DA MODIFICATION
ADDENDUM NO. 3
to
Environmental Impact Statement

for

CTK Natural Resources Pty Ltd

Lookout Road Quarry

DA 2015-953

March 2019

de Groot & Benson Pty Ltd

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1 Introduction

1.1 Background

Development Consent for the Lookout Road quarry (DA 2015/953) was determined by the Joint Regional Planning Panel (JRPP) on 17 February 2017.

The subject land is known as Lot 61 DP 754445 and Crown Land, Lookout Road, Herons Creek (also known as Compartments 42 & 43 of Broken Bago State Forest).

On 25 October 2018, subsequent to the determination of the Development application, a construction certificate was issued by Council for the building works associated with the project, and a separate construction certificate was issued by Council on 18 September 2018 for the civil engineering components of the project.

Construction of the infrastructure is scheduled to commence in the near future.

One of the ancillary components of the development application (approved in the determination by the JRPP) is a water storage dam. A pump (housed in a pump house) was an integral part of the proposed infrastructure.

The capacity of the approved dam is 10 Ml.

In the DA documentation, the position of that dam is situated on a second order stream on the southern side of Milligan Road.

The closest dwelling house to the originally approved dam site is situated more than 1 km away, half of that distance being covered in forest.

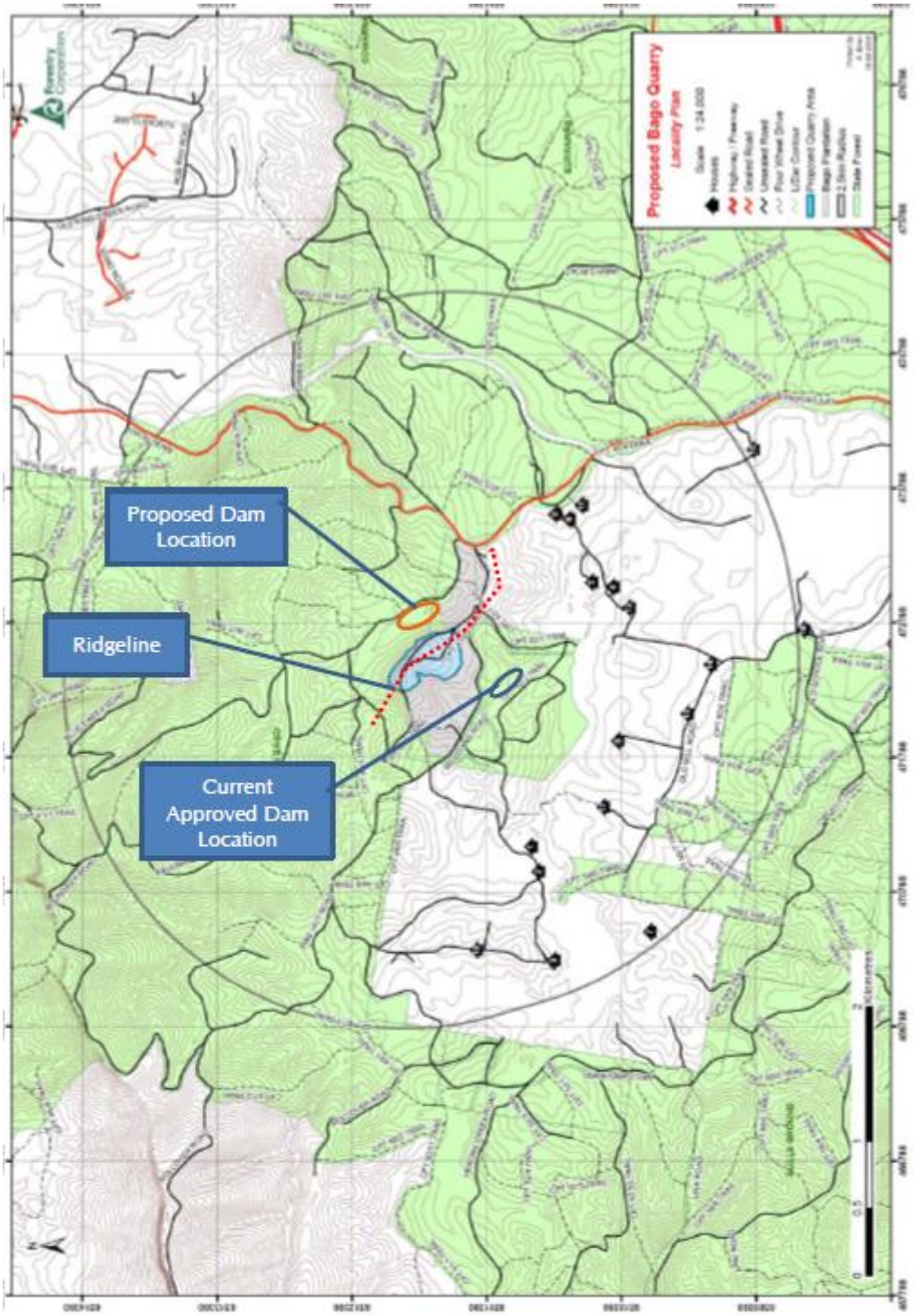
Within 2 km of the approved dam site, there are 14 other dwelling houses, all of which are in the same (hydrographic) catchment as the originally proposed dam.

The originally approved position of the dam has subsequently been shown to be inappropriate.

As a result of recent geological investigation, together with a recent ecological review, and supported by a review of constructability, it has become abundantly clear that it is not feasible to construct the water storage dam in the position shown in the original DA drawings.

Accordingly, it is necessary to change the location of the dam. A more suitable location has been found elsewhere on the subject land.

Illustration 1.1 Approved and Modified Dam Location



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Modification of Development Consent

2.1 Proposed Modification

The application seeks to relocate the position of the water storage dam (and the pump house) associated with the approved quarry.

The proposed (preferred) location of the dam is situated in a second order stream within the subject land approximately 100 m to the north east of the south-eastern corner of the approved quarry precinct.

The location and the conceptual engineering attributes of the dam are illustrated on the drawings which accompany this application.

Those drawings demonstrate that the currently proposed dam site is further away from all of the dwellings within the district than the originally approved dam site. Furthermore, the proposed dam site is situated in a totally separate catchment to the regional dwellings. A significant ridgeline now separates those dwellings from the proposed dam and pump house.

2.2 Alternative Dam Location

The dam is a permissible use within the zone and is consistent with the zone objectives. The proposed dam complies with the relevant development standards in the LEP and does not contravene any development control plan.

It will not affect any neighbouring residences by overshadowing or loss of privacy. It will not result in the loss or reduction of views, particularly having regard to the fact that the Forestry Corporation is about to commence harvesting in the area.

It will not impact on any item of heritage or cultural significance. In this regard, the entire (188 ha) site was originally the subject of an archaeological study. On that occasion, one minor artefact was found high up on the ridge of the subject land, and subsequently relocated to a more appropriate site by the Local Aboriginal Land Council. That aspect was appropriately addressed in the original EIS.

The proposed dam will not result in any land use conflict or incompatibility with neighbouring premises. The proposed dam will not be out of character with the surrounding area. The proposed dam will not be visually prominent within the existing landscape.

Relocation of the proposed dam will not require the erection or display of any advertising signage.

The proposed dam will not be potentially hazardous or offensive. The dam will not rely on utility services, nor require access to town water nor town sewerage. The proposed dam will not generate any need for on-site parking other than that which has already been designed to service the quarry elsewhere (in the separate administration precinct). Lawful and practical access is available to the site.

Relocation of the proposed dam will not increase local traffic movements and volumes.

Social and economic impacts relating to the dam (in the proposed new location) are substantially the same as those that applied to the development as originally documented and approved.

The proposed dam (in the new location) will not generate any waste material.

The catchment area of the preferred dam site is slightly greater than the catchment area of the original dam site approved in the original determination of DA 2015/953. This will lead to greater reliability of water supply.

Preliminary engineering investigation and design has revealed that the proposed new dam will accommodate a storage capacity of approximately 9.1 Ml, however, the capacity will not exceed 10 ML. This attribute is the same as that of the originally approved dam.

Access to, and the servicing of the proposed dam will be gained from Lookout Road. There are no residences serviced by this road.

The geology of the proposed site is appropriate for dam construction. Suitable fill material (both quality and quantity) is available on the site of the proposed dam.

The height of the proposed dam wall is 4 m, which makes it a much safer option with reduced environmental impact than the originally approved dam whose wall height was 10 m.

The superior fill material at the proposed dam site will enhance the reliability and safety of the proposed dam. In the unlikely event of a future failure of the dam wall, there will be no adverse impact on any private property on the grounds that the first 2km downstream of the proposed dam is entirely within the Broken Bago State Forest.

The Forestry Corporation of NSW has advised that the area within which the proposed dam is located will shortly be harvested to extract traditional timber resources. The position of the proposed dam is entirely surrounded by State Forest and it will not be visible from any residential premises anywhere within the region.

The greater remoteness (from all dwelling houses in the district) of the proposed dam will ensure that any noise (generated from the associated pump house) received at any of those dwellings will be considerably less than the noise generated from the originally approved dam site. That noise will not adversely affect neighbouring properties.

2.3 Dam Construction

Assessment of Constructability of the dam in the originally approved location.

The construction contractor who was approached with a view to constructing the dam in the originally approved location has advised that there would be serious problems on the bases of constructability (if construction was to proceed in that location).

Key elements of that advice are based on the following:

- **Construction knowledge:** the contractor has a substantial experience in the field of dam construction in a variety of locations, over many years, in a variety of geological environments.
- **Available resources**: the quality of on-site fill material (with which to construct the dam wall) is very poor. Furthermore, the depth of that material before striking bedrock is very shallow. This problem is exacerbated as a consequence of the dominant sub-grade conditions being fractured rock. The combined effect would lead to significant leakage of water from the dam, associated with an unacceptably high risk of potential (future) failure of the dam wall.
- **Construction methodology:** the abundance of hollow bearing trees in the vicinity would create serious problems in the construction process. In avoiding those trees, a significantly greater area of vegetation would have to be cleared to generate sufficient fill material to construct the dam wall. Furthermore, the steepness of the terrain, and the lack of friction (to stabilize construction machinery) on the rock surface would contribute to further unacceptably high risks with adverse work health and safety outcomes.
- **Accessibility**: the steep terrain on both sides of the stream would create significant difficulties in getting construction machinery onto and off the site.
- **Specifications:** the originally approved dam was designed to have a dam wall height of 10 m. That height was necessary to generate a storage capacity of approximately 10 Ml. However, the fractured nature of the sub-grade material together with the poor quality of the available filled material, combined with the designed wall height would lead to an unacceptably high risk of future failure of the dam wall.
- **Construction program**: recognizing all of the foregoing, any construction of the dam in the originally approved location would lead to and unacceptable delay in the construction program associated with the quarry development project.
- **Project quality:** in terms of maintainability, reliability, and operability, any dam constructed in the originally approved location would have significantly inferior quality when compared to the proposed revised location.
- **Project safety:** as discussed above, any dam constructed in the originally approved location would risk significantly worse safety outcomes when compared to the proposed alternative dam location.

A professional geotechnical assessment has been carried out by Regional Geotechnical Solutions relating to the originally approved dam site. Their report is annexed below, and reiterates the problem issues notified by the construction contractor. It goes on to say that a grout curtain would be required to endeavour to prevent water loss through the fractured rock profile below the dam wall. It also raises troubling questions relating to rock permeability down stream.

Statutory Planning Assessment

4.1 Environmental Planning and Assessment Act 2979

Clause 4.55 (2) Other Modifications

A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:

a) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified (if at all), and
b) it has consulted with the relevant Minister, public authority or approval body in respect of a condition imposed as a requirement of a concurrence to the consent or in accordance with the general terms of an approval proposed to be granted by the approval body and that Minister, authority or body has not, within 21 days after being consulted, objected to the modification of that consent, and
c) it has notified the application in accordance with:
    (i) the regulations, if the regulations so require, or
    (ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and
d) it has considered any submissions made concerning the proposed modification within the period prescribed by the regulations or provided by the development control plan, as the case may be.

(a) Development Consent 2016NTH002 – Port Macquarie Hastings Council – DA2015-953.1 was granted on 15 February 2017 for an ***extractive industry (quarry) and associated infrastructure***.

The reasons for the decision (the approval) were:

The reasons for the decision of the Panel were:

- The relevant clauses in all applicable environmental planning instruments have been satisfied;
- Agriculture and extractive industries are permitted with consent in the RU3 Forestry zone under the Port Macquarie-Hastings LEP 2011;
- The EPA had issued General Terms of Agreements (GTA's) for the development;
- The designated haulage route was deemed appropriate with minimal impacts;
- The Air Quality Impact Assessment had been carried out in accordance with the EPA Approved Methods and the report concluded that the predicted incremental and cumulative TSP, PM_{10} and $PM_{2.5}$ concentrations and dust deposition rates are well within NSW EPA assessment criteria;
- Port Macquarie-Hastings Council ecologist confirmed a Species Impact Statement was not required;
- The visual impacts on residential dwellings has been deemed to be temporary in nature and the overall visual impact from public locations was deemed negligible;
- The hours of operation were amended restricting operations to not commence before 7am Monday to Saturday and at no time on Sundays and public holidays;
- Blasting hours on Saturdays have been restricted by a condition limiting blasting hours to between 10.00am and 1.00pm; and
- The Noise Impact Assessment identifies that no residential receivers are within the 35 dB(A) contour and the GTA'S stipulate the noise at all residential receivers must not exceed this noise limit;

The proposed modification is substantially the same development and has no effect on the above listed matters that were key to the reason for the approval.

(b) The consent authority may consult with NSW Department of Primary Industries, however general terms of approval or a licence under the Water Act 1912 are unlikely to be a requirement.

(c) Notification will be required.

(d) As the amended dam location will have a lesser environmental impact than the approved dam location, it is highly unlikely that any significant issues would be raised in submission.

4.2 Environmental and Assessment Regulation 2000

Part 2 Are alterations or additions designated development?

Clause 35 Is there a significant increase in the environmental impacts of the total development?

Development involving alterations or additions to development (whether existing or approved) is not designated development if, in the opinion of the consent authority, the alterations or additions do not significantly increase the environmental impacts of the total development (that is the development together with the additions or alterations) compared with the existing or approved development.

Clause 36 Factors to be taken into consideration

In forming its opinion as to whether or not development is designated development, a consent authority is to consider:

(a) the impact of the existing development having regard to factors including:

(i) previous environmental management performance, including compliance with the conditions of any consents, licences, leases or authorisations by a public authority and compliance with any relevant codes of practice, and

(ii) rehabilitation or restoration of any disturbed land, and

(iii) the number and nature of all past changes and their cumulative effects, and

(b) the likely impact of the proposed alterations or additions having regard to factors including:

(i) the scale, character or nature of the proposal in relation to the development, and

(ii) the existing vegetation, air, noise and water quality, scenic character and special features of the land on which the development is or is to be carried out and the surrounding locality, and

(iii) the degree to which the potential environmental impacts can be predicted with adequate certainty, and

(iv) the capacity of the receiving environment to accommodate changes in environmental impacts, and

(c) any proposals:

(i) to mitigate the environmental impacts and manage any residual risk, and

(ii) to facilitate compliance with relevant standards, codes of practice or guidelines published by the Department or other public authorities.

As described in this addendum, the proposed alternative dam location will have a lesser environmental impact that the approved location. The attached ecological, geotechnical and acoustic assessments demonstrate that the proposed modification will not have increase adverse impact on the surrounding natural environment or nearby sensitive receivers.

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Conclusion

The subject Modification of Consent pursuant to Clause 4.55 (2) of the *Environmental Planning and Assessment Act 1979* is substantially the same development as approved and will have a lesser environmental impact in terms of the matters for consideration under the Act and the Regulations.

The proposed (modified) location of the dam is superior to the originally approved location on the grounds of geology, dam safety, increased catchment, reliability, constructability, preservation of hollow bearing trees, reduced noise to residents in the region, reduced visibility to residents in the region, accessibility, and closer proximity to the quarry that it is designed to serve.

The proposed relocated dam will have the same capacity as the originally approved dam, and any adverse ecological impacts associated with its construction and operation will be no worse than those associated with the dam in the originally approved location.

The additional information provided in this Addendum provides the determining authority with further justification and certainty that the proposal has merit and should be approved.

Signed

Rob de Groot

de Groot and Benson, Consulting Engineers
5 March 2019

Appendices
A
Concept Drawings

COMPARTMENT 42
BROKEN BAGO STATE FOREST
LOT 161 DP 754445

SPECIAL NOTES:
1. CLEARED VEGETATION TO BE STOCKPILED IN WINDROWS OUTSIDE THE CONSTRUCTION ZONE.
2. CUT TO FILL EXCAVATION INCLUDING ROCK EXCAVATION TO BE CARRIED OUT ON SITE TO ACHIEVE FINAL DESIGN LEVELS

NOTE:
AREA OF PROPERTY =188ha
DAM CAPACITY NOT TO EXCEED 10ML

LOOKOUT ROAD

LOOKOUT ROAD

DAM STORAGE AREA
- TWL RL 52.0m
- Floor level - RL 49.0m
- Flooded Area - 0.70 ha
- APPROX 9.1 ML CAPACITY

DAM WALL EMBANKMENT
- CREST LEVEL -RL 52.5m
- APPROX 4m HIGH
- BATTERS 1:4

W100

N

10 0 10 20 30 40 50
SCALE OF METRES 1:1000

REV.	DATE	REVISION	DR.BY	AP.BY
F	24/07/2018	FINAL NOTES ADDED	LOC	RDG
C	16/03/2018	INTERSECTION & LINEMARKING PLANS AMENDED	LOC	RDG
B	14/02/2018	AMEND TO PMHC REQUIREMENTS	LOC	RDG
A	01/10/2017	PRELIMINARY ISSUE	LOC	RDG

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Scale	AS SHOWN @A3	Cad File No.	14164 Master CC 2019-01-08 dam.dwg
Surveyed		Datum	###
Drawn	JAT	Designed JAT	Approved RDG
Checked	RDG	Date 10/2017	No. of dwgs 1

Project: LOOKOUT ROAD QUARRY
COMPARTMENTS 42 & 43
BROKEN BAGO FOREST, HERONS CK

Client: CTK NATURAL RESOURCES Pty. Ltd.

Title: PROPOSED NORTH EASTERN DAM
Locality Plan

Project No. 14164
Drawing No. CC-40
Amendment No. F

COMPARTMENT 42
BROKEN BAGO STATE FOREST
LOT 161 DP 754445

SPECIAL NOTES:
1. CLEARED VEGETATION TO BE STOCKPILED IN WINDROWS OUTSIDE THE CONSTRUCTION ZONE.
2. CUT TO FILL EXCAVATION INCLUDING ROCK EXCAVATION TO BE CARRIED OUT ON SITE TO ACHIEVE FINAL DESIGN LEVELS

NOTE:
AREA OF PROPERTY =188ha
DAM CAPACITY NOT TO EXCEED 10ML

PROCESS WATER PIPELINE
- POLY PIPE LAID ABOVE GROUND

SPILLWAY- RL52.0m
- BASE WIDTH - 3m
- BATTERS 1:4

LOOKOUT ROAD

DAM STORAGE AREA
- TWL RL 52.0m
- Floor level - RL 49.0m
- Flooded Area - 0.70 ha
- APPROX 9.1 ML CAPACITY

PUMP HOUSE
(with petrol powered pumps)

APPROX AREA TO BE CLEARED FOR EMBANKMENT CONSTRUCTION - (0.35ha)

DAM WALL EMBANKMENT
- CREST LEVEL -RL 52.5m
- APPROX 4m HIGH
- BATTERS 1:4

N

10 0 10 20 30 40 50
SCALE OF METRES 1:1000

REV.	DATE	REVISION	DR.BY	AP.BY
F	24/07/2018	FINAL NOTES ADDED	LOC	RDG
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Drawn	JAT	Designed JAT	Approved RDG
Checked	RDG	Date 10/2017	No. of dwgs 1

Project: LOOKOUT ROAD QUARRY
COMPARTMENTS 42 & 43
BROKEN BAGO FOREST, HERONS CK

Client: CTK NATURAL RESOURCES Pty. Ltd.

Title: PROPOSED NORTH EASTERN DAM

Project No. 14164
Drawing No. CC-41
Amendment No. F

Appendix

B

Ecological Assessment

Thursday 21st February 2019

CTK Natural Resources
Attn: Graham Lockett
Delivery via: Email: [beacon@bigpond.com.au]

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Dear Graham,

Re: Ecological Assessment for New Location of Water Storage Dam, Lookout Road, Herons Creek.

As requested, we undertook a survey at the proposed new dam site on Lookout Road to assess and describe the vegetation and habitat present.

In summary:

- The proposal to establish a water storage dam on Lookout Road to service the approved quarry nearby. The dam will impact approximately 0.8 ha of native vegetation. The vegetation affected is located within a Forestry Corporation plantation and consists of approximately 30 year old regrowth trees.
- The field survey did not detect any threatened flora species and the vegetation does not qualify as an Endangered Ecological community.
- No threatened fauna species were detected on site during the survey however a number of threatened fauna species are considered potential occurrences.
- A Test of Significance was carried out to assess the impact of the proposal on the potentially occurring threatened species listed under the NSW Biodiversity Conservation Act 2016. This determined that the proposal is unlikely to result in a significant impact.
- The proposal is unlikely to result in a significant impact on any species or matter listed under the EPBC Act.
- A number of mitigation measures have been provided to reduce the impact of the proposal on flora and fauna. This assessment has assumed that these will be implemented and successful in reducing impacts of the proposal.

1.0 Background Information

CTK Natural Resources are proposing to modify the location of a water storage dam associated with the Lookout Road Quarry within Bago State Forest. Significant engineering and ecology issues were apparent with the previous approved dam location on the southern side of Milligans Road.

The proposed new water storage dam is located within an ephemeral drainage line approximately 100m to the east of the quarry footprint. It is located within a Forest NSW plantation area which is due to be harvested in the near future.

The proposed new dam will be the same capacity as the previous dam. At capacity the dam will cover an area of 0.7ha. The construction and clearing footprint for the new dam covers 0.35ha. A pipeline easement will also need to be established between the quarry and dam, however this can be designed to avoid the removal of large trees.

This report provides an overview of the ecological features at the proposed new dam location, the potential impacts of establishing the dam, and recommendations to reduce impacts on flora and fauna.

The subject site is defined as the area of vegetation directly affected by the proposed new dam and pipeline easement. The locality is land within 10km of the subject site.

The location of the proposed new dam is shown in Figure 1. Photos illustrating the typical vegetation and habitat within the dam footprint are shown in Photo 1.

Figure 1: Proposed new location of the dam

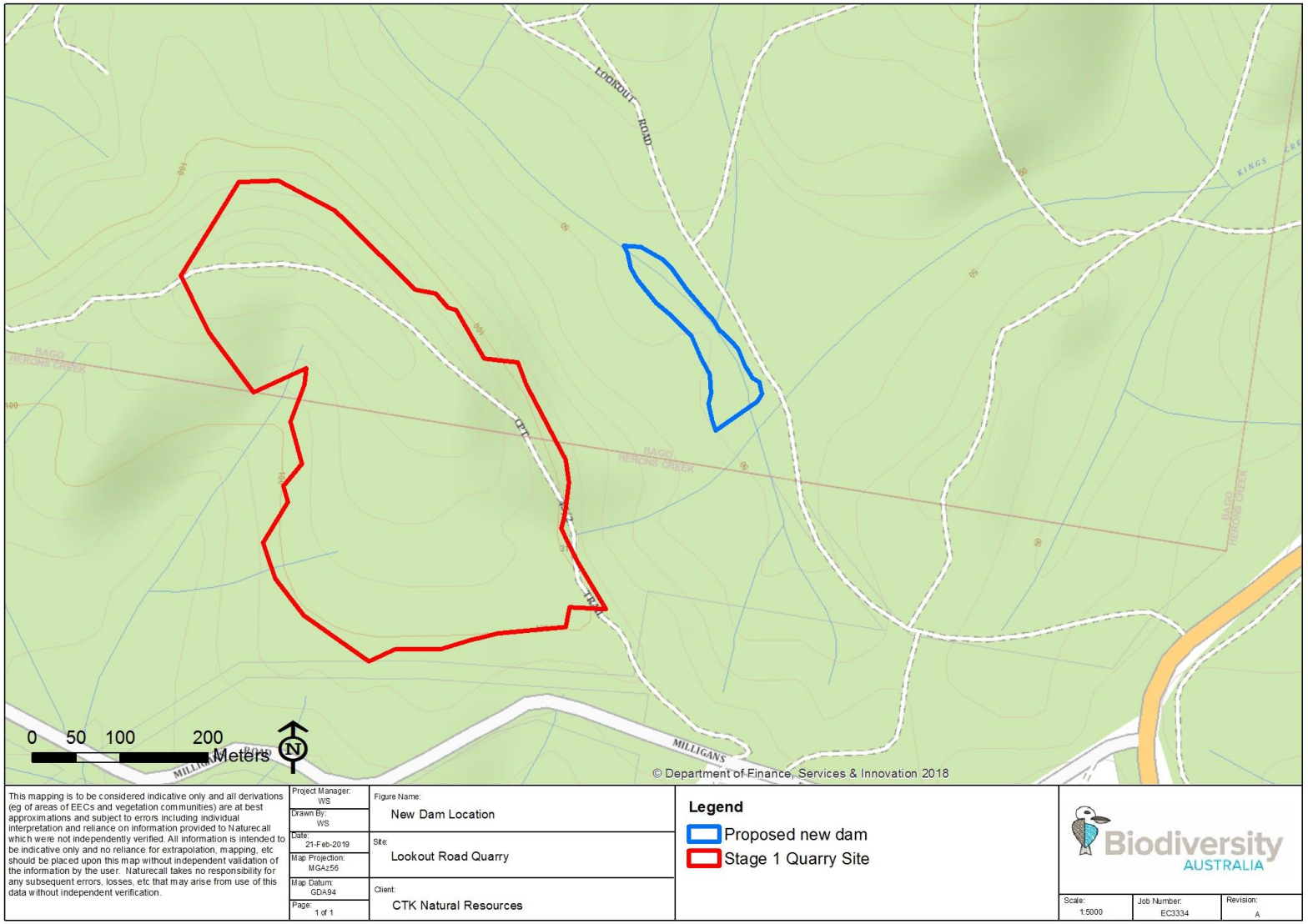

Photo 1: Vegetation within proposed dam footprint

2.0 Ecological Attributes of the Site

A site inspection was undertaken on Thursday 14th February 2019 by Biodiversity Australia's Principal Ecologist.

The dam footprint and surrounding vegetation was inspected via the random meander method. Any opportunistic fauna observations were recorded and searches were conducted for threatened flora and fauna species as well as habitat features including koala food trees, hollow-bearing trees and nests.

2.1. Site Vegetation Communities

The vegetation within the dam footprint consists of a forestry plantation with a wet sclerophyll forest structure and is dominated by Flooded Gum.

Table 1 details the vegetation community found on the site.

Table 1: Vegetation community description

Vegetation Community (NSW PCT)	No 827: Flooded Gum - Tallowwood - Brush Box moist open forest of the coastal ranges of the North Coast
EEC Status	Not an EEC
Location	Occurs within dam footprint and extends further off site in all directions. Grades into dry sclerophyll forest upslope to the west.
Description	**(a) Canopy**: *Structure and Species*: Canopy consists of an open canopy of eucalypts dominated by Flooded Gum (*Eucalyptus grandis*) with occasional Pink Bloodwood (*Corymbia intermedia*). Tallowwood (*Eucalyptus microcorys*) and Turpentine (*Syncarpia glomulifera*) are rare occurrences. Height ranges from approximately 20-28m and canopy cover is approximately 40%. **(b) Midstory:** *Structure and species*: Consists of a mix of canopy juveniles and rainforest species including Lilly Pilly (*Acmena smithii*), Callicoma (*Callicoma serratifolia*) and Grey Myrtle (*Backhousia myrtifolia*) with a cover of approximately 20%. Height ranges in this layer are between 8-15m. **(c) Shrub Layer:** *Structure and Species*: Consists of an open to dense shrub layer dominated by Wilkiea (*Wilkiea huegliana*), Narrow-leaved Palm Lily (*Cordyline stricta*) and Bolwarra (*Eupomatia laurina*). Height ranged from 1-4 m. **(d) Ground Layer:** *Structure and Species*: A sparse to open layer herbs and ferns is present ranging from 0.1-0.5 m in height. Dominant species were Rainbow Fern (*Calochlaena dubia*), Settlers Flax (*Gymnostachys anceps*), Gristle Fern (*Blechnum cartiligenium*) and Spiny Matrush (*Lomandra longifolia*).

Photo 2: Vegetation community in the proposed footprint

Photo 3: Canopy view of vegetation community in the proposed footprint

2.2. Identified Flora

The following table provides a full list of flora species identified during the site inspection.

Table 2: Site flora species list

Common name	Scientific name	Occurrence
Canopy Trees		
Pink Bloodwood	*Corymbia intermedia*	U
Flooded Gum	*Eucalyptus grandis*	D
Tallowwood	*Eucalyptus microcorys*	U
Blackbutt	*Eucalyptus pilularis*	O
Turpentine	*Syncarpia glomulifera*	R
Understory trees and shrubs		
Lilly Pilly	*Acmena smithii*	O
Forest Oak	*Allocasuarina torulosa*	R
Bangalow Palm	*Archontophoenix cunninghamiana*	U
Grey Myrtle	*Backhousia myrtifolia*	C
Coffee Bush	*Breynia oblongifolia*	R
Callicoma	*Callicoma serratifolia*	O
-	*Clerodendrum floribundum*	R
Narrow-leaved Palm Lily	*Cordyline stricta*	C
-	*Cryptocarya sp.*	R
Forest Maple	*Cryptocarya rigida*	O
Bolwarra	*Eupomatia laurina*	O
Sandpaper Fig	*Ficus coronata*	O
Cheese Tree	*Glochidion ferdinandi*	O
Lantana*	*Lantana camara**	R
-	*Myrsine variabilis*	R
Hairy-leaved Bolly Gum	*Neolitsea dealbata*	R
Large Mock-olive	*Notelaea longifolia*	R
Wild Yellow Jasmine	*Pittosporum revolutum*	R
Crabapple	*Schizomeria ovata*	O
Scentless Rosewood	*Synoum glandulosum*	O
Tree Heath	*Trochocarpa laurina*	C
Veiny Wilkiea	*Wilkiea huegeliana*	C
Groundcovers		
Native Ginger	*Alpinia caerulea*	R
-	*Dianella sp.*	R
Settler's Twine	*Gymnostachys anceps*	C
Ground Lily	*Tripladenia cunninghamii*	R
Ferns		
Gristle Fern	*Blechnum cartilagineum*	C

Rasp Fern	*Blechnum neohollandicum*	R
Rainbow Fern	*Calochlaena dubia*	C
Grasses		
Creeping Beard Grass	*Oplismenus imbecillis*	R
Sedges, Rushes and Aquatics		
-	*Carex appressa*	O
Spiny Matrush	*Lomandra longifolia*	R
Vines and Scramblers		
Water Vine	*Cissus hypoglauca*	U
Native Yam	*Dioscorea transversa*	O
Scrambling Vine	*Geitonoplesium cymosum*	R
Sweet Morinda	*Gynochthodes jasminoides*	D
Thin-leaved Parsonsia	*Parsonsia induplicata*	R
Common Silkpod	*Parsonsia straminea*	C
Pearl Vine	*Sarcopetalum harveyanum*	R
Lawyer Vine	*Smilax australis*	R
Sweet Sarsaparilla	*Smilax glyciphylla*	U
Snake Vine	*Stephania japonica*	R
Key: * denotes introduced species Occurrence Key: D = dominant, C = common, O = occasional, U = uncommon, R = rare.		

2.3. Threatened Flora and Endangered Ecological Communities

The site survey recorded only common species. No threatened flora species were observed during the survey and no records of threatened flora have been recorded nearby (Bionet 2019).

The vegetation on the sites and adjacent does not meet the floristic requirements of an Endangered Ecological Community (EEC) listed under the NSW Biodiversity Conservation Act (BC Act 2016) or Environment Protection and Biodiversity Conservation Act (EPBC Act 1999).

2.4. Fauna Habitat Evaluation

In summary, the site has the following habitat values:

Table 3: Habitat evaluation summary

Habitat Attribute/Type	Site Values	Potential Threatened Fauna Species Values
Aquatic/wetland habitat	The site is located on an ephemeral drainage line. No standing water was present during the survey and the drainage line would only hold water temporarily after heavy rain.	Potential foraging and breeding habitat for Green-thighed Frog, forming a very small extent of suitable habitat in the area.
Caves, bridges, culverts, cliffs, overhangs, etc.	Absent on site	No potential roosting value for cave roosting Microchiropteran bats.

Habitat Attribute/Type	Site Values	Potential Threatened Fauna Species Values
Logs and stumps	A number of large fallen logs occur within the dam footprint (Photo 4).	Potential refugia and foraging habitat present e.g. for Phascogale and Quoll.
Groundcover	Sparse groundcover which comprises largely of native forbs and ferns.	Not considered preferred habitat for Eastern Chestnut Mouse, Common Planigale or New Holland Mouse.
Leaf Litter	Deep leaf litter accumulations in most areas of the site.	Areas of dense leaf litter may provide foraging resources for small mammals and amphibians.
Wattles, Melaleucas, Callistemons and Banksias	No wattles, melaleucas, callistemons or banksias present within the site.	Lack of flowering shrubs to provide a foraging resource for nectivorous species such as Gliders, possums and birds.
Koala Browse Species	Two Tallowwood are present which would provide foraging value for Koalas.	Site contains a very small extent of potential foraging habitat for the Koala.
Fruiting Species	Fruiting species are common in the understory and shrub layer.	Minor fruiting resource may provide foraging resources for the Grey Headed Flying Fox.
Flowering Eucalypts, Bloodwoods and other key species	Eucalypts on the site are likely to provide a year-round nectar source.	Nectar resources for nectivorous birds e.g. Little Lorikeet, and the Grey-Headed Flying Fox. Minute fraction of habitat in locality.
Preferred Sap Species	Pink Bloodwood on site are known to be a preferred sap source by Gliders.	Potential foraging habitat for the Yellow-bellied Glider and Squirrel Glider.
Allocasuarinas	Occasional Allocasuarinas occur adjacent to the site.	Foraging resources for Glossy Black Cockatoo in habitat adjacent to the site.
Prey species i.e. passerine birds, small terrestrial mammals, etc.	Good habitat for small terrestrial prey species.	Potential prey base for raptors and forest owls.
Tree Hollows	No hollow-bearing trees were identified within the subject site.	No potential nesting/denning for hollow obligate fauna.

Photo 4: Large habitat log

2.4.1. Hollow-bearing Trees

No hollow-bearing trees were recorded in the proposed footprint for the new dam.

2.4.2. Koala Food Trees

The survey recorded two primary Koala food trees (Tallowwood) within the subject site. These are located within the flooding footprint of the dam, hence are likely to die off when the dam reaches capacity.

No explicit signs of Koala activity (including claw markings and scats) were observed and no Koalas were sighted at the time of survey.

2.5. Observed/Detected Fauna

The fauna survey detected only common forest birds within the site. These included species such as the Rainbow Lorikeet (*Trichoglossus haematodus*), Lewin's Honeyeater (*Meliphaga lewinii*) and Grey Fantail (*Rhipidura albiscapa*). Some were observed on the subject site while others were seen flying over or heard calling from adjacent habitats. No birds' nests were recorded at the time of survey.

A full list of fauna species identified is provided in the following table.

Table 4: Fauna species list

Common name	Scientific name	Occurrence
Red-browed Tree Creeper	*Climateris erythrops*	HC
Grey Shrike-thrush	*Colluricincla harmonica*	HC
White throated Tree Creeper	*Cormobates leucophaeus*	Vis
Torresian Crow	*Corvus orru*	HC
Eastern Yellow-robin	*Eopsaltria australis*	HC
Lewin's Honeyeater	*Meliphaga lewinii*	HC
Golden whistler	*Pachycephala pectoralis*	HC, Vis
Eastern Whipbird	*Psophodes olivaceus*	HC
Grey Fantail	*Rhipidura albiscapa*	HC
White-browed Scrubwren	*Sericornis frontalis*	HC
Rainbow Lorikeet	*Trichoglossus haematodus*	HC, Vis
Key: Heard calling (HC), Visual observation (Vis).		

2.6. Threatened Fauna

The field survey did not detect any threatened fauna species.

2.7. Potential Occurrence Assessment

In total, 20 threatened terrestrial species listed under the *Biodiversity Conservation Act 1995* were considered potential occurrences on the subject site and in adjoining habitats, based on a consideration of potential habitat, local records, and regional records in similar habitat. These are listed in the following table.

Table 5: Threatened species potentially occurring in the study area

Species	Occurrence Type	Occurrence Likelihood
Square-tailed Kite	Potential to form minute portion of large foraging territory. Generic potential nest trees.	Moderate chance as periodic forager.
Little Eagle	Potential to form minute portion of large foraging territory. Generic potential nest trees.	Low chance as periodic forager as no local records.
Powerful Owl	Study area contains broadly suitable foraging habitat that may form small part of a territory which would be very large.	Moderate chance of using site as minute part of wider foraging range.
Masked Owl	Study area contains broadly suitable foraging habitat that may form small part of a territory which would be very large	Moderate chance of using site as minute part of wider foraging range.

Species	Occurrence Type	Occurrence Likelihood
Barking Owl	Study area contains broadly suitable foraging habitat that may form small part of a territory which would be very large.	Low chance of occurrence using site as minute part of wider foraging range.
Brown Treecreeper	Study area contains marginally suitable foraging habitat that may be used seasonally as part of a larger area.	Low chance of occurrence.
Varied Sittella	Study area contains broadly suitable foraging habitat that may be used seasonally as part of a larger area.	Fair chance of using the site and adjacent habitat for foraging and nesting.
Glossy Black Cockatoo	No foraging resources in dam footprint, however foraging resources occur in adjoining habitat.	Recorded near new dam site and likely to forage in the general area. No potential breeding habitat on site.
Little Lorikeet	Site has potential foraging habitat which may be used as a small part of a wider seasonal foraging range.	Fair chance of foraging on site during peak flowering periods.
Koala	Site has some preferred forage species and is connected to large areas of suitable habitat.	Low at best using the site as a non-significant part of a much larger range.
Spotted-tailed Quoll	Site represents potential foraging habitat and some marginal denning opportunities in log piles.	Fair chance of occurrence using habitat in study area as part of large foraging range or dispersing.
Yellow-bellied Glider	Potential foraging habitat within the site and adjacent habitats.	Fair change using site as part of foraging range.
Grey-headed Flying Fox	Minute portion of large foraging territory.	High as minute part of wider foraging range.
Eastern Bent-wing Bat	Suitable foraging habitat over site.	Moderate chance of occurrence foraging on site.
East-coast Freetail Bat	Suitable foraging habitat over site.	Moderate chance of occurrence foraging on site.
Greater Broad-nosed Bat	Suitable foraging habitat over site.	Moderate chance of occurrence foraging on site.
Yellow-bellied Sheathtail Bat	Suitable foraging habitat over site.	Fair chance of occurrence foraging on site.
Eastern False Pipistrelle	Suitable foraging habitat over site.	Fair chance of occurrence foraging on site.

Species	Occurrence Type	Occurrence Likelihood
Eastern Cave Bat	Potential foraging on site however no potential roosts.	Low chance of occurrence foraging over site as part of wider area.
Green-thighed Frog	Ephemeral creek line offers some potential foraging and breeding habitat.	Low chance of occurrence using habitat in the ephemeral creek line and adjoining forest

3.0 Aquatic Habitat and Fisheries

Consideration of the impacts on threatened species listed under the *Fisheries Management Act 1994*, and recreational fishing areas is provided in the following sections.

3.1. Aquatic Vegetation

Vegetation Communities

The ephemeral drainage line which falls into the dam footprint does not contain aquatic vegetation e.g. emergent or submergent aquatic flora, due to the lack of permanent or near permanent water.

Flora of Conservation Significance

To date, no aquatic vegetation has been listed as Vulnerable or Endangered under *the Fisheries Management Act 1994*.

No relevant EECs have been listed (http://www.dpi.nsw.gov.au/content/fisheries/species-protection/conservation/what-current).

3.2. Fauna

3.2.1. Local Records

A search of the Port Macquarie-Hastings LGA was undertaken with the Fisheries NSW Spatial Data Portal (https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries_Data_Portal). The search returned no results for the LGA. No relevant Endangered Populations occur in the Port Macquarie-Hastings LGA.

The drainage line is not mapped as a freshwater fish community in the Fisheries spatial data portal.

3.2.2. Potential Occurrence Assessment

Due to the low quality habitat and lack of records in the LGA, no threatened species listed under the Act is considered a potential occurrence in the subject site.

3.3. Recreational Fisheries

The site or nearby habitat downstream does not contain habitat that may support targeted recreational species e.g. Australian Bass and yabbies.

The nearest potential watercourse potentially supporting such species is Herons Creek to the south.

4.0 Impact Assessment

4.1. Direct Impacts

The creation of the dam will affect approximately 0.8ha of native vegetation comprising a 0.45ha construction footprint for the dam and pipeline and 0.35ha that will be affected by flooding of the dam. This will remove some habitat components which may be used by fauna including nectar sources and fruiting trees.

Fallen hollow logs which potentially provide habitat for fauna were identified within the dam footprint. These are recommend to be relocated into adjacent forest where possible so as to continue to provide habitat for fauna.

4.2. Indirect Impacts

The following potential indirect impacts may be associated with the proposal:

a) ***Fragmentation and landscape change*:** The proposal will contribute local fragmentation as some trees will require removal. No impacts are expected on connectivity as vegetation surrounding the dam will remain.

b) ***Edge effects:*** Clearing of vegetation for the new dam site will increase the potential for edge effects such as weed invasion, light penetration and changes in species composition. This would occur regardless of the dam construction however as the area is proposed to be harvested.

c) ***Weed invasion:*** Weeds are currently very sparse throughout the site. The proposal has the potential to introduce any new weed species and increase the potential for spread of weeds. Mitigation measures are provide to minimise the potential for weed introduction and spread

d) ***Erosion and sedimentation:*** Construction of the dam wall has potential to create erosion and sedimentation. Control mechanisms will be required during the clearing phase and operational phase to ensure downstream habitats are not significantly affected.

5.0 Statutory Considerations

5.1. Biodiversity Conservation Act 2016

5.1.1. Overview

The Test of Significance is prescribed in Part 7, Division 1, Section 7.2 of the *Biodiversity Conservation Act 2016.* The purpose of the Test of Significance is to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

If it is determined that a development or activity will have a significant effect, a Biodiversity Development Assessment Report will be required.

5.1.2. Test of Significance

A potential occurrence assessment has determined that the following species are considered to be potentially occurring on the site and are subject to the Test of Significance:

- Koala
- Spotted-tailed Quoll
- Yellow-bellied Glider
- Grey-headed Flying Fox
- Eastern Bent-wing Bat
- Greater Broad-nosed Bat
- East-coast Freetail Bat
- Yellow-bellied Sheath-tail Bat
- Eastern False Pipistrelle
- Eastern Cave Bat
- Square-tailed Kite
- Little Eagle
- Masked Owl
- Powerful Owl
- Barking Owl
- Brown Treecreeper
- Little Lorikeet
- Varied Sittella
- Glossy Black Cockatoo
- Green-thighed Frog

5.1.2.1. Responses

a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The proposal will result in the removal a small area of forest which is surrounded by an extensive forested area generally contained within Bago State Forest. The potentially occurring threatened species all have large home ranges which would be largely based in adjacent and nearby habitats. No threatened species is likely to be reliant on the habitat to be removed. Furthermore, no hollow-bearing trees will be impacted by the proposed dam.

Two Koala food trees will be impacted to establish the new dam. This has the potential to reduce the amount of foraging resources for the Koala however sufficient foraging resources will remain in adjoining and nearby habitats in the area and the proposal will not crate any new barriers.

The portion of ephemeral drainage line within the new dam footprint provides potential habitat for the Green-thighed Frog. This species has not been detected in the area despite targeted searches at the former dam location to the southeast. It is unlikely that the habitat within the site would support a breeding population of the Green-thighed Frog given that identical and higher quality habitat occurs extensively in the surrounding State Forests and National Parks.

The proposal may also result in indirect impacts such as noise, weed invasion and edge effects. These may reduce the suitability of habitat surrounding the dam for some sensitive species. Provided that the dam is established as per the construction environmental management plan and approval conditions for the quarry, potential indirect impacts should be limited.

Given the above, the proposal is unlikely to place a local population of the subject species at risk of extinction.

b) ***In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:***

i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

ii. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No EECs are present on the subject site.

c) ***In relation to the habitat of a threatened species or ecological community:***

i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposal will impact an estimated 0.8 ha of Flooded Gum forestry plantation. This will include 2 preferred Koala food trees which fall within the new dam footprint which cannot be avoided. Some hollow logs also fall within the footprint and will be relocated where possible.

ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The vegetation proposed to be removed does not form part of a key wildlife linkage and the proposed new location would not lead to isolation of any area of habitat. Remaining areas of vegetation surrounding the dam will continue to support local movements of fauna.

iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

A small extent of potential foraging habitat is present on the subject site however, the range of all the subject species would extend well off the site.

The habitat on site is not of sufficient extent to be of any key importance to the long term survival of any of the subject species.

d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposed development will not directly or indirectly affect an area of outstanding biodiversity value.

e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A Key Threatening Process (KTP) is defined as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities.

Due to the minor impacts associated with the development, it is unlikely to introduce or substantially increase any KTPs.

5.1.2.2. Conclusion

The Test of Significance has determined that the proposed development would not result in a significant impact on threatened species or ecological communities. A BDAR or EIS is not required for the proposed works.

5.2. Environmental Protection and Biodiversity Conservation Act 1999

The provisions of the EPBCA 1999 require determination of whether the proposal has, will or is likely to have a significant impact on a "*matters of national environmental significance"*. These matters are listed and addressed in summary as follows:

1) **World Heritage Properties**: The site is not listed as a World Heritage area nor does the proposal affect any such area.
2) **National Heritage Places**: The site is not listed as a National Heritage Place nor does the proposal affect any such area.
3) **Ramsar Wetlands of International Significance**: A Ramsar wetland does not occur on the site, nor does the proposal affect a Ramsar Wetland.
4) **EPBCA listed Threatened Species and Communities**: No EPBC Act listed threatened species were recorded on site during the survey, however the Koala, Spotted-tailed Quoll and Grey-Headed Flying Fox are considered to be potential occurrences. While the proposal will have some negative impacts, these species are unlikely to be significantly impacted by the proposal.
5) **Migratory Species Protected under International Agreements**: No Migratory species is likely to be significantly affected by the proposal.
6) **The Commonwealth Marine Environment (CME)**: The site is not within the CME nor does it

affect such

7) **The Great Barrier Reef Marine Park:** The proposal does not affect the Great Barrier Reef Marine Park.
8) **Nuclear Actions**: The proposal is not a nuclear action.
9) **A water resource, in relation to coal seam gas development and large coal mining development:** The proposal is not a mining development.

The proposal is unlikely to require referral to Department of Environment and Energy for approval under the EPBCA 1999.

6.0 Recommendations

The following are mitigation measures have been provided to reduce the impact of the works on flora and fauna.

6.1. General Clearing Measures

Clearing should be limited to the minimum required to establish the water storage dam. The clearing limits are to be clearly marked prior to commencement of clearing with flagging tape or bunting. All adjoining trees/vegetation are to remain undisturbed.

Clearing and earthworks is to avoid damage to root zones of the retained trees. There is to be no parking/driving of vehicles or storage of materials (including soils) under retained trees on site.

6.2. Hollow Log Salvage and Relocation

All intact large hollow logs/fallen trees within the clearing footprint should be gently relocated into adjacent forest prior to clearing operations. The relocation of these logs is to be conducted under supervision of an ecologist.

6.3. Pre-clearing Survey

The clearing extent is to be inspected for Koalas and other fauna by a qualified ecologist immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling. This is to occur each morning if clearing spans over multiple days. Pre-clearing checks would include searches of habitat (e.g. lifting and destructive searches of logs) and searches for bird nests. If possible, any detected fauna is to be relocated off-site to nearby suitable areas (preferably within their natural home range) prior to clearing.

During the pre-inspection, any habitat features detected (e.g. hollows, logs, nests) are to be clearly marked with flagging tape to allow easy identification during clearing.

If a Koala is present in an area subject to vegetation removal/modification, works must be suspended until the Koala moves along of its own volition. If the Koala is located in a position that a 50 m buffer may be established, works may proceed outside this buffer.

6.4. Weed Control

Disturbance of the development site's soils has potential to encourage weed invasion. Hence, it is recommended that:

- Disturbance of vegetation and soils on the site should be limited to the areas of the proposed work and should not extend into adjacent vegetation.
- All plant used for clearing works is certified as weed free.
- Appropriate collection and disposal of all weed material removed via clearing.

- Removal of any new weed infestations that have developed throughout the clearing works and operation of the quarry.

6.5. Erosion and Sedimentation Control

Erosion and sedimentation controls are to be established around the clearing footprint as per standard practices to reduce the potential for off-site impacts.

7.0 Conclusion

This report has assessed the impact of the removal of vegetation required for the establishment of a new location for a water storage dam on Lookout Road. The new site is situated within an existing forestry plantation which is due to be harvested in the near future. The new dam location would have a much lower ecological impact than the previous dam site due to the absence of hollow-bearing trees and poorer quality habitat.

No threatened fauna species were recorded on site. The vegetation on the site would only provide a very minor foraging resource which occurs extensively in surrounding vegetation.

The removal of vegetation is not predicted to place any species at risk of further decline. No threatened plant species were recorded on site at the time of survey and vegetation on site does not qualify as an EEC.

A number of recommendations have been provided to reduce the impact on these and any other species including pre-clear surveys and hollow log relocation.

If any additional information is required, please contact the undersigned.

Yours faithfully,

Will Steggall
Principal Ecologist
Mobile: 0438590961
Email: Will.Steggal@biodiversityaust.com.au

Biodiversity AUSTRALIA

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Appendix

C

Geotechnical Assessment

REGIONAL GEOTECHNICAL SOLUTIONS

Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS20262.1-AI

20 February 2019

CTK Natural Resources Pty Ltd
PO Box 665
WAUCHOPE NSW 2446

Attention: Graham Lockett

Dear Graham,

RE: Proposed Water Storage Dam – Lot 61 DP754445, Milligan's Road, Broken Bago State Forest

Geotechnical Assessment

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) have undertaken a site walkover of the proposed water storage dam embankment wall to be located on an unnamed creek in Lot 61 DP754445 Milligan's Road, Broken Bago State Forest.

The proposed storage dam will have a capacity of 10MegL and the dam wall embankment will be up to approximately 10m in height, have a 4m crest width, 80m crest length and wall batters of approximately 1V:3H. It is proposed to source the embankment fill from site won material in the vicinity of the storage dam.

An excerpt from the supplied drawing showing the proposed dam embankment wall location is presented in Plate 1.

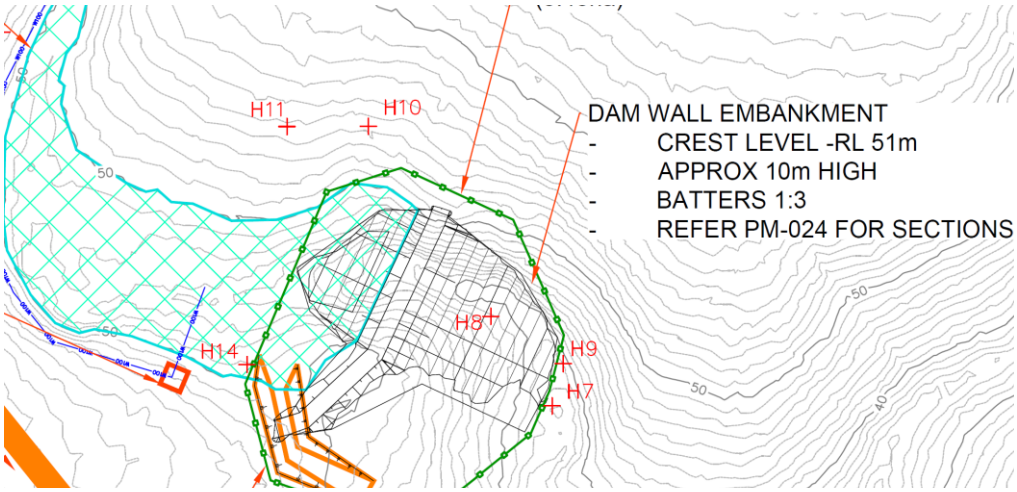


***Plate 1**: Supplied drawing (Dam Rev 4.1) showing proposed embankment dam wall layout.*

The purpose of the assessment was to provide comment on the proposed dam wall location and suitability of existing site soils for use in embankment wall construction.

The site is located within moderately undulating topography that is thickly vegetated. Surface elevations across the width of the proposed dam wall range from approximately 41m AHD to 51m AHD. The creek line where the dam wall will be located flows to the south west and is an unnamed upper tributary of Herons Creek. An image that shows the location of the site and the site setting is reproduced in Plate 2.

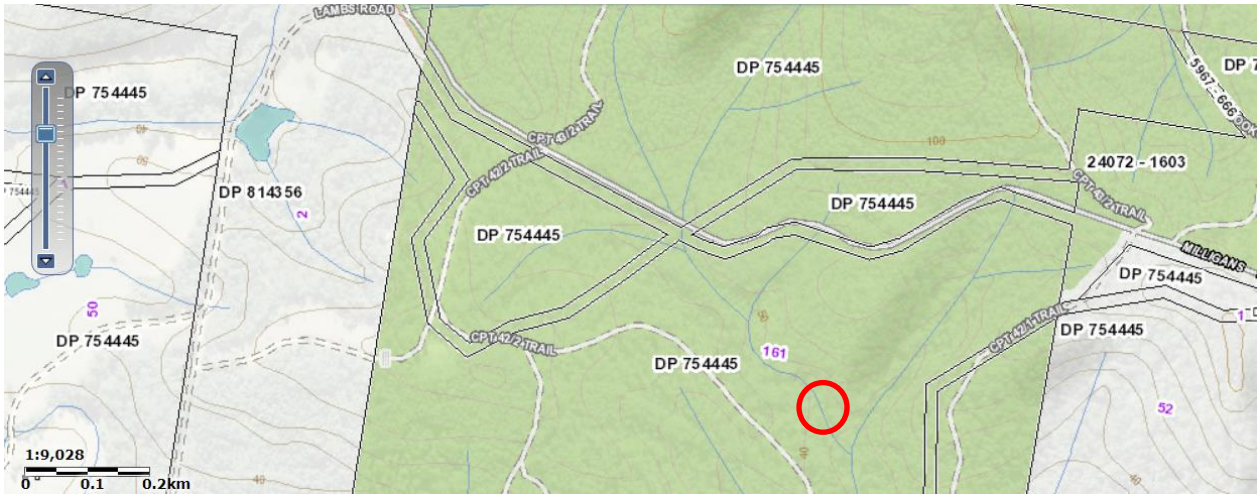


***Plate 2**: Image obtained from the NSW Government 'Six Maps' website that illustrates the site location and setting. The approximate position of the proposed dam embankment wall is circled in red.*

The creek line includes an incised channel of approximately 5m width and variable height within a broader gully that is approximately 80m wide. Slightly weathered rhyolite rock, fractured, high strength was exposed on the southern side of the incised channel and gravel bar deposits up to 1m in height were present to the north.

On the gully slopes on the south side of the creek, bulldozer track marks had exposed silty sand soils, pale brown, overlying weathered rock. It is understood that a series of test holes were recently undertaken by CTK Resources on the ridge to the south west of the proposed dam embankment wall using a mini-excavator. Soil profiles are understood to have comprised topsoil overlying sand soils grading into weathered rock from 0.5m.

Reference to the Hastings 1:250,000 Geological Series Sheet SH56-14 indicates the site is underlain by conglomerates, sandstones and shales of the Camden Haven Beds. Previous geological mapping of the general area by RGS has identified porphyritic volcanic rhyolites that are considered to represent a late Triassic felsic intrusion that has not been identified in published geological mapping.

Typical site photographs are presented below.

	
Looking north west along incised channel where embankment dam wall is proposed. Slightly weathered rhyolite rock and gravel deposits exposed on base of channel.	*Looking across gully slope to south of proposed embankment dam wall. Silty sand soils exposed overlying weathered rock.*

The following comments are made based on the site walkover undertaken on 7 February 2019:

- Exposed surface soils in the vicinity of the proposed dam wall were assessed visually to be a silty sand which is typically not recommended for dam wall construction due to the moisture sensitive nature of the material which can be difficult to work when over-wet. In addition, such materials can be susceptible to internal erosion;
- If site soils are to be used for dam wall construction it is noted that following stripping of unsuitable material including topsoil and root impacted material there will be minimal remaining soils available for reuse due to the shallow depth to rock;
- Construction of the dam wall is therefore likely to require importation of a suitable clay type material;
- Laboratory testing including particle size distribution, Atterberg's Limits and Emerson dispersion testing is recommended as a minimum to confirm properties of materials proposed for dam wall construction;
- Details of the proposed dam wall construction have not been provided, however, due to the irregular profile present in the base of the gully, keying in of the dam wall, or the internal wall is likely to be required into the natural profile to reduce potential seepage of water through the interface between the wall and the natural profile. This may require excavation in potentially high strength rock using hydraulic rock hammers or potentially drill and blast techniques;
- Where fractured rock is present at the base of the dam wall, construction of a grout curtain where grout is pumped into a closely spaced grid of percussion holes may be required to prevent water loss through the fractured rock profile below the dam wall;
- Following clearing works and prior to construction, additional investigations including test pits on the proposed wall alignment to assess foundation conditions and the drilling of cored boreholes to assess the rock mass structure and packer testing to assess rock permeability are recommended to provide appropriate design recommendations.

The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted geotechnical design practises and standards. To

our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points. If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Tim Morris

Associate Engineering Geologist

Appendix D
Visual Assessment

Ref: 14164

26 February 2019

The General Manager
Port Macquarie Hastings Council
PO Box 84
Port Macquarie NSW 2444
via email to council@pmhc.nsw.gov.au

de Groot & Benson Pty Ltd

Consulting Engineers & Planners

Dear Sir

DA 2015/953 - Lookout Road Quarry, Herons Creek
Compartments 42 and 43, Broken Bago State Forest
DA Modification relating to Storage Dam

A DA modification has been lodged with Council to re-locate the proposed water storage dam further to the north on the site. We undertook a Visual Assessment as part of the DA process, and we have been asked to comment on whether the proposed new dam has any visual impact on the various residences and properties considered in eth original report.

The report that accompanied the DA was entitled "Visual Assessment – Lookout Road Quarry" for CTK Natural Resources Pty Ltd – DA 2015-953 and was dated May 2016. The report was prepared by the author of this letter with help from the GIS section of State Forests.

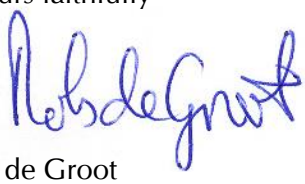
Existing Dam
It is noted that the existing dam did not figure in the original assessment as it was located in a gully and was surrounded by high trees. There was no visual impact of this dam on the surrounding residences.

Proposed Dam
Figure 1 shows the new location of the proposed Dam in relation to the existing residences considered in the original Visual Assessment. It has been moved just under 1km to the north east of the current dam. In addition the ridge line that forms the basis of the quarry will now be between the existing residences.

As such, the there will be no visual impact of the proposed new dam on existing residences in the area.

Should you have any further queries, please contact Rob de Groot on 02 6652 1700, or mobile 04 1883 1700 or by email at rob@dgb.com.au.

Yours faithfully



R J de Groot

Robert de Groot
Gregory Benson
Graham Knight
Anthony Greenland
John Anderson

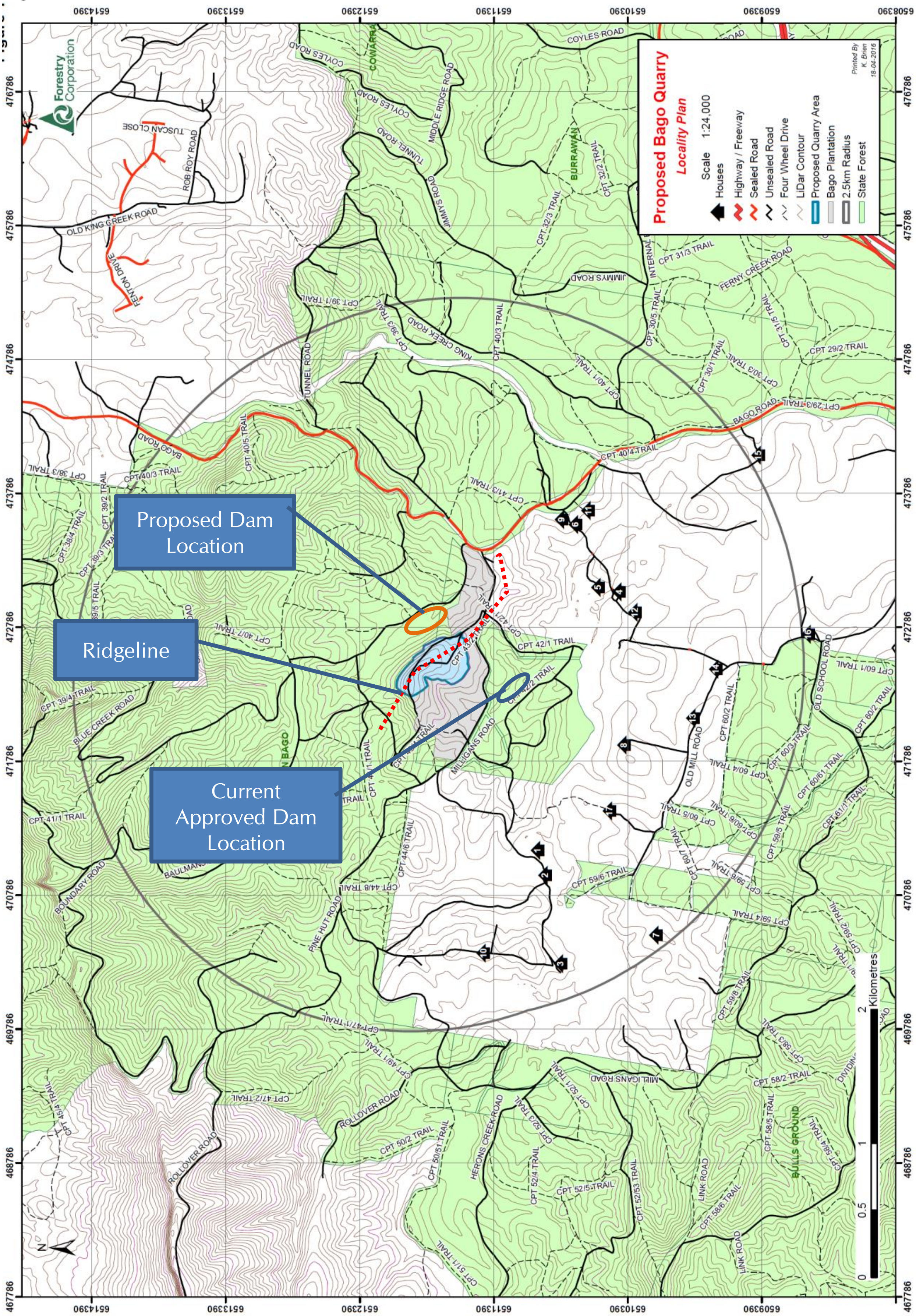
236 Harbour Drive, Coffs Harbour 2450

PO Box 1908, Coffs Harbour 2450

Phone: (02) 6652 1700

Email: email@dgb.com.au
A.C.N. 052 300 571
A.B.N. 50 772 141 249

Figure 1 Dam Location



Appendix
E
Acoustic Assessment

Level 1, Suite 6, 146 Hunter Street
Newcastle NSW 2300

T 02 4907 4800
F 02 4907 4899
E info@emmconsulting.com.au

www.emmconsulting.com.au

5 March 2019

Graham Lockett
CTK Natural Resources Pty Ltd
PO Box 655
Wauchope NSW 2446

Re: Lookout Road Quarry - Proposed relocation of Storage Dam

Dear Graham,

A DA modification has been lodged with Port Macquarie Hastings Council to re-locate the proposed water storage dam to a location further north on the site. EMM Consulting Pty Limited (EMM) prepared a Noise Impact Assessment (NIA) (refer *Bago Quarry*[1] *- Noise Impact Assessment* dated November 2015) to accompany the original development application (DA 2015/953) submitted by CTK Natural Resources. EMM have been requested to comment on the acoustic impacts of the proposed change in location of the storage dam on the sensitive receivers considered in the original NIA.

The proposed location of the storage dam is approximately 750 metres to the north east of the original location. It is noted that this proposed location is significantly further from the nearest sensitive receivers in the surrounding area and is proposed to be located behind a ridgeline. This ridgeline intersects the proposed storage dam location from the nearest sensitive receivers.

The NIA predicted that all operational and construction noise levels would comply with relevant noise goals under worst-case meteorological conditions. Due to the increased distance to the nearest sensitive receivers and the topographic shielding provided by the intersecting ridgeline, the proposed location of the storage dam would only serve to decrease noise levels received at the nearest sensitive receivers.

As such, there will be no acoustic impacts associated with the proposed change in location of the storage dam on existing residences in the surrounding area.

We trust the preceding meets your current requirements. If you have any questions or require any further information, please do not hesitate to contact the undersigned.

Yours sincerely

Lucas Adamson
Acoustic Consultant
ladamson@emmconsulting.com.au

[1] "Bago Quarry" in the title of this document refers to the Lookout Road Quarry.

Appendix

F

Forestry Corporation of New South Wales

Forestry Corporation of NSW ABN 43 141 857 613
Hardwood Forests Division
Maher Street Wauchope NSW 2446
(PO Box 168 Wauchope NSW 2446)
T 02 6585 3744
F 02 6585 2392
www.forestrycorporation.com.au

14/02/2019

Ref No.: F2017/00176

The Directors
CTK Natural Resources Pty Ltd
145 Edinburgh Street
COFFS HARBOUR NSW 2450

Dear Troy and Graham,

CTK Natural Resources Pty Ltd (CTKNR) – Proposed Dam & Associated Matters
Broken Bago State Forest - Compartments 42 & 43 – DA2015-953.1

Following on from our site inspection of 7th February 2019, and associated discussions, Forestry Corporation of NSW (FCNSW) would like to confirm the following:

1. FCNSW will be undertaking harvesting operations in Compartment 43 of Broken Bago State Forest in the near future.
2. Part of that harvest will be from that part of the Blackbutt plantation adjacent to Lookout Road.
3. With respect to the drainage line on the western side of Lookout Road (approximately 650 metres from Bago Road), there are no ecological constraints to impede FCNSW' pending harvest operations.
4. FCNSW' medium term strategy includes the construction of a fire fighting dam in this drainage line.
5. FCNSW would have no objection to CTKNR constructing a water storage dam in this drainage line as an integral part of the development consent relating to the Lookout Road quarry, provided FCNSW' has periodic access to such a dam for fire fighting purposes.
6. FCNSW is aware of the considerable challenges and risk, engineering and otherwise, that confront any construction of a water storage dam (for the Lookout Road quarry) in the originally approved drainage line position in Compartment 42, on the southern side of Milligans Road.
7. FCNSW acknowledges the important need to change the position of the originally approved dam for reasons of economics, protection of the environment, and dam safety.
8. FCNSW believes that the construction of the water storage dam in the drainage line adjacent to Lookout Road will have less environmental impact than the originally approved dam location (especially with respect to hollow bearing trees).
9. There appears to be adequate volume and quality fill material on this site to build a dam wall in the drainage line adjacent to Lookout Road.

10. There will be less risk of adverse outcomes (if there was to be a future dam wall failure) in the case of the Lookout Road drainage line dam as opposed to the originally approved position of the dam south of Milligans Road.
11. The Lookout Road drainage line dam is remote from private land, and is therefore less likely to create any significant noise disturbance.

Taking account of the above situation, Forestry Corporation of NSW therefore consents to CTKNR' lodgement of an application to modify consent to vary the approved storage dam location to the new location to the north, as discussed above.

Yours sincerely

Richard Rienstra I Senior Land Administrator
Forestry Corporation of NSW I Forests Stewardship