

Appendix 7 Supplementary Soil and Water Impact Assessment Report

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20 November 2025

Collector Resources Pty Ltd
 By Email

Attention: Chris Eveston

Dear Chris

RE: Request for Additional Information – Barina Quarry (DA1-01-2000 Modification 3)

INTRODUCTION

Collector Resources Pty Ltd (Collector Resources) (the Applicant) owns the Barina Quarry (the Project), located at 2692 Collector Road near Collector NSW, in the Queanbeyan-Palerang Regional Council (QPRC) Local Government Area. The Project is approved under a State Significant Development (SSD) consent by Orders of the Land & Environment Court issued on 28 March 2001 (DA1-01-2000). The approval permits production of up to 300,000 tonnes per annum with a maximum monthly production of 40,000 tonnes of hard rock (quartzite) quarry products including aggregates and sand for the construction industry.

The Applicant is seeking approval for the modification (Mod 3) of DA1-01-2000 to extend the life of the operation for a 15-year period and extend the stockpiling area. Engeny Australia Pty Ltd (Engeny) prepared a Surface Water Impact Assessment (SWIA) for Mod 3 which was submitted with the Barina Quarry Modification Report (prepared by Irwin Environmental Management) to the Department of Planning, Housing, and Infrastructure (DPHI) in July 2025.

Additional information in relation to the SWIA was requested by the DPHI. The information requested is summarised in Table 1. This memorandum provides a response to the additional information requests.

TABLE 1: ADDITIONAL INFORMATION REQUESTED

Item	Requested By	Request	Response Provided in Section
1	NSW Environmental Protection Agency (EPA)	<i>“Water security - Section 6.6.5.1 of the Modification Report states that there is a risk of having insufficient water however dust suppression will be prioritised in the case of a water shortage. In order to address this issue, the EPA recommends that a robust Trigger Action Response Management plan be developed that informs the relationship between dust emissions, management controls and ceasing operations.”</i>	Item 1 – Dust Suppression Trigger Action Response Plan.
2	NSW EPA	<i>“Classification of water - Section 6.6.3.2 of the Modification Report states that there are three proposed discharge points on proposed Dam 1, Dam 6 and Dam 9 and outlines consideration of NSW Water Quality Objectives (NSW WQO) Australian and New Zealand Guidelines for fresh and Marine Water Quality (ANZG 2018) and appears to adopt 50mg/L as a total suspended solids discharge criteria. The EPA considers that 50mg/L is not an appropriate discharge criterion as any discharge from the site must protect the NSW WQO and environmental values of the receiving waterway. The EPA considers that quarries can be designed and managed to prevent pollution of waterways. Accordingly, the EPA recommends that the premises be managed to prevent a discharge of sediment laden water to the environment by considering a hierarchical approach to on site water management with procedures clearly captured in a Sediment and erosion control management plan. The EPA recommends that a detailed water quality objective assessment be undertaken in accordance with the ANZG 2018 prior to consideration of an approved discharge point on the EPL. The EPA does not usually provide licensed water discharge points for a quarry as</i>	Item 2 – Hierarchical Water Management Approach and Water Quality Objective Assessment.

Item	Requested By	Request	Response Provided in Section
		<i>such developments are expected to be able to operate without polluting the receiving waterway by implementing practical measures to avoid water pollution (for example, utilising sediment basin sizing, reusing water on site, minimising the generation of dirty water)."</i>	
3	NSW EPA	<i>"Operational Water Management - Section 6.6.3.3 of the Modification Report states that in the event of a discharge to Dam 1 the use of flocculants would be used at a proposed licence discharge point. The EPA recommends that a discharge point only be considered after all other avenues for dirty water reuse are exhausted. If any controlled discharges are proposed, a robust NSW WQO assessment should be undertaken in accordance with the ANZG 2018. The EPA has attached its information requirements for assessing the discharge of wastewater that has been flocculated/coagulated in Attachment A."</i>	Item 3 – Dirty Water Reuse and Use of Flocculants.
4	NSW EPA	<i>"Conceptual WMS - Section 6.6.3.1 of the Modification Report outlines that untreated runoff be designed to cater for a 5-day 95th percentile design storm event. The EPA recommends that the proponent design stormwater management to cater for a 1 in 10 year storm event to prevent the pollution of receiving waterways."</i>	Item 4 – Water Management System Design Standard.
5	QPRC	<i>"Water Security - It does not appear that climate change projections have been considered in assessing water security impacts. Given the proposed period of operations and the potential for an ultimate 30-year life of the quarry, it is essential to have regard to anticipated warming, more severe droughts and more intense rainfall events. The modification report notes that operations would need to be scaled down in the event of low onsite water availability and that a water shortfall would occur in very low rainfall years. In this event, the Applicant proposes applying for a licence to extract groundwater. This means there could be impacts on surrounding groundwater users that are unknown at this time."</i>	Item 5 – Water Security and Climate Change Considerations.
6	Resources Regulator	<i>"Post Mining Landform - Provide clarification of the potential for a pit lake to develop in Pit 2 void. Whilst groundwater is not predicted to be intercepted, the surface water assessment does not provide enough information on the surface water flows. In particular, whether water management infrastructure such as diversion drains are required in the final landform to prevent inundation (both short and long term) of the Pit 2 void and how this would impact the proposed final land use of grazing."</i>	Item 6 – Post Mining Landform

RESPONSE TO INFORMATION REQUEST

Item 1 – Dust Suppression Trigger Action Response Plan

Agency Submission

Submission from the NSW EPA:

"Water security - Section 6.6.5.1 of the Modification Report states that there is a risk of having insufficient water however dust suppression will be prioritised in the case of a water shortage. In order to address this issue, the EPA recommends that a robust Trigger Action Response Management plan be developed that informs the relationship between dust emissions, management controls and ceasing operations."

Response

The water balance model (WBM) developed for the Project was used to simulate the total annual water demand and the forecast shortfall for different climate conditions. The total site water demand is estimated to be between 23.6 ML /year and 25.0 ML/year (depending on

climate conditions). This volume is inclusive of 4.7 ML/year for crushing dust suppression, 10.0 ML/year sand wash plant losses and 8.9 ML/year to 10.3 ML/year for haul road dust suppression. The forecast annual shortfall results are as follows:

- 10th percentile (Indicative of wet conditions): 0 ML/year.
- Median: 0 ML/year.
- 90th percentile (indicative of dry conditions): 4.9 ML/year.

As discussed in Section 4.2.4 of the SWIA report, if there is insufficient water to meet demands, operations will be scaled to match the available water supply while maintaining environmental controls (i.e. dust suppression) as a priority.

The Applicant will include a robust Trigger Action Response Plan (TARP) to guide management of water shortages in the Soil and Water Management Plan (SWMP) to be developed for the Project, post approval of Mod 3. It is anticipated that the TARP will include:

- Trigger levels based on the total inventory stored at the quarry that will be adequate to supply demands over a set forecast period.
- Actions to be taken if the volume stored drops below the trigger levels (such as cessation of crushing and/or sand washing operations) to preserve water for dust suppression.

Item 2 – Hierarchical Water Management Approach and Water Quality Objective Assessment

Agency Submission

Submission from the NSW EPA:

“Classification of water - Section 6.6.3.2 of the Modification Report states that there are three proposed discharge points on proposed Dam 1, Dam 6 and Dam 9 and outlines consideration of NSW Water Quality Objectives (NSW WQO) Australian and New Zealand Guidelines for fresh and Marine Water Quality (ANZG 2018) and appears to adopt 50mg/L as a total suspended solids discharge criteria. The EPA considers that 50mg/L is not an appropriate discharge criterion as any discharge from the site must protect the NSW WQO and environmental values of the receiving waterway. The EPA considers that quarries can be designed and managed to prevent pollution of waterways. Accordingly, the EPA recommends that the premises be managed to prevent a discharge of sediment laden water to the environment by considering a hierarchical approach to onsite water management with procedures clearly captured in a Sediment and erosion control management plan.

The EPA recommends that a detailed water quality objective assessment be undertaken in accordance with the ANZG 2018 prior to consideration of an approved discharge point on the EPL. The EPA does not usually provide licensed water discharge points for a quarry as such developments are expected to be able to operate without polluting the receiving waterway by implementing practical measures to avoid water pollution (for example, utilising sediment basin sizing, reusing water on site, minimising the generation of dirty water).”

Response

Hierarchical Water Management Approach

Based on the nominated storage capacities of the proposed on-site dams and sediment basins, and the proposed annual water usage, water balance modelling for the Project indicates that controlled discharges will likely be required in median and wet years to prevent excessive water accumulation in the water management system and reduce the risk of uncontrolled discharges.

After consideration of the EPAs submission, Collector Resources has identified that a single licensed discharge point will adequately facilitate management of surplus water. Inclusion of a discharge point (licensed under Environmental Protection Licence (EPL) 5554) is considered a responsible approach to the management of water so that discharges can be made in a controlled manner with water quality concentrations achieving EPL limits that have been set with a view to maintain receiving environment water quality objectives (WQOs).

The intent of any controlled discharges would be to restore the required settling volume capacity in sediment basins (as determined in accordance with Managing Urban Stormwater – Soils and Construction Volume 2E: Mines and quarries (Department of Environment and Climate Change (DECC, 2008) (the 'Blue Book')) prior to the onset of rainfall that is considered to have the potential to result in uncontrolled discharges.

Wherever possible, and in order to reduce the frequency and volume of discharges, water drawn from sediment basins to restore settling zone capacity will be used to meet operational water demands (e.g. sand washing, dust suppression) as a first priority, with controlled discharges used as a last resort.

The Applicant may not need to undertake controlled discharges (as the need for discharges will be largely dependent on climatic conditions) from the proposed WMS, however, consideration of controlled discharges was included in the SWIA to assess the environmental impacts if controlled discharges are required. Should controlled discharges be required, the Applicant will include a procedure for the hierarchical approach to on-site water management in the SWMP to be developed for the Project, post approval of Mod 3. It is anticipated that the approach will include details of how to manage water on-site to reduce the frequency and volume of controlled discharged from the proposed licenced discharge points, including:

- (1) Transfers made to another sediment dam or pit sump with available storage and retained in the water management system to be used to meet operational water demands as a priority.
- (2) Discharged via the proposed licenced discharge point in accordance with analyte concentration limits specified in EPL 5554.

Water Quality Objective Assessment

Section 6.1.1 of the SWIA report presents the proposed analyte concentration limits for pH, TSS and EC for a licenced discharge point (should the Applicant seek approval for a discharge point). It is noted that the EPA considers that 50 mg/L for TSS is not an appropriate discharge criterion as any discharge from the site must protect the NSW water quality objectives (WQOs) and environmental values of the receiving waterway. Noting the proposed 50 mg/L limit is consistent with Blue Book guidance, the Applicant has indicated it will apply a more stringent criteria of 30 mg/L as an interim criteria whilst a detailed assessment of baseline receiving water quality is undertaken in accordance with ANZG 2018. The proposed values, and an explanation of why the values were selected are provided in Table 2.

TABLE 2: PROPOSED ANALYTE CONCENTRATION LIMITS FOR CONTROLLED DISCHARGES PRESENTED IN THE SWIA REPORT

Pollutant	Units of Measurement	Proposed Discharged Water Concentrations in SWIA	Source and Justification
pH	pH	6.5 – 8.0	Trigger values for aquatic ecosystems specified for the NSW Water Quality Objectives (WQO) for upland rivers (>150 mAHd) in the Murrumbidgee River and Lake George catchments.
EC	µs/cm	350	Trigger values for aquatic ecosystems specified for the NSW Water Quality Objectives (WQO) for upland rivers (>150 mAHd) in the Murrumbidgee River and Lake George catchments.
TSS	mg/L	30	The primary pollutant of concern in a sediment basin discharge is TSS. As there is no value for TSS specified in the NSW WQOs, the proposed discharge TSS concentration was established with consideration of guidance in the Blue Book. Given the proposed discharge TSS is lower than the recommended 50 mg/L TSS put forward in the Blue Book, it is considered sufficiently conservative for infrequent controlled discharges.

The Applicant has been sampling and analysing the surrounding environment water quality quarterly since the start of 2025¹ to establish baseline data that can be used to refine receiving environment WQOs. The Applicant will continue to collect baseline data as part of a detailed WQOs assessment to be undertaken in accordance with the ANZG 2018 for review by the EPA. In the event the Applicant makes application for a licensed discharge point prior to completion of the detailed WQOs assessment, it is proposed that the values presented in Table 2 with

¹ Samples were collected in quarter 3 with analysis results yet to be provided.

be adopted as interim controlled discharge limits while a sufficient quantity of receiving environment water quality data is collected to establish site specific WQOs that can be used as a basis for updating the limits (if required) to ensure the receiving environment WQOs are protected.

The baseline water quality data for receiving environment monitoring locations captured to date is provided in Table 3. The water quality data can be interpreted as follows:

- Results for pH indicate that the water quality surrounding the site is neutral to slightly alkaline.
- Electrical conductivity at the upstream and downstream reference sites is variable and notably higher than the aquatic ecosystem WQO (30 to 350) for upland rivers.
- The turbidity result is generally lower than the aquatic ecosystem WQO (25 NTU) for upland rivers.
- Results for TSS are variable, ranging between <2 mg/L and 48 mg/L.

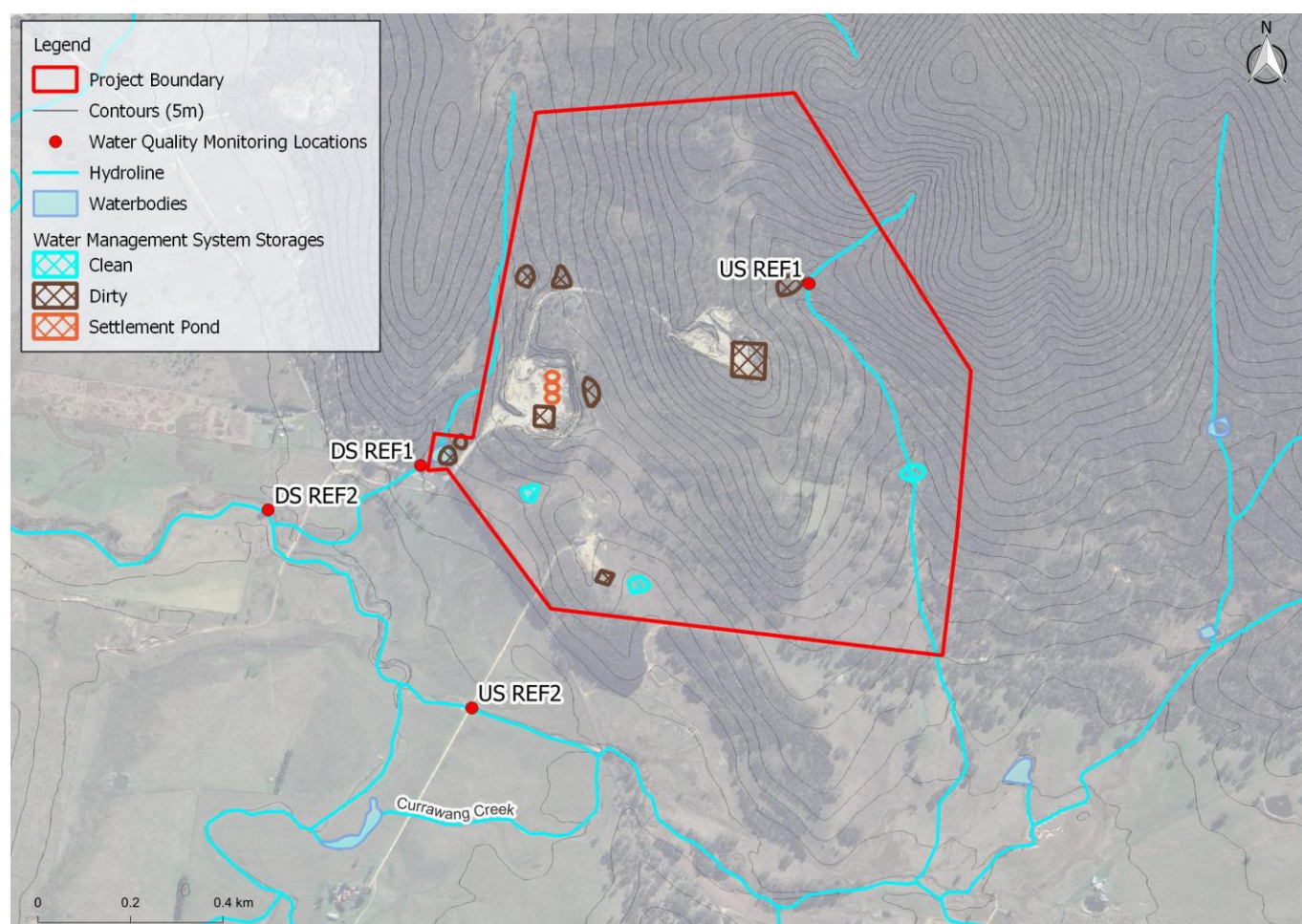


Figure 1: Receiving Environment Water Quality Monitoring Locations

TABLE 3: RECEIVING ENVIRONMENT WATER QUALITY

Monitoring Location	Date	pH	EC (µS/cm)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)
Upstream Reference Site 1	March 2025	Dry at the time of sampling				
	June 2025	6.3	37	Not analysed	7	3.7
	March 2025	Dry at the time of sampling				

Monitoring Location	Date	pH	EC (µS/cm)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)
Downstream Reference Site 1	June 2025	Dry at the time of sampling				
Upstream Reference Site 2	March 2025	7.3	1,060	668	48	41.0
	June 2025	7.3	772	Not analysed	<2	0.7
Downstream Reference Site 2	March 2025	7.4	760	457	13	5.7
	June 2025	7.4	1,070	Not analysed	4	5.6

Item 3 – Dirty Water Reuse and Use of Flocculants

Agency Submission

Submission from the NSW EPA:

“Operational Water Management - Section 6.6.3.3 of the Modification Report states that in the event of a discharge to Dam 1 the use of flocculants would be used at a proposed licence discharge point. The EPA recommends that a discharge point only be considered after all other avenues for dirty water reuse are exhausted. If any controlled discharges are proposed, a robust NSW WQO assessment should be undertaken in accordance with the ANZG 2018. The EPA has attached its information requirements for assessing the discharge of wastewater that has been flocculated/coagulated in Attachment A.”

Response

Sediment dams will be dewatered as required to restore the settling volume capacity within 5 days of a rainfall event (as per Volume 2E of the Blue Book). The volume required to be dewatered will be managed as follows, in order of priority:

- (1) Transferred to another sediment dam or pit sump with available storage and retained in the water management system to be used to meet operational water demands.
- (2) Discharged via a licenced discharge point (if the Applicant seeks to apply for one) in accordance with analyte concentration limits specified in the EPL.

In order to reduce TSS concentrations prior to discharge, coagulation and/or flocculation of suspended sediment may be required. If coagulation and/or flocculation is required, Gypsum (calcium sulfate) will be used as the first priority chemical to reduce TSS concentrations. Gypsum is the most common coagulant used in sediment basins in Australia (Landcom, 2004), is considered to carry a low risk of environmental harm (even when overdosed) and is commonly referenced by the NSW EPA in EPLs, often noting that approval must be sought for the use of alternative flocculants and/or coagulant other than Gypsum to settle suspended solids in sediment basins.

If controlled discharges are required and Gypsum proves to be ineffective with respect to achieving the ultimate EPL TSS discharge limit, the Applicant will provide a robust ecotoxicology assessment undertaken on the proposed coagulants and/or flocculants and specify dosing management measures that demonstrates how the proposed chemical can be utilised for TSS concentration reduction without polluting the receiving waterways.

Item 4 – Water Management System Design Standard

Agency Submission

Submission from the NSW EPA:

“Conceptual WMS - Section 6.6.3.1 of the Modification Report outlines that untreated runoff be designed to cater for a 5-day 95th percentile design storm event. The EPA recommends that the proponent design stormwater management to cater for a 1 in 10 year storm event to prevent the pollution of receiving waterways.”

Response

The primary objective of the proposed dams in the Project water management system is to capture sediment laden runoff from disturbed areas and prevent the runoff from reporting to the receiving environment. The water management system has been sized to contain runoff from a 5 day 95th percentile design storm event, as per the sediment dam sizing requirements specified in Volume 2E of the Blue Book for sensitive receiving environments and a disturbance duration of more than 3 years.

The dam sizing requirements specified in the Blue Book were selected as the document is the contemporary guideline for management of erosion and sediment control (ESC) in NSW and is often referenced in project approvals and EPLs. Numerous EPLs reference the Blue Book as an “EPA endorsed publication” that is to be used for the sizing of sediment dams. On that basis, it is considered that sizing the sediment dams for a 5 day 95th percentile and managing the sediment dams using a hierarchical water management approach is sufficient to not warrant the requirement to size the sediment dams for a 1 in 10-year design storm event as recommended by the EPA.

Item 5 – Water Security and Climate Change Considerations

Agency Submission

Submission from QPRC:

“Water Security - It does not appear that climate change projections have been considered in assessing water security impacts. Given the proposed period of operations and the potential for an ultimate 30-year life of the quarry, it is essential to have regard to anticipated warming, more severe droughts and more intense rainfall events.

The modification report notes that operations would need to be scaled down in the event of low onsite water availability and that a water shortfall would occur in very low rainfall years. In this event, the Applicant proposes applying for a licence to extract groundwater.

This means there could be impacts on surrounding groundwater users that are unknown at this time.”

Response

To address the QPRC comments regarding water security, the WBM for the Project was used to simulate a climate change forecast scenario. A climate change forecast scenario is simulated by applying forecast climate change factors (percentage changes) to rainfall and evaporation data. The climate change factors were sourced using the ‘Projection Builder’ tool on the *Climate Change in Australia* website². The Projection Builder tool allows the user to select ‘best case’ and ‘worst case’ climate change scenarios based on the vulnerability or sensitivity of the system. In this instance, a ‘worst case’ water security scenario was considered where rainfall has decreased, and evaporation has increased with climate change. The climate change scenario details are provided in Table 4.

TABLE 4: CLIMATE CHANGE SCENARIO DETAILS

Representative Concentration Pathway	Forecast Horizon	Projection	Rainfall Change (%)	Evaporation Change (%)
RCP4.5	2040 (closest horizon to the 15-year life of quarry)	HadGEM20-CC	-11.8	+4.2

² <https://www.climatechangeinaustralia.gov.au/en/projections-tools/climate-futures-tool/projections-builder/>

The climate change factors applied to the 134-year historical climate data set WBM was simulated for a 1-year quarry operational. A comparison of the forecast shortfall for the baseline scenario (i.e. climate data with no climate change factors applied) and the climate change scenario is provided in Table 5. The results indicate that:

- There is no change in forecast shortfall for the 5th percentile (indicative of wet conditions) or median results.
- The forecast 90th percentile (indicative of dry conditions) shortfall for the climate change scenario is 3.2 ML greater than the baseline scenario.

TABLE 5: FORECAST SHORTFALL

Result	Unit	Baseline Scenario	Climate Change Scenario
5th Percentile Shortfall	ML/year	0.0	0.0
Median Shortfall	ML/year	0.0	0.0
95th Percentile Shortfall	ML/year	4.9	8.1

As noted Item 1, the SWIA report states that if there is insufficient water to meet demands, operations will be scaled to match the available water supply while maintaining environmental controls (i.e. dust suppression) as a priority (refer to Item 1 – Dust Suppression Trigger Action Response Plan). If ongoing shortfalls be considered likely, the Applicant will investigate the feasibility of extracting groundwater via an appropriately approved and licensed bore to supplement operational demands. If the applicant does apply for a groundwater access licence and associated water supply work approval, a review of impacts to surrounding groundwater users will be undertaken.

Item 6 – Post Mining Landform

Agency Submission

Submission from the Resources Regulator:

“Provide clarification of the potential for a pit lake to develop in Pit 2 void. Whilst groundwater is not predicted to be intercepted, the surface water assessment does not provide enough information on the surface water flows. In particular, whether water management infrastructure such as diversion drains are required in the final landform to prevent inundation (both short and long term) of the Pit 2 void and how this would impact the proposed final land use of grazing.”

Response

The Pit 2 void (the void) is located on top of a ridgeline (refer to Figure 2). The existing grade of the surrounding landform will be maintained so that there will be minimal external catchment reporting to the void. Clean water drains may be required to divert clean water runoff from the north away from the void. Any clean water drains would be appropriately sized and lined to prevent scour. The only rainfall runoff inflows to the void will be the result of incident rainfall on the void itself. Groundwater inflows are not anticipated as the maximum proposed extraction depth is above the groundwater table. The void is estimated (based on the preliminary void design) to have a capacity of around 2.3 GL at the end of the quarry life.

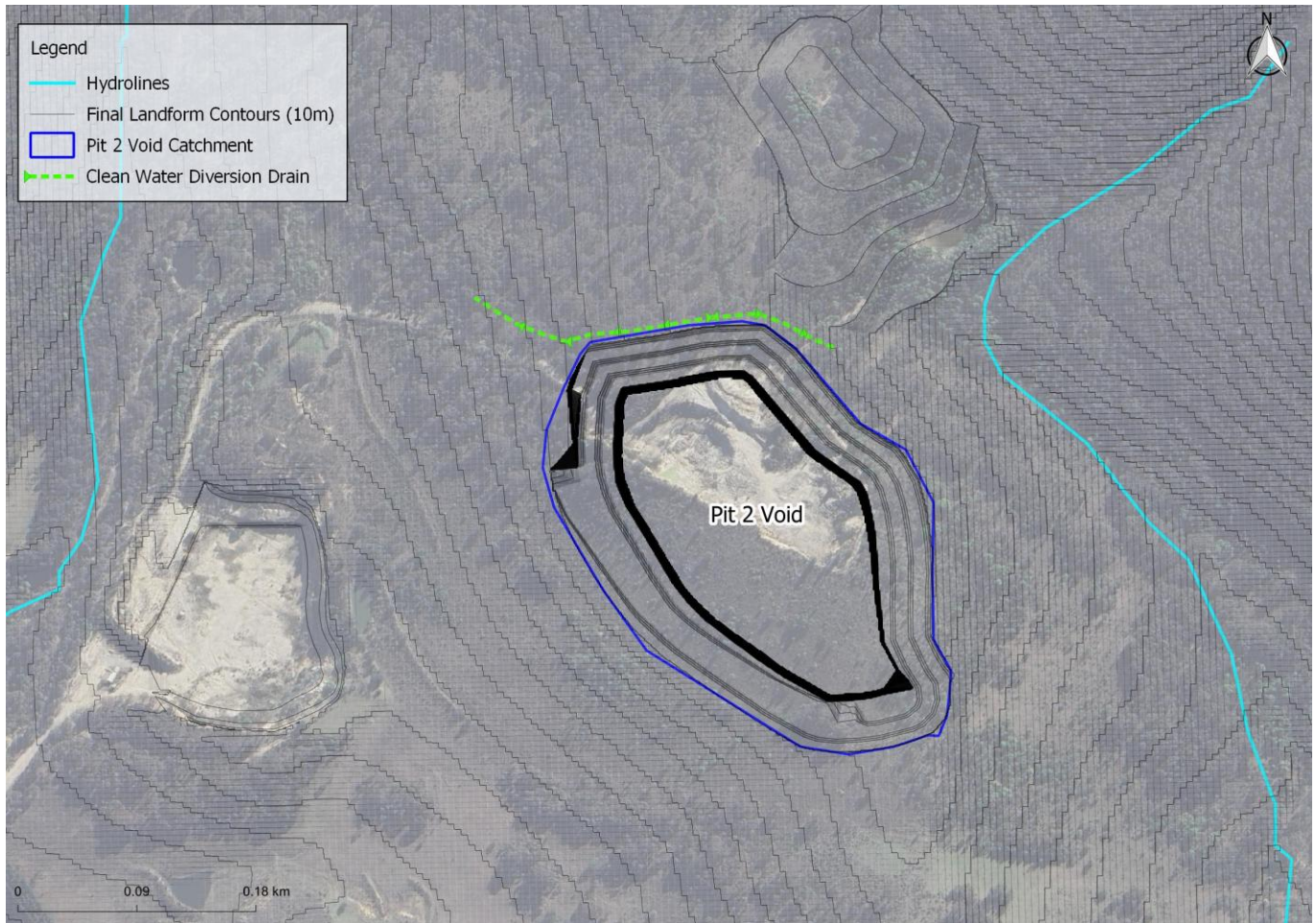


Figure 2: Pit 2 Void Landform Catchment

To assess the potential for a pit lake to form in the void, the water balance model (WBM) for the Project was updated to incorporate the void topography as a water storage with no dewatering. The WBM was simulated for 134 realisations using the historic climate dataset to assess the potential for a pit lake to develop under different climate conditions. The WBM was simulated for a 100-year period. The maximum volume and level results for the 100 year forecast period are presented in Figure 3 and Figure 4. Smaller scale results for the first 15 years of the 100 year forecast period are also presented in Figure 5 and Figure 6.

The results indicate that:

- The volume of water in the void is likely to fluctuate seasonally. The modelled inventory increases in winter when evaporative losses are lower and decreases in summer when evaporation exceeds rainfall.
- For the median result the inventory stored in the void fluctuates between being empty and up to approximately 7.9 ML. At 7.9 ML, the depth of water is around 0.2 m.
- For the maximum result (indicative of wet conditions), the maximum inventory stored in the void is around 38.7 ML. At 38.7 ML, the depth of water is around 0.8 m.
- For the minimum result (indicative of dry conditions), the void remains empty for the forecast period.

The results show that there is potential for a shallow pit lake to form in wetter periods and remain empty during dry periods. During median climate conditions there is potential for intermittent wetting and drying in the void to occur.

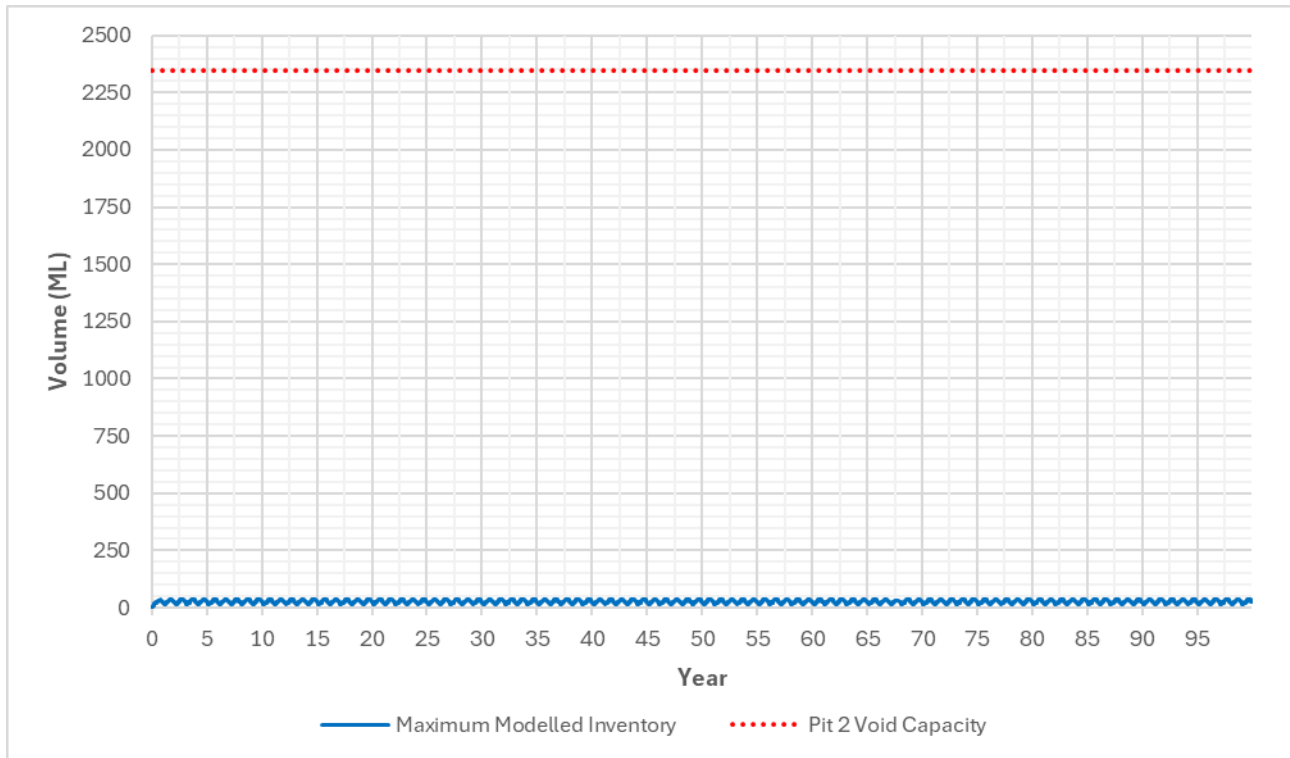


Figure 3: Pit 2 Void Forecast Volume – 100 Year Forecast Period

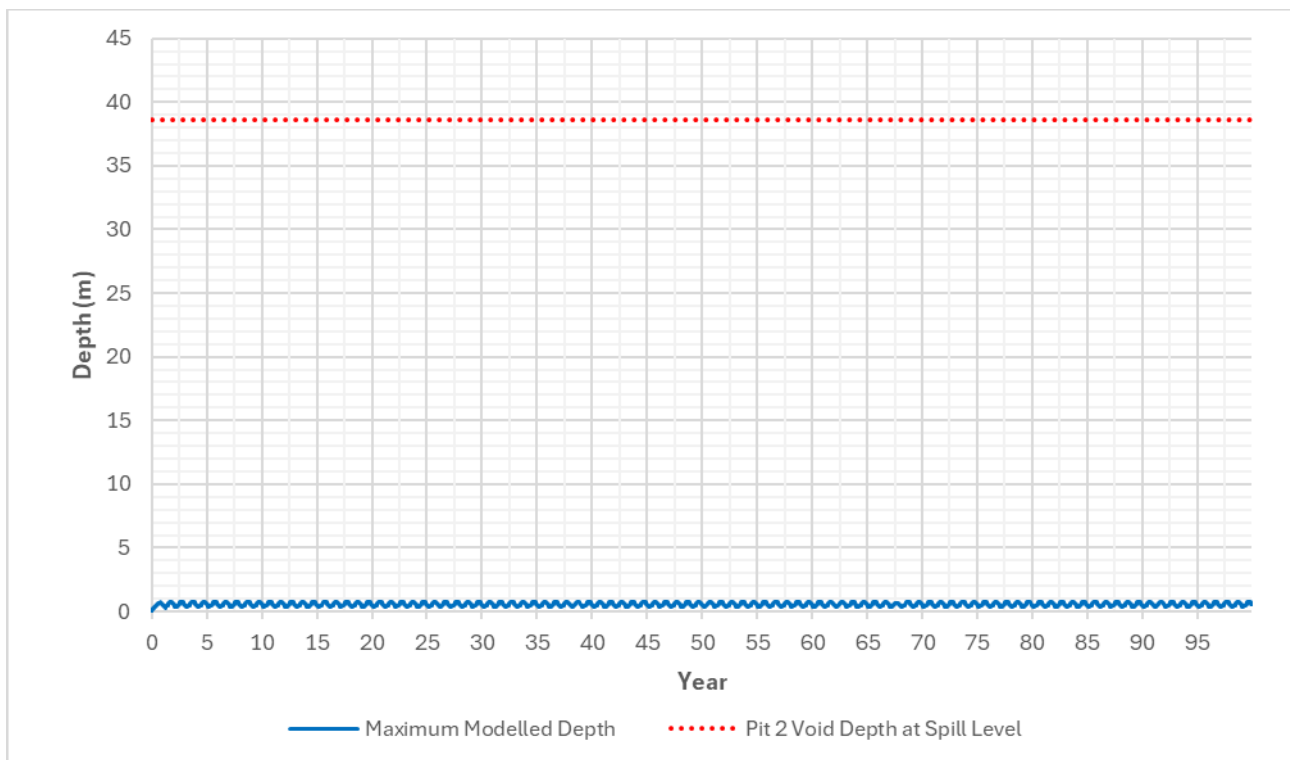


Figure 4: Pit 2 Void Forecast Depth – 100 Year Forecast Period

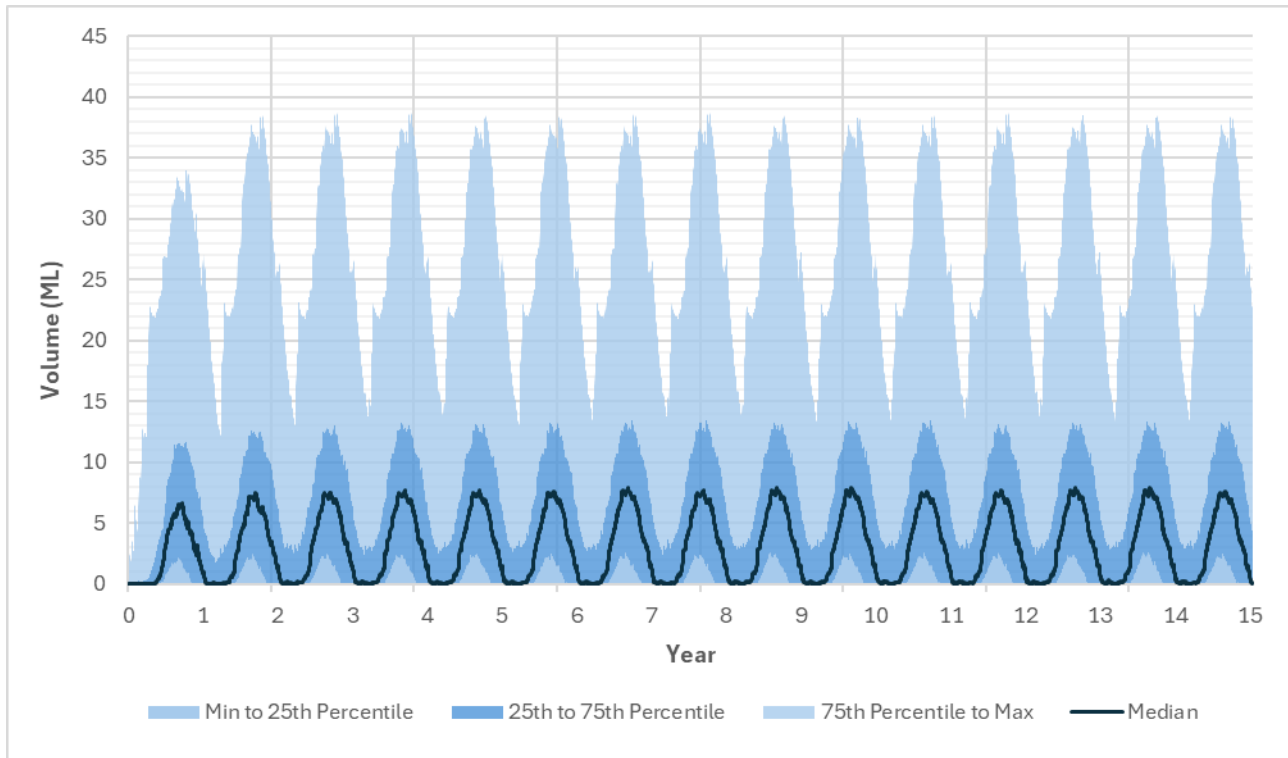


Figure 5: Pit 2 Void Forecast Volume – 15 Year Forecast Period

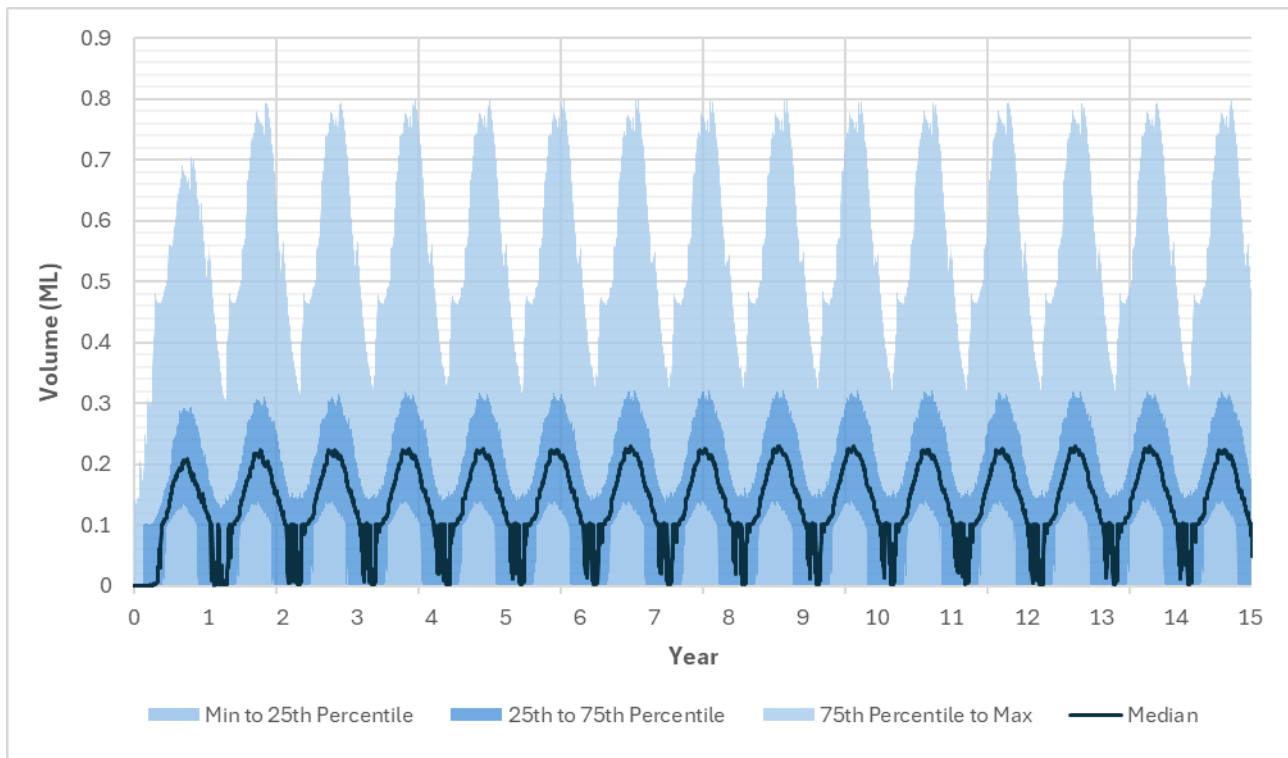


Figure 6: Pit 2 Void Forecast Depth – 15 Year Forecast Period

Regards,



Sarah Green Goldberg
Environmental Specialist

cc. Chris Bonomini (Engeny)
Alex Irwin (IEM)

DISCLAIMER

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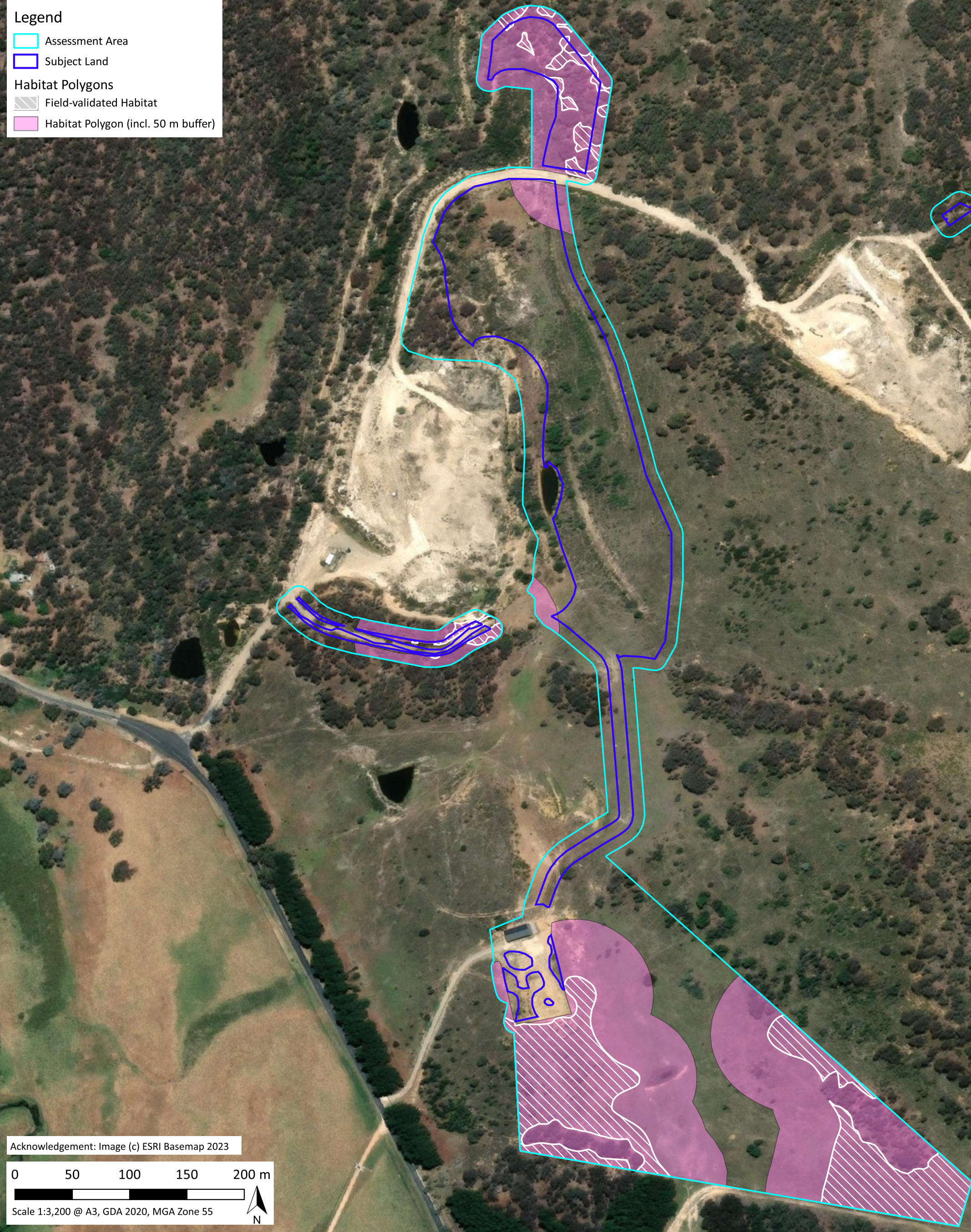
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Appendix 8 Pink-tailed Legless Lizard Habitat Assessment – Working Draft

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Prelim Figure 1. Pink-tailed Legless Lizard Habitat Assessment - Working Draft

Appendix 9 Air Quality Trigger Action Response Plan

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	Normal Operations		Minor Operational Changes		Major Operational Changes	
Work Area/Equipment	Trigger	Action/Response	Trigger	Action/Response	Trigger	Action/Response
Haul Trucks/Haul Roads	Dust below wheel height 	- No visible dust observed. - Normal activities to proceed subject to standard measures being carried out. - Climate – Temperature forecasts to remain below 35 degrees Celsius or wind speed below 20km/h (5.5m/s).	Dust above wheel height, but below tray height 	- Quarry Manager to complete inspections of operating equipment and review emissions. - Implement Supplementary and targeted dust mitigation measures including: Water application to active zones; Relocation of activities (to utilise natural wind breaks where possible)	Dust above tray height 	- Inspect all active and static areas of the Quarry Site and identify locations of excessive dust generation. - Suspend operations creating the greatest dust emissions. - Increase rate of water application to areas of excessive dust generation static areas of the Quarry Site.
Dozers		- No visible dust observed. - Normal activities to proceed subject to standard measures being carried out. - Climate – Temperature forecasts to remain below 35 degrees Celsius or wind speed below 20km/h (5.5m/s).		- Water application to active zones; - Relocation of activities (to utilise natural wind breaks where possible. - Limit travel speed. - Reduce drop height of materials.		- Suspend operations creating the greatest dust emissions. - Increase rate of water application to areas of excessive dust generation static areas of the Quarry Site. - Only recommence work if the dust suppression system is operable, site preparation is adequate and weather conditions permit.
Excavator/Loaders		- No visible dust observed. - Normal activities to proceed subject to standard measures being carried out. - Climate – Temperature forecasts to remain below 35 degrees Celsius or wind speed below 20km/h (5.5m/s).		- Water application to active zones; - Relocation of activities (to utilise natural wind breaks where possible. - Limit tramming or pushing distances.		- Suspend operations creating the greatest dust emissions. - Increase rate of water application to areas of excessive dust generation static areas of the Quarry Site.
Drills	No visible dust below deck height 	- No visible dust observed. - Normal activities to proceed subject to standard measures being carried out. - Climate – Temperature forecasts to remain below 35 degrees Celsius or wind speed below 20km/h (5.5m/s) - Continue to monitor operations. - Monitor dust suppression activities.	Dust visible at deck height 	- Water application to active zones; - Relocation of activities (to utilise natural wind breaks where possible. - Assess impact of weather conditions and modify operations as required.	Emissions of dust above deck height 	- Suspend operations creating the greatest dust emissions. - Increase rate of water application to areas of excessive dust generation static areas of the Quarry Site. - Only recommence work if the dust suppression system is operable, site preparation is adequate and weather conditions permit.

Appendix 10 Consolidated Project Description (Modified)

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CONSOLIDATED PROJECT DESCRIPTION

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1. INTRODUCTION

The Modified Project Description for the Barina Quarry presents an overview of operations as originally approved by DA 1-01-2000 in March 2004 along with the proposed changes associated with Modification 4. The presentation of the Modified Project Description is consistent with State Significant Development Guidelines - Preparing a Modification Report (DPIE, 2022) and should be read in conjunction with the documents listed in **Section 5**.

2. PROJECT OVERVIEW

The Barina Quarry is located at 2692 Collector Road on Lot 3 DP1177623, Lot 33 DP750008 and Lot A DP1177623, Collector Road, Collector NSW, within the Queanbeyan-Palerang Regional Council (QPRC) Local Government Area (LGA).

The approved operation, as last modified, includes the following components (identified on **Figure A**).

- Extraction (by drill and blast methods) from the original open cut (Pit 1) to a floor elevation of 716 m Australian Height Datum (AHD) and area of 1.5 hectares (ha).
- Extraction by drill and blast methods from a second open cut (Pit 2) to a maximum depth of 714 mAHD.
- Delivery and disposal of overburden to create a supplementary product stockpile area to the north of Pit 2.
- Crushing and screening operations utilising a primary jaw crusher, one or more cone crushers and a variety of stationary and vibrating screens.
- Sand and fine aggregate washing operations.
- Construction and maintenance of stockpile areas for the placement, loading and despatch of Quarry Products.
- Production of up to 300,000 tonnes per annum (tpa) until 2040 (15 years from approval of Modification 4).
- Movement of up to 134 laden trucks per day and 20 laden trucks per hour.
- Construction and maintenance of internal roads, drainage lines, dams, bunds and cut batters as illustrated on Quarry Plans.
- Establishment and maintenance of a weighbridge, Quarry office and amenity buildings, workshops and car parking.
- Upgrade and maintenance of Collector Road in accordance with a Planning Agreement with Upper Lachlan Shire Council.
- Rehabilitation of the Quarry Site in accordance with Schedule 8A requirements of the *Mining Regulation 2016*.



3. CONSOLIDATED PROJECT DESCRIPTION

Table 1 below provides a summary of the key features of the operations, with any modifications highlighted in **red text**. The referenced Figures are provided in **Section 4**.

Table 1 Consolidated Project Description

Project Component	Description
Quarry Address	2692 Collector Road, Collector NSW
Quarry Site	Part Lot 3 DP1177623, Lot 33 DP750008 and Lot A DP1177623 (Figure A)
Quarry Access and Security	The main access to the Quarry Site is via Basic Left / Basic Right intersection of a sealed access road with Collector Road. The Site Entrance is secured by a lockable gate and includes signage identifying key Quarry contacts. An alternative egress from the Quarry Site is available via the Quarry Workshop and Collector Road (Figure A). Perimeter agricultural type fencing is maintained to prevent unauthorised entry to the site.
Quarry Resource	Quartz – 9.55 million tonnes
Term of Quarry Operations (under DA)	15 years (to 2040)
Extraction areas	Pit 1: - Area - 2.6 ha - Maximum depth - 716 mAHD - Status (2025) - Extraction complete and maintained for processing operations Pit 2 (Figure B): - Area - 9.6 ha - Maximum depth - 714 mAHD - Status (2025) - Extraction commenced
Extraction methods and sequence	Drill and blast (parameters to be defined by qualified blast engineer) Staged development of Pit 2 in a generally north-south direction (refer to Figure C)
Waste Rock (Overburden) Management	Delivery to the Pit Overburden Emplacement for the construction of a Supplementary Stockpile Area (Figure D). Progressive rehabilitation of the outer batters of the structure as constructed. Overburden may be used as required for road, bund or drain construction or maintenance.
Extraction Rate	Less than 500,000 tpa
Processing Operations (Crushing and Screening)	Crushing and screening by combination of: - jaw crusher - cone crushers, - vibrating and stationary screen decks



	- conveyors and stackers (Figure E). Crushing and screening units are mobile and will be initially placed within Pit 1. In order to complete the rehabilitation of Pit 1 (or transition to alternative land use), the Applicant proposes the relocation of crushing and screening operations to either: - Pit 2 (preferred option), or - Stockpile Areas subject to compliance with air and noise criteria.
Processing Operations (Washing)	Sand and fine aggregate washing incorporating a combination of: - A loading hopper, vibrating wet screen and rotating/log washer - A second (multi-deck) screen (for additional silt removal and fraction sizing) - Mixing tank where heavier materials (aggregates and sand) move to the bottom of the tank and the silt containing water is drawn off the top, and - One or more silt settlement cells to allow for the silts and clays to settle out with the water returned to the washing circuit (Figure E).
Quarry Products	Variously sized hard rock aggregates, road construction gravels and base materials, ballast, crusher dust, select fill materials and sand.
Clean Fill Importation	Importation of clean fill materials for use as engineered fill in the construction, maintenance of internal roads and stockpile areas, and blending with extracted quartzite. Fill materials will include the following. - Virgin Excavated Natural Materials (VENM) where a certificate confirming source can be supplied. - Excavated Natural Materials (ENM) where the material meets the requirements of the Resource Recovery Order (RRO) for ENM made under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation). - Any other material meeting the requirements of an RRO issued under clause 93 of the Waste Regulation for which application to land for as engineering fill or in earthworks, construction, landscaping or other applicable activity is permitted by equivalent Resource Recovery Exemption (RRE) of made under clauses 91 and 92 of the Waste Regulation.
Clean Fill Land Application	Clean fill materials will be used to construct the South Stockpile Area and (in combination with overburden) the Supplementary Stockpile Area.
Stockpile Management	Construction and maintenance of three stockpile areas for the placement of Quarry products prior to loading and despatch. - South Stockpile Area: constructed by cut and fill supplemented by imported clean fill materials (Figure F). - North Stockpile Area: constructed by clearing and compaction supplemented by imported clean fill placement. - Pit 2 Overburden and Supplementary Stockpile Area: constructed by placement of overburden, supplemented by imported clean fill

	materials.
Production Rate	Up to 300,000 tpa.
Transport Route	Right turn from the Quarry only on to Collector Road. Distribution to north and south via Federal Highway.
Truck Speed Limits	Trucks will be limited to 80 km/hr on Collector Road.
Transport Limits	134 laden truck movements per day 20 laden truck movements per hour A temporary 50% restrictions on daily and hourly truck movements will be applied whilst Collector Road is upgraded. Trucks will be limited to 40 km/hr until upgrades to Collector Road are complete.
Road Upgrades and Maintenance	Collector Road will be upgraded to the satisfaction of Upper Lachlan Shire Council.
Ancillary Infrastructure	Prior to Construction of South Stockpile Area - Offices, amenities, car parking and a portable weighbridge will remain at the exit of Pit 1 Following construction of South Stockpile Area Weighbridge, quarry office, supplementary buildings, amenities, water tanks and car parking to be constructed on South Stockpile Area. Quarry workshops will be located on Lot A DP86342 to the south as identified on Figure A. Final arrangement may vary to satisfy operational requirements.
Services	Power: As there is no mains power close to the Project Site, diesel or solar powered generators will provide power for the existing operation. Future connection to Mains power may be completed (under authority of the energy provider) may result in replacement of generators. Water: There is no reticulated water supply to the Quarry and potable water will be sourced from rainwater or purchased. Communications: Mobile service is available at the Quarry. Fuel: The Applicant currently maintains an above-ground, elevated diesel fuel tank near the Quarry Workshop. The tank is fully banded to contain potential spills or leaks.
Water Management	Water is managed to maximise opportunities for reuse and recycling, whilst minimising the potential for uncontrolled discharge. The operating rules for the Quarry Water Management System are as follows. Clean water will be diverted away from disturbance towards clean water storages (Dams 3, 4 and 5) (Figure A). Dirty water is captured in sediment basins (Dams 1, 2, 6, 8, 9 and 10) and used in priority to clean water for dust suppression (Figure A). Water captured in Quarry water storages, including sumps constructed in Pits 1 and 2 (Figure B) will supply the Wet Processing Plant. All sediment basins will be dewatered as required so as to maintain the



	minimum storage requirements within five days following a 5-day 95th percentile rainfall event. The installation or construction of any erosion and sediment control structures will be undertaken in accordance with the Blue Book.	
Water Supply	Water for use in processing and for dust suppressions will be harvested in on-site dams with cumulative capacity to remain less than 12.7 ML, the harvestable right for the contiguous landholding of the Applicant (181 ha).	
Waste Management	Production waste - Overburden, processing scalps, crusher dust and consolidated silt will be blended where possible with crushed quartzite for sale. - Residual overburden, scalps and dust will be used in the construction of the Overburden Emplacement and Supplementary Stockpile Area. - Residual silt may be combined with stripped soil to improve nutrients or disposed of as above. Non-production waste - Oils and greases. Will be stored in leak-proof containers within a bunded area adjacent to the Quarry Workshop to await collection by a licenced recycling contractor. - Sewage. Will be managed using septic systems installed at the Quarry Office / Weighbridge and Quarry Workshop. These systems will be pumped out by a licenced contractor on an as-needs basis. - Maintenance Consumables and Domestic-Type Wastes. All paper and general wastes, together with maintenance consumables such as grease cartridges, are stored in appropriate containers for collection by a licenced waste contractor.	
Hours of Operation	Activities	Hours of Operation
	Extraction, processing, product dispatch and material importation	Monday to Friday: 7:00 am – 6:00 pm Saturday: 7:00am to 1:00pm Sundays / Public Holidays: none
	Blasting	Monday to Friday: 9:00 am – 5:00 pm
	Maintenance Activities	Any time (subject to no audible off-site noise)
Rehabilitation	Progressive rehabilitation of completed components of the Quarry Site to form the conceptual landform of Figure G. In summary, rehabilitation of the Quarry Site would comprise the following activities. Decommissioning - On completion of quarrying activities, the Applicant would either sell or scrap the surface infrastructure of the Project Site. - All concrete footings and foundations of buildings or structures would be broken up and removed. The materials used to form roads and hardstands would be removed and/or the areas ripped. - Analysis for land contamination would be completed and remediation	

	undertaken as required. Landform Establishment ▪ Prior to extraction from the terminal faces of the extraction area, a geotechnical review of the final faces would be completed to confirm the slope that would provide for a safe and stable landform. ▪ Hardstand and compacted surfaces would be ripped and any overburden or unsold products removed. ▪ The outer batters of the stockpile areas would be inspected to confirm the slope is no greater than the surrounding landforms. ▪ The final slope would be lightly ripped parallel with the contour. Where the slope exceeds 10m, contour banks would be constructed to divert runoff off the landform and discharge to natural drainage at a non-erosive velocity. Growth Media Development ▪ Previously excavated and stockpiled soil would be placed on the shaped landform. ▪ The soil would be replaced as a single blended topsoil/subsoil unit with the depth of respread soil to vary between 300 mm and 600 mm in depth (deeper on flatter areas and shallower on steeper areas). ▪ The surface of the shaped landform would be left even but slightly scarified to assist in maintaining soil stability, maximising seed retention and germination and minimising erosion. Ecosystem Establishment ▪ A seed mix of locally endemic native grass, shrub or tree species would be sown to establish the targeted pasture or grassy woodland. ▪ Tubestock would be planted along the rim of the final void. ▪ Ongoing monitoring of the success of rehabilitation would be undertaken in accordance with the procedures outlined in a RMP, and remedial action would be implemented should the progression of rehabilitation not be satisfactory.
Biodiversity Management	Disturbance to new disturbance associated with Modification 4 will not proceed until biodiversity offset credits have been retired to the satisfaction of the Biodiversity Conservation Trust and Department of Climate Change, Energy Environment and Water.



4. QUARRY SITE LAYOUT AND COMPONENTS

The following figures are provided to illustrate the modified operations of the Quarry.

Figure A: Modified Quarry Site Layout

Presents the Indicative layout of the Quarry Site incorporating all approved and modified components.

Minor variation may be required over the life of the Quarry, e.g. relocation of buildings, dams, drains or bunds, to accommodate operational requirements, however, these will only occur following review of potential environmental impacts and identification in annual reporting documents.

Figure B: Extraction Area – Pit 2

Presents the proposed extraction area in plan and section form noting:

- The location of the lined sump will be subject to variation over the life of the Quarry, and
- Crushing and washing activities will be undertaken within the extraction area as sufficient area is created.

Figure C: Extraction Sequence – Pit 2

Presents the indicative extraction sequence within Pit 2.

Figure D: Modified Overburden Emplacement and Supplementary Stockpile Area

Presents the proposed development of this structure in plan and section form along with key environmental controls.

The proportion of overburden to clean fill is not nominated and will be subject to availability of overburden over time to create the flat surfaces required for stockpile management.

Figure E: Crushing, Screening and Washing Operations

Identifies the initial (Pit 1) and indicative future locations of crushing, screening and washing operations, along with a schematic diagram of operations.

Locations are indicative only and may be placed in alternative locations within the nominated impact footprint subject to confirmation relevant air and noise impact criteria can be adhered to.

The exact crushing equipment, number of screens and conveyors and product size specifications may vary over time subject to compliance with air and noise impact criteria.

Figure F: South Stockpile Area

Presents the conceptual design of the South Stockpile Area to be constructed primarily from imported clean fill materials. Cross-sections are included to provide an illustration of fill volumes required.

Figure H: Modified Final Landform and Rehabilitation

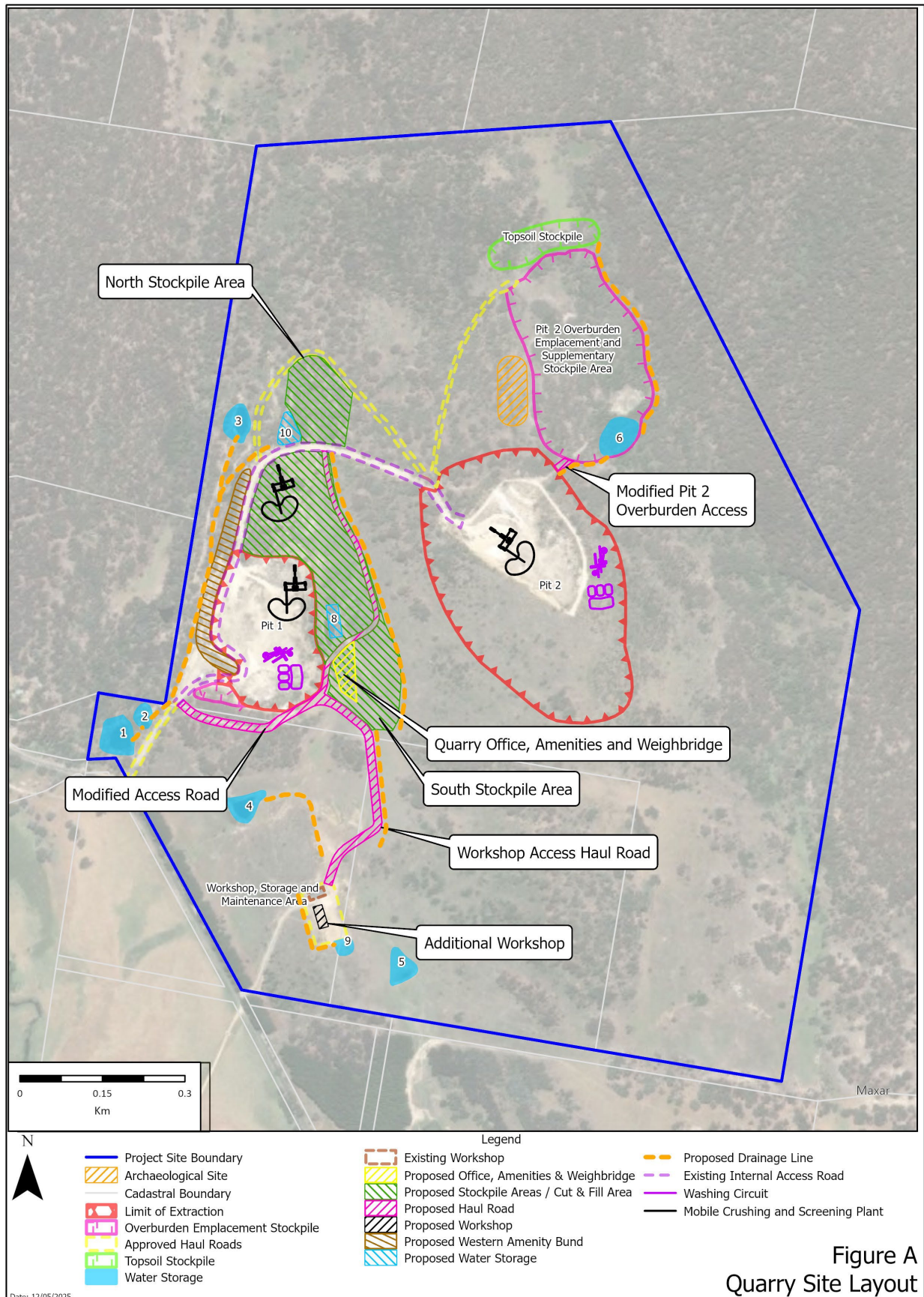
Presents the modified final landform and rehabilitation concept. Final land use, landform, rehabilitation objectives and completion criteria, and methods may be modified in accordance with the requirements of the regulator and Schedule 8A of the Mining Regulation 2016.

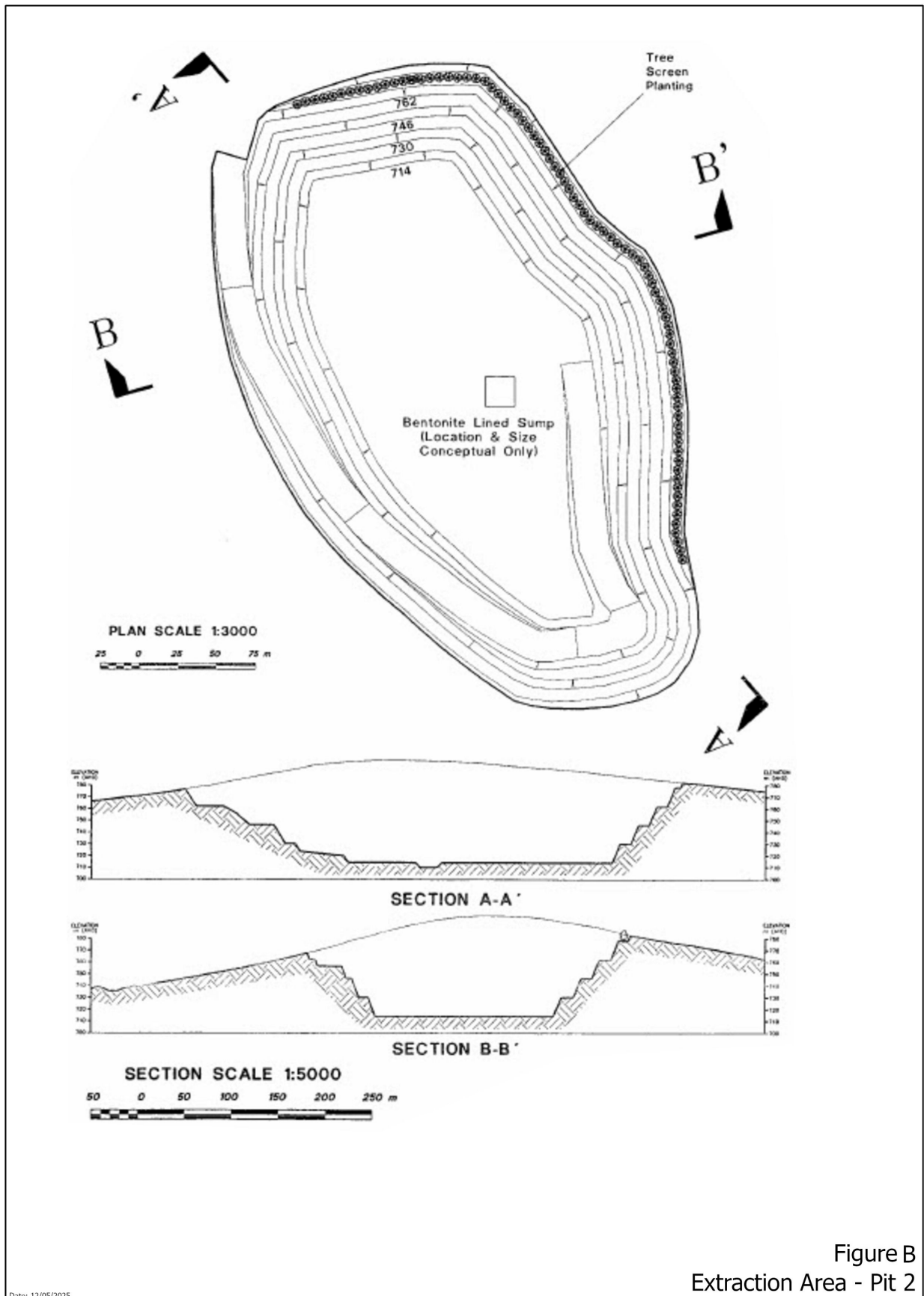
5. RELEVANT AND REFERENCE DOCUMENTS

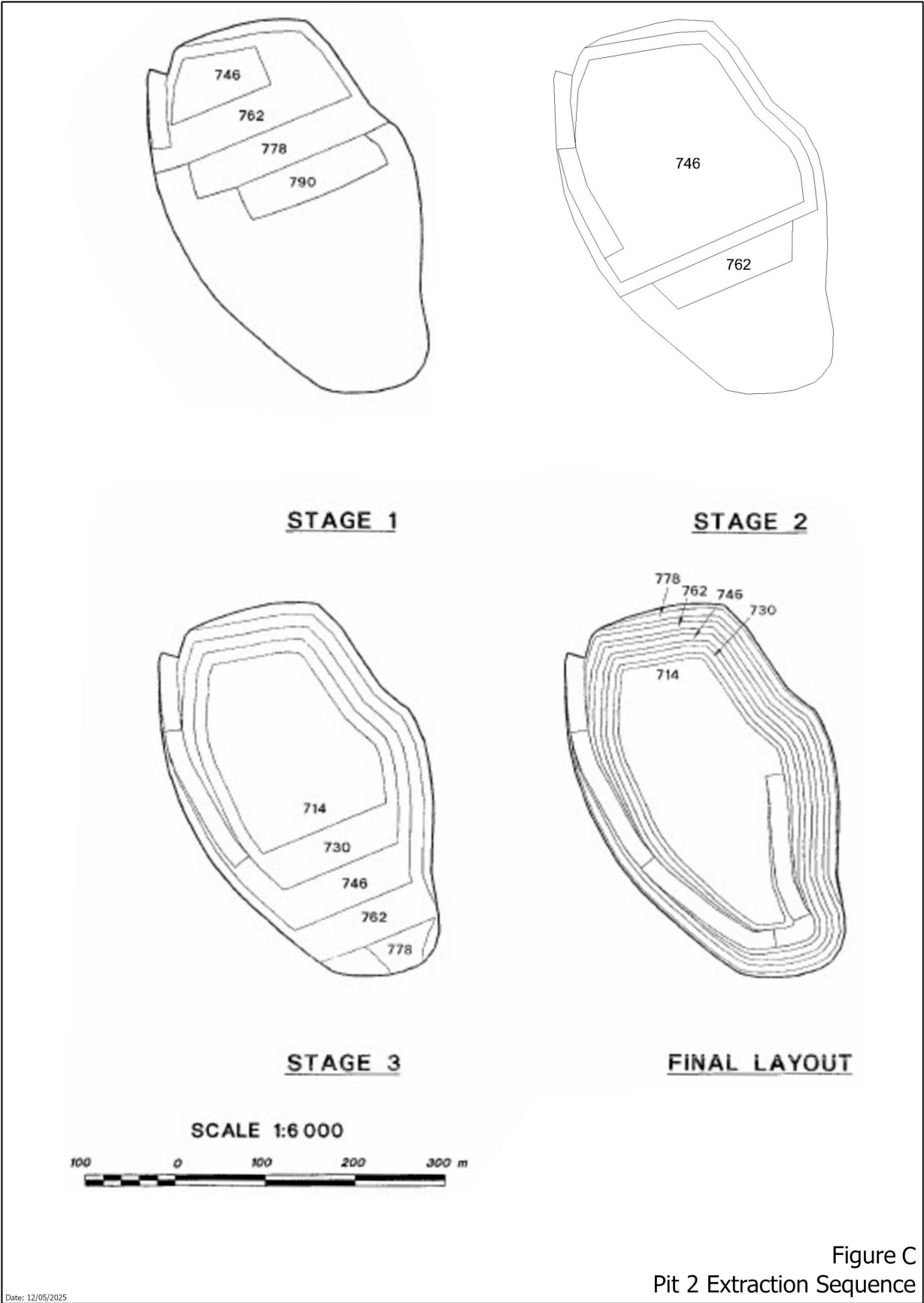
This Consolidated Project Description follows from the following documents.

- Lake George Quarries: Barina Quarry – Collector Environmental Impact Statement. Prepared by R.W. Corkery & Co. Pty. Limited on behalf of Lake George Quarries, December 1999 (Report No 480/02).
- Barina Quarry Geology / Reserve Calculations, Letter Report to Tiocliiff Pty Ltd, 17 July 2000 (Don Reed & Associates, 2000).
- Modification Report for Proposed Modification No. 2 (MOD 2) to DA1-01-2000 (Barina Quarry), May 2023. Prepared by Umwelt (Australia) Pty Limited on behalf of Collector Resources Pty Limited (Report No 20257/R03).
- Barina Quarry Modification 2 Submissions Report, February 2023. Prepared by Umwelt (Australia) Pty Limited on behalf of Collector Resources Pty Limited (Report No 20257/R04).









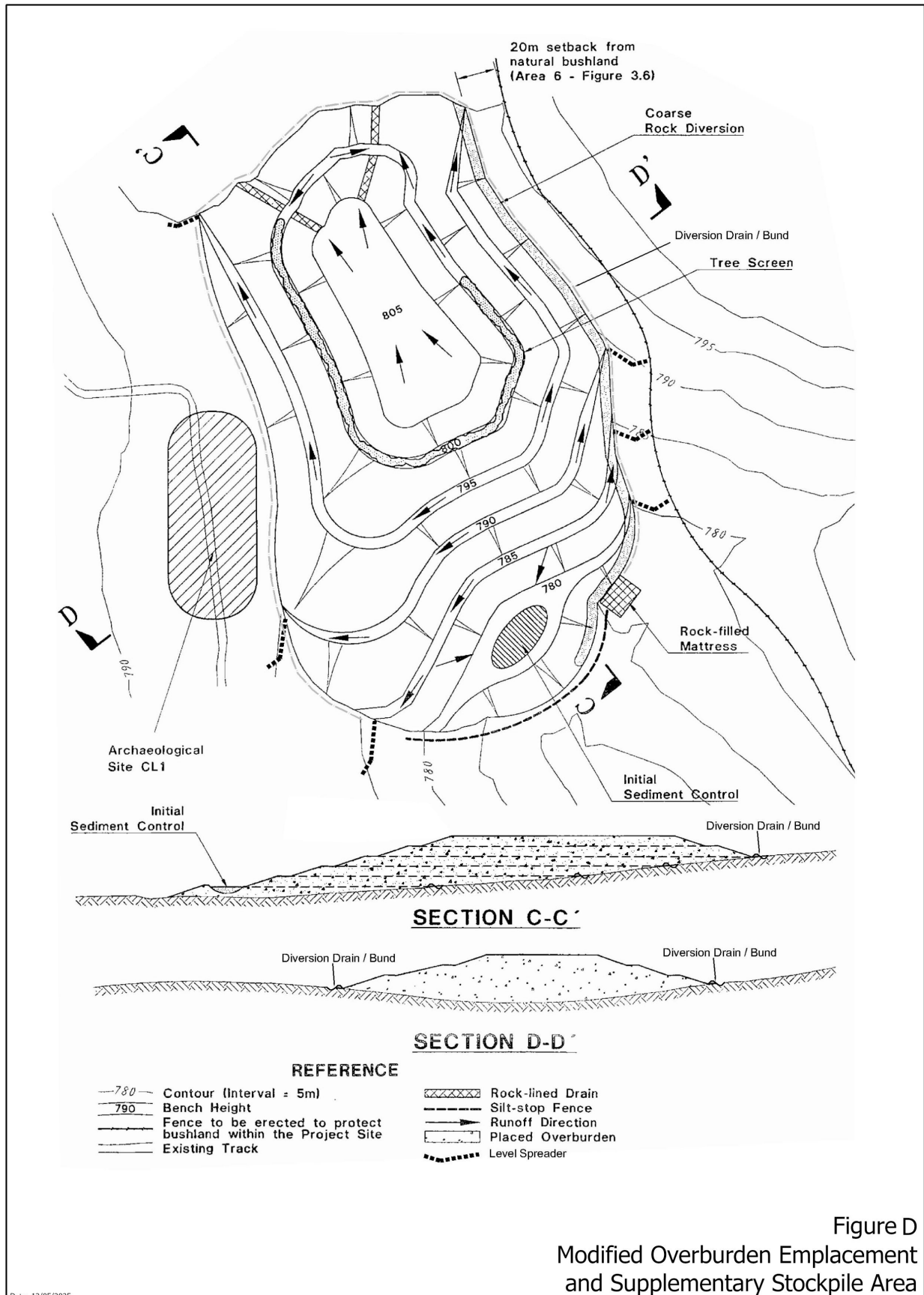
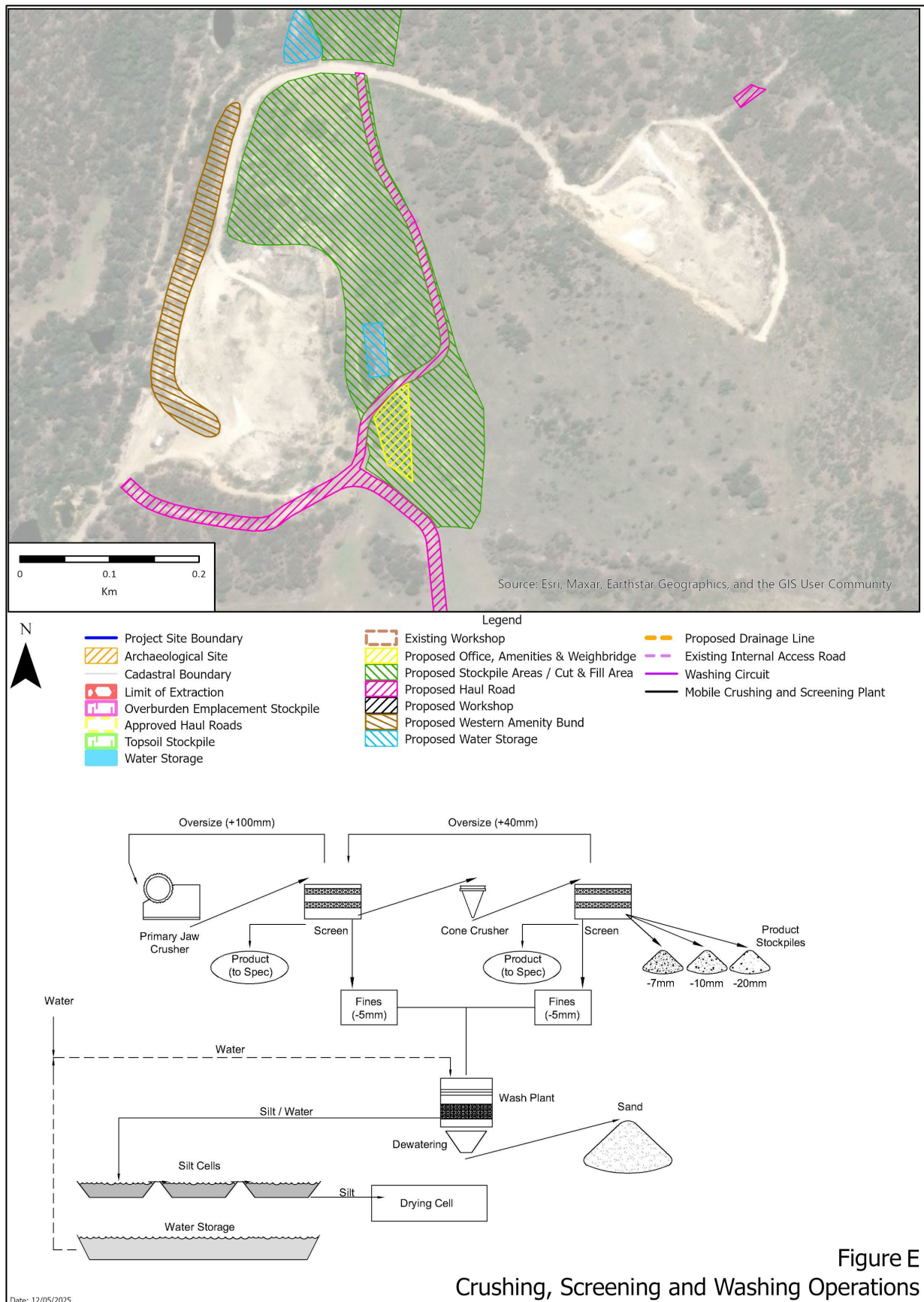


Figure D
Modified Overburden Emplacement
and Supplementary Stockpile Area



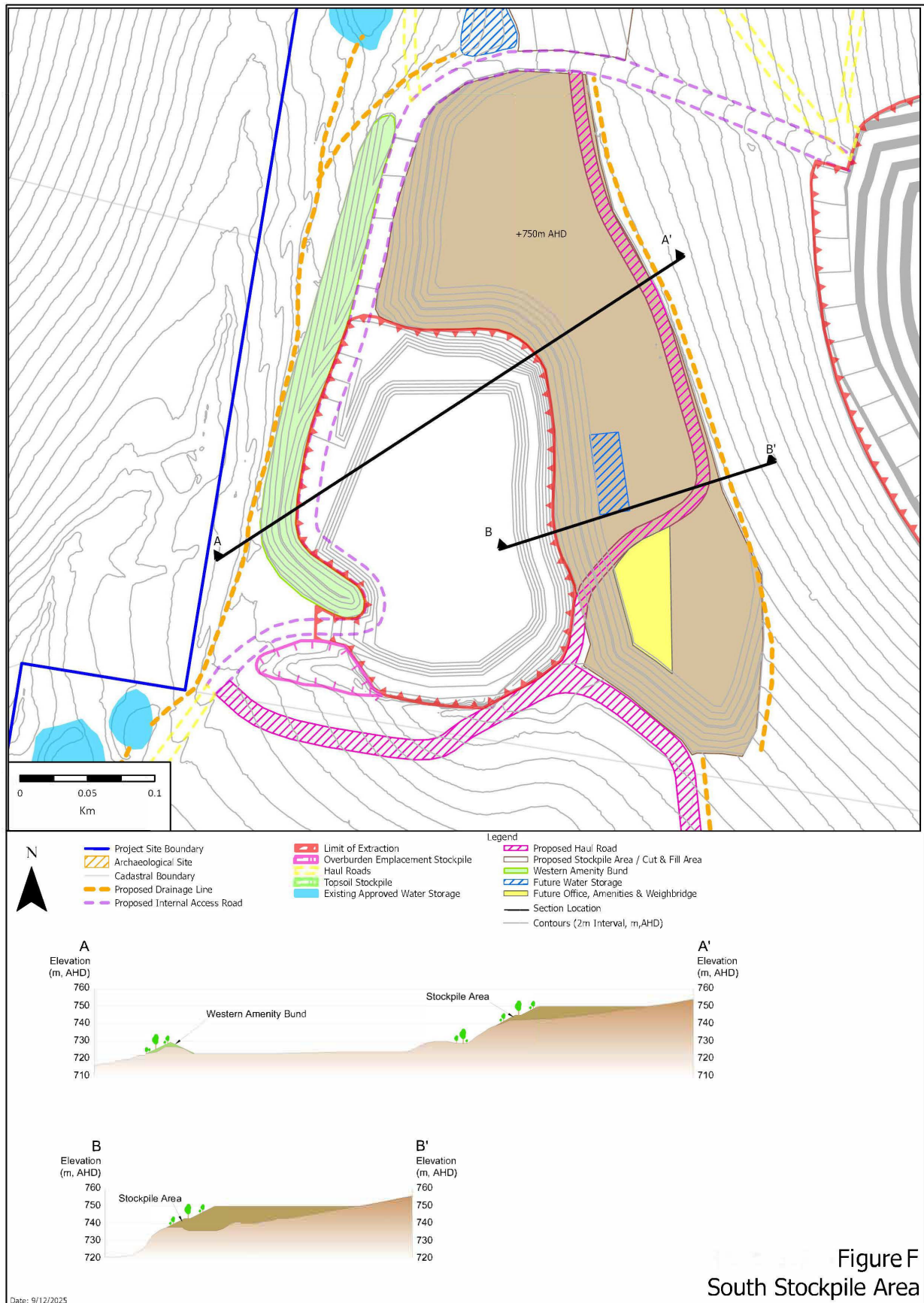
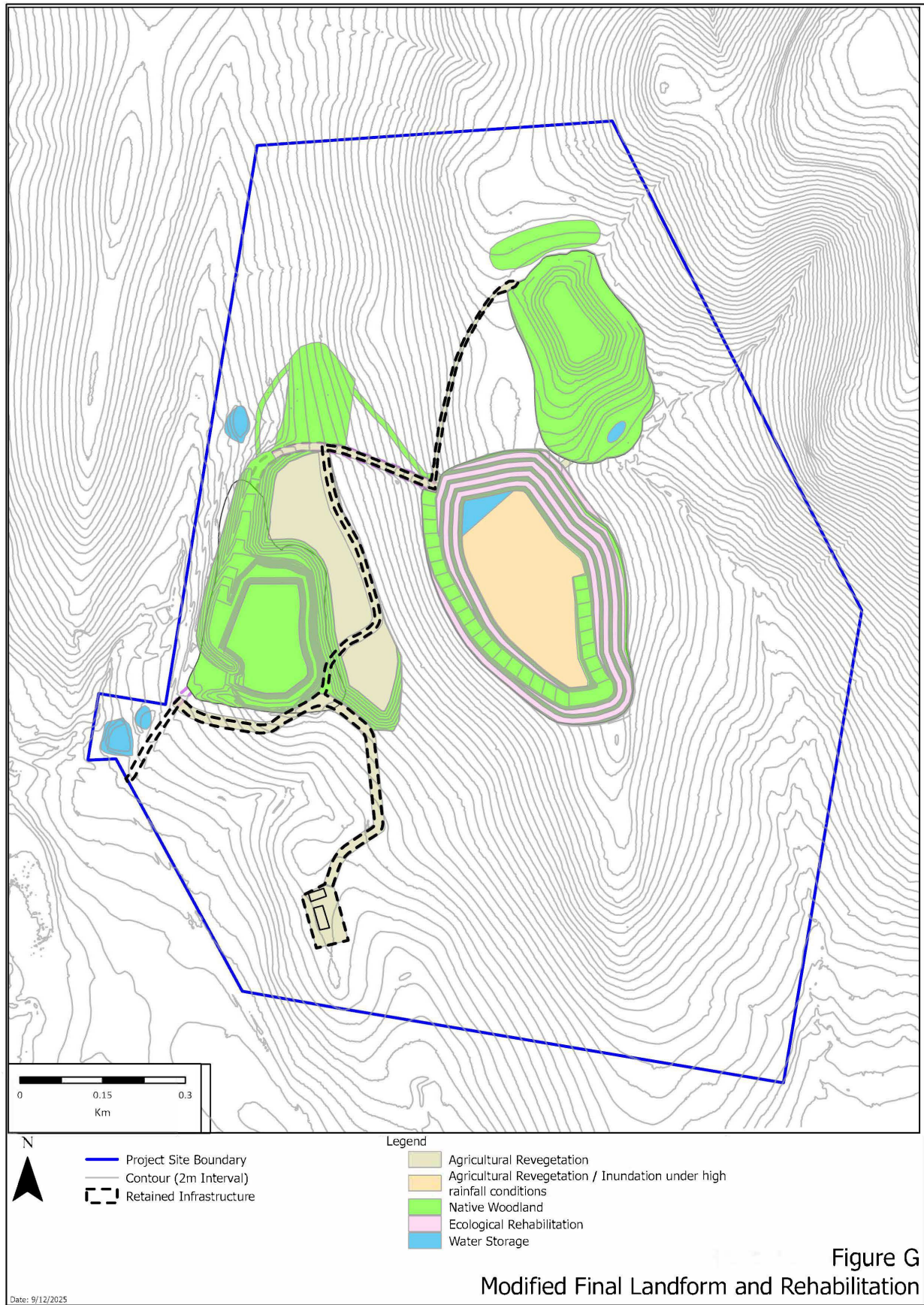


Figure F
South Stockpile Area



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