.

The preliminary pH setpoint will be 7.5. This figure is suitably lower than the required upper threshold (8.0) and suitably higher than the lower threshold (6.5), such that it is outside of a typical pH probe's drifting error bounds between calibrations. This figure is easily changed via the pH controller, if required.

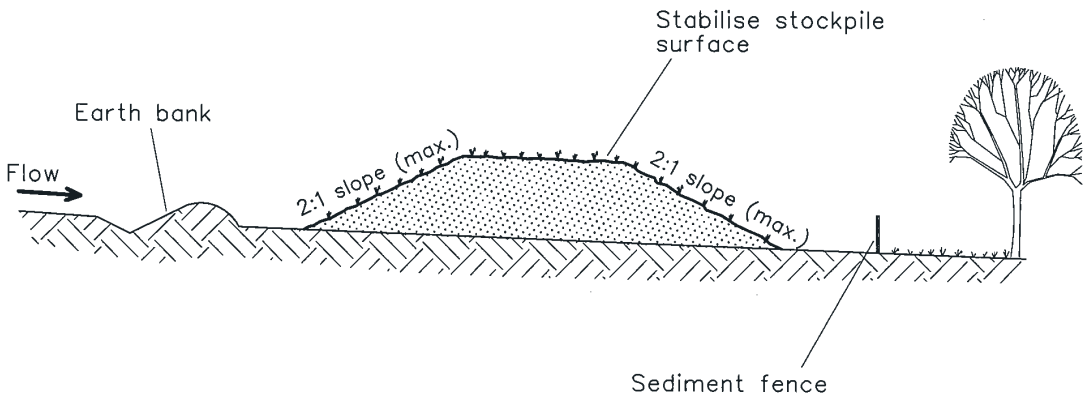
The operator initiating discharge of water from the dam is able to fill the mixing tank with representatively-treated water, before taking a sample for lab analysis prior to discharge by tank overflow, if required.

Storage of the acid will be in IBCs; the IBCs will be stored on a compatible and compliant plastic bund, which will be inside the secure shed.



APPENDIX B

Blue Book Standard Drawing

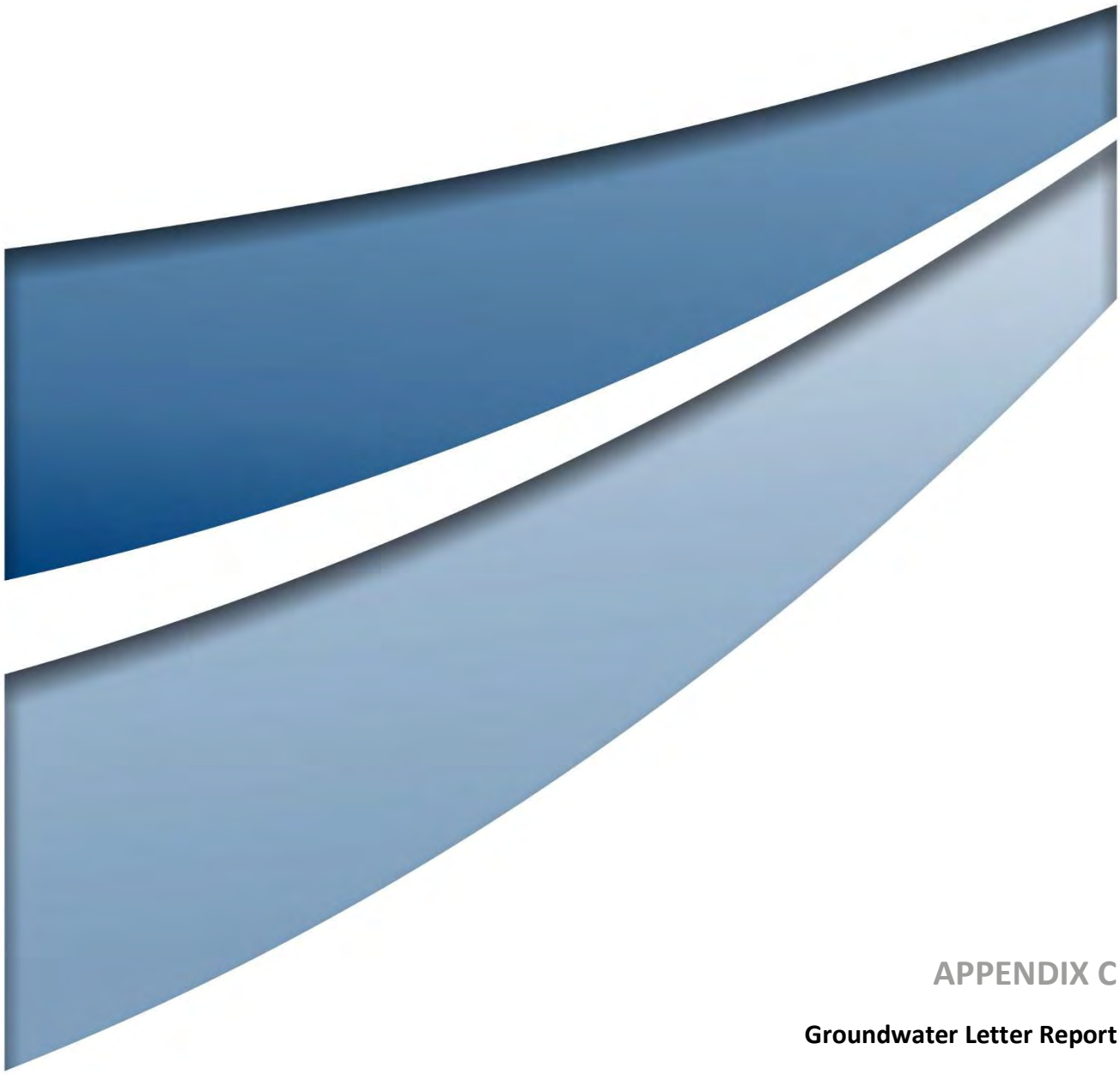


Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES

SD 4-1



APPENDIX C

Groundwater Letter Report

umwelt
Environmental & Social Consultants

Inspired People
Dedicated Team
Quality Outcomes

Our Ref: 21409_Ardglen Desktop Review and Bore Plan_V2.0.docx

21 July 2021

Luke Robinson
Systems Manager – Construction Materials
Daracon Group

E|luke.robinson@daracon.com.au

Dear Luke

Re: Ardglen Quarry Desktop Review and Bore Plan

1.0 Introduction

Ardglen Quarry (the Site), formerly operated by Railcorp, has been established for over 100 years and is situated approximately 4.5 km north-west of Murrurundi and 53 km north of Scone in NSW. The site has been in care and maintenance since 2012, and in March 2021 Daracon Group (Daracon) received approval for the Ardglen Quarry Extension (Modification 2) by the Minister of Planning (Ref: 06_0264).

In accordance with the consolidated consent Condition 18E of the Project Approval, Daracon is required to install of a groundwater monitoring bore with a minimum depth equivalent to the finished depth of the in-pit sump in consultation with DPIE Water. In addition, under Condition 20 the Site Water Management Plan requires development of a Groundwater Monitoring Program (GMP), with specific requirements for the program outlined under condition 23B.

This report provides a review of the relevant publicly available data for the site and includes recommendations for the proposed location and construction details for the monitoring bore to address Condition 18E (**Section 4.0**). **Section 4.0** also outlines indicative locations and construction details for additional monitoring locations that could be used for the GMP, along with recommendations on monitoring frequency and parameters.

2.0 Conditions and Regulation

As outlined in the current Project Approval, the following Conditions relate to groundwater:

- Condition 18E - Prior to commencing quarrying operations in the Extension Area (or other timeframe as agreed by the Planning Secretary), the Applicant must install a groundwater monitoring bore with a minimum depth equivalent to the finished depth of the in-pit sump, in consultation with DPIE Water.

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- Condition 20 - The Applicant must prepare a Site Water Management Plan for the development, a in consultation with EPA, DPIE Water, DPIE Crown Lands and ARTC, and to the satisfaction of the Planning Secretary. This plan must be prepared by suitably qualified expert/s whose appointment/s have been approved by the Planning Secretary, and must include:
    - (d) a Groundwater Monitoring Program.
- Condition 23B - The Groundwater Monitoring Program must:
    - (a) incorporate at least 12 months of baseline data on groundwater levels obtained from the monitoring bore required under condition 18E of this Schedule;
    - (b) include groundwater performance criteria, including trigger levels for identifying and investigating any potentially adverse groundwater impacts (or trends) associated with the development;
    - (c) include a program to identify, report on and respond to any unauthorised groundwater interference, including inflows into extraction areas or interaction between on-site water storages and the groundwater system; and
    - (d) include a protocol to obtain appropriate water licence(s) for any groundwater take; and
    - (e) be submitted to the Planning Secretary for approval within 12 months of commencing quarrying operations in the Extension Area (or other timeframe as agreed by the Planning Secretary).

To address Condition 18E, a groundwater monitoring bore with a minimum depth equivalent to the finished depth of the in-pit sump has been proposed (**Section 4.1**). Additional monitoring bores have also been proposed in **Section 4.1** to be included in the Groundwater Management Plan. To address Condition 23B (a), an initial monitoring program to collect 12 months of baseline data has been proposed, with further information provided in **Section 4.0**. Once sufficient data has been collected, the GMP can be developed with site specific triggers.

As captured under Condition 23B(d), Daracon are required to obtain appropriate licenses for any groundwater intercepted as part of the operations. The Site occurs within the eastern extent of the Liverpool Ranges Basalt groundwater management area under the Murray Darling Basin Fractured Rock Groundwater Sources (2020). In accordance with the *Water Management Act 2000*, groundwater intercepted within the Liverpool Ranges Basalt MDB Groundwater Source is required to be licenced, with the long-term average annual extraction limit set at 2,160 ML/year.

To support the licence application and ongoing reporting, it is anticipated that work will be required to characterise the groundwater regime and quantify the volume of groundwater likely to be intercepted over the life of the operations. The monitoring program outlined in **Section 4.0** is proposed to provide initial data to assist in characterising the groundwater regime and developing a tool (i.e. analytical or numerical model) to quantify potential take.

3.0 Site Setting

3.1 Hydrogeological Regime

The Site is located near the top of the Liverpool Ranges, on the western boundary of the Hunter Valley. Based on State Seamless Geology mapping, the main geological unit at site is the Tertiary basalt of the Liverpool Range Volcanics.

The Tertiary basalt unconformably overlies Jurassic aged Pilliga Sandstone and Purlawaugh Formation. Carboniferous aged Carrabubula Formation is also mapped approximately 400 – 500 m to the north-east of Site, on the northern side of Murrurundi Fault.

The Tertiary basalt is described as undifferentiated basalt, dolerite, polymictic conglomerate, quartzose sandstone and shale. Based on available drill logs for Site, the basalt can be up to around 100 m thick, with weathering extending between 6 m and 36 m depth.

Groundwater distribution within the Tertiary basalt in the vicinity of the Site is likely heterogeneous and influenced by local fracture networks (secondary porosity). The Tertiary basalt is recharged from rainfall, and likely discharges where the unit is incised along creeks and via downward seepage to underlying units. Discharge would also occur where abstracted by private water supply bores and where intersected by mining/quarrying below the water table.

A drilling program within the Site was undertaken during the Millennium Drought in 2007, at the time all holes were reported as dry (ERM 2007). An additional drilling program in 2015 (VGT 2015) intersected water at two holes (Hole 1 and Hole 2) within the extension area at depths of 18.38 mbgl (661.00 mAHD) and 26.00 mbgl (670.42 mAHD) respectively. The location of Hole 1 and Hole 2 is presented in **Figure 2**. These water levels indicate a general flow direction towards the north, following topography. From anecdotal information, it is also understood that seepage expressed at the existing quarry pit face has previously been observed.

Surface elevations within the proposed extension area range from ~735 mAHD in the south-west to 672 mAHD in the north-east and the operations are planned to be extended down to around 626 mAHD. Based on these elevations and the water levels identified in the 2015 drilling program, the extension has the potential to intersect groundwater.

3.2 Private Groundwater Users

A review of the National Groundwater Information System (NGIS) database identified five private groundwater bores within 2 km of the Site. Details on the five bores are included in **Table 1**, and the locations shown in **Figure 1**.

Four of the five registered bores likely target the Tertiary basalt, to depths of 7 m to 91 m depth. The bores are noted as being used for domestic and stock water supply. One bore (GW966777) is located in an area of mapped Carrabubula Formation and is apparently used for domestic water supply.

The existing registered bores could provide additional information on groundwater conditions and usage in the region. A bore census has been proposed to capture this data, and is discussed further in **Section 4.4**.

Table 1 Private bores within 2 km of the Site (NGIS)

Bore ID	Easting GDA94 Z56	Northing GDA94 Z56	Depth (m)	Drilled Date	Status	Likely Geology	Use
GW901077	289091.0	6487614.0	91.00	14/03/1998	Removed	Basalt	House
GW901577	289913.0	6486803.0	7.01	01/01/1978	Unknown	Basalt	House
GW966777	289991.0	6487008.0	4.00	-	Unknown	Carrabubula Formation	House
GW902866	290481.4	6485976.5	61.00	24/02/2018	Unknown	Basalt	Stock
GW969393	290690.0	6486368.0	66.00	25/04/2007	In use	Basalt	House

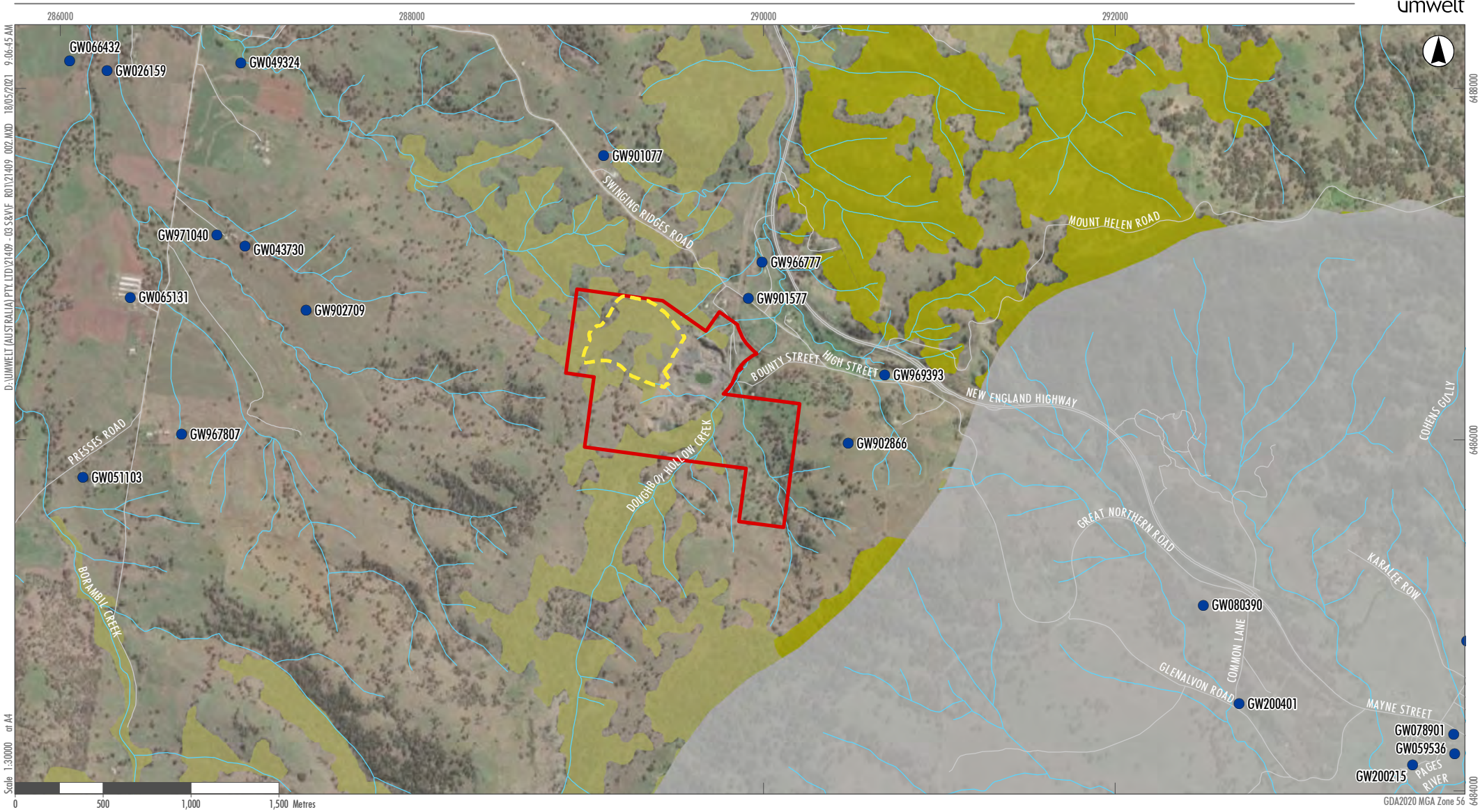
Note: Geology inferred based on State Seamless Geology Mapping.

3.3 Groundwater Dependent Ecosystems

A groundwater dependant ecosystem (GDE) is one in which the plant and/or animal community is dependent on the availability of groundwater to maintain its structure and function. The Commonwealth Government has established the National Atlas of Groundwater Dependent Ecosystems (GDE Atlas). The GDE Atlas includes a consolidated database developed based on the Bioregional Assessment Programme conducted in 2016. The GDE Atlas shows known and potential GDEs, and provides a desktop-based inventory of the location and characteristics of GDEs in Australia. GDE Atlas mapping at the Site is shown in **Figure 1**. The mapping indicates:

- No areas of high potential for groundwater interaction are mapped within the Site or immediate surrounds.
- No areas of moderate potential for groundwater interaction are mapped within the Site, but are mapped approximately 680 m to the north-east from the current pit extent.
- Terrestrial areas of low potential for groundwater interaction have been mapped within the Site, as well as to the south of the current operations. The mapping indicates these correlate with *Angophora floribunda - Eucalyptus albens - Eucalyptus laevopinea* vegetation communities.
- No subterranean ecosystems or ecosystems that rely on the surface expressions of groundwater were mapped within the Site or surrounding area.

It was noted that individual mapping for different river regions is also available online from the Bureau of Meteolology (BoM) GDE Atlas website. This mapping is based on a national assessment conducted from 2009 to 2012 and is apparently updated with recent regional studies. This mapping shows a high potential for groundwater interaction for terrestrial vegetation in the Site, while the more recent mapping indicates only low potential groundwater interaction. Based on the site data that indicates groundwater levels are over 10 mbgl, it is anticipated there would be a low potential for groundwater interaction in this area.



Legend

- Site Boundary
- Extension Area
- Registered Bore (NGIS)

Terrestrial GDE

- Moderate potential for GW interaction
- Low potential for GW interaction
- No EcoSystems Analysed

FIGURE 1

Groundwater Users

Image Source: ESRI Basemap Data source: NSW DFSI (2020), BOM (2021)

4.0 Proposed Field Plan

The requirements set out in Condition 18E and 23B of the project approvals require the installation of a bore with a minimum depth equivalent to the finished depth of the in-pit sump, as well as the development of a GMP as outlined in Conditions 20 and 23B. To address satisfy the requirements of Condition 18E and gather additional data required for Conditions 20 and 23B the following field plan is proposed. **Section 4.1** presents the locations of four proposed monitoring bores with construction details outlined in **Section 4.3** A monitoring program is outlined in **Section 4.4**, with a bore census of surrounding privately owned bores proposed in **Section 4.5** to provide additional baseline data, which will help inform the GMP and future groundwater modelling.

4.1 Proposed Monitoring Locations

To address Condition 18E, a groundwater monitoring bore P3 with a minimum depth equivalent to the finished depth of the in-pit sump has been proposed.

Additional monitoring bores have also been proposed that could be used for the GMP. The proposed bores have been positioned to provide a spatial spread of data. This will enable assessment of the local groundwater regime and inform further assessment for the quantification of groundwater. The proposed monitoring locations, total depth, screened interval, as well as monitoring bore purpose is presented in **Table 2**, and locations shown in **Figure 2**.

The construction details are indicative only and would be dependent on findings during drilling. The final bore construction should be confirmed by a hydrogeologist to optimise the design based on the geology. The locations are also indicative only, and the finalised locations will depend on accessibility and input from Daracon. Alternative locations have been provided for two bores (P2 & P4) if access outside of the site boundary is not possible.

Table 2 Proposed Additional Monitoring Locations

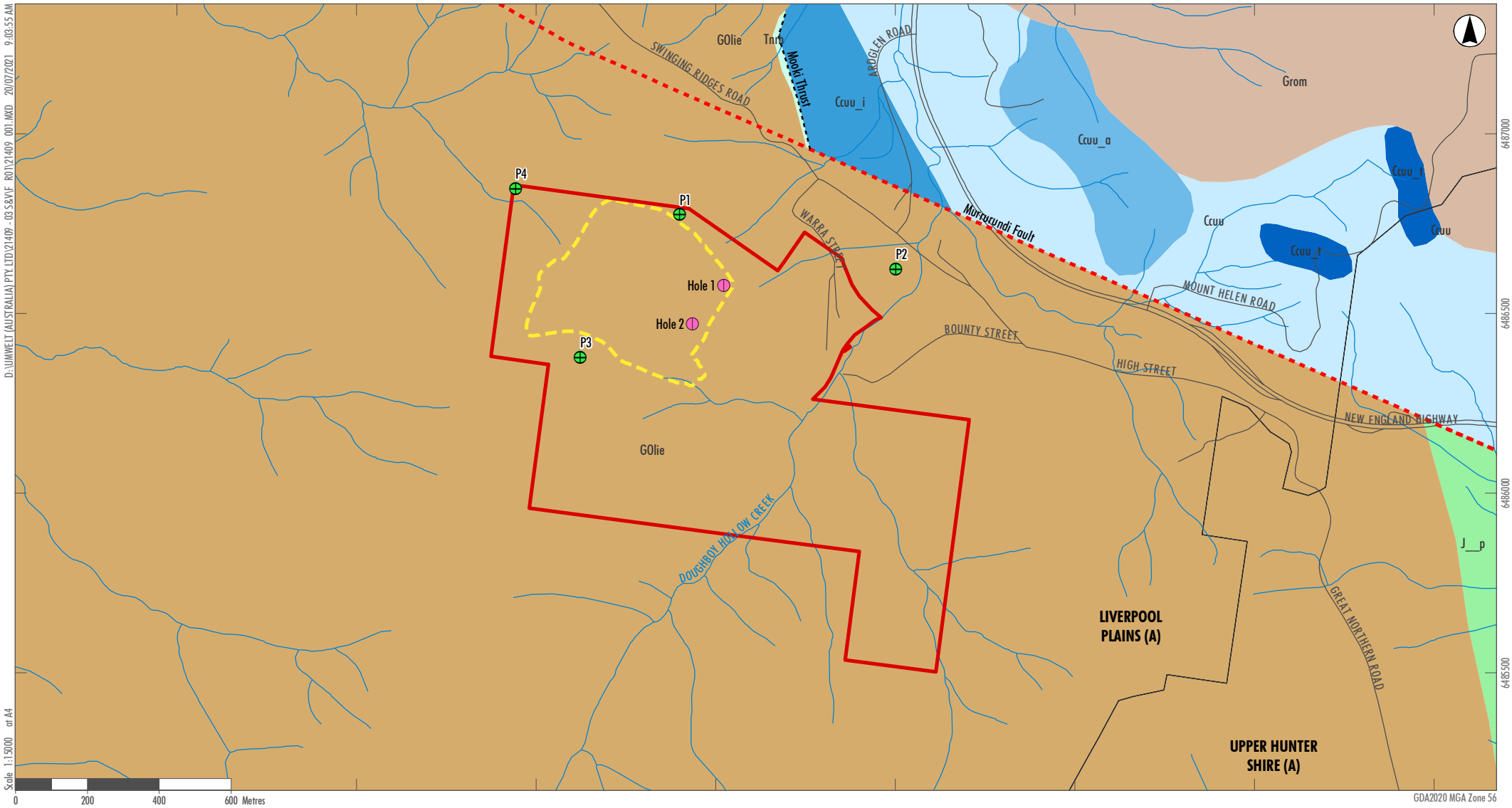
Bore ID	Easting GDA94 Z56	Northing GDA94 Z56	Total Depth	Screened depth (mbgl)	Purpose
P1	289400	6486776	40 mbgl (646 mAHD)	28 – 40	GMP. Targeting fresh basalt, positioned down-gradient of the extension area to map groundwater levels and flow direction and monitor changes during and following operations.
P2	290001	6486624	40 mbgl (572 mAHD)	28 – 40	GMP. Targeting fresh basalt, positioned down-gradient of the extension area and along Doughboy Hollow Creek. To capture any changes in groundwater conditions during and following operations and inform understanding of groundwater regime and surface water/groundwater interactions.
P3	289123	6486379	120 mbgl (to be below total depth of sump at 626.5 mAHD)	99 – 117*	Condition 18E and GMP. Targeting fresh basalt, positioned up-gradient of the extension area, to monitor groundwater conditions and changes during and following operations.

Bore ID	Easting GDA94 Z56	Northing GDA94 Z56	Total Depth	Screened depth (mbgl)	Purpose
P4	288943	6486848	40 mbgl (620 mAHD)	28 – 40	GMP. Targeting fresh basalt, positioned to the north-west near a tributary of Borambil Creek. To capture any changes in groundwater conditions during and following operations and inform understanding of groundwater regime and surface water/groundwater interactions.

Note: all bores should be screened within at least 6 – 12 m of fresh basalt depending on intersected geology;
* 3 m sump on base of bore below screen

4.2 Consultation

In accordance with Condition 18E, a bore must be installed down to the minimum depth equivalent to the finished depth of the in-pit sump, in consultation with DPIE Water. John Williams of DPIE Water was contacted on 19th July 2021 to briefly discuss the concept of installing four bores across the site to obtain the background data on groundwater conditions. As per discussion with John, it is understood a license is not required for the construction of the monitoring bores. However, the proposed locations should be notified to NRAR prior to installation.



Legend

- Site Boundary
- Extension Area
- Proposed Monitoring Bore
- 2015 Drilling Program Water Intersections

Geology

- Liverpool East Basalt
- Mount Royal Volcanics
- Purlawaugh Formation
- Banks Wall Sandstone
- Currabubula Formation
- Currabubula Formation - two-pyroxene andesite
- Currabubula Formation - mudstone
- Currabubula Formation - tuff

Fault

- Fault, position approximate
- Fault, inferred

FIGURE 2

Proposed Monitoring Bores

Data source: NSW DFSI (2020), NSW PI&E (2020)

4.3 Monitoring Bore Construction

Details on the proposed bore locations and indicative depths and screened intervals are included in **Table 2**. All proposed groundwater monitoring bores should be drilled and constructed in accordance with the minimum construction requirement for water bores in Australia 4th edition (National Uniform Drillers Licensing Committee 2020). As bores are proposed to be installed across a single aquifer, a minimum Class 1 licenced driller should be engaged. The method of drilling both the groundwater monitoring bores and VWP's is at the discretion of the drilling contractor.

During drilling, details relevant to the hydrogeology should be recorded, including:

- Lithological logging and sampling at a minimum of 1 m intervals, dependent on the drill method.
- Record the drill progress and conditions, based on information from the driller (i.e. anecdotal information on rock strength and consolidation).
- Monitoring of groundwater inflow during drilling using standard methods (i.e. v-notch weir or bucket). Inflows should be measured at a minimum of 6 m intervals and whenever water is intersected.
- Field sampling of pH and electrical conductivity (EC), and temperature to be recorded using a calibrated water quality meter at regular intervals when drilling on air/water. Water quality to be measured at a minimum at a minimum of 6 m intervals and when water is intersected.

Indicative monitoring bore construction diagrams are presented in **Figure 3**. Construction will be dependent on driller requirements and the actual geology intersected at the location, with final construction details to be confirmed by a hydrogeologist prior to construction. As shown in these figures, bores are proposed to be constructed using:

- Minimum 6 inch (150 mm) diameter hole for groundwater monitoring bores to accommodate surface casing, and 4 ¾ minimum to accommodate bore casing. The hole size will be determined by the chosen licensed water bore drillers.
- 50 mm PN18 PVC-U casing, with preference for PN18 threaded casing (no screws) to assist with sampling.
- 4 mm machine slotted casing.
- A bentonite seal with a minimum thickness of 1 m.
- 150 mm galvanised standpipe with lockable cap.
- Stamped steel plate attached to the standpipe displaying the bore ID.
- Well-rounded and clean gravel pack.
- Grout to surface using factory fresh Portland or Blended (GP) cement to prepare a 5% bentonite powder/cement mix.

Based on the materials listed above and the proposed drill depths, **Table 3** presents an estimate of the required materials for the proposed monitoring bores.

Following installation, all bores should be developed in accordance with the minimum construction requirement for water bores in Australia (2020) using a suitable method (i.e. air lifting and jetting) to ensure water quality samples collected are representative of the groundwater unit.

Table 3 Indicative Monitoring Bore Construction Materials

Item	Description	Quantity	Unit
1	Surface Casing - 150mm PN12 uPVC, bell end	As required	6 m length
2	Blank Casing - 50mm PN18 uPVC, threaded joints	36	6 m length
3	Slotted Casing - 50mm PN18 uPVC, 1mm aperture	21	3 m length
4	Gravel pack - 3-6mm diam. washed, rounded quartz	69	20 kg bag
5	Bentonite - 1/4" pellets	20	buckets
6	Bentonite - powder	2	25 kg bag
7	Cement	117	20 kg bag
8	End caps - for 50mm PN18 uPVC	8	item
9	Headworks - Steel Protector, 150mm lockable	4	item
10	Marker Posts - 1900mm x 60mm steel post with name plate	4	item
11	Poly pipe 32mm HDPE (PN12.5) grout line (incl. bore development)	280	m

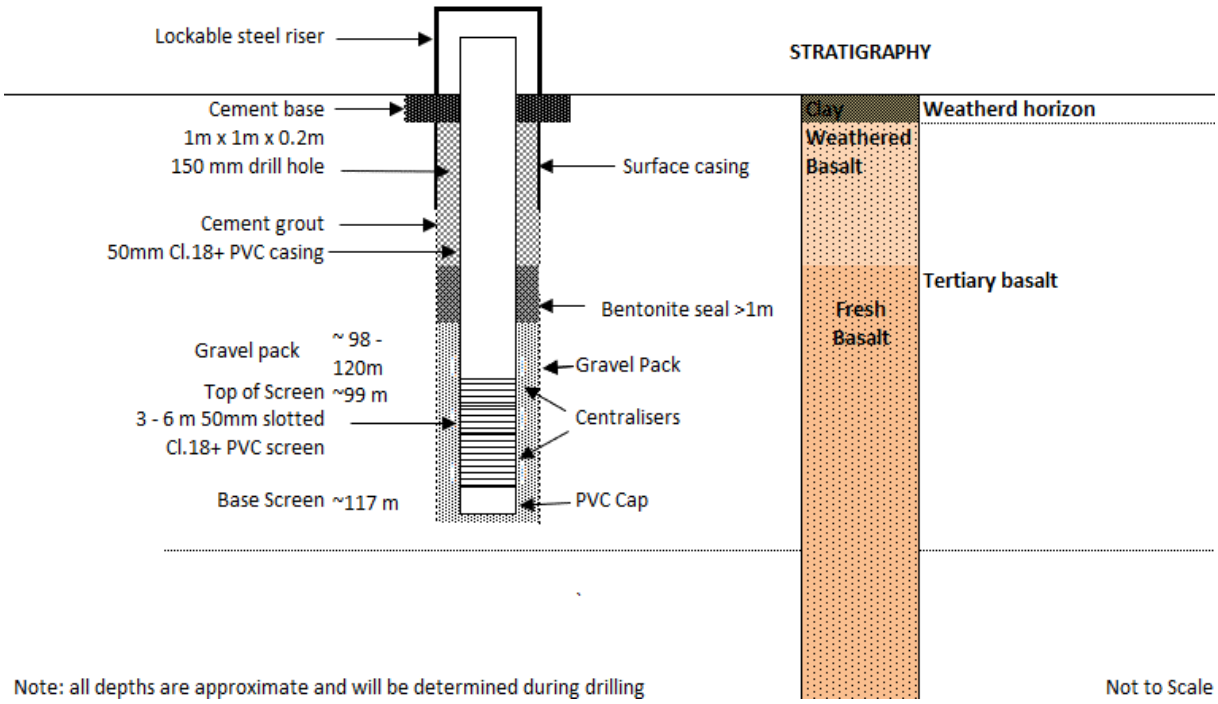


Figure 3 Indicative Monitoring Bore Construction Diagram (Proposed Bore 3)

4.4 Monitoring Program

Following construction, all bores should be surveyed for a top of casing (monitoring reference point) and ground level elevation. The monitoring reference point should also be marked on the casing to assist with consistency of data collection between monitoring events.

It is recommended that all proposed bores be monitored for groundwater level and quality at the additional monitoring bores on a monthly basis for the first year of installation to collect sufficient baseline data for Condition 23B Groundwater Monitoring Program. Following an initial 12 month baseline data collection period, groundwater monitoring should occur on a quarterly basis.

The baseline data collected will be utilised for the characterisation of the groundwater regime, water types, and the identification of potential recharge mechanisms. This will assist in the overall development of the GMP and requirements outlined in Conditions 20 and 23B.

It is recommended that groundwater level loggers be installed in all the proposed monitoring bores to capture seasonality and any response to rainfall events. A single barometric logger should also be installed at one of the bores to allow for data corrections. The loggers should be setup to take measurements every 4 hours on the hour and the data downloaded and checked with each sampling event.

Groundwater monitoring should be conducted in line with standard practices outlined in Groundwater Sampling and Analysis – A Field Guide (Geoscience Australia 2009) and transported with a Chain of Custody (COC) form to a NATA accredited laboratory for analysis. It is proposed that groundwater samples be analysed for the following analytical suites:

- Physical parameters
    - Temperature (field), pH (field and laboratory), EC (field and laboratory), total dissolved solids, redox potential
- Major ions
    - Ca, Cl, K, Na, sulfate as SO_4 – turbidimetric, bicarbonate alkalinity as $CaCO_3$, carbonate alkalinity as $CaCO_3$, hydroxide alkalinity as $CaCO_3$, total alkalinity as $CaCO_3$

Dependent on the activities to be conducted on site, other analytes may be useful to collect to obtain a full baseline dataset for comparison and trigger development in future. This includes:

- Total and dissolved metals
    - Ag, Al, As, Cd, Co, Cu, Fe, Hg, Mg, Mn, Mo, Ni, Pb, Sb, Se, Zn
- Total petroleum hydrocarbons
    - TRH (C6 – C40)/BTEXN plus F1 & F2 (Silica Gel).
- Nutrients
    - Nitrate as N, nitrate + nitrate as N, nitrite as N, Total Kjeldahl Nitrogen as N, total nitrogen as N, total phosphorus as P

4.5 Bore Census

A bore census of the private groundwater user bores identified in **Section 3.2** (refer **Table 1**) could be conducted to provide additional baseline data which will help inform the GMP and future groundwater modelling. The bore census would provide more water level data, as well as assist in understanding the water usage and potential receptors within the aquifer. The bore census would also identify any unregistered or recently drilled bores. It is understood that there may also be bores on land owned by Daracon.

During the bore census it is recommended that details be recorded about the bore construction, including the total depth of the bore, screened interval, how it is equipped (i.e. pump infrastructure) and usage (i.e. stock water). Where possible, groundwater levels should be measured and groundwater quality samples collected to test for field parameters (i.e. EC and pH) and for laboratory analysis. The bore census findings should be recorded on a bore census card, which can be utilised in the GMP. The card should include photos of the site and detail the location of the bore, construction details, use and other relevant information.

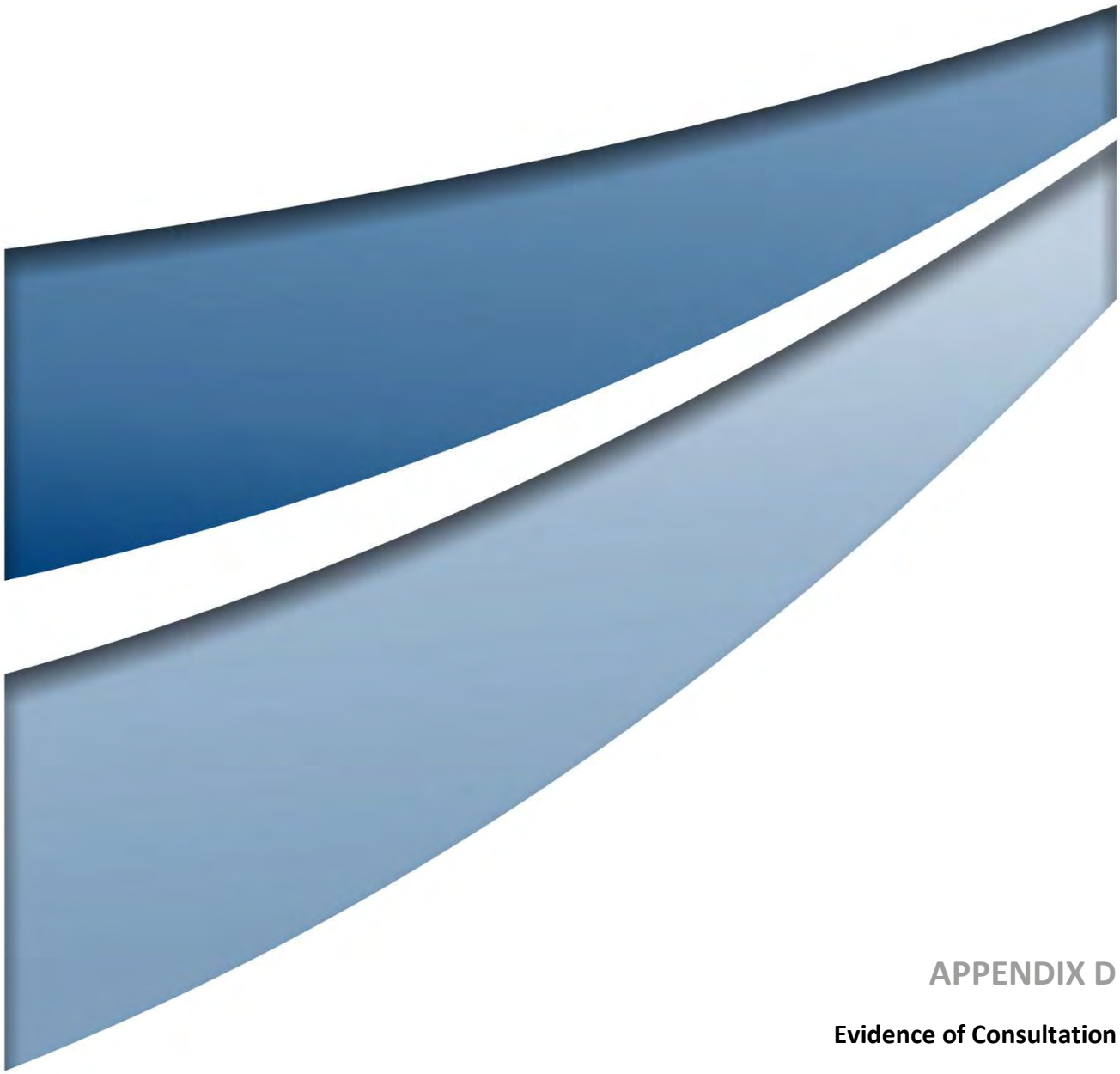
5.0 Closing

To address Condition 18E and 23B of the Project Approval, this letter report presents locations and construction details for four proposed groundwater monitoring bores and a proposed initial monitoring program. This report also proposes a private bore census with recommendations about data that could be collected to help inform the GMP.

We trust this information meets with your current requirements. Please do not hesitate to contact the undersigned on 0436 613 948 should you require clarification or further information.

Yours sincerely

Jackson Newton
Senior Hydrogeologist



APPENDIX D

Evidence of Consultation

Planning, Industry & Environment

MP06_0264-PA-15

Ardglen Quarry - Site Water Management Plan (MP06_0264-PA-15)

The Department of Planning, Industry and Environment – Crown Lands has reviewed the proposal.

Crown land and Crown waterways are impacted by the water management associated with historical and planned works at Ardglen Quarry. Changes to the hydrology of Doughboy Hollow Creek will impact the Crown estate adjacent to and downstream of the project area.

Consent will be required (potentially by way of Crown land licences) for:

- works occurring within Doughboy Hollow Creek
- surface water pump sites on Crown waterways
- extractive bores on Crown land or within Crown waterways
- monitoring bores on Crown land. Potential that the P2 monitoring bore may be intended to be located on Crown land.

It is noted that the proponent has indicated awareness of this requirement for consent and intends to consult. If the required mechanism for authority is a licence, then it must be secured prior to the impact occurring on Crown land. Licencing can take a protracted length of time in some cases and so it is encouraged that the proponent consult early on these works.

Crown reserves and Crown roads are located adjacent to the proposed works site. There is a limited right of access to Crown waterways, and a right of public access to both Crown reserves and Crown roads – the existence of tenures (such as licences or enclosure permits) does not negate the right of access to the wider public. Given the scale of the works and the potential public interface, we recommend discussions with Tamworth Crown lands to plan mitigation of public safety risks.

Details on how to apply for a licence are available via the following link.
https://www.industry.nsw.gov.au/lands/use/licences

For consultation on site-specific matters, please contact Tamworth Crown lands at tamworth.crownlands@crownland.nsw.gov.au

Thank you

Deb Alterator
Project Support Officer
Crown Lands
| E lands.ministerials@dpie.nsw.gov.au

DOC21/657649-2
5 August 2021

Industry Assessments
Planning and Assessment Division
Department of Planning, Industry and Environment
Locked Bag 5022
PARRAMATTA NSW 2124
Email: @planning.nsw.gov.au

EPA Submission on Request for Advice on Site Water Management Plan

Thank you for your request from Public Authority Consultation (PAE-24877627) for the Environment Protection Authority (EPA)'s advice on the Site Water Management Plan for Ardglen Quarry (MP06_0264-PA-15).

The EPA does not provide advice on or endorsement of any management plans developed for planning assessments.

Accordingly, the EPA will not be providing comment further to this request.

Please contact myself on (02) 6773 7000 or by email to armidale@epa.nsw.gov.au if you wish to discuss this matter further.

Yours sincerely,

LINDSAY FULLOON
Manager Regulatory Operations, Regional West

Department of Planning and Environment

Our ref: OUT22/3325

Jess Watson
Planning and Assessment Group
NSW Department of Planning and Environment

Email: jess.watson@dpie.nsw.gov.au

28 April 2022

Subject: Ardglen Quarry (MP06_0264-PA-15) – Site Water Management Plan (SWMP)

Dear Ms Watson

I refer to your email of 18 March 2022 to the Department of Planning and Environment (DPE) Water about the above matter.

The most recent approval granted for this quarry was in March 2021 for a modification to the Consent (Modification 2). This current request is to review the Site Water Management Plan (SWMP).

Recommendations regarding the requirements of approval conditions relating to groundwater monitoring, operational performance and licencing are provided in Attachment A.

Please note that the licensing and approval function has now moved from NRAR to DPE Water. Any further referrals to DPE Water and NRAR can be sent by email to water.assessments@dpie.nsw.gov.au. or to the following coordinating officer within DPE Water:

Simon Francis – Senior Project Officer
E: simon.francis@dpie.nsw.gov.au
M: 0428 926 117

Yours sincerely

E Rogers

Liz Rogers
Manager, Assessments, Knowledge Division
Water Group

Attachment A

Detailed advice to DPE Planning & Assessment regarding the Ardglen Quarry (MP06_0264-PA-15) - Water Management Plan (WMP)

1.0 Groundwater

1.1 Recommendation

The proponent should drill the monitoring bore to a depth equivalent to the in-pit sump as required under Condition 18E at least 12 months prior to commencing quarrying within the expansion area.

Explanation

Condition 18E states "prior to commencing quarrying operations in the Extension Area (or other timeframe as agreed by the Planning Secretary), the Applicant must install a groundwater monitoring bore with a minimum depth equivalent to the finished depth of the in-pit sump, in consultation with DPE-Water".

Initial discussions were held with DPE-Water in July 2021 resulting in a commitment for four monitoring bores. The SWMP refers the reader to Appendix C Groundwater Letter Report. This letter presents a scope of proposed works for up to 4 monitoring bores with one bore being (P1) nominated to satisfy condition 18E.

DPE-Water notes the quarry's proposed depth is 626 m AHD (ref: SWMP Appendix C Section 3.1). The nominated monitoring bore depths are presented in Appendix C Table 2 showing the total depth for bore P1 at 646m AHD which is not equivalent to the in-pit sump depth.

1.2 Recommendation

That the proponent develop a Groundwater Monitoring Program for inclusion in the SWMP as required under Condition 20.

Explanation

'Section 7.0 Groundwater Management Plan' of the SWMP states a commitment to update the SWMP within 12 months of quarrying in the extension area. No technical information has been provided for review at this point in time.

1.3 Recommendation

That the proponent present the baseline data, performance targets and other elements of a Groundwater Monitoring Program as required under Condition 23B.

Explanation

Condition 23B of Schedule 3, states prescriptive requirements for the Groundwater Monitoring Program, the content of which is to be submitted within 12 months of commencing quarrying operations. No technical information has been submitted for review at this point in time.

1.4 Recommendation

That the proponent obtain a Water Access Licence (WAL) to account for the estimated groundwater inflow.

Explanation

Condition 21 specifies that the site water balance must predict groundwater inflows and out flows. Section 4.1.1 of the SWMP indicates the potential groundwater take of between 28.5 to 57 kL/day of groundwater take is possible. However, until the conditions 18E, 20 and 23B are

satisfied predicted groundwater take cannot be accurately determined and will require revision once the observation bores are completed.

Should groundwater be intercepted, a WAL under the *Water Management Act 2000* must be obtained unless the take is less than or equal to 3ML of water per year for any aquifer interference activities listed in Clause 7 of Schedule 4 of the Water Management (General) Regulation 2018. For more information visit:

https://www.dpie.nsw.gov.au/nrar/how to apply/water licences/Groundwater

To qualify for an exemption to hold a water access licence, the proponent should:

- record the water take within 24 hours in the approved form and manner;
- provide the water take records to the Minister by no later than 28 July for the year ending 1 July during which the water was taken (e.g. included in the annual report); and
- keep the water take records for a period of five years.

End Attachment A

Luke Robinson

From: Timothy Baker
Sent: Friday, 17 June 2022 12:04 PM
To: Jess Watson
Cc: Simon Francis
Subject: FW: DPE Water advice on MP06_0264-PA-15

Hi Jess,

In response to your request below please see my comments in your email in red. If you need to discuss further please let me know.

Regards
Tim

Tim Baker
Senior Project Officer
Water Assessments
Department of Planning and Environment—Water
T 0428162097 | E tim.baker@dpie.nsw.gov.au

From: Jess Watson <jess.watson@dpie.nsw.gov.au>
Sent: Thursday, 12 May 2022 12:21 PM
To: Simon Francis <simon.francis@dpie.nsw.gov.au>
Cc: Wayne Jones <wayne.jones@planning.nsw.gov.au>
Subject: FW: DPE Water advice on MP06_0264-PA-15

Hi Simon,

As per our phone conversation, could you please advise whether Daracon's comments below adequately address the comments contained in the advice from DPE Water (ref. OUT22/3325, see attached). Please see my additional questions/comments for consideration by DPE Water in blue text below.

In regard to Daracon's comment:

> Within DPE Water's response Section 1.1 (Explanation), they state *"The nominated monitoring bore depths are presented in Appendix C Table 2 showing the total depth for bore P1 at 646m AHD which is not equivalent to the in-pit sump depth"* which is correct, however the DPE Water representative has neglected to review the details of the three other bores installed. As shown below, it is clearly demonstrated within Appendix C Table 2, that Bore P3 satisfies condition 18E of the Approval, so we therefore consider this recommendation and explanation to be redundant;

Three bores have been installed, however not in the initial location proposed by the Appendix C Groundwater Letter Report (refer to Page 82 attached to this email). The Groundwater letter report contains conflicting information, proposing that P1 will satisfy condition 18E in text, however then refers to bore P3 in the below table (see highlighted on Page 82). The depth of bore P3 is inferred to be equivalent to the in-pit sump depth, however bore P3 is located to the south of the extension area, which is up-gradient from the in-pit sump. Does DPE Water have any concerns with the placement and depth of the alternate bore (P3)? It is noted that Daracon are still to confirm the depth of bore P3 and the depth of the in-pit sump.

DPE Water accepts the use of a bore at the location of P3 to fulfil the requirement of Condition 18E. The key aspect however is the ability of the bore to monitor groundwater levels at the required depth. This requires the bore to be screened at that depth. The reference in the Table for P3 indicates the bore was proposed to a depth of 626.5mAHD however it is understood there would then be a 3m plug installed which would mean the screened interval could not start until 629.5mAHD, which is not at the base of the in-pit sump. DPE Water recommends the proponent demonstrate the screened interval of the monitoring bore is at a depth equivalent to the base of the in-pit sump.

.....

- Within DPE Water's response Section 1.2 (Recommendation), they state "*That the proponent develop a Groundwater Monitoring Program for inclusion in the SWMP as required under Condition 20*" which is correct, however due to the fact that Condition 23B (e) of the Approval also states "*The Groundwater Monitoring Program must – be submitted to the Planning Secretary for approval within 12 months of commencing quarrying operations in the Extension Area*" the current SWMP does include a Groundwater Monitoring Program (GMP), albeit a preliminary document as a preface to a more substantial GMP once we've obtained sufficient monitoring data;
- Within DPE Water's response Section 1.2 (Explanation), they state "'*Section 7.0 Groundwater Management Plan' of the SWMP states a commitment to update the SWMP within 12 months of quarrying in the extension area. No technical information has been provided for review at this point in time*", which is incorrect as the GMP does include technical information, once again in a preliminary form as a preface to a more substantial GMP once we've obtained sufficient monitoring data;
- Our response to DPE Water's Section 1.3, is effectively the same to their Section 1.2 above;

Are DPE Water satisfied with the preliminary Groundwater Monitoring Plan and Groundwater Management Plan to be included within the SWMP, to be updated when sufficient baseline data has been collected?

Yes. DPE Water will be keen to see the updated plan once the baseline data has been collected.

- Within DPE Water's response Section 1.4 (Recommendation), they state "*That the proponent obtain a Water Access Licence (WAL) to account for the estimated groundwater inflow*" however within Section 1.4 (Explanation) they note that "*predicted groundwater take cannot be accurately determined*", which is correct;

Daracon have not provided further actions to be undertaken in response to DPE Water's initial advice. Are Daracon required to obtain a WAL, and can DPE please advise of the required timing?

The proponent is responsible for predicting the potential groundwater inflows and associated water take (or providing justification where this is not to occur) and ensuring a WAL is obtained with sufficient entitlement to account for water take prior to the take occurring (unless an exemption applies eg. the 3ML exemption). As mentioned in OUT22/3325 it is understood the observation bores need to be installed to assist in determining this. Following installation of the observation bores it is expected the GW inflow/outflows will be predicted and the need to hold a WAL confirmed.

Could you please advise when we may receive a response so I can inform Daracon.

Thank you for your help. Please give me a call on 0420 200 359 if you have any questions.

Kind Regards,

Jess Watson
Planning Officer

Energy, Resources and Industry | Department of Planning and Environment
T 02 9373 2845 | M 0420 200 359 | E jess.watson@dpie.nsw.gov.au

2

From: Michelle Read <michelle.read@crownland.nsw.gov.au>
Sent: Friday, 11 November 2022 8:54 AM
To: Luke Robinson
Cc: BAR Ardglen Quarry; John Cannon; Anna Cronin
Subject: RE: Daracon Ardglen quarry - Crown Land approvals required

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Luke

Thanks for sending through the update – we look forward to receiving your licence application in the near future.

Kind regards

Michelle Read
Group Leader Property Management

Crown Lands | Department of Planning and Environment
T 02 6763 3013 | E michelle.read@crownland.nsw.gov.au
Level 2, 155-157 Marius Street, Tamworth NSW 2340

The Department of Planning and Environment acknowledges that it stands on Aboriginal land. We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically

---

From: Luke Robinson <Luke.Robinson@daracon.com.au>
Sent: Wednesday, 9 November 2022 1:22 PM
To: Michelle Read <michelle.read@crownland.nsw.gov.au>
Cc: BAR Ardglen Quarry <BAR@daracon.com.au>; John Cannon <John.Cannon@daracon.com.au>; Anna Cronin <anna.cronin@crownland.nsw.gov.au>
Subject: RE: Daracon Ardglen quarry - Crown Land approvals required

Good afternoon Michelle,

Apologies for the delay in responding to your email below, but it's taken us a while to navigate through the various matters associated with the Crown Lands general licence.

As an update, we still plan to apply for the Crown Lands general licence however before we're able to do that, we needed to clarify the requirements associated with 'other' approvals and that's taken a while.

Pleasingly we've recently received advise from the following regulatory authorities and currently plan to proceed with the advice received from DPE Water and DPI Fisheries:

- DPE Water – As shown in the attached email, DPE Water have confirmed that we do not need to obtain a Controlled Activity Approval (CAA) as the Ardglen quarry Approval is a State Significant Development (SSD) and this negates the need for a specific CAA;
- DPI Fisheries - As shown in the attached email, DPI Fisheries have confirmed that we do not need to obtain a Fisheries Permit as the Ardglen quarry Approval is a State Significant Development (SSD) and this negates the need for a permit under the Fisheries Act ;

We genuinely appreciate the help you and your team continue to provide and we hope to complete the Crown Lands general licence approval process shortly.

Regards Luke

Luke Robinson | Systems Manager - Construction Materials
20 Kullara Close | PO Box 401 Beresfield NSW 2322
p: 02 4974 9200 m: 0417 481 785
Luke.Robinson@daracon.com.au | www.daracon.com.au

DARACON

From: Michelle Read <michelle.read@crownland.nsw.gov.au>
Sent: Wednesday, 7 September 2022 4:31 PM
To: Luke Robinson <Luke.Robinson@daracon.com.au>; Anna Cronin <anna.cronin@crownland.nsw.gov.au>
Cc: BAR Ardglen Quarry <BAR@daracon.com.au>; John Cannon <John.Cannon@daracon.com.au>
Subject: RE: Daracon Ardglen quarry - Crown Land approvals required

Dear Luke

Thanks for your email – Anna is on leave for a few weeks, so I'm answering on her behalf. Crown Lands has just updated our website and yes, navigation is a little tricky even for us.

Here is the link to the licence application and guidelines for a general licence - Apply for a general licence | Crown Lands (nsw.gov.au)

To accompany the licence application you will need to provide the plans for the works, a copy of your mod approval, a copy of the relevant EA and any other associated approvals (eg Fisheries). The licence application will be initially assessed by our Business Centre who will then forwarded it on to our local office for review. If you have a particular deadline for the licence to be issued, you will need to indicate this on the application.

Once you've had a look at the application and guidelines, please contact me if you need any clarification on the requirements.

Kind regards

Michelle Read
Group Leader Property Management

Crown Lands | Department of Planning and Environment
T 02 6763 3013 | E michelle.read@crownland.nsw.gov.au
Level 2, 155-157 Marius Street, Tamworth NSW 2340

The Department of Planning and Environment acknowledges that it stands on Aboriginal land.
We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically

From: Luke Robinson <Luke.Robinson@daracon.com.au>
Sent: Friday, 2 September 2022 7:41 AM
To: Anna Cronin <anna.cronin@crownland.nsw.gov.au>
Cc: Michelle Read <michelle.read@crownland.nsw.gov.au>; BAR Ardglen Quarry <BAR@daracon.com.au>; John Cannon <John.Cannon@daracon.com.au>
Subject: Daracon Ardglen quarry - Crown Land approvals required

Good morning Anna,

As mentioned in the recent Ardglen quarry CCC meeting, we're slowly making progress towards the re-opening of Ardglen quarry and we're at the point where we need to obtain the additional approvals to undertake the work in and adjacent to Doughboy Hollow Creek.

As shown below, condition 18B from the Consent provides the details. I've attempted to navigate the Crown Lands webpage but it's not clear to us how this works, so we're hoping you're able to assist us to obtain the appropriate licence / approval?

SURFACE AND GROUND WATER

18A. The Applicant must ensure that the sediment basin described in EA MOD 2 and any structures required for the carrying out of the development are located wholly within authorised in writing by ARTC and/or DPIE Crown Lands (as relevant).

18B. The Applicant must obtain any necessary licences and/or approvals from DPIE Cro *Crown Lands Management Act 2016* prior to:
(a) carrying out any works on Crown Land; or
(b) allowing the controlled discharge of water from the site to Doughboy Hollow Cr

18C. The Applicant must obtain any necessary licences and/or approvals from the ARTC any works described in the MOD 2 EA within the Right of Carriageway which burden

18D. The Applicant must not undertake any excavation exceeding 2 m in depth withi Northern Railway corridor unless otherwise approved in writing by ARTC.[a]

[a] *The 25 m setback is to be measured from the site boundary adjacent to the Main Northern*

18E. Prior to commencing quarrying operations in the Extension Area (or other timefram Planning Secretary), the Applicant must install a groundwater monitoring bore wit equivalent to the finished depth of the in-pit sump, in consultation with DPIE Water.

Notes:
- *The in-pit sump is shown in Appendix 1*
- *The purpose of the groundwater monitoring bore is to inform the development of the G Program*

18F. The Applicant must ensure that any works to be conducted on waterfront land accordance with *Guidelines for Controlled Activities on Waterfront Land* (2018) and DPIE Water.

Thank you.

Regards Luke

Luke Robinson | Systems Manager - Construction Materials
20 Kullara Close | PO Box 401 Beresfield NSW 2322
p: 02 4974 9200 m: 0417 481 785
Luke.Robinson@daracon.com.au | www.daracon.com.au

DARACON

4

From: CL Licences Mailbox <cl.licences@crownland.nsw.gov.au>
Sent: Monday, 21 November 2022 3:48 PM
To: Luke Robinson
Subject: Acknowledgement of Crown Lands Licence Application

File Reference: 16/07878
Account No: RN 638192

Dear Sir/Madam,

Re: ACKNOWLEDGEMENT OF CROWN LANDS AND/OR CROWN ROADS LICENCE APPLICATION

This letter is to acknowledge receipt of your application for a licence. An invoice for payment of $576.00 being the balance of the licence application fee will be sent within the coming weeks

We will be in contact with you again once your licence application has progressed, or, if any additional information is required from you in order to proceed with the application.

If your application is urgent or if you would like to contact us to discuss your particular circumstance, please do so by emailing cl.licences@crownland.nsw.gov.au

If you have any queries in relation to your application, please use the below contact details.

Kind regards,

Kathryn

Licences - Dubbo Business Centre
Crown Lands | Department of Planning and Environment | PO Box 2185 DANGAR NSW 2309
T: 1300 886 235 | F 02 4925 3517 E: licences@crownland.nsw.gov.au
W: www.crownland.nsw.gov.au | www.dpie.nsw.gov.au

The Department of Planning and Environment acknowledges that it stands on Aboriginal land. We acknowledge the traditional custodians of the land and we show our respect for elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

1

From: HV Property Services <HVPropertyServices@ARTC.com.au>
Sent: Monday, 20 September 2021 6:56 PM
To: John Cannon
Cc: Luke Robinson; John Brown; Mark Robinson
Subject: FW: Extension - In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms (E-1679)
Attachments: In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms E-1679.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Afternoon,

Please accept this email as ARTC Consent to grant an extension to the attached Agreement in Principle until 31 March 2022, noting the conditions within the Agreement in Principle have not changed.

Thanks

Sarah

Sarah Lawrence
Property Officer
Hunter Valley

ARTC

M. 0438 149 053
E. SLawrence@ARTC.com.au

Australian Rail Track Corporation
6 Kings Road
Broadmeadow NSW 2292

artc.com.au

From: HV Property Services
Sent: Monday, 22 March 2021 11:49 AM
To: John Cannon <John.Cannon@daracon.com.au>
Cc: Luke Robinson <Luke.Robinson@daracon.com.au>; John Brown (JBrown@artc.com.au) <JBrown@artc.com.au>; Mark Robinson (MRobinson@ARTC.com.au) <MRobinson@ARTC.com.au>
Subject: FW: Extension - In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms (E-1679)

Morning,

Please accept this email as ARTC Consent to grant an extension to the attached Agreement in Principle until 30 September 2021, noting the conditions within the Agreement in Principle have not changed.

Thanks

Sarah

Sarah Lawrence
Property Officer
Hunter Valley

ARTC

P. 02 4941 9602
M. 0438 149 053
E. SLawrence@ARTC.com.au

Australian Rail Track Corporation
2 Kings Road
Broadmeadow NSW 2292

artc.com.au

From: HV Property Services
Sent: Thursday, 24 September 2020 11:21 AM
To: John Cannon <John.Cannon@daracon.com.au>; Luke Robinson <Luke.Robinson@daracon.com.au>
Subject: Extension - In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms (E-1679)

Morning,

Please accept this email as ARTC Consent to grant an extension to the attached Agreement in Principle until 20 April 2021, noting the conditions within the Agreement in Principle have not changed.

Thanks

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Sarah Lawrence
Property Officer
Hunter Valley

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E. SLawrence@ARTC.com.au

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2 Kings Road
Broadmeadow NSW 2292

artc.com.au

From: Sarah Lawrence
Sent: Tuesday, 21 April 2020 9:15 PM
To: John Cannon <John.Cannon@daracon.com.au>
Subject: In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms (E-1679)

Hi John,

Please find attached *Agreement in Principle* for proposed Sediment Basin Upgrade Works at Ardglen.

We look forward to receiving documentation in relation to the construction of facilities in due course.

Also note to provide the ARTC reference number (located in the top right hand corner) on your application to avoid further fees and charges. An Invoice will be forwarded to you for payment of this AiP.

Thanks

Sarah

Sarah Lawrence
Property Officer
Hunter Valley

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Broadmeadow NSW 2292

artc.com.au

ARTC

2 Kings Road
Broadmeadow, NSW, 2292
Locked Bag 1
Broadmeadow, NSW, 2292

P. 02 4978 9800
E. info@artc.com.au
W. artc.com.au

Mr John Cannon
Divisional Manager – Construction Materials
Daracon Group
20 Kullara Close
Beresfield NSW 2322

Email: john.cannon@daracon.com.au

21 April 2020

Dear John

In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms

I refer to your application and advise that "agreement in principle" for the location and design can only be granted by ARTC at this stage.

Therefore, before ARTC can grant approval for the **construction/installation** and issue a Licence for the infrastructure the following is required for review:

1. Final design plans complying with ARTC Standards, Australian Standards, Heavy Haul Infrastructure Guidelines and any reasonable requirements of ARTC.
2. Current Public Liability Insurance
3. Safe Work Method Statement – relating to working in the rail corridor
4. Evidence of Accreditation for personnel working in rail corridor – WHS Induction and Track Safety Awareness/One Track
5. Evidence of RSW Accreditation of Protection Officer
6. ARTC Services Search
7. Transfer water from the quarry extension area into the in-pit sump at a time as to not coincide with the peak flow from the catchment; as per Northrop recommendation Ref: 140154
8. If runoff from the extension area does become directly connected to the in-pit sump, operate the in pit sump at its operating capacity via the controlled release of water when it is above this level, as per Northrop recommendation Ref: 140154
9. Quarry Owner / Quarry's contractors is responsible to repair/replace any of the ARTC Boundary fence if damaged as result of the works.
10. No material is to encroach on ARTC Property.

I look forward to receiving the associated documentation required for the approval of construction of the infrastructure within 6 **months** of the date of this correspondence. For the avoidance of doubt, should ARTC not receive the abovementioned documentation during the specified timeframe this "In Principle Agreement" will be withdrawn.

ARTC

If you have any questions in relation to the application process please feel free to contact the undersigned.

Yours faithfully

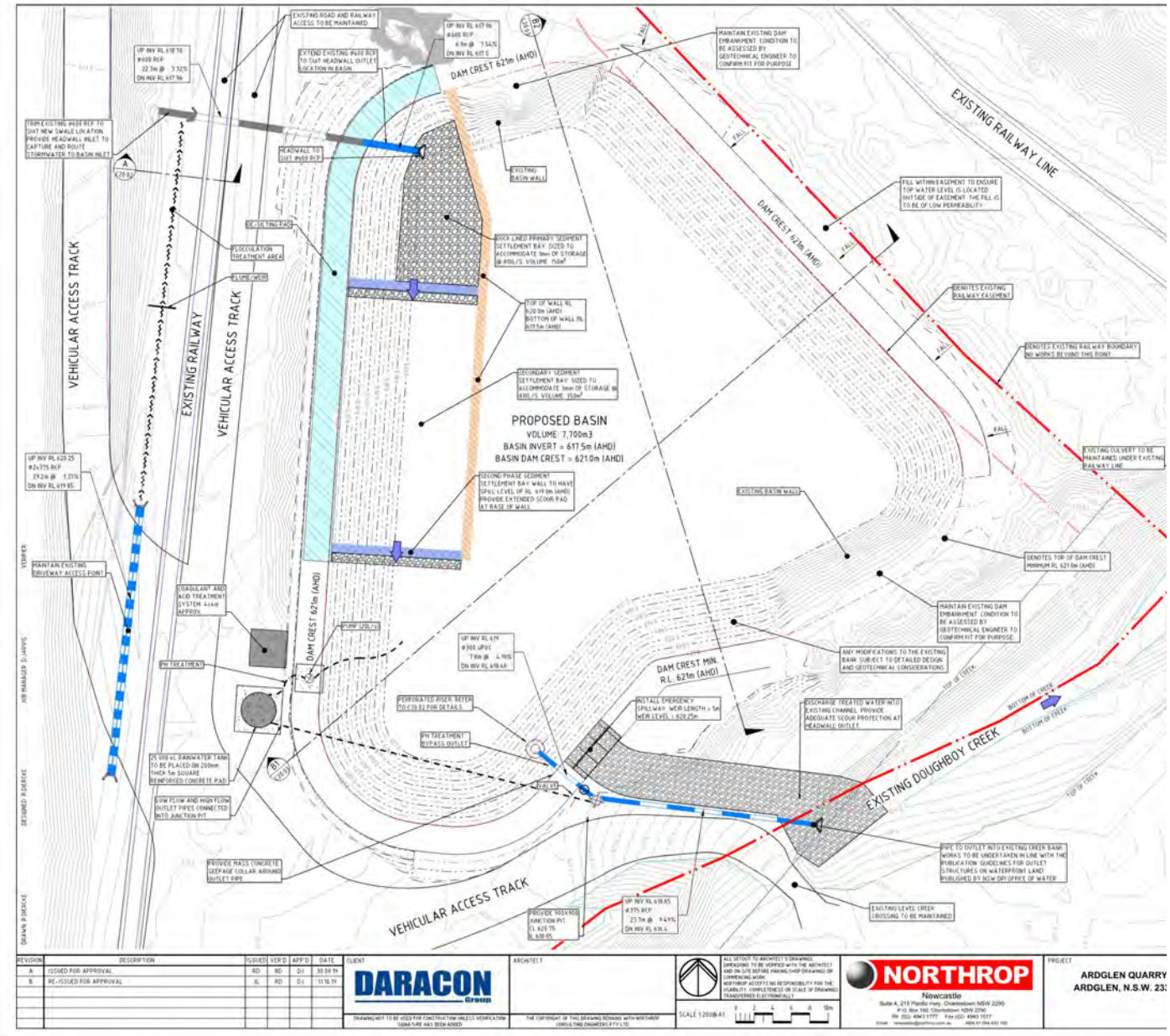
Sarah Lawrence
Property Officer – Hunter Valley

Chris Bonomini

From: John Cannon <John.Cannon@daracon.com.au>
Sent: Friday, 17 February 2023 2:31 PM
To: HV Property Services
Cc: Luke Robinson; John Brown; Mark Robinson; BAR Ardglen Quarry
Subject: RE: Extension - In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms (E-1679) - Additional Extension Request.
Attachments: In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms E-1679.pdf; FW: Extension - In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms (E-1679); NL140154 _CIVIL_BASIN_REDESIGN.pdf

Hi Sarah,

These works are now ready to go ahead – I would be grateful if we could have a meeting to discuss the works and clarify the requirements we need to get to ARTC. The works are not within the boundary of the ARTC Corridor at all so in my head do not require ARTC Sign off or compliance to ARTC Standards, ARTC Accredited personnel, Protection Officer, ARTC Service Search as such.



Be great to touch base again and refresh and confirm on what ARTC would like to see from us.

Yours faithfully,

John Cannon | Divisional Manager Construction Materials
20 Kullara Close | PO Box 401 Beresfield NSW 2322
p: 02 4974 9200 m: 0429 930 458
John.Cannon@daracon.com.au | www.daracon.com.au

From: John Cannon
Sent: Monday, 14 March 2022 4:49 PM
To: HV Property Services <HVPropertyServices@ARTC.com.au>
Cc: Luke Robinson <Luke.Robinson@daracon.com.au>; John Brown <JBrown@artc.com.au>; Mark Robinson <MRobinson@ARTC.com.au>
Subject: RE: Extension - In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms (E-1679) - Additional Extension Request.

Sarah,

Further to previous correspondence we are still progressing planning and preparation works to undertake the upgrades at Ardglen Quarry.

All water monitoring bores have been installed and are now monitored so this will enable works to commence on the extension area in the next 12 months.

If we could please get a further extension to the Agreement in Principle it would be appreciated.

If you have any questions please do not hesitate to contact me.

Yours faithfully,

John Cannon | Divisional Manager Construction Materials
20 Kullara Close | PO Box 401 Beresfield NSW 2322
p: 02 4974 9200 m: 0429 930 458
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Afternoon,

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Thanks

Sarah

Sarah Lawrence
Property Officer
Hunter Valley

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Subject: In Principle Agreement – Ardglen Quarry – Sediment Basin Upgrade Works – 363.700kms (E-1679)

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We look forward to receiving documentation in relation to the construction of facilities in due course.

Also note to provide the ARTC reference number (located in the top right hand corner) on your application to avoid further fees and charges. An Invoice will be forwarded to you for payment of this AiP.

Thanks

Sarah

Sarah Lawrence
Property Officer
Hunter Valley

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2 Kings Road
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LICENCE

Crown Land Management Act 2016 - Section 2.18

File Reference	Licence Number
16/07878	RN 638192

MINISTER

The Minister administering the Crown Land Management Act 2016, (hereinafter referred to as the Minister)

grants to

LICENSEE name & address

BUTTAI GRAVEL PTY LIMITED
20 Kullara Cl
BERESFIELD NSW 2322
(hereinafter referred to as the Holder)

a Licence pursuant to the provisions of Section 2.18 of the Crown Land Management Act 2016 in respect of the land described hereunder in Parts 1 and 2 and subject to the terms and conditions contained in the following pages and Schedule 1, and in any additional Schedules or documents referred to in Schedule 1.

EXECUTION

Dated this 8th day of May 2023

THE MINISTER

K Carr
as delegate of the Minister administering the Crown Land Management Act 2016

Kerrelle Carr Supervisor Tenure Operations - Licences
name and position

THE HOLDER

In consideration of the grant of this Licence I / We agree to be bound by the terms, conditions and provisions of the Licence.
Certified on behalf of the corporation named below by the authorised person(s) whose signature(s) appear(s) below pursuant to the authority specified.

Corporation: BUTTAI GRAVEL PTY LIMITED
Authority: Section 127 of the Corporation Act 2001

Signature of authorised person:
Name of authorised person: ADAM JOHN KELLY
Office held: DIRECTOR
Signature of authorised person:
Name of authorised person: David Dickson
Office held: SECRETARY

DESCRIPTION OF LANDS

PART 1

Local Govt. Area	LIVERPOOL PLAINS			
County	BUCKLAND			
Parish	TEMI			
Locality	ARDGLEN			
Status:		**Lot**	**Section**	**DP**
Crown land located near		1		DP: 1001734

PART 2

Plan/diagram: Schedule 3	Area: 250m2

TEXT DESCRIPTION: Part of Crown Waterway being DoughBoy Hollow Creek (Reserve 56146 from Sale or Lease Generally, notified 11 May 1923 and Reserve 1011268 for Future Public Requirements, notified 3 February 2006) adjacent to Lot 1 DP 1001734 as shown by red edge in Schedule 3 Diagram.

******** **End of Description of Land** ********

1. Definitions

In this Licence unless the contrary intention appears:

"Act" means the Crown Land Management Act 2016

"Commencement Date" means the date on which this Licence is stated to commence.

"Holder" means the person described as the Holder on the front page of this Licence.

"Improvements" means all buildings structures facilities works and pontoons situated on or in the land or which under the terms of this Licence are to be situated on or in the land.

"Land" means the land specified in Parts 1 and 2 of this Licence under the heading "DESCRIPTION OF LAND" (including any submerged land and waterway) or where the context so admits any part thereof.

"Licence" means this Licence including the Schedules and Annexures hereto.

"Minister" means the Minister referred to on the front page of this Licence as the Minister and where not repugnant to the context includes the Successors of Minister and the servants and agents of the Minister.

"Pontoon" means a floating landing stage.

"Premises" means the Land the Improvements and the Holder's Plant and where the context so permits any part of the foregoing.

"RA" means the Roads Act 1993.

"Rent" means the rent provided for in this Licence.

"Term" means the period commencing on the "Commencement Date" and terminating on the "Termination Date".

"Termination Date" means the date on which the Licence is revoked or ceases to have effect in accordance with the provision of this Licence. (6.002)

2. Plurals and Genders

(a) Words importing the singular number shall include the plural and vice versa.

(b) Words importing the masculine gender shall include the feminine or neuter and vice versa.

(c) Any reference to a person shall be deemed to include a reference to a corporation and vice versa. (6.004)

3. Contra Proferentum

No rules of construction shall apply to the disadvantage of a party on the basis that that party was responsible for the preparation of this Licence or any part of it. (6.005)

4. Headings Plans and Code Numbers

(a) Headings (and subheadings within clauses) marginal notes the matter appearing in Column 1 of Schedule 1 and the Table of Contents have been inserted for guidance only and shall be deemed not to form any part of the Licence.

(b) Any plan or diagram attached or annexed to this licence, which purports to depict the land shall be deemed not to form any part of the licence unless that plan or diagram is referred to in PART 2 in the DESCRIPTION OF LAND.

(c) The code number appearing at the end of each clause of the Licence shall be deemed not to form part of the Licence. (6.006)

5. Clauses and Schedules

References to Clauses Parts and Schedules are references to clauses parts and schedules of this Licence. (6.007)

6. Statutes

(a) A reference to a statute statutory instrument or ordinance includes amendments to that statute statutory instrument or ordinance whether by subsequent statutes statutory instruments or ordinances or otherwise and any statute statutory instrument or ordinance passed in substitution for the statute statutory instrument or ordinance referred to or incorporating any of its provisions.

(b) A reference to a statute includes a reference to any regulation made thereunder. (6.008)

7. Joint and Several Covenants

Any covenant or agreement on the part of two or more persons shall be deemed to bind them jointly and severally. (6.009)

8. Severability

Any provision of this Licence which is prohibited or unenforceable in any jurisdiction shall as to such jurisdiction be ineffective to the extent of such prohibition or inability to enforce without invalidating the remaining provisions of such provision in any other jurisdiction. (6.010)

9. Applicable Law

This Licence shall be construed and interpreted in accordance with the law of New South Wales. (6.011)

10. Licence a "Holding" for purposes of the Act

The Holder acknowledges that this Licence is a Holding within the meaning of the Act and the Holder is a Holder within the meaning of the Act and the provisions of the Act relating to holdings and holders apply to this Licence and the Holder. (6.012)

11. Performance of Functions etc

Any power authority duty or function conferred or imposed upon the Minister under this Licence may be exercised or performed by any person authorised by the Minister. (6.013)

12. Authorised Officer

Where under this Licence the Minister is empowered to authorise any person to perform or exercise any power authority duty or function under this Licence such person shall be validly authorised if he is authorised to exercise any power authority duty or function conferred by any Licence granted by the Minister or any Licence of a specified type or any Licence within a specified locality. (6.014)

13. Minister as Public Authority

The Minister and Holder acknowledge that nothing in this Licence can in any way restrict or otherwise affect the Minister's unfettered discretion as to the use of the Minister's statutory powers as a public authority. (6.015)

14. Approval by the Minister

(a) In any case where pursuant to this Licence the doing or executing of any act matter or thing by the Holder is dependent upon the approval or consent of the Minister such approval or consent shall not be effective unless given in writing and may be given or withheld by the Minister in the Minister's absolute discretion and may be given subject to such conditions as the Minister may determine unless otherwise herein provided.

(b) The Holder expressly agrees that any failure to comply with a condition imposed by the Minister will constitute a failure by the Holder to comply with a condition of this Licence. (6.016)

15. Opinion of the Minister

Any opinion to be formed by the Minister for the purposes of this Licence may be formed by the Minister on such grounds and material as the Minister determines to be sufficient after consultation if the Minister deems it necessary with any New South Wales Government Department or other public authority Standards Australia or any other body whose objects and functions are relevant. In forming any such opinion the Minister shall be deemed to be exercising merely administrative functions. (6.017)

16. Holder to pay Cost of Work

Whenever the Holder is required in this Licence to do or effect any act matter or thing then the doing of such act matter or thing shall unless this Licence otherwise provides be at the sole risk cost and expense of the Holder. (6.018)

17. Notices

(a) All notices or communications required to be or which may be given or served by the Minister to or upon the Holder under this Licence or which may be convenient to be given or served in connection with this Licence shall be in writing and shall be sufficiently given or served if left at or sent by ordinary post addressed to the Holder at his address specified in Column 2 of Item 1 of Schedule 1 or at the Premises or at such other place as notified in writing by the Holder to the Minister.

(b) All notices or communications required to be or which may be given or served by the Holder to or upon the Minister under this Licence or which may be convenient to be given or served in connection with this Licence shall be in writing and shall be sufficiently given or served if signed by the Holder or if the Holder is a corporation by the Secretary of the Holder or the person acting as such for the time being and if left at or sent by ordinary post addressed to the person specified in Column 2 of Item 2 of Schedule 1.

(c) Any notice or communication given or served by post shall be deemed to have been duly given or served at the time when it would in the ordinary course be delivered. (6.019)

18. Manner of Payment of Rent and Other Moneys

The rent and other moneys payable in accordance with this Licence shall be paid to the Minister at the address specified in Column 2 of Item 3 of Schedule 1 or to such other person or at such other address as the Minister may from time to time direct by notice in writing served on the Holder. (6.020)

19. Time to be of the Essence

The Minister and the Holder expressly agree that where in any provision of this Licence the Holder is given or allowed a specified time within which to undertake or do any act or thing or any power is conferred or any event occurs after the lapsing of a specified time time shall be the essence of the contract in that regard. (6.021)

20. Whole agreement

The conditions covenants and provisions contained in the Licence expressly or by statutory implication and any provision of the Act which apply to this Licence cover and comprise the whole of the agreement between the parties hereto and it is expressly agreed and declared that no further or other covenants or provisions whether in respect of the Premises or otherwise shall be deemed to be implied herein or to arise between the parties hereto by reason of the invitation by the Minister to the Holder to submit a proposal for the redevelopment of the Premises or any document issued by the Minister prior thereto or by reason of the subsequent negotiations between the parties hereto or by reason or any promise representation warranty or undertaking given or made by any party hereto to another on or prior to the execution hereof or during the Term and the existence of any such implication or collateral or other agreement is hereby negatived. (6.022)

21. Permitted Use

(a) This Licence confers on the Holder a right to occupy the Premises for the purpose specified or referred to in Column 2 of Item 4 in Schedule 1.

(b) The Holder will not use the Premises or allow them to be used for any purpose other than the purpose specified in Column 2 of Item 4 in Schedule 1. (6.023)

22. No Exclusive Possession

The Holder acknowledges that this licence does not confer exclusive Possession of the Premises upon the Holder. (6.023A)

23. Holder not to Commit Nuisance etc

The Holder will not at any time during the Term of this Licence:

(a) carry on or permit to be carried on at the premises any noxious nuisance or offensive trade business.

(b) do or permit to be carried on at the premises any act matter or thing which results in nuisance damage or disturbance to the Minister or owners or occupiers of adjoining or neighbouring lands or buildings.

(c) use the premises for any illegal activity. (6.024)

24. No Residence on Premises

The Holder will not reside or permit any other person to reside on the Premises other than as may be specified or referred to in Column 2 of Item 4A of Schedule 1. (6.025)

25. Commencement and Revocation of Licence

(a) This Licence shall commence on the date specified or referred to in Column 2 of Item 5 of Schedule 1 and shall continue in force until it is revoked in accordance with the provisions of this clause.

(b) The Minister may in his absolute discretion revoke this Licence at any time by serving on the Holder a notice in writing revoking this Licence.

(c) A revocation made under this clause shall take effect on the date specified in the notice or where no date is specified in the notice on the date on which the notice is served on the Holder.

(d) Except as may be expressly provided for in this Licence the Holder acknowledges and agrees that the Holder will not be entitled to any compensation costs or damages in respect of the revocation of this Licence. (6.027)

26. Licence Granted subject to Aboriginal Land Claim

(a) The Holder is granted this licence subject to a possible Aboriginal Land Claim over this land provided in s36 of the Aboriginal Land Rights Act 1983.

(b) Notwithstanding any other provision of this Licence, this Licence shall terminate or require alteration in the event that the Minister determines that the land is claimable Crown land or a Court determines that the land is claimable Crown land.

(c) Except as may be expressly provided for in this Licence the Holder acknowledges and agrees that the Holder will not be entitled to any compensation costs or damages in respect of the termination or alteration of this Licence by operation of this clause. (6.029C)

27. Transfer upon grant of Aboriginal Land Agreement

(a) Despite anything else in this Licence, the Holder agrees to and approves of the transfer of this Licence as it applies to any or all of this Site (which for the purposes of this clause, includes any access routes associated with use of the Site) without any further notice if an Aboriginal Land Agreement (ALA) within the meaning of section 36AA(1) of the Aboriginal Land Rights Act 1983, affecting the Site or part thereof, provides for the transfer of this Licence as it applies to any or all of this Site.

(b) Except as may be expressly provided for in this Licence, the Holder acknowledges and agrees that the Holder will not be entitled to any compensation, costs or damages in respect of the transfer of this Licence as it applies to any or all of this Site by operation of this clause.

(c) The Holder agrees that the date of transfer under this clause is the date provided for in the ALA, or if it is not so provided, the date the ALA is entered into.

(d) The Minister may give notice to the Holder of the transfer of this Licence as it applies to any or all of this Site under this clause but is not required to do so to effect the transfer. (6.029F)

28. Payment of Rent (CPI)

(a) For the purposes of this clause:

"*Initial Rent*" means the rent specified in Column 2 of Item 11 of Schedule 1.

"*Consumer Price Index number*" has the same meaning given to that term in the Act.

"*CPI Review Date*" means each anniversary date of the Commencement Date.

"*CPI Review Period*" means the period between each CPI Review Date.

"*Due Date*" means each anniversary date of the Commencement Date.

"*Market Rent Review Date*" means the date of the expiration of each period of years as specified in Column 2 of Item 12 of Schedule 1 calculated from the Commencement Date.

"*Market Rent Review Period*" means the period between each Market Rent Review Date.

(b) The Holder covenants with the Minister that the Holder will during the whole of the Term pay to the Minister in accordance with the provisions of this clause without demand free of exchange and without deduction whatsoever the rent hereinafter provided.

(c) The Holder will pay to the Minister on the commencement Date the Initial Rent and thereafter shall pay on each Due Date rent in advance adjusted as hereinafter provided.

(d) (i) On the CPI Review Date the rent shall be adjusted in accordance with the following formula:

$$R = B \times \frac{C}{D}$$

where:

R represents the adjusted rent;

B represents the annual rent payable during the year preceding the CPI Review Date;

C represents the Consumer Price Index number for the last quarter for which such a number was published before the CPI Review Date; and

D represents the Consumer Price Index number for the last quarter for which such a number was published before the immediately preceding CPI Review Date (or if there is no immediately preceding CPI Review Date then the Commencement Date).

(ii) Any rent adjusted under this subclause shall be adjusted to the nearest whole dollar.

(e) In addition to the indexation review provided for in subclause (d) on the first Market Rent Review Date after commencement and thereafter on each Market Rent Review Date the rent may be redetermined by the Minister pursuant to the provisions of Sections 6.5 and 6.7 of the Act.

(f) A redetermination of rent for the purposes of subclause (e) shall be deemed to have been made on the Market Rent Review Date if it is made at any time within the period of six months before the market Rent Review Date.

(g) Where the Minister does not redetermine the rent as provided for in subclause (e) he may redetermine the rent pursuant to the provisions of Sections 6.5 and 6.7 of the Act at any time prior to the next Market Rent Review Date and no succeeding Market Rent Review Date shall be postponed by reason of the operation of this subclause.

(h) Where the Minister does not redetermine the rent on the First Market Rent Review Date or a Market Rent Review Date as provided for in subclause (e) the Holder may by notice in writing served on the Minister require that the Minister redetermine the rent pursuant to the provisions of Sections 6.5 and 6.7 of the Act. Where the Holder requires the Minister to redetermine the rent under this subclause he shall pay on demand the costs of the Minister (or so much of the cost as the Minister may require) in making that determination.

(i) The Holder may object to a redetermination of rent under Section 6.8 of the Act. A redetermination of rent as provided for in subclauses (e) (g) and (h) shall take effect and be due and payable from the date of issue of the notice of redetermination under Section 6.7 of the Act, even if an objection under that Section 6.8 has been lodged. On the completion of the objection process any necessary adjustments shall be made.

(j) A redetermination of rent made before its relevant Market Rent Review Date as provided for in subclause (f) shall take effect from the relevant Market Rent Review Date even if an objection under Section 6.8 of the Act has been lodged. On the completion of the objection process any necessary adjustments shall be made.

(k) The Holder acknowledges that the Minister may make a direction under Section 12.16 of the Act in respect of any rent payable under this Licence. (6.031)

29. Continuing Obligation

The obligation of the Holder to pay the Rent shall be a continuing one during the term of this Licence and shall not abate in whole or in part or be affected by any cause whatsoever. (6.037)

30. Holder to Pay Rates etc

The Holder will when the same become due for payment pay all (or in the first and last year of the term of this Licence the appropriate proportionate part) rates taxes (including Land Tax) assessments duties charges and fees whether municipal local government parliamentary or otherwise which are at any time during the currency of this Licence lawfully charged upon imposed or levied in respect of the Premises or on the Minister or the Holder on account thereof and will if required by the Minister produce to the Minister the receipts for such payments within ten business days after the respective due dates for payment AND in case such rates taxes duties and fees so covenanted to be paid by the Holder are not paid when the same shall become due the Minister may if the Minister thinks fit pay the same and any such sum or sums so paid may be recovered by the Minister as if such sums were rent in arrears. (6.039)

31. Holder to Pay Other Charges

The Holder will pay all other fees charges and impositions which are at any time during the Term payable in respect of the Premises or on account of the use and occupation of the Premises by the Holder. (6.040)

32. Goods and Services Tax

(a) Definitions

In this clause the expressions "GST", "supply", and "taxable supply" have the meanings given to those expressions in the A New Tax System (Goods and Services Tax) Act 1999.

(b) Amounts GST Exclusive

With the exception of any amount payable under this clause, unless otherwise expressly stated all amounts stated to be payable under this Licence are exclusive of GST.

(c) Responsibility for GST

(i) Despite any other provision in this Licence, if GST is imposed on any supply made under this Licence, the recipient must pay to the supplier an amount equal to the GST payable on the taxable supply.

(ii) The recipient must pay the amount referred to in subclause (c)(i) in addition to and at the time payment for the taxable supply is required to be made under this Licence.

(d) Valuer/Umpire to return GST Exclusive Value

Any valuer or umpire returning a valuation must return a GST exclusive market value for it in any case where the valuation is for the purpose of determining a supply value to which GST is to be added under this Licence. (6.040A)

33. Holder to Pay for Services

The Holder will as and when the same become due for payment pay to the Minister or to any other person or body authorised to supply the same all proper charges for gas electricity water or other services supplied to or consumed in or on the Premises and will also pay all charges in respect of any telephone services connected to the Premises. (6.041)

34. Holder not to Impose Liability on Minister

Subject to any other provision of this Licence the Holder will not without the written consent of the Minister by any act matter or deed or by failure or omission cause or permit to be imposed on the Minister any liability of the Holder under or by virtue of this Licence. (6.042)

35. Holder not to undertake development without consent notwithstanding any other provision of this Licence

The Holder will not undertake any development within the meaning of the Environmental Planning and Assessment Act 1979 contrary to the provisions of that Act or in breach of any restriction condition or prohibition imposed by an Environmental Planning Instrument or condition of a development consent. (6.043)

36. Development Consent

The Holder will not undertake any activity on or within the Premises for which consent is required under the Environmental Planning and Assessment Act 1979 or any Instrument made thereunder without first obtaining such consent and in accordance with any condition or requirement of that consent. (6.044)

37. Compliance with Statutes

(a) The Holder will comply with the requirements of all statutes regulations or by-laws and requirements of all relevant public and local authorities in so far as they apply in relation to the use and occupation of the premises.

(b) The Holder will forthwith on being served with a notice by the Minister comply with any notice or direction served on the Minister by a competent authority relating to the destruction of noxious animals or plants or pests or the carrying out of repairs alterations or works on or to the Premises. (6.045)

38. Holder not to deal with Licence or part with possession of Premises

Subject to any other provision of this Licence the Holder will not during the Term of this Licence transfer or create any interest in the Licence or authorise or permit any person to occupy the Premises. (6.047)

39. Revocation on the Request of the Holder

The Holder may at any time by notice served on the Minister request that this Licence be revoked and the Minister if he is satisfied that the Holder has complied with the conditions and provisions of this Licence or the Act will as soon as practicable comply with such a request. (6.051)

40. Interest on Overdue Money

The Holder shall pay interest on any money due and payable under this Licence to the Minister at the rate prescribed from time to time under the provisions of Section 12.12 of the Act and any such interest shall for the purposes of this Licence be deemed to be Rent in arrears. (6.052)

41. Failure to pay money or Undertake Works

(a) Where under this Licence the Holder is required to pay any money to a third party and neglects to do so for a period of 14 days after the money became due and payable it shall be lawful for but not obligatory upon the Minister (and without prejudice to any rights and powers arising from such default) to pay such money as if it were the Holder and the Holder will reimburse the Minister in respect of any such payments on demand.

(b) Where under this Licence the Holder is required to do or cause to be done any work or thing and the Holder neglects to do the work or thing for a period of 14 days after that work or thing was due or required to be done it shall be lawful for but not obligatory upon the Minister (and without prejudice to any rights and powers arising from such default) to do or effect such work or thing as if the Minister were the Holder and for that purpose the Minister the Minister's officers agents contractors and workmen may enter upon the whole or any part of the Premises and there remain for the purposes of doing or effecting any such work or thing and the Holder will reimburse the Minister for the cost of the doing or effecting the work or thing on demand. For the purposes of this clause the word cost shall include any sums paid for any insurance indemnities under the laws relating to workers compensation.

(c) The Holder expressly agrees that any money or cost payable to the Minister under this clause shall constitute a debt owed by the Holder to the Minister and may be recovered by the Minister accordingly.

(d) Where the Premises has a common boundary with other land owned leased or held by the Holder (hereinafter called the "other land"). The Holder irrevocably grants to the Minister the Minister's officers agents contractors and workmen a licence to enter upon the said other land for the purpose of gaining access to the Premises or for the purpose of undertaking any work or thing authorised permitted or contemplated by this Clause.

In exercising any power conferred by this subclause the Minister the Minister's servants employees and agents will not be liable for any reasonable damage suffered or occasioned to the other land or anything constructed thereon.

(e) The Holder expressly agrees that the provisions of this clause shall continue after the expiration or sooner determination of this Licence and the Minister may make any payment or effect any work or thing authorised by this clause after the expiration or sooner determination of this Licence as if such expiration or sooner determination had not taken place. (6.053)

42. Release of the Minister from Liability

(a) For the purposes of this clause the term Minister shall include Her Majesty The Queen Her Heirs and Successors the State of New South Wales the Minister and the agents servants employees and contractors of the Minister Her Majesty Her Majesty's Heirs and Successors the State of New South Wales and the Minister.

(b) The holder agrees to occupy use and keep the Premises at the risk of the Holder and hereby releases to the full extent permitted by law the Minister from all claims and demands of every kind resulting from any accident damage or injury occurring therein and the Holder EXPRESSLY AGREES that the Minister shall have no responsibility or liability for any loss of or damage to fixtures and/or personal property of the Holder or any agent or servant of the Holder or of any member of the public whilst in or upon the Premises.

(c) The Holder expressly agrees that the obligations of the Holder under this clause shall continue after the expiration or other determination of this Licence in respect of any act deed matter or thing happening before such expiration or determination. (6.055)

43. Indemnities

(a) For the purposes of this clause the term Minister shall include Her Majesty the Queen Her Heirs and Successors the State of New South Wales the Minister and the agents servants employees and contractors of Her Majesty Her Majesty's Heirs and Successors the State of New South Wales and the Minister.

(b) The Holder agrees that the Holder will indemnify and keep indemnified the Minister from and against all actions suits claims demands proceedings losses damages compensation sums of money costs legal costs charges and expenses whatsoever to which the Minister shall or may be or become liable for or in respect of the Premises or the occupation operation and use of the Premises or for or in respect of all losses damages accidents or injuries of whatsoever nature or kind and howsoever sustained or occasioned (and whether to any property or to any person or resulting in the destruction of any property or the death of any person or not) at or upon the Premises or originating on the Premises although occurring or sustained outside the same except to the extent that any such claims and demands arise wholly from the negligence or wilful act or omission on the part of the Minister.

(c) Notwithstanding that any of such actions suits claims demands proceedings losses damages compensation sums of money costs charges and expenses shall have resulted from any act or thing which the Holder may be authorised or obliged to do under these presents AND notwithstanding that at any time waiver or other indulgence had been given to the Holder in respect of any obligation of the Holder under this Licence and without limiting the generality of the preceding subclause (b) the Holder agrees that the Holder will indemnify and keep indemnified the Minister from and against all actions claims demands proceedings loss damage costs and expenses incurred by the Minister or for which the Minister may become liable in respect of or arising from:

(i) the negligent use misuse waste or abuse by the Holder or any servant agent tenant sub-tenant or occupier of the Holder or any person claiming through or under the Holder of the gas electricity water sewerage or other services and facilities of the Premises or arising from any faulty fitting or fixture in the Premises;

(ii) overflow or leakage of water (including rain water) in or from the Premises or having origin within the Premises or caused or contributed to by any act or omission on the part of the Holder its servants agents tenants occupiers or other persons claiming through or under the Holder;

(iii) loss damage or injury from any cause whatsoever to property or persons within or outside the Premises and whether lawfully there or not caused or contributed to by the use of the Premises by the Holder or any servant agent tenant sub-tenant occupier or other person claiming through or under the Holder or caused or contributed to by any act omission neglect breach or default of the Holder or any person aforesaid within or on the Premises; and

(iv) loss damage or injury to property or persons within or without the Premises and whether lawfully there or not caused by the malfunction or failure to function of air conditioning or elevators or other machinery installed in or on the Premises.

(d) The Holder expressly agrees that the obligations of the Holder under this clause shall continue after the expiration or other determination of this Licence in respect of any act deed matter or thing happening before such expiration or determination. (6.056)

44. Insurance - Public Risk

The Holder will (without in any way limiting the liability of the Holder under any other provision of this Licence) forthwith take out and thereafter during the Term keep current a public risk insurance policy for the amount specified in Column 2 of Item 19 of Schedule 1 for any one claim (or such other reasonable amount as the Minister may from time to time specify in writing to the Holder) whereby the Minister shall during the continuance of this Licence be indemnified against claims and demands of every kind arising from death or bodily injury or damage to property arising out of the Holder's use of the Premises. (6.057)

45. Provisions Re Policies

(a) The following provisions apply to all policies of insurance required to be effected by the Holder under this Licence:

(i) Where the Minister serves a notice on the Holder directing the Holder to enter into a policy with an insurer approved by the Minister the policy is to be entered into with an insurer approved by the Minister. The Minister shall specify a list of approved insurers in any notice served under this paragraph. Where the Minister does not serve a notice as provided for in this paragraph policies of insurance shall be entered into with an insurer carrying on business in Australia.

(ii) Where a provision of this Licence specifies an amount for which a policy is to be entered into for (or makes provision for such an amount to be specified) then the policy shall be entered into for the amount specified. Where a provision does not specify the amount for which a policy is to be entered into for the policy shall be entered into for an amount sufficient to cover the risks likely to be encountered having regard to the type of activity undertaken on the Premises and the nature of the Premises.

(iii) All policies are to contain conditions and exclusions commonly effected in relation to the type of activity undertaken on the Premises and the nature of the Premises provided that the Minister may by notice served on the Holder direct the Holder to enter into a policy containing specified provisions or which does not contain specified provisions or exclusions and the Holder shall use his best endeavours to comply with the direction.

(iv) All policies are to be taken out in the names of the Minister and the Holder for their respective rights and interests and in the name of such other parties having an insurable interest as the Minister may require.

(v) Duplicate or certified copies of the policies and all renewal certificates and endorsement slips are to be lodged by the Holder with the Minister if required by the Minister.

(vi) All premiums payable in respect of policies and renewals of policies are to be paid punctually by the Holder and the receipt for each premium payable in respect of each policy (or other proof of payment to the Minister's satisfaction) is to be produced by the Holder to the Minister at the request of the Minister.

(vii) Where the Minister has served a notice on the Holder under paragraph (i) the Holder will use all reasonable endeavours to ensure that the insurer which issues a policy advises the Minister of any failure by the Holder to renew any policy or pay any premium in respect thereof.

(viii) The Holder will not at any time during the Term do or bring upon the Premises anything whereby any insurance relating to the Premises against damage by fire and other risks may be rendered void or voidable. If the Holder does or brings anything upon the Premises whereby the premium on the insurance shall be liable to be increased the Holder will obtain insurance cover for the increased risk and pay all additional premiums (if any) required to be paid.

(ix) The Holder will use all reasonable endeavours to ensure that full true and particular information is given to the insurer with which the insurances are effected of all matters and things the non-disclosure of which might in any way prejudice or affect any policy of insurance or the payment of all or any moneys thereunder.

(b) The Minister in his own name or as the attorney of the Holder in the name of the Holder shall be entitled to institute all proceedings against any insurer which issues a policy of insurance required by this Licence to recover from it any amount for loss damage or injury or other money payable under any indemnity in favour of the Minister. The Holder hereby appoints the Minister the attorney of the Holder for the purpose as aforesaid.

(c) The Holder expressly agrees that the provisions of subclause (b) continue in force after the Termination Date. (6.065)

46. Construction Of Improvements

(a) For the purposes of this clause "Improvement" means any building structure facility work or pontoon.

(b) The Holder may construct effect erect or undertake any of the Improvements specified or referred to in Column 2 of Item 20 of Schedule 1.

(c) Any Improvements constructed erected effected or undertaken shall be constructed erected effected or undertaken in accordance with the plans conditions and specifications contained or referred to in Column 2 of Item 21 of Schedule 1.

(d) The Holder will not construct effect erect or undertake any Improvements on the Premises other than the Improvements specified or referred to in Column 2 of Item 20 of Schedule 1 or which may be authorised or required under any other provision of this Licence. (6.068)

47. Improvements - No demolition without Consent

(a) For the purposes of this clause "Improvement" means any building structure facility work or pontoon.

(b) The Holder will not demolish destroy remove take away or pull down any Improvements on the Premises without the written consent of the Minister. (6.070)

48. Ownership of Improvements the Act

The Holder acknowledges that the provisions of section 7.16 of the Act apply. (6.074)

49. Ownership of Improvements

(a) For the purposes of this clause "Improvement" means any building structure facility work or pontoon.

(b) The Holder expressly acknowledges that any Improvement constructed erected effected or undertaken on the Premises during the Term shall forthwith become the property of the Minister and the Holder will not be entitled to any compensation in respect thereof. (6.075)

50. General Requirement to repair

Without prejudice to the specific obligations contained in this Licence the Holder will to the satisfaction of the Minister at all times during the Term keep all Improvements now erected or hereafter to be erected on the Land in good repair and properly maintained in all respects. (6.083)

51. Premises to be kept in clean and tidy condition

The Holder will at all times during the Term keep the Premises in a clean and tidy condition and will (subject to any other provision of this Licence) on the Termination Date leave the Premises in a clean and tidy condition. (6.088)

52. Holder May Repair Improvements

(a) For the purpose of this clause "Repair" means to replace part of an Improvement with material of a similar type and size but not so as to enlarge or significantly alter the appearance or structure of the Improvement.

(b) The Holder may from time to time at the Holder's own expense Repair the Improvement.

(c) The Holder shall not undertake any work upon an Improvement which does not involve the painting of the Improvement or is not a Repair as defined in this clause. (6.088A)

53. Minister's Right to Enter Inspect and Repair

The Minister and the Minister's agents may at all reasonable times upon giving to the Holder reasonable notice (except in the case of emergency when no notice shall be required) enter upon the Premises and view the state of repair thereof and may serve upon the Holder a notice in writing of any defect (the repair of which is the Holder's obligation hereunder) requiring the Holder within fourteen days to repair the same. (6.090)

54. Breakages

The Holder will immediately at the Holder's expense make good any breakage defect or damage to the Improvements (including but not limited to broken glass) or to any adjoining premises or to any facility or appurtenance of the Minister occasioned by want of care misuse or abuse on the part of the Holder or the Holders sub-tenants or other persons claiming through or under the Holder or otherwise occasioned by any breach or default of the Holder hereunder. (6.096)

55. Carrying out of Alterations

(a) The Holder will not make or undertake any alterations to the Premises unless full and proper plans and specifications shall have been previously submitted to and approved by the Minister in writing and all work in connection thereto shall be carried out by and at the expense of the Holder and to the satisfaction of the Minister using contractors or workmen previously approved by the Minister whose approval shall not be unreasonably withheld and subject thereto the Holder will observe and comply with:

(i) all requirements of the Minister the Local Council and any other statutory authority having jurisdiction over the Premises; and

(ii) the plans and specifications approved by the Minister the Council and any other statutory authority.

(b) The Minister may appoint such consultants as it may reasonably deem proper to inspect any work undertaken by the Holder pursuant to this clause and the Holder will comply with the reasonable directions of such consultants and shall pay the whole of their fees charges and expenses in relation thereto. (6.101)

56. Soil Conservation Act

The Holder will comply with the provisions of the Soil Conservation Act 1938. (6.116)

57. Minister not liable to provide Access

The Holder acknowledges that the Minister is not liable to provide access to the Premises over other land held by the Minister or any other land. (6.121)

58. Exterior Signs

The Holder will not without the consent of the Minister erect paint display affix or exhibit upon the exterior of the Premises or upon the interior of the Premises so as to be visible from the outside of the Premises any signs advertisements lights embellishments names notices or hoarding. (6.189)

59. Holder not to remove Materials

(a) The Holder will not mine remove extract dig up or excavate any sand stone gravel clay loam shell or similar substance or permit any other person to undertake any such action without the prior consent in writing of the Minister and subject to such conditions as the Minister may determine.

(b) Subclause (a) shall not apply to any removal digging up or excavation as may be necessary to construct or undertake any improvement authorised by or under this Licence provided that any such removal digging up or excavation is undertaken in accordance with the requirements of that authority.

(c) The Minister and the Holder expressly agree that a failure by the Holder to comply with any condition imposed pursuant to subclause (a) shall constitute a failure by the Holder to comply with a provision or covenant of this Licence. (6.194)

60. Minister May Grant Licences to Extract Material

(a) The Minister may during the Term grant a Licence to any person over the land specified in Column 2 of Item 66 of Schedule 1 to mine remove extract dig up or excavate any sand stone gravel clay loam shell or similar substances.

(b) Upon the grant of a Licence under this clause the Holder will be entitled to the compensation specified in Column 2 of Item 67 of Schedule 1.

(c) The Holder agrees that he will not hinder interfere or prevent any person authorised under this clause from entering upon the Premises together with such servants employees agents or contractors and equipment as may be necessary in exercising the rights conferred on him by any Licence authorised to be granted under this clause.

(d) The Minister may authorise any person (hereinafter called "the Licencee") who is granted a licence in accordance with the provisions of subclause (a) to construct such gates roads bridges and other works as may be necessary and the Holder will not hinder the Licencee in undertaking such work. (6.195)

61. No liability for Failure of Services

The Minister will not be under any liability for any loss injury or damage sustained by the Holder or any other person at any time as a result of or arising in any way out of the failure of the electricity telephones gas or water supply sewerage drainage or any other services or facilities provided by the Minister or enjoyed by the Holder in conjunction with the Premises or this Licence provided that such failure is not due to the wilful act or wilful omission of the Minister. (6.198)

62. Holder to Yield Up

The Holder will forthwith upon the revocation of this Licence peaceably surrender and yield up to the Minister the Premises in good condition reasonable wear and tear excepted together with all conveniences amenities and appurtenances relating thereto clear and free from rubbish and in good and substantial repair order and condition in every case having regard to the age of what is being surrendered or yielded up. (6.199)

63. No Right to Purchase etc

The Holder expressly acknowledges that the grant of this Licence does not confer a right to purchase the land or to the grant of a lease or to the grant of a further licence. (6.200)

64. Special Conditions

The special conditions specified or referred to in Column 2 of Item 71 of Schedule 1 shall be deemed to be conditions and provisions of this Licence. (6.201)

******** **End of Licence Clauses** ********

Schedule 1

Item	Column 1 (description of variable particulars)	Column 2 (particulars)
1	Holder's Address for service of notices	PO Box 401 BERESFIELD NSW 2322
2	Minister's Address for service of notices	Department of Planning and Environment - Crown Lands PO Box 2185 DANGAR NSW 2309
3	Address for payment of rent	Department of Planning and Environment - Crown Lands PO Box 2155 Dangar NSW 2309
4	Purpose for which Premises may be used	Drainage Channel (1)
4A	No Residence on Premises	No residence
5	Commencement Date	The date specified on page 1 of the Licence being the date of the execution of the Licence.
11	Initial Rent	$566.00
12	Market Rent Review Period	3 years
19	Insurance - Public Risk	$20 Million
20	Improvements that may be constructed	As per SSD MP06_0264 - MOD - 2
21	Improvements - plans conditions and specifications	As per SSD MP06_0264 - MOD - 2
66	Land over which Licence to extract Materials may be granted	Whole
67	Compensation in the event that Licence to extract Material is granted	Nil
71	Special conditions or provisions	Annexed as Schedule 2

******** **End of Schedule 1** ********

Schedule 2

ADDITIONAL TERMS AND CONDITIONS

1. Native Title*

Native title under the *Native Title Act 1993 (Cth) ("**NTA**")* may exist with respect to the Land.
To the extent that the Holder is permitted to do something under this Licence, then the Holder's right to do the activity prevails over any native title rights and interests and the existence of those native title rights do not prevent the Holder from doing the activity.
In such a case, if the act is wholly inconsistent with the continued existence, enjoyment or exercise of the native title rights and interests, that native title continues to exist in its entirety but the rights and interests have no effect in relation to the act.
For some activities under the Licence, you must first obtain the Minister's Consent. In those cases, the Minister may only be able to consent to those acts if that consent can be given in accordance with the *NTA*.
*These notes do not form part of this Licence's terms and conditions.

2. Relics

(a) Unless authorised to do so by an Aboriginal Heritage Impact Permit under Section 90 of the National Parks and Wildlife Act 1974 and subject to observance and compliance with any conditions imposed on the grant of such permit the Holder will not knowingly disturb destroy deface or damage any Aboriginal object or place or other item of archaeological significance within the land and shall take every precaution in drilling excavating or carrying out other operations or works in the Land against any such disturbance destruction defacement or damage.

(b) If the Holder becomes aware of any Aboriginal object, place or other item of archaeological significance within the Land the Holder will within 24 hours notify Heritage NSW of the existence of such object, place or item.

(c) The Holder will not continue any operations or works on the Land likely to interfere with or disturb any object, place or item referred to in subclause (b) without the approval of Heritage NSW and the Holder will observe and comply with all reasonable requirements of Heritage NSW in relation to the carrying out of the operations or works.

3. Artefacts

All fossils artefacts coins articles of value articles of antiquity structure and other remains or things of geological historical or archaeological interest discovered on or under the surface of the Premises shall as between the Minister and the Holder be deemed to be the absolute property of the Minister and the Holder will as authorised by the Minister watch or examine any excavations and the Holder will take every precaution to prevent such articles or things being removed or damaged and shall immediately upon discovery thereof notify the Minister of such discovery and carry out at the reasonable expense of the Holder the Minister's orders as to the delivery up or disposal of such articles or things.

4. Water Quality Testing Results

Supply or provide access upon request to the Department the results of routine water quality testing at discharge location and structural reports on infrastructure impacting Crown waterway.

5. Monitor and Maintain Infrastructure

Monitor and maintain infrastructure to ensure discharge of water into the Crown waterway does not impact stability of bank or bed of Doughboy Hollow Creek.

6. Modifications

Ensure any necessary modifications to streambank do not remove any natural meanders or straighten

channel.

7. **Native Vegetation**

Establish or promote native vegetation within licence area.

8. **Weeds**

Control environmental weeds within the project area, including woody weeds.

Schedule 3

*** * * * * * * * End of Schedule 3 * * * * * * * ***