

Environmental Assessment

for the

Modification of PA 08_0212

1 INTRODUCTION

This Environmental Assessment has been prepared on behalf of The Austral Brick Company Pty Limited (“Austral”) to accompany a Section 75W modification under the *Environmental Planning and Assessment Act 1979* to Project Approval 08_0212 granted for the New Berrima Clay/Shale Quarry. The following sections provide a summary of the proposed modification and review the potential environmental effects resulting from the modification.

2 PROPOSED MODIFICATION

Austral proposes to modify the approved site layout as follows (see **Figure 1**).

1. Construction of a new causeway over Stony Creek.
2. Realignment of the western access road.
3. Repositioning of the site office, amenities, and storage container.
4. Installation of underground power and removal of a section of overhead power line.

2.1 NEW CAUSEWAY OVER STONY CREEK

The 2010 Environmental Assessment (RWC, 2010) stated that “*The bridge on the site access road currently supports large cattle trucks but would undergo an engineering inspection and rectification or improvement as required, prior to use by heavy haulage vehicles*”.

An engineering inspection has subsequently been completed by Taylor and Herbert Structural Pty Ltd Consulting Civil & Structural Engineers. The inspection identified that the bridge is currently only suitable for trucks in the order of 15t and therefore is not suitable for the heavy vehicle usage as required by the quarry operations.

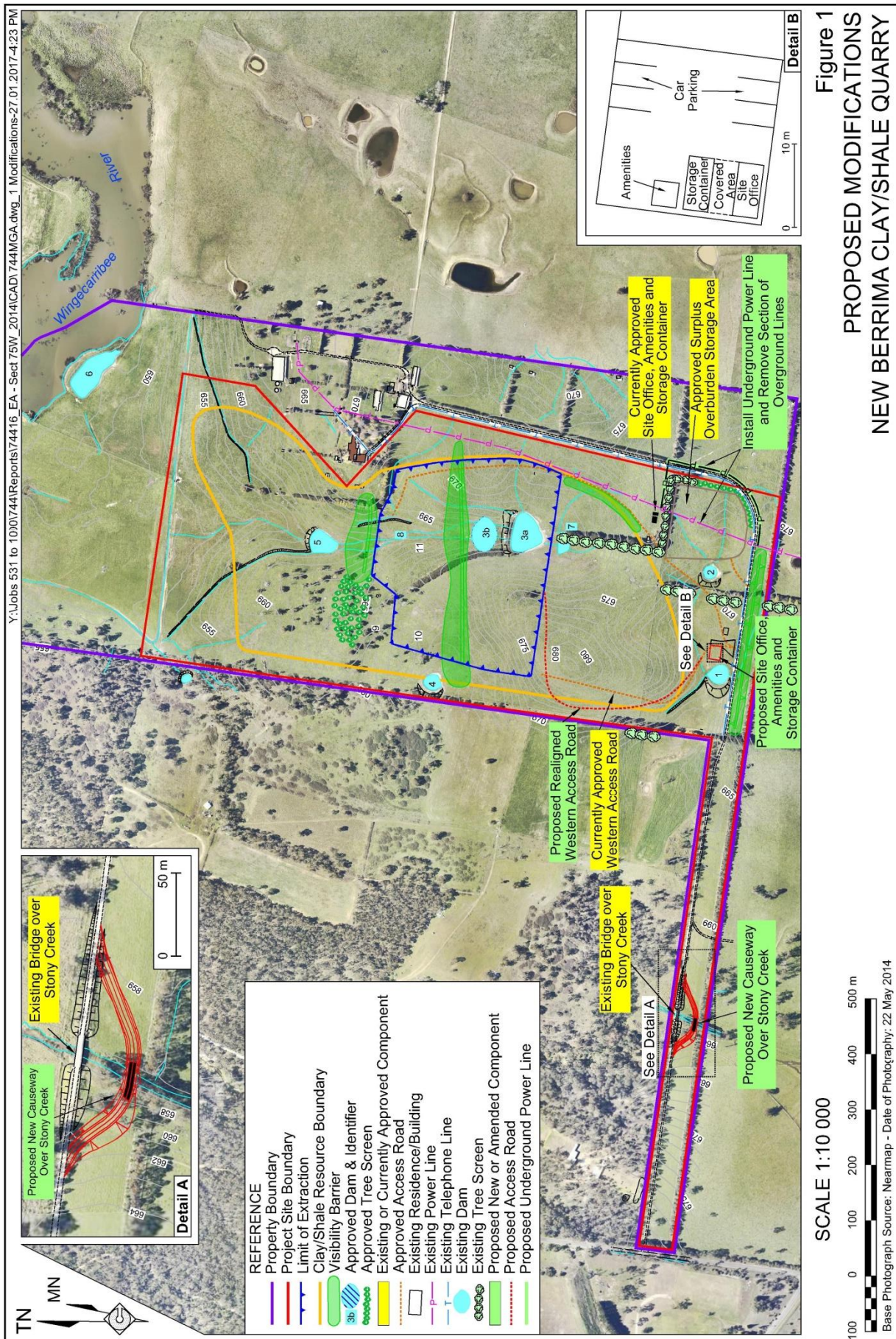


Figure 1
PROPOSED MODIFICATIONS
NEW BERRIMA CLAY/SHALE QUARRY

Three options were considered to provide long term access across ‘Stony Creek’ for Quarry related heavy vehicles, including either a level crossing or causeway south of the existing bridge or replacement of the bridge with a causeway.

Austral’s preferred option is to construct a causeway with short connecting access ramps south of the existing bridge. The causeway would provide a dry heavy vehicle access in most flow conditions (up to approximately a 1 in 1 year annual recurrence interval storm event) whilst the retention of the existing bridge would provide for ongoing light vehicle use, including during higher flow events.

The other two options were not favoured for the following reasons.

Although the construction of a level crossing south of the existing bridge would be the cheapest option, it may result in trucks frequently driving through shallow water (low flow conditions) and more frequent inaccessibility of the Quarry during higher flow conditions. As a result, this option would increase the need for ongoing operational and environmental management considerations.

Replacement of the bridge with a large causeway was also considered, however, a temporary crossing adjacent the bridge for equipment access would still be required during the construction of the replacement bridge. Therefore it was concluded that the permanent causeway south of the existing bridge would have the least impact on the creek environment, as it would not require disturbance of the creek for both a temporary causeway and again for the foundations of a new bridge.

Figure 2 and **Plates 1** to **4** provide further detail on the proposed causeway and connecting access ramp design and indicative alignment. The causeway would include two sets of three concrete culverts, each approximately 2.7m long, 2.1m wide and 0.6m in height (providing an overall crossing width of 5.4m and length of 6.3m), concrete headwalls, and non-mountable (castle style) kerbing. The proposed connecting access ramps from the east and west would be constructed approximately 4.5m wide and with a two coat bitumen seal.

Construction of the causeway and access ramps is planned to commence during February or March 2017 and would be completed within approximately 6 weeks. Construction would involve the following.

- Prior to any ground-disturbing works, sediment controls would be installed including sediment fencing and rock filter drains for collection of runoff from the earthworks associated with the connecting access ramps. Sufficient temporary groundcover material, e.g. geotextile fabric or similar, would also be retained on site for the duration of the construction works to enable covering of exposed surfaces which are not yet stabilised in the event of substantial rainfall or creek flows.
- Prior to any ground disturbing works within the creek channel, temporary bunding would be installed upstream and sediment fencing with hay bales downstream of the proposed causeway. The bunding would be constructed using gabion lined with geofabric or similar. In order to divert any low flows, a rip rap stabilised 600mm by 600mm surface inlet pit would be excavated at the upstream bund to receive water and a temporary 300mm diameter pipe would be buried in a trench from the inlet and along the eastern bank, discharging to a rip rap stabilised area downstream of the crossing. A geofabric lined swale would be retained across the top of the bund and buried pipe to provide for high flow events should they occur during construction (see **Figure 3**).



Plate 1: View westwards – proposed location of connecting access ramp east of existing bridge (Photo: E744R_024)

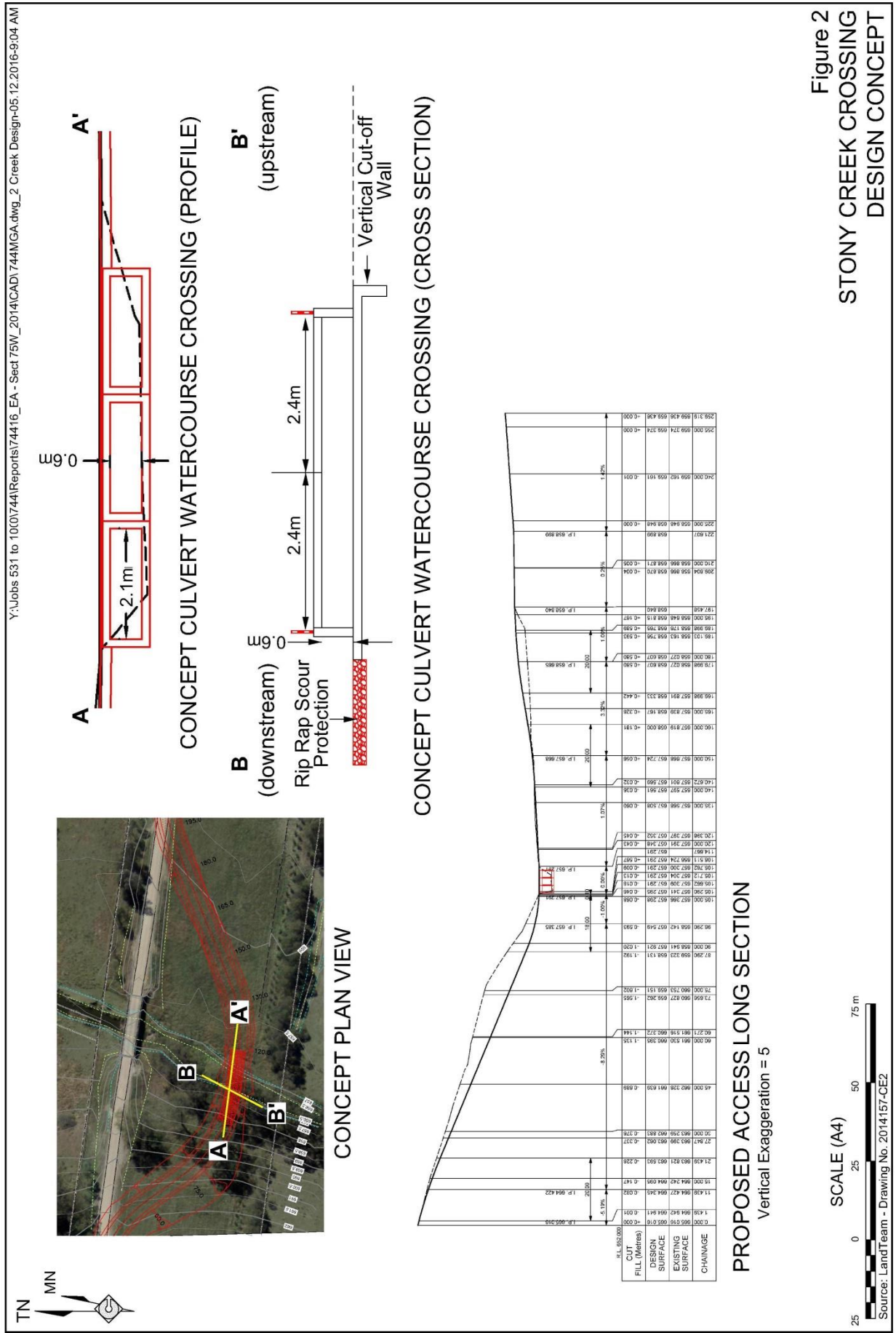
Plate 2: View eastwards - proposed location of connecting access ramp east of existing bridge (Photo: E744R_028)



Plate 3: View westwards – proposed causeway location (Photo: E744R_026)

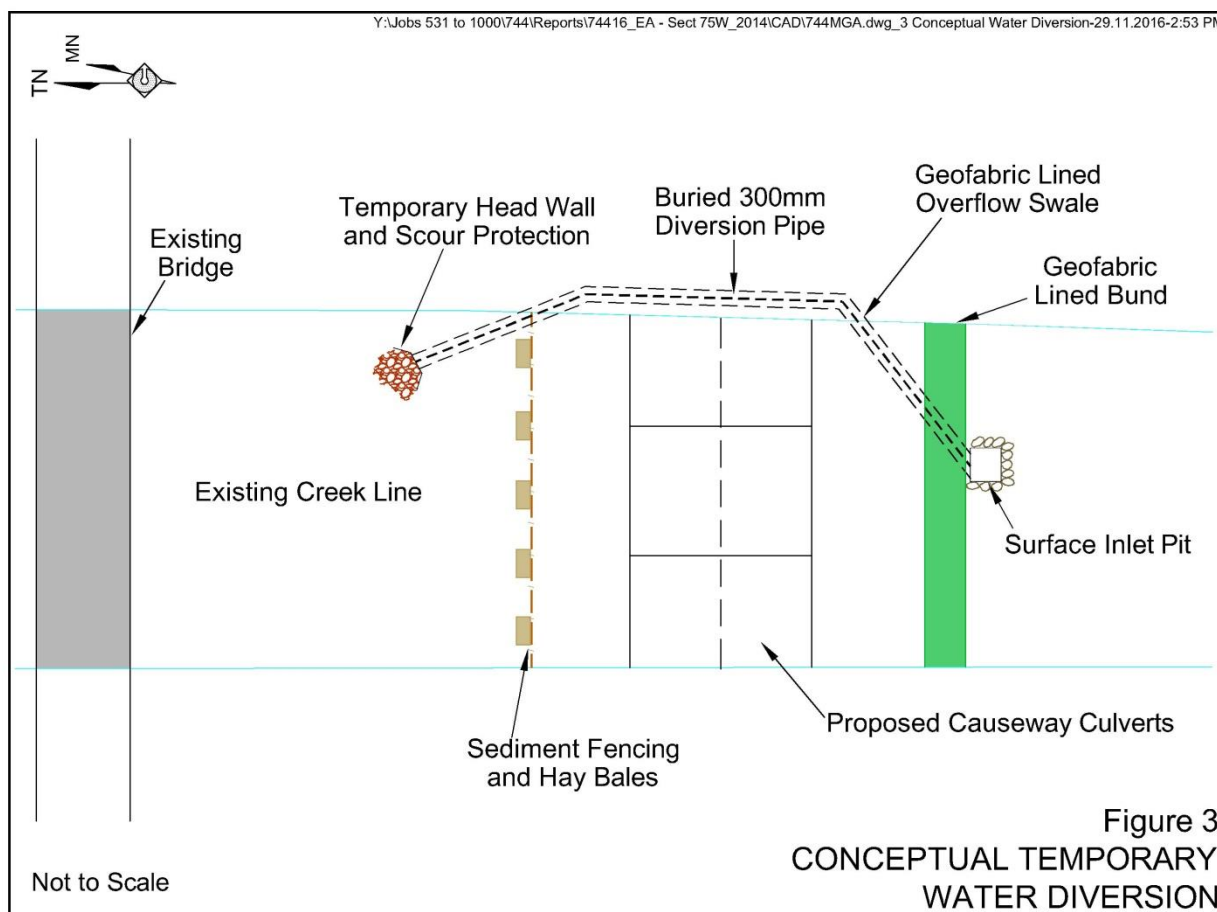
Plate 4: View eastwards - proposed location of connecting access ramp west of existing bridge (Photo: E744R_029)





- A 30t excavator would be used to strip the topsoil and subsoil, complete the cut and fill earthworks, install roadside drainage, and to fell the trees that would require removal.
- Stripped topsoil would be temporarily stockpiled adjacent the cut and fill works for placement over the completed batters adjacent to the connecting access ramps. Grass material stripped with the soil material would preferentially be placed at surface to aid in stabilisation. Any excess soil material would be transported to the quarry for use in rehabilitation in that area.
- Material recovered from cutting on the western access ramp and would be used for the fill on the eastern access ramp. Subsoil material would also be stripped from the ramps to a depth of approximately 0.4m to provide for the placement of competent road base material. Excess subsoil and fill material would similarly be transported to the quarry for use in construction of the visibility barriers, rehabilitation works, or placement within the surplus overburden stockpile area.
- A concrete base approximately 0.3m thick would be laid within the bed of the creek and for a distance of approximately 6m to 8m each side to provide a competent surface for the placement of the box culverts which would be subsequently lifted into place utilising a 25t franna.
- Rip rap (rock armouring), concreting and road sealing works would then be completed as soon as possible. Once all works are stabilised, the bunding, diversion piping, and swale would be removed, re-establishing natural flows.

In the event that sediment-laden water is present within the works areas, this would either be allowed to filter through the sediment fencing and hay bales or be pumped out to the rock filter dams.



2.2 REALIGNMENT OF THE WESTERN ACCESS ROAD

To date, the western access road has not yet been constructed. It is proposed to realign the currently approved western access road to provide a more curved alignment more closely follows existing contours thereby reducing the earthworks required and the overall gradient of the road (**Figure 1**). The construction method and standard would remain as approved for the existing alignment.

2.3 REPOSITIONING OF THE SITE OFFICE, AMENITIES, AND STORAGE CONTAINER

To date, the site office, amenities, and storage container have not yet been installed. It is proposed that the site office, amenities, and storage container be repositioned from the location adjacent the eastern access road approximately 250m southwest to a location adjacent the site access road within the vehicle turning area (see **Figure 1**). The new location would be more suitable as it would meet requirements for access to the extraction area from both the western and eastern access roads.

2.4 INSTALLATION OF UNDERGROUND POWER & REMOVAL OF THE OVERHEAD POWER LINE

It is proposed that the section of overhead power line located above the approved surplus overburden stockpile area be removed and replaced with a section of underground power located adjacent the property access road (see **Figure 1**). This would remove potential safety management concerns during the placement of overburden material within the approved surplus overburden stockpile area.

All works would be undertaken either by the energy provider or approved electrical contractor to required standards and would involve trenching of power cables within existing disturbed or grassed areas. Soil material removed during trenching would be temporarily stockpiled adjacent the trench with subsoil and then topsoil returned to the trench. Any grass material removed with the topsoil would be placed on top to facilitate stabilisation of the soil.

3 ENVIRONMENTAL MANAGEMENT AND EFFECTS

3.1 SURFACE WATER AND FLOODING

The design and construction of the causeway would be undertaken in accordance with the *Guidelines for Watercourse Crossings on Waterfront Land* (NOW, 2012) and *Why do fish need to cross the road? Fish passage requirements for waterway crossings* (Fairfull and Witheridge, 2003). In accordance with these guidelines:

- the culvert design has been prepared by a suitably qualified engineer;
- the proposed crossing location is not within or near a bend in the creek channel;
- the culverts would be aligned with the downstream channel;

- no significant filling or construction of embankments is proposed;
- the crossing would incorporate recessed wet cells with the invert at or below the stable bed level thereby not restricting fish passage;
- potential scouring effects would be mitigated through the use of vertical cut-off walls and rip rap armouring for a distance of twice the channel width; and
- the entire length of the access ramps would be sealed with a combination of concrete (adjacent to the culvert) and road sealing thereby minimising the potential for erosion and sedimentation.

Surface water management during the construction of the access ramps and crossing are detailed in Section 2.2.1. During operations, the culverts would be inspected monthly and following significant rainfall events (i.e. >25mm in 24hrs) with remedial works undertaken, such as removal of debris, as required to ensure adequate functioning of the culverts.

A review of the potential flood effects of the proposed causeway has been undertaken by LandTeam Australia Pty Limited (see **Appendix 1**). The review concluded that the proposed crossing and connecting access ramps would not result in the loss of any flood storage volume within the flood plain of Stony Creek or result in a significant increase in flood levels or velocities within the site or adversely affect adjoining properties.

General surface water and erosion / sediment control and management for all proposed activities would be undertaken in accordance with the objectives and processes included within the approved Water Management Plan. These measures are consistent with *Managing Urban Stormwater. Soils and Construction* Volumes 1 and 2e (Landcom, 2004 and DECC, 2008).

Based on the implementation of these design features and management measures, it is assessed that no significant surface water or flooding impacts would result from the proposed modification.

3.2 ECOLOGY

Kevin Mills & Associates inspected the area of the proposed causeway and connecting access ramps on 21 November 2016. A copy of the assessment report is provided in full as **Appendix 2**.

The area in which the connecting access ramps are proposed to be located consists of sown pasture species *Phalaris aquatica* and Cocksfoot *Dactylis glomerata*. The channel of Stony Creek supports some wetland vegetation, primarily the introduced garden plant Louisiana Iris. However, on the western side of Stony Creek there is a band of Paddys River Box (*Eucalyptus macarthurii*), a species listed as endangered under the NSW *Threatened Species Act 1995* (TSC Act) and Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act).

The proposed causeway would require the removal of three to four of these trees. In order to offset the removal of these trees, seed from the Paddys River Box would be collected and propagated at a local nursery. Ten saplings would be planted along the creek for each tree removed and maintained for a period of 5 years to ensure their establishment. The area would also be fenced or otherwise excluded from stock.

Kevin Mills & Associates considers that the stand of Paddys River Box is slowly dying with trees not being replaced, as evidenced by the two dead trees in the stand and the lack of saplings. It is therefore considered that the proposed tree plantings would result in an overall improvement in the long-term viability of this local population. It is concluded that the proposed causeway is not likely to have any significant impacts and does not warrant referral to the Commonwealth Minister for the Environment.

The realigned western access road, location of the repositioned site office, amenities, and storage container, and locations for the underground power lines would not result in the clearing of any additional shrubs or trees and remain wholly within cleared pastureland.

3.3 OTHER ENVIRONMENTAL CONSIDERATIONS

Air and Noise

No significant changes to air quality or noise impacts are expected given that the proposed modification would not result in an increase in the intensity of activities, the proposed connecting access ramps would be sealed, and the location of noise-generating activities would not substantially change. The nature of the construction activities would also be of a low intensity and short duration compared to the existing approved activities.

Heritage

Previous heritage surveys completed by ASR (2009) identified no sites or places of archaeological or Indigenous cultural significance and no Potential Archaeological Deposits. A review of the Aboriginal Heritage Information Management System (AHIMS) on 27 January 2017 confirmed that no cultural heritage sites have been recorded within (or within 50m) of the Quarry Site, including in the vicinity of the proposed causeway. A copy of the search has been provided separately to the Department of Planning & Environment. Therefore it is expected that the proposed modification would not result in impacts to heritage. Notwithstanding this, Austral would continue to implement the approved Aboriginal Heritage Management Plan which includes stop work and reporting protocols in the event that any heritage objects were to be located.

Visual Amenity and Socio-Economics

The proposed modification would not result in any significant changes to the potential visual amenity or socio-economic impacts.

Transportation and Groundwater

The proposed modification would not result in changes to transportation or any impacts to groundwater.

4 CONCLUSION

The proposed modifications would provide for improved traffic access efficiencies and improved safety and security without resulting in any significant changes to environmental impacts.

5 REFERENCES

ASR (2009). *New Berrima Clay/Shale Quarry Cultural Heritage Assessment.*

DECC (2008). *Managing Urban Stormwater. Soils and Construction.* Volume 2e Mines and Quarries. NSW Department of Environment and Climate Change, Sydney.

Fairfull and Witheridge (2003). *Why do fish need to cross the road? Fish passage requirements for waterway crossings.*

GCNRC (2009). *New Berrima Clay/Shale Quarry Flora Assessment.*

Landcom (2004). *Managing Urban Stormwater. Soils and Construction.* Volume 1.

NSW Office of Water (2012). *Guidelines for Watercourse Crossings on Waterfront Land.*

RWC (2010). *Environmental Assessment for the New Berrima Clay/Shale Quarry.*

Appendices

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Appendix 1 Assessment of Flood Effects

Appendix 2 Ecology Review

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Appendix 1

Assessment of Flood Effects

(Total No. of pages including blank pages = 4)

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Our ref: 204157

Austral Bricks
PO Box 656
BOWRAL NSW 2576

Attention: Peter Young-Whitford

Dear Sir,

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**RE: ASSESSING THE POTENTIAL FLOOD EFFECTS OF PROPOSED CAUSEWAY CROSSING
NEW BERRIMA SHALE QUARRY ACCESS ROAD
LOT 1 DP 414246 "MANDURAMA" BERRIMA ROAD BERRIMA**

This letter has been prepared to verify that the construction of the proposed low level box culvert crossing, as conceptually detailed in LandTeam drawing 204157-CE2, will not increase flood effects elsewhere. This assessment has addressed potential:

- Loss of flood storage
- Changes in flood levels and velocities caused by alterations to the flood conveyance

Loss of Flood storage

The proposed crossing design, including the incoming road, does not involve any significant amount of filling or the construction of embankments that could potentially remove any flood storage volume within the flood plain.

Changes in Flood Levels and Velocities

The proposed crossing design does not significantly increase the flood levels or flow velocities within the site. There are no adverse effects on any adjoining properties. Design storms ranging from the 1 year to 100 year ARI peak events have been considered.

A minor localised increase in flow velocity occurs as the flow transitions from sub-critical to super-critical flow as it passes the culvert structure during certain storm events, however this reduces back to the existing model velocities prior to discharging from the site. Any potential scour effects are mitigated with locally designed rip-rap armouring and cut-off walls as detailed in the concept drawings. Hence it is considered that the proposed culvert design, as detailed in concept drawing 204157-CE2, would not increase the flood effects elsewhere for all storm events. Any minor increases in localised flood levels and flow velocities would have no effect on adjoining lands.

Yours faithfully,
LANDTEAM AUSTRALIA PTY. LIMITED

Dean Ingenhoff
Civil Engineer BE (Civil) MIE (Aust)





Appendix 2

Ecology Review

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Mr Scott Hollamby
R W Corkery & Co. Pty Limited
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PO Box 239
BROOKLYN NSW 2083

19 December 2016

Dear Sir

New Berrima Clay/Shale Quarry
Mandurama No. 524 Berrima Road, Moss Vale
Assessment of Causeway

Further to your instructions, we have investigated the site of the proposed causeway and connecting access ramps to the New Berrima Clay/Shale Quarry. The results of our field survey and subsequent flora and fauna assessment are attached.

Please do not hesitate to contact me if we can be of further assistance.

Yours sincerely
KEVIN MILLS & ASSOCIATES
Dr Kevin Mills
Managing Director



New Berrima Clay/Shale Quarry
Mandurama No. 524 Berrima Road, Moss Vale
Assessment of Causeway – Flora and Fauna

Kevin Mills & Associates

19 December 2016

The Proposal

The proposal is to construct a causeway across Stony Creek adjacent to the existing access road to the New Berrima Clay/Shale Quarry site at No. 524 Berrima Road, Moss Vale; see Figure 1.

The following is an extract from the Environmental Assessment Report:

“The previous Environmental Assessment (RWC 2010) stated that “The bridge on the site access road currently supports large cattle trucks but would undergo an engineering inspection and rectification or improvement as required, prior to use by heavy haulage vehicles”.

An engineering inspection has subsequently been completed by Taylor and Herbert Structural Pty Ltd Consulting Civil & Structural Engineers. The inspection identified that the bridge is currently only suitable for trucks in the order of 15t and therefore is not suitable for the heavy vehicle usage as required by the quarry operations.

Three options were considered, including: replacement of the bridge with a causeway; and two causeway options south of the existing bridge. Rather than replace the current single lane bridge, the Proponent proposes to construct a causeway with short connecting access ramps adjacent to the bridge for use by heavy vehicles and retain the existing bridge for ongoing light vehicle use.”

The site of the proposed causeway is just south of the existing access road bridge; see Figure 1.

The Site

The proposed causeway is located across Stony Creek about 430 metres east of Berrima Road. The length of creek on the property at this location is about 40 metres; the proposed causeway is about 25 metres upstream from the existing bridge crossing. The site is within a largely treeless paddock with a long history of stock grazing. Several trees and other non-pasture plants grow next to the creek.

Description of vegetation and habitats

The land either side of the creek supports sown pasture, particularly *Phalaris aquatica* and Cocksfoot *Dactylis glomerata*.

On the western side of Stony Creek there is a band of Paddys River Box *Eucalyptus macarthurii*, a species listed as endangered under NSW and Commonwealth legislation. This tree is common in the area around Moss Vale (NSW Wildlife Atlas).

Ten live trees of *Eucalyptus macarthurii* occur in the vicinity of the proposed causeway; see **Photographs 1 and 2**. The identification of this species via a specimen gathered by the consultant on this site has been confirmed by the National Herbarium, Sydney.

Two dead trees are also present. The dch (diameter of trunk at chest height) of the ten live trees were measured: 18,19,20,28,29,35,40,44,44 and 54 cm. No very large trees occur here, although one or two trees further from the crossing point are larger.

The immediate channel supports some wetland vegetation, primarily the introduced garden plant Louisiana Iris (the large strappy plant in Photograph 3). Various weeds dominate the channel area. The few native species are Swamp Stonecrop *Crassula helmsii*, Water Couch *Paspalum distichum*, Water Ribbons *Triglochin procera*, River Club-rush *Schoenoplectus validus* and Sedge *Cyperus* sp.

Previous Assessments

The New Berrima Clay/Shale Quarry site was investigated previously, although the access road was not studied.

In regard to flora, Geoff Cunningham Natural Resource Consultants (2010) stated:

“The overall area is highly cleared and what native tree vegetation that remains lacks a shrub layer. The ground cover over the whole study area is dominated by introduced weed and pasture species.”

and

“It is concluded that no threatened flora species, endangered or critically endangered ecological communities, endangered flora populations or critical habitat exist within the Project Site or study area.”

The fauna study by Aquila Ecological Surveys (2010) stated:

“It was found that fauna habitat at the Project Site is highly modified consisting of pasture, several hedgerows and five small dams. Consequently, it is only suitable for a narrow range of fauna species, none of which are of conservation significance. The Project Site is not part of any regional corridor for fauna.”

and

“No threatened fauna species or endangered fauna populations listed on the Threatened Species Conservation Act were found at the Project Site, nor are any such species considered likely to occur. The Project Site does not have any conservation value for fauna. Therefore, the proposal satisfies the guiding principles of threatened species assessment in relation to Part 3A projects.”

Impact assessment – TSC Act 1995

The amount of clearing of native vegetation required to construct the causeway is very minor. The clearing is likely to involve the removal some trees and the ground cover, including the wetland vegetation, which is mostly exotic.

The channel of Stony Creek would be impacted to some extent, but this will be short term. Consideration has been given to the need to minimise the changes to the channel and to provide for fish habitat. The Environmental Assessment sets out at Section 3.1 the measures to achieve minimal impact on fish habitat and channel form. The documents *Why do fish need to cross the road? Fish passage requirements for waterway crossings* (Fairfull & Witheridge 2003) and *Guidelines for Watercourse Crossings on Waterfront Land* (Office of Water 2012) have been considered in designing the causeway crossing.

The endangered tree *Eucalyptus macarthurii* occurs along the creek, as described above. Based on the concept plans, the causeway would result in the removal of approximately three or four trees.

Threatened Species

The only matter of legislative importance in the area to be impacted is the endangered tree *Eucalyptus macarthurii*. This tree is quite common on the Central Tablelands from about Mittagong in the north to Bundanoon in the south, and east to west from Marulan to west of Robertson. There is an outlying population in Kanangra Boyd National Park. In total, the NSW Wildlife Atlas contains 691 records of this species as at November 2016. While the tree is common in a limited area, there are few trees within protected areas; most are scattered across farming land.

The removal of three to four trees during the construction of the proposed causeway across Stony Creek is assessed below employing the Part 3A - Major Project / Development assessment criteria.

Assessment under Part 3A

Guidelines that identify matters relevant to the assessment of potential impact on threatened species, populations or ecological communities of proposed development under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) have been prepared by the then Department of Environment and Conservation (now Office of Environment and Heritage) and the then Department of Primary Industries (DEC July 2005).

The *Guidelines for Threatened Species Assessment* identify the following objectives with regard to conserving threatened species, etc.:

- "Maintain or improve biodiversity values (i.e. there is no net impact on threatened species or native vegetation).
- Conserve biological diversity and promote ecologically sustainable development.
- Protect areas of high conservation value (including areas of critical habitat).

- Prevent the extinction of threatened species.
- Protect the long-term viability of local populations of a species, population or ecological community.
- Protect aspects of the environment that are matters of national environmental significance.”

The *Guidelines* outline a broad five-step process for assessing impacts on threatened species. Note that ‘threatened species’ refers here to species, populations and communities listed as threatened under the *Threatened Species Conservation Act 1995* (NSW) or the *Fisheries Management Act 1994* (NSW). As this project is being assessed under Part 3A of the EP&A Act, this investigation and report follow the *Guidelines* where relevant; these are provided in italics below. The assessment process under the TSC Act commonly known as the ‘test of significance’ is switched off for Part 3A matters. The matters to be considered in the assessment of a Part 3A development are determined by the Minister for Planning for each development.

Step 1 – Preliminary Assessment

“The main purpose of a preliminary assessment is to determine the likelihood of the study area and subject site supporting threatened species” (Guidelines, page 2). As noted in the Guidelines, this step is primarily a ‘desktop’ study, using existing information, literature and data bases to identify relevant threatened species. The Guidelines state that the following matters should be included in the preliminary assessment:

- “a description of the location and nature of the proposed development;*
- a description of dominant vegetation types;’*
- a description of habitat features;*
- a list of threatened species that are known or likely to occur within the study area;*
- an assessment of which of the threatened species that are known or likely to occur are likely to be directly or indirectly affected by the proposal provides a list of factors for consideration in identifying adverse impacts. This list is not necessarily exhaustive and is not development-specific.” (Guidelines, page 3)*

The *Guidelines* state that certain matters should be included in the preliminary assessment. These are primarily concerned with descriptions of the development, the vegetation types, habitats, the threatened species known and likely to occur in the area and those threatened species that may be impacted by the proposed development. Descriptions of the project area and its environments associated with the project site are provided in previous reports (Aquila Ecological Surveys 2010; Geoff Cunningham Natural Resource Consultants 2010). This current report describes the Stony Creek area. The previous reports identified the potential threatened species for the locality.

Step 2 – Field Survey and Assessment

As noted in the Guidelines, “the required intensity and extent of survey will vary greatly depending upon the species likely to be present, size of the development area, the level of

biological and habitat diversity on the site, and the type and complexity of vegetation on the site.” (Guidelines, page 3)

The Guidelines point out the need “to ensure that a reliable assessment of the presence or absence of threatened species can be made” (Guidelines, page 3). It is also noted that consideration needs to be given to the relevance of climatic or seasonal conditions for the target species.

Where relevant, the survey methods set out in the document titled Threatened Biodiversity Survey & Assessment: Guidelines for Developments and Activities (DECC 2004) should be followed. As noted above, the level of the survey will very much depend upon site conditions.

The outcome of Step 2 should be that adequate field surveys are undertaken for all target species identified in Step 1 such that confident statements can be made regarding the potential for the presence of the species on the subject site. In some instances, the precautionary principle should be adopted and the presence of a species assumed for the purposes of impact assessment.

A field survey was undertaken on one day in November 2016 and given the small size of the impacted area, this is considered to be adequate. The known and potential threatened species in the locality were discussed in the previous reports dealing with the broader site and referenced above. The only matter of relevance to the proposed modification (causeway crossing) is the presence of *Eucalyptus macarthurii*.

Step 3 – Evaluation of Impact

This step involves identifying the potential magnitude and extent of the impact, if any, the development will have on each of the target species.

The Guidelines suggest that “impacts will be more significant if:

- areas of high conservation value are affected;*
- individual animals and/or plants and/or subpopulations that are likely to be affected by the proposal play an important role in maintaining the long-term viability of the species, population or ecological community;*
- habitat features that are likely to be affected by the proposal play an important role in maintaining the long-term viability of the species, population or ecological community;*
- the duration of impacts are long-term;*
- the impacts are permanent and irreversible.” (Guidelines page 4)*

The potential impact of constructing the proposed causeway is the loss of several mature trees of *Eucalyptus macarthurii*. The species is not regenerating on this site, which is within paddocks of improved and sown pasture. The trees are slowly dying and not being replaced, as evidence by the two dead trees in the stand and the lack of saplings.

Step 4 – Avoid, mitigate and then offset

Where there is a potential to impact on threatened species, this should be addressed through, firstly, avoiding the impact; this may mean making some changes to the proposed development. If avoidance is not possible, then some form of mitigation may be required. Finally, if neither avoidance nor mitigation is possible, then some form of offset or compensation will be required. This could entail the rehabilitation of similar habitat nearby.

Several alternatives to locating the causeway at the proposed location were explored; all had disadvantages. The scope for alternatives is limited by the narrow piece of land containing the access road.

While avoidance is difficult to achieve, it is proposed to mitigate and offset the impact by planting a copse of this species adjacent to the site. The methods are summarised below.

- Gather seeds from the *Eucalyptus macarthurii* trees as soon as possible (seed is currently available) and grow on in a local nursery familiar with propagating eucalypts until tube stock size is reached. If necessary, this step should be repeated during subsequent seeding events to provide the required number of trees.
- Plant ten trees for every tree removed in a suitable location adjacent to the existing trees.
- If stock are present, fence the area or otherwise exclude the stock.
- Plant out tube stock sized plants outside the winter period.
- Maintain the trees and replace dead trees for a period of five years from planting.

Step 5 – Key thresholds

The Guidelines state that “the development application needs to contain a justification of the preferred option based on the following”:

whether or not the proposal, including actions to avoid or mitigate impacts or compensate to prevent unavoidable impacts will maintain or improve biodiversity values

The proposed tree plantings will improve the situation for this species at this site. As noted above, the trees are slowly dying. Planting many more trees than exist at the site at present and ensuring their survival can only benefit the species in this area.

whether or not the proposal is likely to reduce the long-term viability of a local population of the species, population or ecological community

The proposed tree plantings would increase the local population by between 200 and 300 percent and improving long-term viability of the local population.

whether or not the proposal is likely to accelerate the extinction of the species, population or ecological community or place it at risk of extinction

The proposal would increase the population and improve its long-term survival, compared to the poor prospects for the population to survive in the long term under the current situation.

whether or not the proposal will adversely affect critical habitat.

There is no declared critical habitat within or in the vicinity of the locality involved in the proposed modification.

Impact Assessment – EPBC Act 1999

The *Significant Impact Guidelines 1.1* for Matters of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999* prepared by the Commonwealth in 2013 contain the following impact criteria for endangered species.

“An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of a population
- reduce the area of occupancy of the species
- fragment an existing population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of a population
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species’ habitat
- introduce disease that may cause the species to decline, or
- interfere with the recovery of the species.”

While the proposal involves removal of some specimens of an endangered species, the proposed mitigation and offset measures increase the local population through propagation and care of a new population of the species nearby. Thus, the population is not only increased significantly, the long-term viability of the stand, currently only old, non-regenerating trees, is improved. In this case, none of the above impacts are likely to be significant.

In our opinion, the proposed modification to the New Berrima Clay/Shale Quarry is not likely to have a significant impact on matters of national environmental significance listed under the *Environment Protection and Biodiversity Conservation Act*. Referral to the Commonwealth Minister for the Environment for assessment and approval is therefore not warranted.

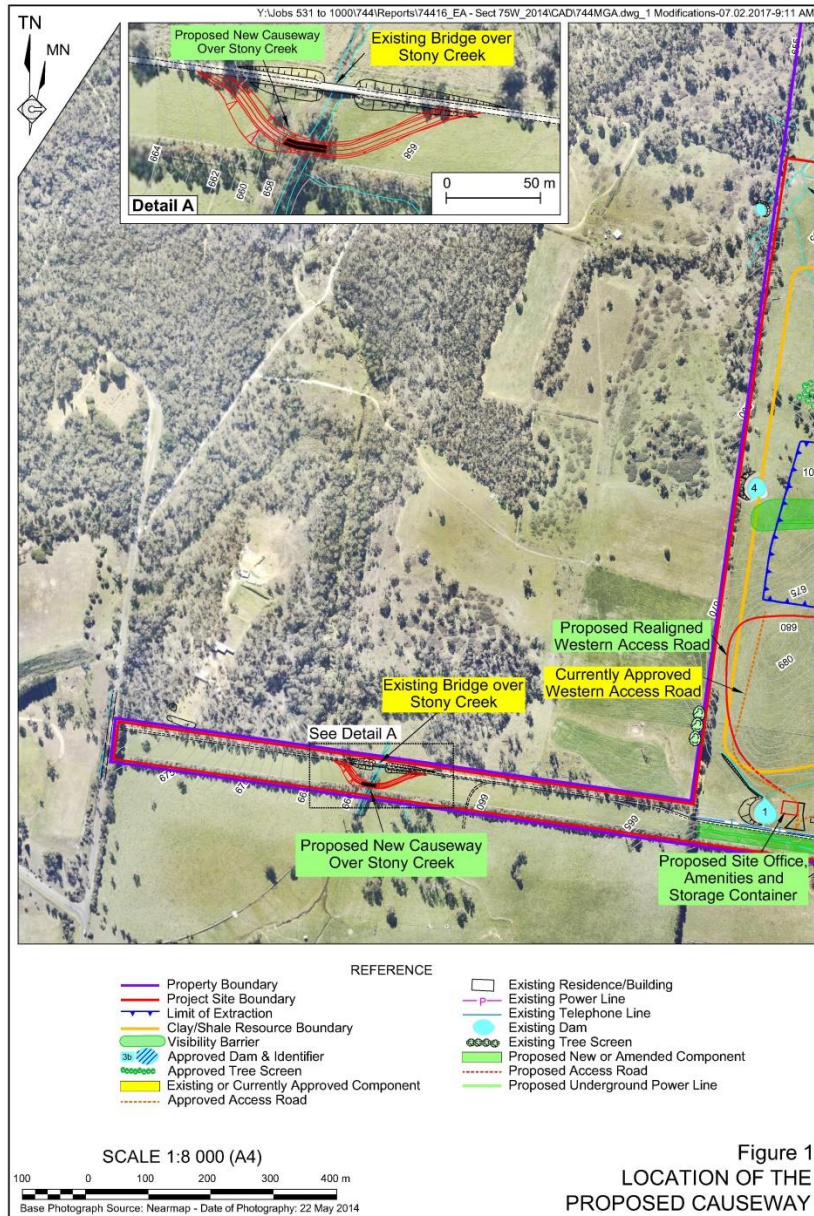


Figure 1. Location of the proposed causeway.

This study is restricted to the proposed causeway over Stony Creek, shown in red at the bottom of the plan.



Photograph 1. View looking east across Stony Creek.



Photograph 2. View looking west across Stony Creek.



**Photograph 3. The channel of Stony Creek, looking upstream from the existing bridge;
the tree are on the western side of the creek bank.**