

# LOWER FITZROY RIVER

## INFRASTRUCTURE PROJECT

# Addendum to the additional information to the draft environmental impact statement

August 2016



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## Appendices

Appendix A - (Additional information to the draft EIS submissions analysis register)

## Glossary and abbreviations

Acronym/abbreviation	Term
AHD	Australian Height Datum
AMTD	Adopted middle thread distance
AOs	Acceptable outcomes
Brigalow	Brigalow ( <i>Acacia harpophylla</i> dominant and co-dominant) threatened ecological community
CCC	Capricorn Conservation Council
DAF	Department of Agriculture and Fisheries (Qld)
DEHP	Department of Environment and Heritage Protection (Qld)
DNRM	Department of Natural Resources and Mines (Qld)
DE	Department of the Environment (Cth)
DSDIP	Department of State Development, Infrastructure and Planning (Qld) (former)
EIS	Environmental Impact Statement
EO Act	<i>Environmental Offsets Act 2014</i> (Qld)
EO Regulation	Environmental Offsets Regulation 2014
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FBA	Fitzroy Basin Association
Fitzroy ROP	Fitzroy Basin Resource Operations Plan (2011 and 2014)
Fitzroy WRP	Water Resource (Fitzroy Basin) Plan 2011
FSL	Full supply level
GAWB	Gladstone Area Water Board
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
MNES	Matters of national environmental significance
MSES	Matters of State environmental significance
NC Act	<i>Nature Conservation Act 1992</i> (Qld)



Acronym/abbreviation	Term
OCG	Office of the Coordinator-General
POs	Performance objectives
Project	The Lower Fitzroy River Infrastructure Project
QFES	Queensland Fire and Ambulance Service
Reef 2050 Plan	Reef 2050 Long-term Sustainability Plan
REs	Regional Ecosystems
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>
SMP	Species management program
Submissions register	Additional information to the draft EIS Submissions Analysis Register
SunWater	SunWater Limited
SP Act	<i>Sustainable Planning Act 2009</i> (Qld)
SRI	Significant residual impact
SRI Guideline - SP Act	Significant Residual Impact Guideline for matters of state environmental significance and prescribed activities assessable under the Sustainable Planning Act 2009 (Queensland Environmental Offsets Policy, December 2014)
TEC	Threatened ecological community
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
WQIP	Water Quality Improvement Plan
WWF	World Wildlife Fund - Australia

# 1. Introduction

## 1.1 Environmental impact assessment process

The Project environmental impact statement (EIS) is being undertaken through the bilateral assessment process in accordance with the provisions of the:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), as a 'controlled action'
- *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act) as a 'coordinated project'.

The draft EIS was released by the Coordinator-General in July 2015 for public and advisory agency review and comment. Thirty-seven submissions were received by the Coordinator-General on the draft EIS. In response to the draft EIS submissions the Project joint proponents, the Gladstone Area Water Board (GAWB) and SunWater Limited (SunWater) prepared additional information to the draft EIS.

The additional information to the draft EIS was publicly notified in May 2016. Seventeen submissions were received by the Coordinator-General on the additional information to the draft EIS. The additional information to the draft EIS submissions analysis register (submissions register) is included at Appendix A.

On 18 July 2016 the Coordinator-General requested that the proponents work with the Office of the Coordinator-General (OCG) to provide further information in an addendum (this report) in regard to the submissions made on the additional information to the draft EIS.

## 1.2 Finding your submission

Submissions on the additional information to the draft EIS were received from environmental groups and Commonwealth and State regulatory agencies and addressed as indicated in Table 1-1 and a is provided in the submissions register (Appendix A). This indicates how and where individual submissions have been addressed either in this addendum report or directly within the submissions register as applicable.

**Table 1-1 Submission references**

Entity (submission #)	Issue number	Addendum report reference
Capricorn Conservation Council (CCC) (14)	14.1, 14.2, 14.3, 14.6, 14.7, 14.8	Appendix A
	14.4	Sections 5, 6 and 8
	14.5	Section 3.2
Department of Agriculture and Fisheries (DAF) (6)	6.1, 6.5, 6.5A, 6.6 and 6.7	Appendix A
	6.2	Sections Fishway maintenance and operation 4.1 and 4.2

Entity (submission #)	Issue number	Addendum report reference
	6.3	Section Fishway maintenance and operation 4.1
	6.4	Section Fishway maintenance and operation 4.2
Department of Education and Training (18)	18.1	Appendix A
Department of Energy and Water Supply (4)	4.1	Appendix A
Department of the Environment (DE) <sup>1</sup> (10)	10.1	Sections 5.1 and 8
	10.2	Section 3.2
	10.3, 10.4 and 10.5	Section 7.1
	10.6	Section 7.2
	10.7	Appendix A
Department of Environment and Heritage Protection (DEHP) (11)	11.1	Section 3.2
	11.2, 11.6 11.8, 11.9 and 11.10	Appendix A
	11.3	Section 7.3
	11.4	Sections 5.1 and 8
	11.5	Sections 6 and 8
	11.7	Sections 3.2 and 8
	11.11 and 11.12	Section 8
Department of Health (Queensland Ambulance Services) (7)	7.1	Appendix A
Department of Infrastructure, Local Government and Planning (8)	8.1 and 8.2	Appendix A

<sup>1</sup> It is noted that as at 19 July 2016, responsibility for energy policy was transferred to the Commonwealth Department of Environment and Energy. For the purposes of reporting reference to DE only is maintained herein.

Entity (submission #)	Issue number	Addendum report reference
Department of National Parks, Sport and Racing (12)	12.1 and 12.2	Appendix A
Department of Natural Resources and Mines (DNRM) (16)	16.1, 16.2, 16.3	Section 8
	16.4 and 16.10	Section 3.2
	16.5, 16.6, 16.7, 16.8, 16.9, 16.11, 16.12, 16.13, 16.14, 16.15, 16.16, 16.17, 16.18, 16.19, 16.20, 16.21, 16.22, 16.23, 16.24, 16.25, 16.26	Appendix A
Department of State Development (Business Solutions and Partnerships) (5)	5.1	Appendix A
Department of Transport and Main Roads (15)	15.1 and 15.2	Appendix A
Ergon Energy (2)	2.1	Appendix A
Fitzroy Basin Association (FBA) (3)	3.1, 3.2	Appendix A
	3.3	Section 3.2
Great Barrier Reef Marine Park Authority (GBRMPA) (9)	9.1	Section 3.2
	9.2 and 9.3	Section 3.1
Public Safety Business Agency (13)	13.1	Appendix A
Queensland Fire and Emergency Services (QFES) (13)	13.2, 13.3	Appendix A
QFES – Community Safety Capability Branch (13)	13.4	Appendix A
Queensland Treasury (Hazardous Industries & Chemicals Branch) (1)	1.1	Appendix A
World Wildlife Fund – Australia (WWF) (17)	17.1, 17.2 and 17.3	Section 3.2

Consultation activities are also discussed (Section 9).

### 1.3 Report purpose and structure

This addendum report has been prepared in response to the Coordinator-General's request to address submissions and provide further information to support the environmental, social, cultural and economic assessment and evaluation of the Lower Fitzroy River Infrastructure Project (Project). Importantly, this addendum report is compiled to facilitate that the draft EIS and additional information to the draft EIS can be taken to be a final EIS for evaluation by the Coordinator-General.

This addendum report is structured to address submissions relative to key themes and issues as presented in Table 1-2.

**Table 1-2 Addendum report structure**

Chapter	Title	Description
1	Introduction	EIS status, report objectives and structure
2	Project description	Summary Project description
3	Facilitated agricultural development	Assessment methods, water quality, sediment, nutrient and pesticide loads, Reef 2050 Plan targets
4	Fisheries resources	Financial assurance, significant residual impact assessment outcomes
5	Red goshawk	Potential impact areas, significant residual impact assessment
6	Powerful owl	Potential impact areas, significant residual impact assessment
7	<i>Rheodytes leukops</i> (Fitzroy River turtle) and <i>Elseya albagula</i> (white-throated snapping turtle)	Offset framework, species management program (SMP) and turtle movement study, water resources and weir operations
8	Environmental management and offsets	Offsets strategy
9	Consultation	Consultation updates

This addendum report should be read with reference to the draft EIS and the additional information to the draft EIS available at [www.statedevelopment.qld.gov.au/lower-fitzroy](http://www.statedevelopment.qld.gov.au/lower-fitzroy).

## 2. Project description

The Project comprises the construction and operation of a raised Eden Bann Weir and construction and operation of Rookwood Weir on the Fitzroy River, Central.

Key Project components include the following:

- Eden Bann Weir
  - Eden Bann Weir Stage 2 – a raise of the existing Eden Bann Weir Stage 1 full supply level (FSL) 14.5 m Australian Height Datum (AHD) to a FSL 18.2 m AHD and associated impoundment of the Fitzroy River
  - Eden Bann Weir Stage 3 – the addition of 2 m high flap gates to achieve FSL 20.2 m AHD and associated impoundment of the Fitzroy River.
- Rookwood Weir
  - Rookwood Weir Stage 1 – a new build to FSL 45.5 m AHD, a saddle dam and associated impoundment of the Fitzroy, lower Mackenzie and lower Dawson rivers
  - Rookwood Weir Stage 2 – the addition of 3.5 m high flap gates to achieve FSL 49.0 m AHD and associated impoundment of the Fitzroy, lower Mackenzie and lower Dawson rivers.
- Aquatic fauna passage infrastructure, namely fish locks and a turtle bypass, at each weir
- Any combination of the above stages.

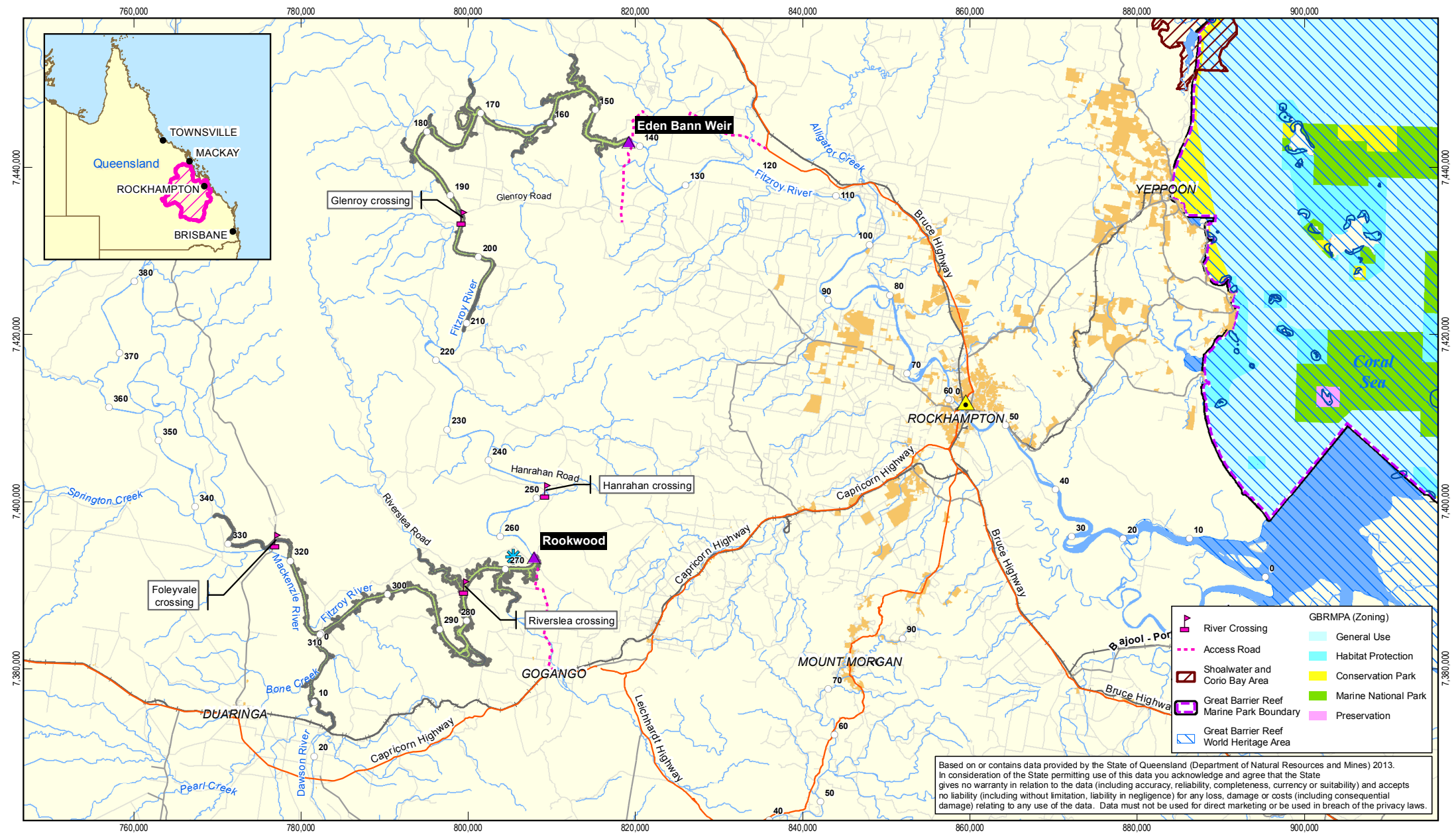
The Project is expected to be staged, with sequencing and timing dependant on a number of demand triggers including existing and new consumers, drought conditions and security of supply requirements.

Other infrastructure components associated with the Project include:

- Augmentation to and construction of access roads (public and private) to and from the weir sites for construction and operations and upgrades to intersections
- Construction of low level bridges in areas upstream of weir infrastructure that will be impacted by the impoundments, specifically at Glenroy, Riverslea and Foleyvale crossings
- Installation of culverts at Hanrahan Crossing downstream of Rookwood Weir to facilitate access during operational releases
- Relocation of existing and/or installation of new gauging stations
- Removal and decommissioning of existing low level causeways and culverts at river crossings described above
- Water supply for construction will be sourced directly from the river and will not require the construction of additional water supply infrastructure.

Figure 2-1 shows the Project location.



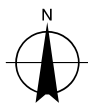


1:600,000 (at A4)

0 5 10 15 20

Kilometres

Map Projection: Universal Transverse Mercator  
Horizontal Datum: Geocentric Datum of Australia (GDA94)  
Grid: Map Grid of Australia 1994, Zone 55



**LEGEND**

- AMTD (km)
- Highway
- Major Road
- Streets (Local)
- Access Road
- ▭ Fitzzy Basin
- ▭ Urbanised Area
- ▭ Rookwood Weir Stage 1 impoundment
- ▭ Eden Bann Weir Stage 2 impoundment
- ▭ Eden Bann Weir Stage 3 impoundment
- ▲ Weir Location
- ▲ Fitzzy Barrage
- ▲ Saddle dams



Gladstone Area Water Board, SunWater Job Number 41-29212  
Lower Fitzroy River Infrastructure Project Revision J  
Date 03 Mar 2016

Project locality plan

Figure 2-1

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### 3. Facilitated agricultural development

Additional information to the draft EIS submissions addressed in this section include those from:

- CCC – submission #14.5
- DE – submission #10.2
- DEHP – submissions #11.1 and #11.7
- DNRM – submissions #16.4 and # 16.10
- FBA – submission #3.3
- GBRMPA – submissions #9.1, #9.2 and #9.3
- WWF – submissions #17.1, #17.2 and #17.3.

#### 3.1 Assessment approach and outcomes

At the time of compiling the additional information to the draft EIS the State were unable to provide the Great Barrier Reef Source Catchments model nor provide assistance in undertaking model runs in relation to potential land use changes resulting from potential facilitated agricultural development.

As such an alternative assessment approach and methodology was developed to assess the impacts from potential facilitated agricultural development. The approach was to use the best available public data, namely Bartley and Speirs (2010) and Bartley et al (2012).

The approach was proposed in a Technical Note (dated 23 February 2016). The Technical Note was submitted to the OCG, DE, DEHP and DNRM for review and comment. A teleconference was held with Commonwealth and State advisory agencies on 26 February 2016 to:

- Review the approach and methodology applied to the determination of potential changes in sediment and nutrient load outputs to the Great Barrier Reef (GBR). This included the assumed potential facilitated agricultural development scenario, the use of 42,000 ML per annum of water from the Project for potential agricultural use, application of publicly available data to predict loads from the potential facilitated agricultural use, the comparison of the changes relative to published modelled and monitored loads.
- Review the predicted loads in relation to sediment (as total suspended solids (TSS) and nutrients (total nitrogen (TN) and total phosphorous (TP)) based on potential changes to land uses from grazing to an assumed agricultural scenario potential facilitated by the Project.

The outcomes of the Technical Note review and comments received were used to report on consequential impacts in Chapter 11 of the additional information to the draft EIS.

The additional information to the draft EIS concludes that the Project has the potential to facilitate agricultural development:

- A three per cent contribution to the current level of irrigated cropping
- A thirty per cent contribution to the total number of animals produced by feedlots.



The contribution that the potential facilitated agricultural development land uses may have on monitored and/or modelled TSS, TN and TP loads are summarised as follows:

- TSS load may increase by up to 0.02 per cent
- TN load may increase by up to 0.46 per cent
- TP load may increase by up to 0.10 cent.

It is considered that a valid and acceptable approach (based on publicly available published data) was prepared and agreed with the Commonwealth and the State for consideration in the additional information to the draft EIS and that the outcomes presented are adequate to inform the assessment of consequential impacts.

The proponents however commit to further analysis and assessment with regard to impacts associated with potential facilitated agricultural development to further validate the predicted results. This may include estimating the predicted impacts of potential facilitated agricultural using the GBR Source Catchments model, providing the model can be made available to the proponents in a timely manner.

### **3.2 Actions to benefit Reef 2050 Long-term Sustainability Plan targets**

While the predicted increases in nutrient and sediment load in relation to potential facilitated agricultural development are considered low to negligible it is acknowledged that there is potential to impact on downstream water quality. In particular, the potential to impact negatively on water quality targets set in the Reef 2050 Long-term sustainability plan (Commonwealth of Australia 2015) (Reef 2050 Plan) (however minor) are noted.

The proponents currently contribute to water quality enhancement initiatives within the Fitzroy Basin through participation in partnerships (Fitzroy Partnership for River Health) and in collaboration with State agencies (DNRM) in the provision of water quality monitoring data.

Addressing the targets of the Reef 2050 Plan, in particular water quality, is a complex issue and requires the collaboration of multiple stakeholders across all sectors (government, industry, private etc).

It is therefore proposed that opportunities to contribute further to the Reef 2050 Plan targets and improvement of water quality within waterways and at the GBR be explored as part of the Project's overall environmental management and offset strategy framework (Section 8).

This may include the implementation of on-ground activities promoting the prevention and/or restoration of land areas to promote riparian vegetation growth and reduce input loads to the system. Other considerations may include contributions to existing and/or new initiatives, such as programs being undertaken by FBA, the Office of the Great Barrier and the Great Barrier Reef Task Force and recommendations made by the Great Barrier Reef Water Science Taskforce in its recently released Final Report (State of Queensland 2016) and as per the Fitzroy Water Quality Improvement Plan 2015 (WQIP 2015) (FBA 2015), amongst others.

Further, as the Project is likely to be staged, and that potential facilitated agricultural development uptake of water may occur as staging progresses the provision of actions in relation to water quality improvement initiatives should similarly be staged where appropriate to do so. Development staging is likely to occur over time. As such it should be considered that opportunities to contribute to water quality improvement will change as new information is

garnered, new technologies are developed in relation to land use practices and their application in the agricultural field.

The commitments to benefiting the Reef 2050 Plan targets and water quality improvement with regard to impacts from potential facilitated agricultural may include:

- Assessment and analysis of predicted impacts from potential facilitated agriculture based on the results of the GBR Source catchments model
- The implementation of a strategy to inform the knowledge about agricultural land use practices and their impacts on GBR water quality
- The strategy must preferentially be implemented within the Fitzroy Basin of the Fitzroy natural resource management area and Fitzroy catchment as defined as a GBR catchment
- The strategy must account for project staging and development over time and must specify implementation timeframes, including provisions for review and auditing
- The strategy must be developed in consultation with Commonwealth and State departments and independent advisory organisations as agreed between the Commonwealth and State departments and the approval holder

## 4. Fisheries resources

Additional information to the draft EIS submissions addressed in this section include those from:

- DAF – submissions #6.2; #6.3 and #6.4.

### 4.1 Fishway maintenance and operation

The proponents commit to the effective operation of the fish passage and that aspects of the structure must be maintained for the life of the barrier. This maintenance must include regular, documented inspections of the structures (fish way, baffles, roughening etc.) especially after flood events, and prompt clearing of debris or rectifying any other failures, malfunctions, breakdowns or other impediments to fish movement.

The performance outcomes (POs) and acceptable solutions in the State Development Assessment Provisions, particularly Module 5.2 Fisheries resources performance outcome PO12 includes consideration of this:

- PO12: Any fish way proposed as part of the development is demonstrated to be a feasible and reliable solution that will provide adequate fish passage.

Acceptable outcomes (AOs) relating to the requirement to effectively operate fish passage infrastructure and monitor fish passage include the following (amongst others):

- AO12.3 Development provides for the installation of monitoring equipment, such as traps and lifting equipment, access for monitoring, and a monitoring program of sufficient rigour to:
  - Demonstrate the success of the fish way and fish passage at the site
  - Provide the basis for optimising operation of the works and fish way.
- AO12.4 The fish way design maximises flexibility for future adjustments that may be needed once in place.
- AO12.5 The owner or operator demonstrates the means and commitment to promptly rectify any faults found in the fish way during commissioning, monitoring and operation, if these lead to inadequacies in the fish movement that are provided.

Further commitments regarding Fishway maintenance, operation and monitoring will be included in the fishway monitoring program and fishway operations plan to be included as part of the waterway barrier works application. The proponents are legally bound to compliance with conditions of the approvals they receive. GAWB and SunWater have annual budgets with regard to environmental management obligations as part of operations and maintenance activities.

It is not considered appropriate that financial assurance be attached to the Project in relation to MSES for waterway providing for fish passage.

### 4.2 Aquatic habitat

The non-statutory guideline *Significant Residual Impact Guideline for matters of state environmental significance and prescribed activities assessable under the Sustainable Planning Act 2009 (Queensland Environmental Offsets Policy, December 2014)* (DSDIP 2014) (SRI

Guideline - SP Act) applies to development made assessable under the *Sustainable Planning Act 2009* (Qld) (SP Act).

In accordance with the SRI Guideline – SP Act, under section 3.8.1, an action is likely to have a significant residual impact (SRI) on a waterway providing for fish passage if the action will result in:

- A permanent modification to the volume, depth, timing, duration or flow frequency of the waterway
- Permanent modification or fragmentation of fish habitat including but not limited to in stream vegetation, snags and woody debris, substrate, bank or riffle formation necessary for breeding and/or survival of native fish species
- The mortality or injury of fish species; OR
- Works that permanently reduce the level of fish passage provided in a tidal waterway or a waterway identified as a major high risk waterway for waterway barrier works, to a level that would increase stress on fish populations.

Notwithstanding the above, an action is UNLIKELY to have a SRI on a waterway providing for fish passage if (amongst others):

- For works that permanently alter existing fish passage, equal or better passage will be provided immediately on completion of the works.

Queensland Fisheries considers that the Project would impact on 'passage' through:

- Creating a physical barrier
- The permanent modification and fragmentation of habitat.

The Queensland Environmental Offsets Regulation 2014 (EO Regulation) defines 'passage', for fish, as the natural movement patterns of fish species required to maintain the biological integrity of the species'.

Further to the assessment presented in the draft EIS (Volume 1, Chapter 7, section 7.3.3.4) an assessment against the SRI Guidelines – SP Act was presented in the additional information to the draft EIS (Chapter 3, section 3.1.2, Table 3-1).

The assessment is considered appropriate and valid and that significant residual impacts are unlikely. The provision of fish passage as an integral component of the weir infrastructure which manages and mitigates the potential modification and fragmentation of habitats. The provision of fish passage facilitates the movement of fish to maintain biological integrity of the species.

The addition of a right bank fish lock at Eden Bann Weir will improve on current passage efficiency above spilling flows. Currently fish are attracted to the right bank spillway section of the weir, and as there is no passage, become stranded as tailwater levels drop. New fish locks at Eden Bann Weir cover between 96.6 per cent and 100 per cent of the seasonal flow range and the increase in coverage across the seasons is generally improved. Fish locks at Rookwood Weir will provide for between 89.4 per cent and 99.8 per cent of flows across the seasons.

Movement upstream and downstream is facilitated via the fish passage and the retention of instream vegetation will contribute to the provision of snags and debris providing for fish habitat.

Fish species in the Fitzroy Basin are adapted to the highly dynamic and variable nature of the system (Long 2000). These adaptations are represented by the specific foraging, breeding and

sheltering preferences of the species that occur within the system. A review of the ecology of fish species known to occur within the Fitzroy Basin catchment (and are representative of those within the Fitzroy, Mackenzie and Dawson rivers) revealed that most species prefer (or are tolerant of) the still or slow flowing conditions that are present in pool habitats (Pusey et al. 2004; Allen et al. 2003; Marsden and Power 2007; DERM 2010).

Notwithstanding this, an offset in relation to altered aquatic habitat for the Fitzroy River turtle and white-throated snapping turtle has been proposed. The aquatic habitat footprint is co-located with aquatic habitat common to all aquatic. Further water quality improvement initiatives (Section 3.2) will contribute to improvements in water quality and habitat restoration within waterways contributing to enhanced aquatic habitat values.

## 5. Red goshawk

Additional information to the draft EIS submissions addressed in this section include those from:

- CCC – submission #14.4
- DE – submission #10.1
- DEHP – submission #11.4.

### 5.1 Survey effort

A summary of survey effort in relation to red goshawk was presented in the additional information to the draft EIS and is presented below in Table 5-1. It is considered that the survey effort is adequate and that survey was undertaken in accordance with the Commonwealth survey guidelines for the species with an effort of at least 196 person hours spent searching suitable habitat for nests, with teams undertaking searches on foot, from boats and from vehicles during wet and dry season surveys. No nests or individuals were observed.

**Table 5-1 Summary of red goshawk survey effort**

Method	Location	Purpose	Estimated effort
On foot	All areas	As part of habitat assessments, targeted nest searches were undertaken at 17 fixed bird census sites (mapped on Figure 8-1 and 8-2 draft EIS, Volume 1, Chapter 8 Terrestrial Fauna).	28 hours (100 minutes per site x 17 sites)
Boat-based	Eden Bann Weir existing impoundment and upstream reach	Boat-based nest searches along the Fitzroy River between the existing weir and site 6 (Figure 8-1, draft EIS, Volume 1, Chapter 8 Terrestrial Fauna). This included all adjoining tributaries.	72 – 96 hours (12 days x 3 - 4 hours on river x 2 boats)
Canoe-based	Rookwood Weir Project area	Canoe-based surveys along the Fitzroy, Dawson and Mackenzie rivers.	24 hours (6 days x 4 hours on river x 1 canoe)
By vehicle	Rookwood Weir Project area	Opportunistic vehicle-based surveys were undertaken whilst driving between fixed terrestrial fauna sites. This included assessments of areas within the broader region, up to 1 km from the river.	72 hours (12 days x 3 teams x 2 hours)

## 5.2 Habitat requirements

The red goshawk occupies a range of habitats in northern and eastern Australia including coastal and sub-coastal tall open forests and woodlands. The species has a large home range covering between 50 and 220 km<sup>2</sup>. It prefers a mix of vegetation types with its habitat including tall open forest, woodland, lightly treed savannah and the edge of rainforest (Marchant and Higgins 1993). The red goshawk has specific nesting habitat preferences, typically nesting in tall trees, frequently the tallest tree in a tall stand of vegetation and invariably within 1 km of permanent water (Aumann and Baker-Gabb 1991; Debus and Czechura 1988).

## 5.3 Habitat assessment

Mapping of potential foraging and nesting habitat has been undertaken to quantify the magnitude of impact on the red goshawk resulting from the Project. To assess the significance of impact, the area of habitat lost was compared with that occurring within a 10 km radius which is roughly equivalent to the home range of the species.

### 5.3.1 Foraging habitat

Foraging habitat for the red goshawk is shown in Figure 5-1. Criteria used to map habitat is detailed below:

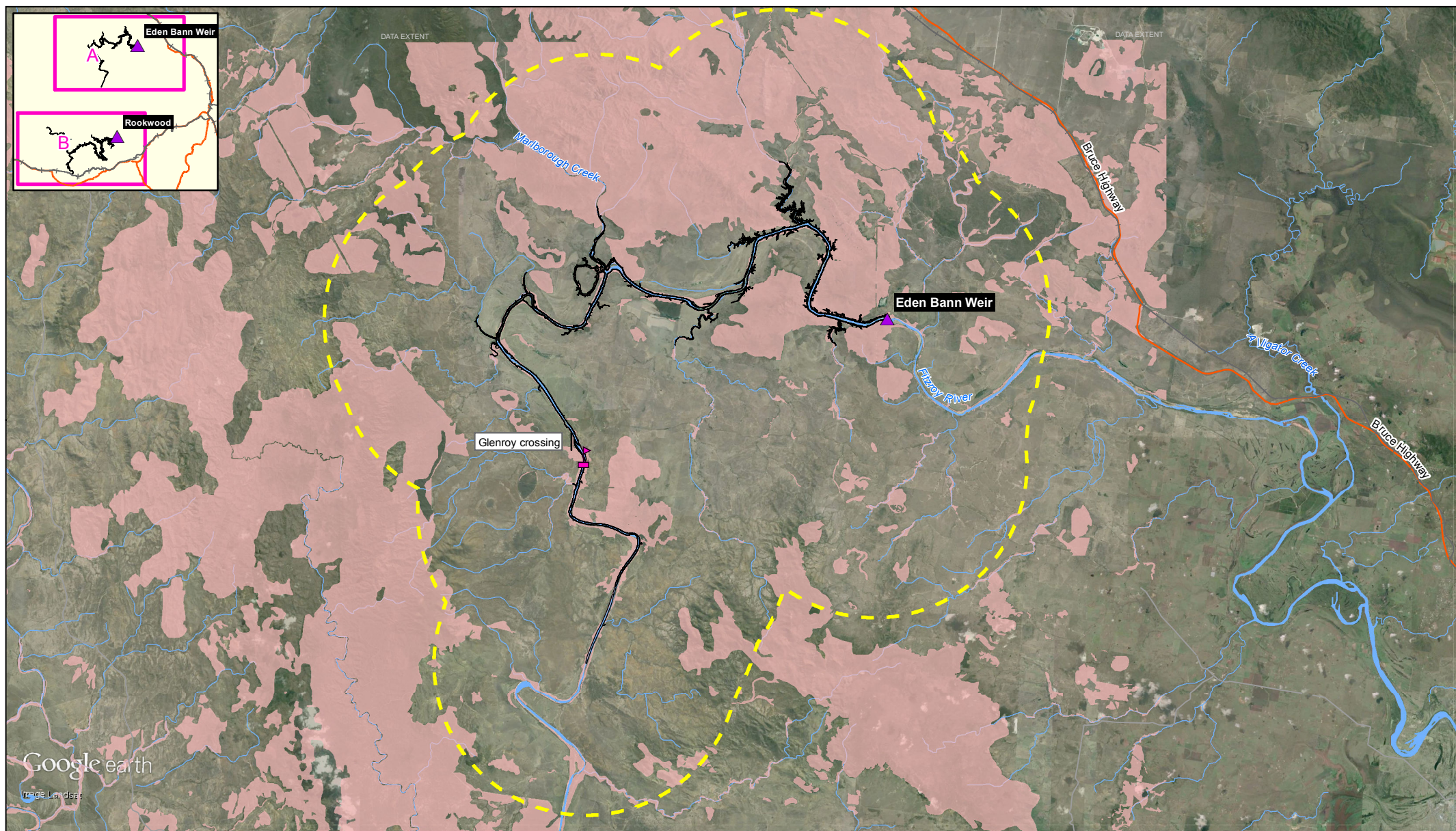
- Foraging habitat includes all woodland, open woodland and vine thicket Regional Ecosystems (REs) within the Project area (REs 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.11, 11.3.25, 11.3.26, 11.3.29, 11.3.30, 11.3.38, 11.4.1, 11.4.2, 11.4.8, 11.5.2, 11.5.3, 11.5.9, 11.7.1, 11.7.4, 11.8.1, 11.8.4, 11.9.1, 11.9.4, 11.9.9, 11.10.1, 11.11.1, 11.11.4, 11.11.5, 11.11.7, 11.11.9, 11.11.10, 11.11.15, 11.11.16, 11.11.18, 11.11.21, 11.12.1, 11.12.2, 11.12.4, 11.12.6).
- It excludes areas mapped as water (based on the watercourse cadastre).

Loss of potential foraging habitat is estimated to be in the order of 1,243 ha:

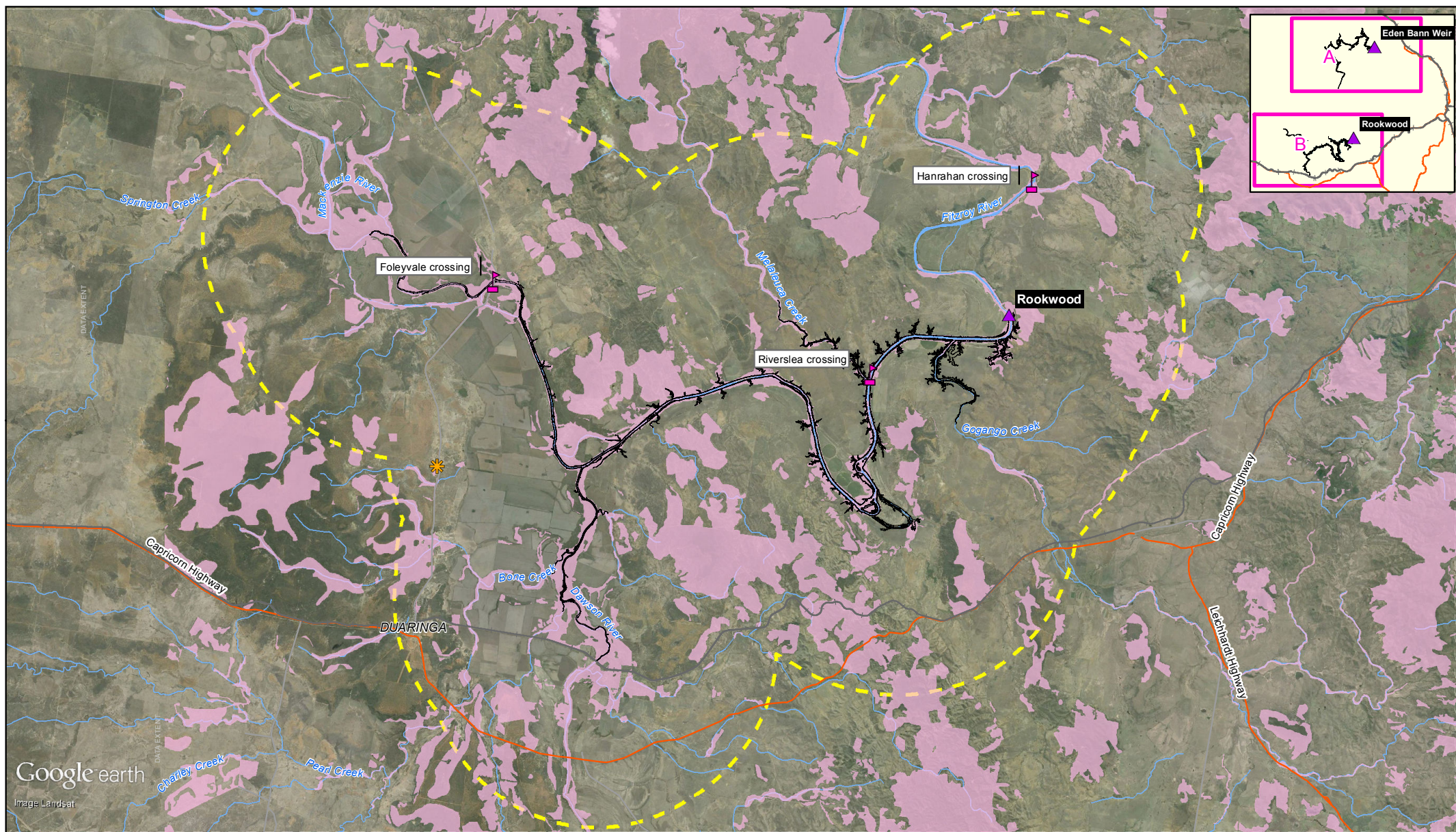
- Eden Bann Weir Stage 3 impoundment: 454 ha
- Rookwood Weir Stage 2 impoundment: 789 ha.

This represents 1.4 per cent of the potentially available foraging habitat available within a 10 km radius (90,443 ha).











### 5.3.2 Nesting habitat

Potential nesting habitat for the red goshawk is shown in Figure 5-2. Criteria used to map habitat is detailed below:

- Nesting habitat overlaps with foraging habitat areas and includes all woodland REs with median vegetation taller than 22 m (REs: 11.11.16, 11.3.25, 11.3.26, 11.3.38, 11.10.1, 11.3.4) within 1 km of rivers (defined as stream orders 6 – 9) (excluding areas mapped as water (based on the watercourse cadastre))
- This is based on published information on the nesting requirements of the species: large trees, frequently the tallest and most massive in a tall stand, and nest trees are invariably within one km of permanent water (Aumann and Baker-Gabb 1991; Debus and Czechura 1988)
- In mapping potential nesting habitat for the red goshawk, a buffer of 1 km was used as literature states the species invariably nests within 1 km of permanent water (Aumann and Baker-Gabb 1991; Debus and Czechura 1988)

To quantify the magnitude of the loss of nesting habitat, relative to the area of accessible nesting habitat available within the region, the following criteria was used:

- The area of suitable nesting habitat (i.e. suitable REs within 1 km of permanent water) that occurs within a 10 km radius based on the following:
  - Given the red goshawk has a home range of 120 to 200 km<sup>2</sup> and can move distances of up to 10 km (Czechura, 1996), 10 km was considered an ecologically meaningful distance for comparison
  - Reducing the area for comparison to 1 km would be less ecologically meaningful, given that it would ignore the presence of other areas of suitable nesting habitat outside the Project area that would be well within the species home range

Loss of potential nesting habitat is estimated to be 972 ha:

- Eden Bann Weir Stage 3 impoundment: 384 ha
- Rookwood Weir Stage 2 impoundment: 588 ha.

This represents 10.9 per cent of the potential nesting habitat available within a 10 km radius (8,847 ha).

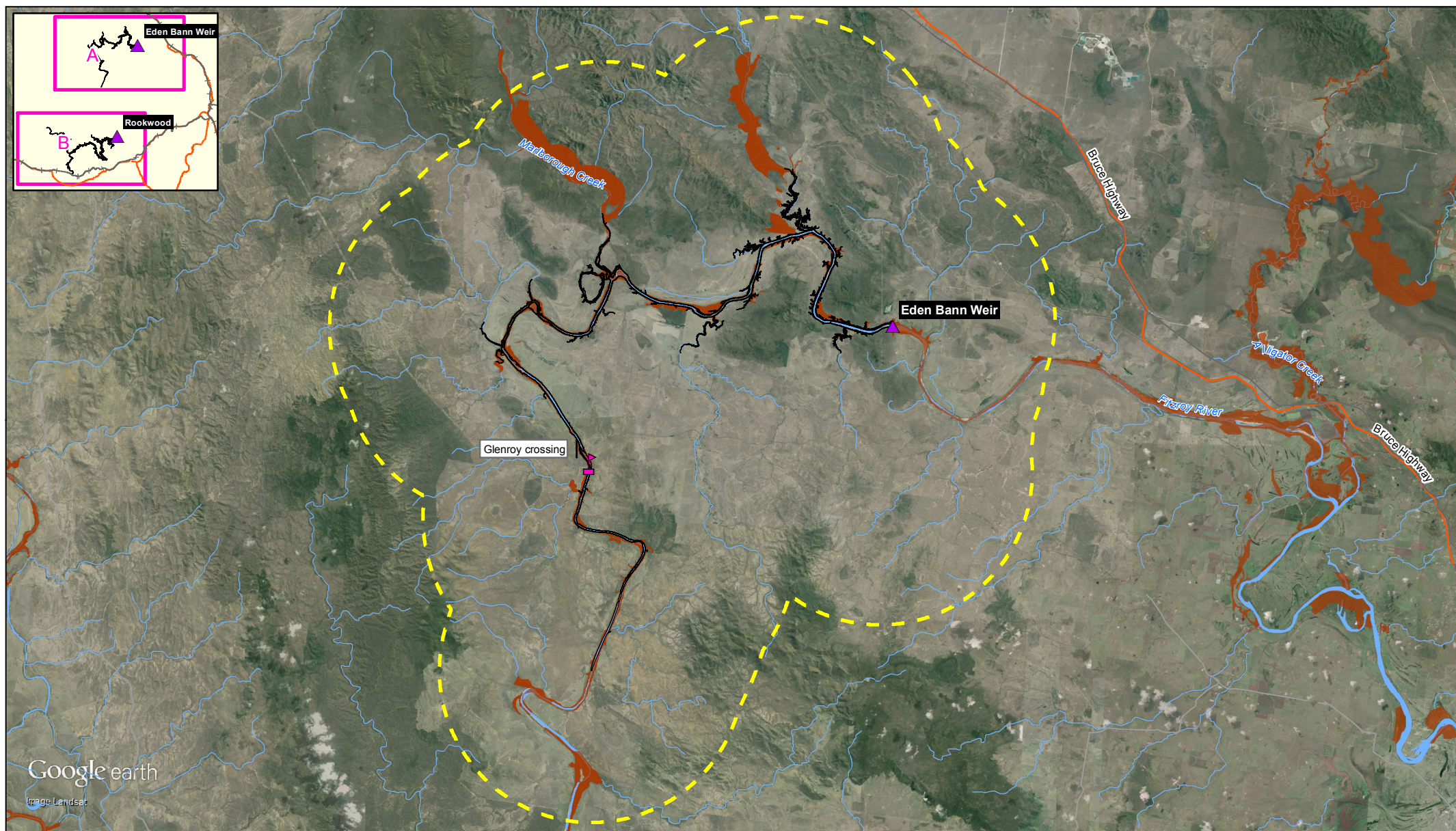
### 5.3.1 Significance assessment

The red goshawk is listed as vulnerable under the EPBC Act and endangered under the *Nature Conservation Act 1992* (NC Act).

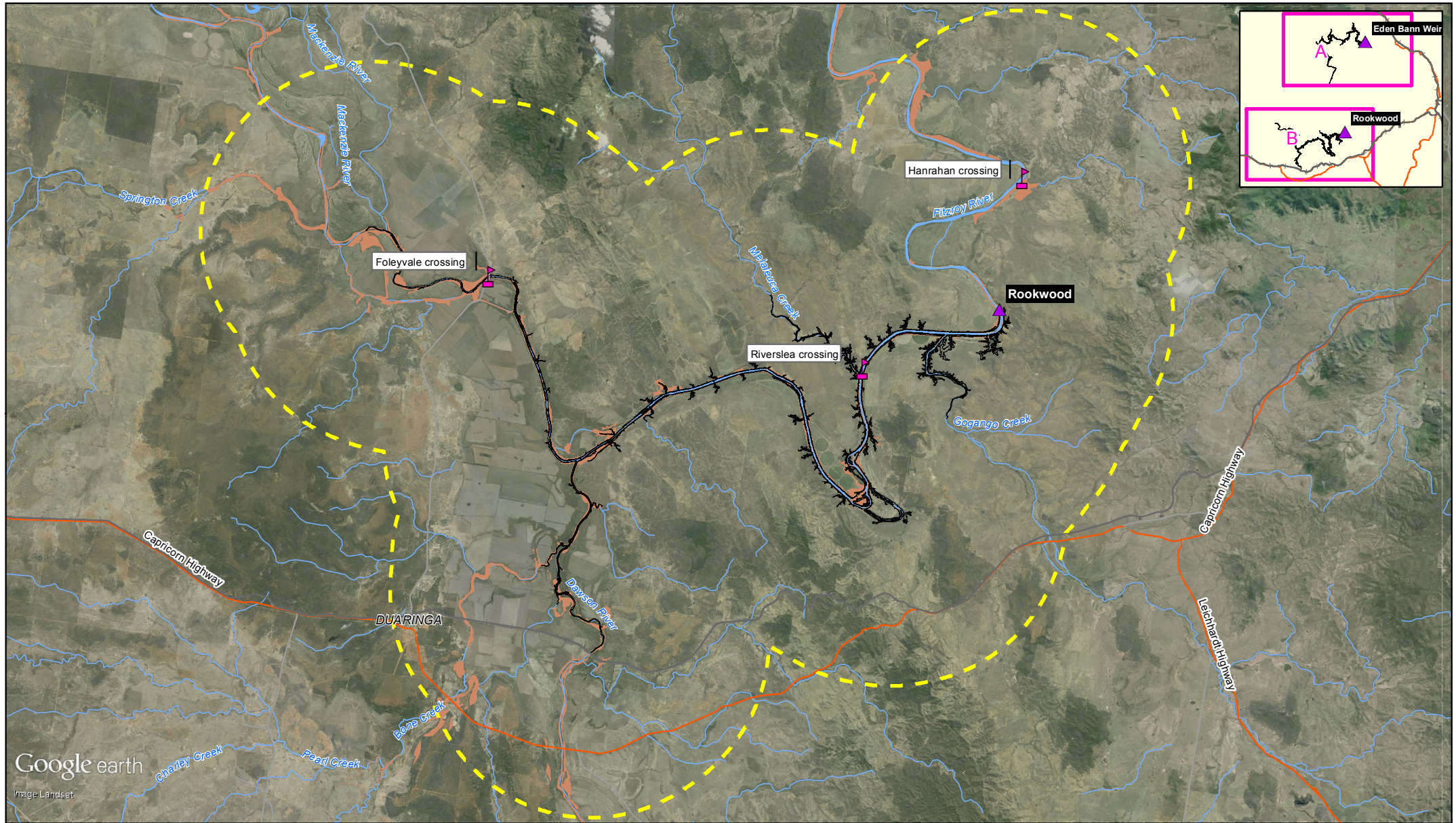
The Commonwealth Matters of National Environmental Significance Significant impact guidelines 1.1 has been adopted for the assessment of the significance of residual impacts on red goshawk as presented in Table 5-2.

It is not considered that the Project is likely to have a significant impact on the red goshawk and offsets are not proposed. Notwithstanding this it is noted in Section 8 that proposed offsets for remnant vegetation would co-locate with habitat requirements for the red goshawk and serve to further reduce potential Project impacts.









Map B  
Figure 5-2



**Table 5-2 Significant impact assessment for red goshawk**

Significance criterion	Assessment
An action is likely to have a significant residual impact on habitat for an animal that is vulnerable wildlife if the action will:	
Lead to a long term decrease in the size of a local population	The Project is not expected to result in a decrease in the size of the local red goshawk population. Given that no individuals or nests were observed in field survey effort that was consistent with Commonwealth survey guidelines for the species (196 person search hours from surveys undertaken on foot, from boats and vehicles) suggests the Project is unlikely to impact on actual nesting habitat. The loss of potential habitat is considered moderate. Potential red goshawk nesting habitat has been mapped for the area, based on published information on nesting habitat requirements (that is, tall eucalypt forest within 1 km of rivers as detailed in Aumann and Baker-Gabb 1991; Debus and Czechura 1988). The Project will result in a loss of 972 ha of potential nesting habitat, which represents 10.9 per cent of the total area of potential nesting habitat within a 10 km radius. The Project will result in the loss of 1,243 ha of potential foraging habitat, representing 1.4 per cent of the available foraging habitat within a 10 km radius. Given the low density at which red goshawks occur (estimated at one breeding pair per 10 - 20 km of riverine habitat (Czechura 2001), the lack of impact on actual nesting habitat and the relative abundance of potential nesting habitat and foraging habitat that will remain available within their home range, the species is unlikely to experience a significant increase in competition for resources as a result of the Project.
Reduce the area of occupancy of an important population	The red goshawk has a large home range that exceeds the size of the Project area. Large areas of potentially suitable red goshawk habitat will persist within the local area and surrounding landscape. Possible impacts are expected to be experienced at a more localised scale that will not disrupt movement of individuals between habitat remnants or across the area more broadly. As such, there will be no change in the extent of occurrence of the species as a result of the Project.
Fragment an existing important population into two or more populations	The red goshawks' large home range and capacity for foraging within ecotones suggests the species is to some extent tolerant of fragmentation. The species has been observed persisting within fragmented habitats at least during non-breeding periods (Hughes and Hughes 1988). While nesting habitat may be more sensitive to fragmentation effects, the scale of habitat fragmentation anticipated to result from the Project is small in comparison with the home range of the species. As a result, the localised nature of habitat fragmentation would likely be of insufficient magnitude to fragment the population into isolated populations. As a result, the Project is not likely to fragment an existing population into two or more populations.

Significance criterion	Assessment
Adversely affect habitat critical to the survival of a species	The absence of records and nests from the Project footprint (despite intensive search effort) and the presence of a single red goshawk record 10 km from the confluence of the Dawson and Mackenzie rivers (outside the Project footprint) suggests the species is likely to be nesting near that location. Given the species fidelity to nesting territories, impact on critical nesting habitat resulting from the Project is therefore likely to be negligible. Impacts likely to result from the project are therefore limited to a loss of foraging habitat and a reduction in the area of potential nesting habitat, available to individuals that may need to establish new breeding territories in the future. The inundation of vegetation represents a loss of 10.9 per cent of potential nesting habitat and 1.4 per cent of foraging habitat available within a 10 km radius. In the context of the surrounding landscape, the scale of habitat loss is of insufficient magnitude to adversely affect habitat critical to the survival of the species. While it may reduce the capacity for the species to establish new breeding territories and increase its local density of occurrence, the proportional loss of habitat would be insufficient to threaten the species persistence in the region.
Disrupt the breeding cycle of an important population	Due to the low density at which red goshawks occur, any breeding pairs are considered part of an important population. However, since no individuals or nests were identified in field surveys (using survey methods and effort consistent with Commonwealth survey guidelines), and given the species typically uses the same nesting territories year after year, the species is considered unlikely to nest within the Project footprint. While the Project will result in a localised loss of potential nesting, it is unlikely to disrupt the breeding cycle of existing individuals.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Loss or modification of habitat resulting from the Project is unlikely to be of sufficient magnitude to cause a decline in the species. The Project will result in the loss of 972 ha of potential nesting habitat and 1,243 ha of potential foraging habitat. This represents 10.9 per cent of potential nesting habitat and 1.4 per cent of potential foraging habitat present within a 10 km radius. Individuals do occur within the region, and sufficient nesting and foraging habitat is likely to persist.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species habitat	Invasive species are not listed among the key threats to the red goshawk. The Project is also unlikely to result in significant increases in invasive species. As such, the Project will have negligible impact on the red goshawk through any potential or conceivable increase in the density of invasive species.
Introduce disease that may cause the species to decline	Recognised threats to red goshawk do not include diseases. It is however not expected that the Project would result in the introduction of disease.
Interfere substantially with the recovery of the species	Given the relative abundance of suitable habitat remaining within the region, and the lack of impact on current nesting habitat, the Project is not expected to interfere with the recovery of the species.

## 6. Powerful owl

Additional information to the draft EIS submissions addressed in this section include those from:

- CCC – submission #14.4
- DEHP – submission #11.5.

### 6.1 Habitat requirements

The powerful owl is known to occur in a range of habitats boasting large trees including mountain forests and woodlands, coastal forests, woodlands, pine plantations and urban areas. The preferred habitat of the powerful owl includes forests and woodlands with a high abundance of large trees. Mating pairs occupy a large home range (Higgins 1999).

Riparian nesting habitats of the powerful owl are typically located in larger intact remnants of forest associated with small streams and minor drainage lines (DEC 2006). The species typically does not occur within fragmented forest remnants <200 ha (Kavanagh and Stanton 2002). Within the Project area, riparian habitats along the main river channels are generally small and fragmented and therefore do not represent nesting habitat. Areas of more protected dense woodland associated with smaller side tributaries and gullies, particularly those in rocky foothills and headwaters are considered to represent nesting habitat within the region.

A further literature review has been undertaken to define powerful owl habitat requirements as summarised in Table 6-1.

**Table 6-1 Powerful owl habitat requirements summary**

Description	Source
Habitat for this species is widespread, with the species occurring in coastal habitats from 0 to 1500 m above sea level between Eungella in Queensland to Victoria.	Higgins, 1999
Currently, the majority of potential habitat for this species is restricted to conservation reserves and state forests, although the powerful owl also occurs within large areas of forest on other public lands and on private land, including suburban bushland.	DEC NSW 2006
The powerful owl inhabits a range of habitat types including wet sclerophyll forest, dry sclerophyll forest and woodland, inland riverine woodland and rainforest gullies within sclerophyll forest	Higgins, 1999
The species nests in large hollows (1 m wide and 2 m deep) usually in mature living eucalypts in unlogged, unburnt gullies and lower slopes immediately adjacent to streams or minor drainage lines, surrounded by canopy trees and sub-canopy or understorey trees or tall shrubs.	Higgins, 1999
The species typically nests in large hollow-bearing trees in unlogged, unburnt gullies and lower slopes within 100m of streams or minor drainage lines	Schodde and Mason, 1980; Higgins, 1999
The species typically roosts in dense groves of mid-storey vegetation within closed forest, including rainforest, wet sclerophyll forest, mangrove forest, melaleuca, acacias and casuarina in sheltered gullies typically on wide creek flats and at the heads of minor drainage lines, but also adjacent to cliff faces and below dry waterfalls.	Higgins, 1999

Description	Source
The species relies on the presence of mature, hollow-bearing trees for nesting sites and also to provide den sites for the hollow-dwelling arboreal mammals which form the bulk of its prey. Given the reliance on hollow-bearing trees, the species favours mature mid-to-late succession, mixed age or multi-aged forest greater than 60 years old. Nests are typically found in trees greater than 150 years of age and prey items utilise hollows in trees greater than 120 years of age.	Davey, 1993; Milledge et al., 1991; Higgins, 1999
Despite the species reliance on old growth forest, it does appear to be tolerant of some levels of selective logging, with owls persisting in areas that have been exposed to light, moderate and heavy logging. Nesting appears to be restricted to unlogged areas.	Kavanagh and Peake 1993; Kavanagh et al. 1995; Kavanagh and Bamkin 1995; Kavanagh 1997
Optimal habitat includes a tall shrub layer and abundant hollows supporting high densities of arboreal marsupials.	DEC NSW 2006
The powerful owl is generally thought to require large intact forest remnants, >200 ha and avoids small patches and strips of vegetation. For this reason, the species has been inferred to be adversely affected by habitat fragmentation. While the species has been found in small forest remnants, these are typically used for foraging only and are located within 1 km of a more extensive remnant of intact forest.	Kavanagh and Stanton, 2002
The species has demonstrated considerable resilience to low-level habitat disturbance through its continuing and successful occupancy of bushland among the outer suburbs of major Australian cities.	Pavey et al., 1994; Pavey, 1995; Kavanagh, 1997; Webster et al, 1999
Historically, powerful owls have been considered dependent on old growth forests and of being susceptible to habitat modification and human induced disturbance (Fleay 1968). They have been thought to require large home ranges (about 1,000 ha per pair) and need habitat with nest hollows for their own breeding and that of their arboreal marsupial prey (Schodde and Mason 1980). However, habitat and dietary studies on the powerful owl have found that it is more numerous, flexible and tolerant of low level disturbance with a wider habitat, altitudinal and dietary tolerance than formerly believed (Debus and Chafer 1994).	Cooke and Wallis, 2004
Powerful owls are known to disperse up to 18 km including across sparsely wooded areas (Higgins 1999; Isaac et al 2008) so population fragmentation is unlikely.	NSW Scientific Committee 2008

## 6.2 Habitat assessment

Mapping of potential foraging and nesting habitat has been undertaken to quantify the magnitude of impact on the powerful owl resulting from the Project. To assess the significance of impact, the area of habitat lost was compared with that occurring within a 10 km radius which is roughly equivalent to the home range of the species.

The 10 km buffer selected represented the most ecologically meaningful spatial scale at which to quantify the significance of impact. The buffer represents the area to which individuals within a local population (if present) can be reliably be expected to access, given the species movement capabilities. This was based on movement information in DEC (2006) which states 'the powerful owl has the ability to disperse over tens of kilometres through a mosaic of forested and cleared land'. Given their capacity for movement, the use of a 10 km buffer is considered more ecologically meaningful than a 1 km buffer.



### 6.2.1 Foraging habitat

Potential foraging habitat for the powerful owl is shown in Figure 6-1. Criteria used to map habitat is detailed below:

- All woodland and open woodland REs within the Project area that are likely to support hollow-bearing trees required by their arboreal mammal prey (REs 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.25, 11.3.26, 11.3.29, 11.3.30, 11.3.38, 11.4.2, 11.4.8, 11.5.2, 11.5.3, 11.5.9, 11.7.1, 11.7.4, 11.8.1, 11.8.4, 11.9.1, 11.9.9, 11.10.1, 11.11.1, 11.11.4, 11.11.7, 11.11.9, 11.11.10, 11.11.15, 11.11.16, 11.12.1, 11.12.2, 11.12.6)
- Areas mapped as watercourse (based on the watercourse cadastre) are excluded.

Loss of potential powerful owl foraging habitat is estimated to be 1,243 ha:

- Eden Bann Weir Stage 3 impoundment: 454 ha
- Rookwood Weir Stage 2 impoundment: 790 ha.

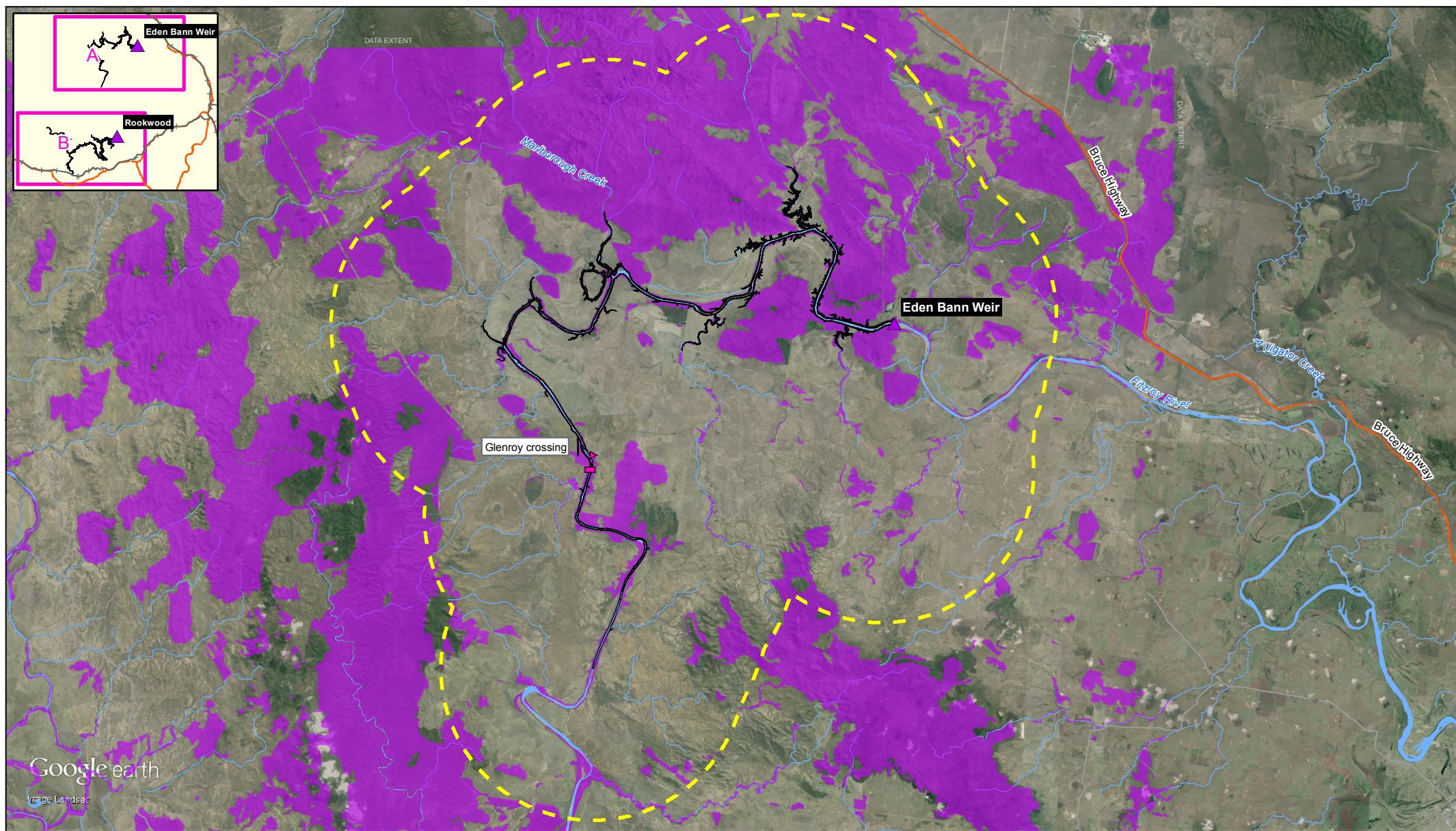
This represents 1.4 per cent of the potentially available foraging habitat available within a 10 km radius (89,995 ha).

### 6.2.2 Nesting habitat

Potential nesting habitat for the powerful owl is shown in Figure 6-2. Nesting habitat overlaps with foraging habitat and criteria used to define powerful owl nesting habitat is as follows:

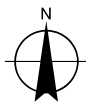
- All woodland, open woodland and vine thicket REs - REs 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.11, 11.3.25, 11.3.26, 11.3.29, 11.3.30, 11.3.38, 11.4.1, 11.4.2, 11.4.8, 11.5.2, 11.5.3, 11.5.9, 11.7.1, 11.7.4, 11.8.1, 11.8.4, 11.9.1, 11.9.4, 11.9.9, 11.10.1, 11.11.1, 11.11.4, 11.11.5, 11.11.7, 11.11.9, 11.11.10, 11.11.15, 11.11.16, 11.11.18, 11.11.21, 11.12.1, 11.12.2, 11.12.4, 11.12.6
- Woodland, open woodland and vine thicket within 100 m of all mapped first to eighth order streams
  - Powerful owl nests are typically located within close proximity to minor tributaries (Higgins 1999). Consistent with the New South Wales Recovery Plan for Large Forest Owls (DEC 2006) an extent of 100 m has been adopted. Previous assessment assumed a 40 m distance based on Isaac et al (2007)
  - Stream orders 1 to 8 are considered appropriate to be classified as minor stream consistent with habitat descriptions provided by DEC (2006). The Fitzroy River (as stream order 9) is excluded. The Fitzroy River is a major and relatively permanent watercourse
  - In calculating nesting habitat, a relatively conservative approach has been taken by buffering streams (stream order 1 – 8), including some of the larger stream orders (i.e. stream order 6, 7 and 8). These are likely to be larger than the 'streams and small drainage lines' described in the species habitat preferences (DEC, 2006). The suggestion that the best available habitat will be along the major waterway is contrary to existing literature on the species nesting preferences as specified in DEC (2006).
  - The calculation includes vine thicket RE communities which are likely to be more valuable for roosting than nesting
- Areas mapped as watercourse (based on the watercourse cadastre) are excluded.














Paper Size A4  
0 1 2 4 6 8  
Kilometres

Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 55



#### LEGEND

-  Weir Location
-  River Crossing
-  Railway
-  Highway
-  Major Road
-  Eden Bann Weir Impoundment (Stage 3)
-  10km Buffer
-  Powerful owl foraging habitat
-  Waterway



Gladstone Area Water Board, SunWater  
Lower Fitzroy River Infrastructure Project

Job Number | 41\_29212  
Revision | 2  
Date | 09 Aug 2016

Eden Bann Weir - Potential  
powerful owl foraging habitat

Map A  
Figure 6-1

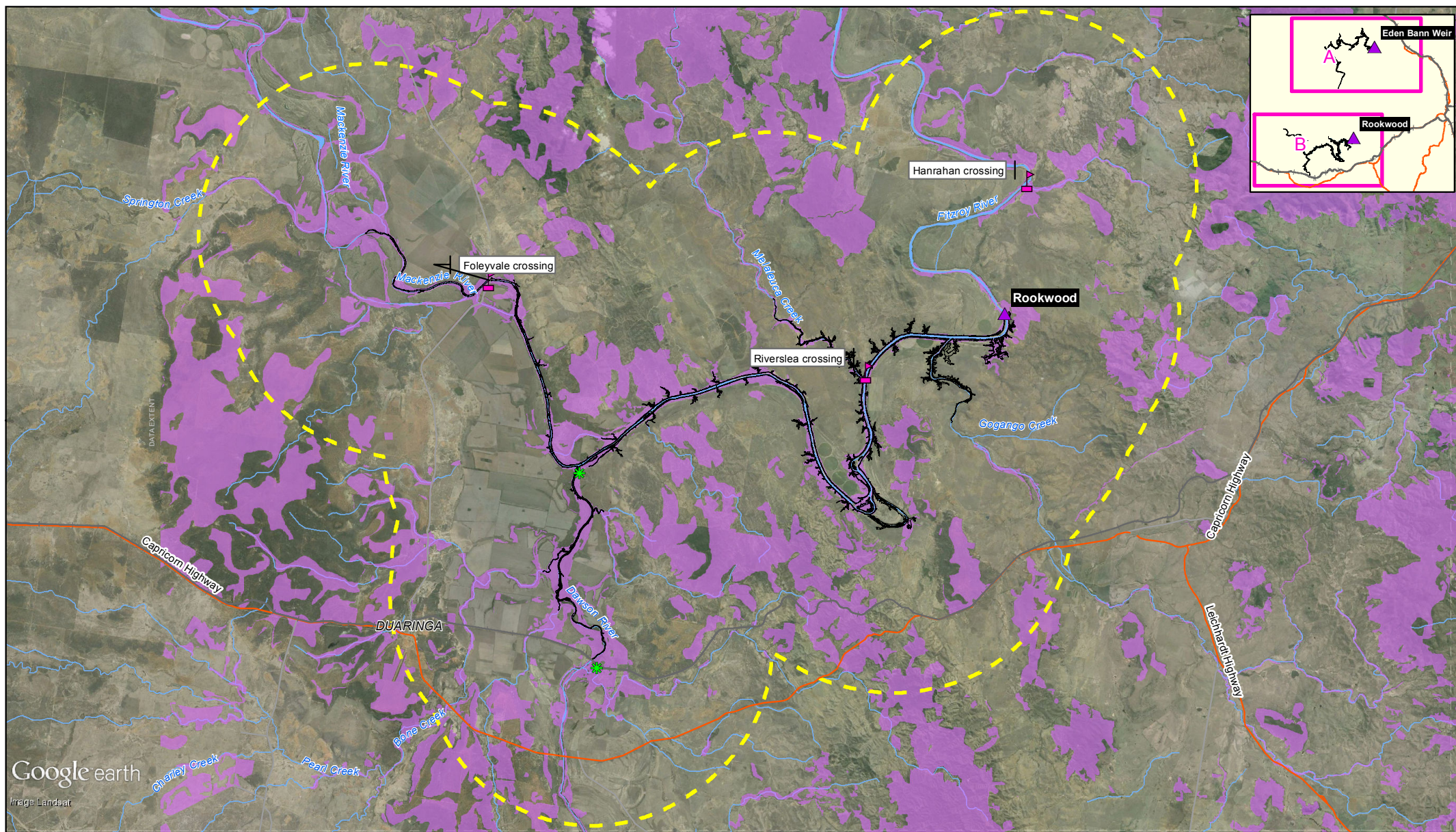
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145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

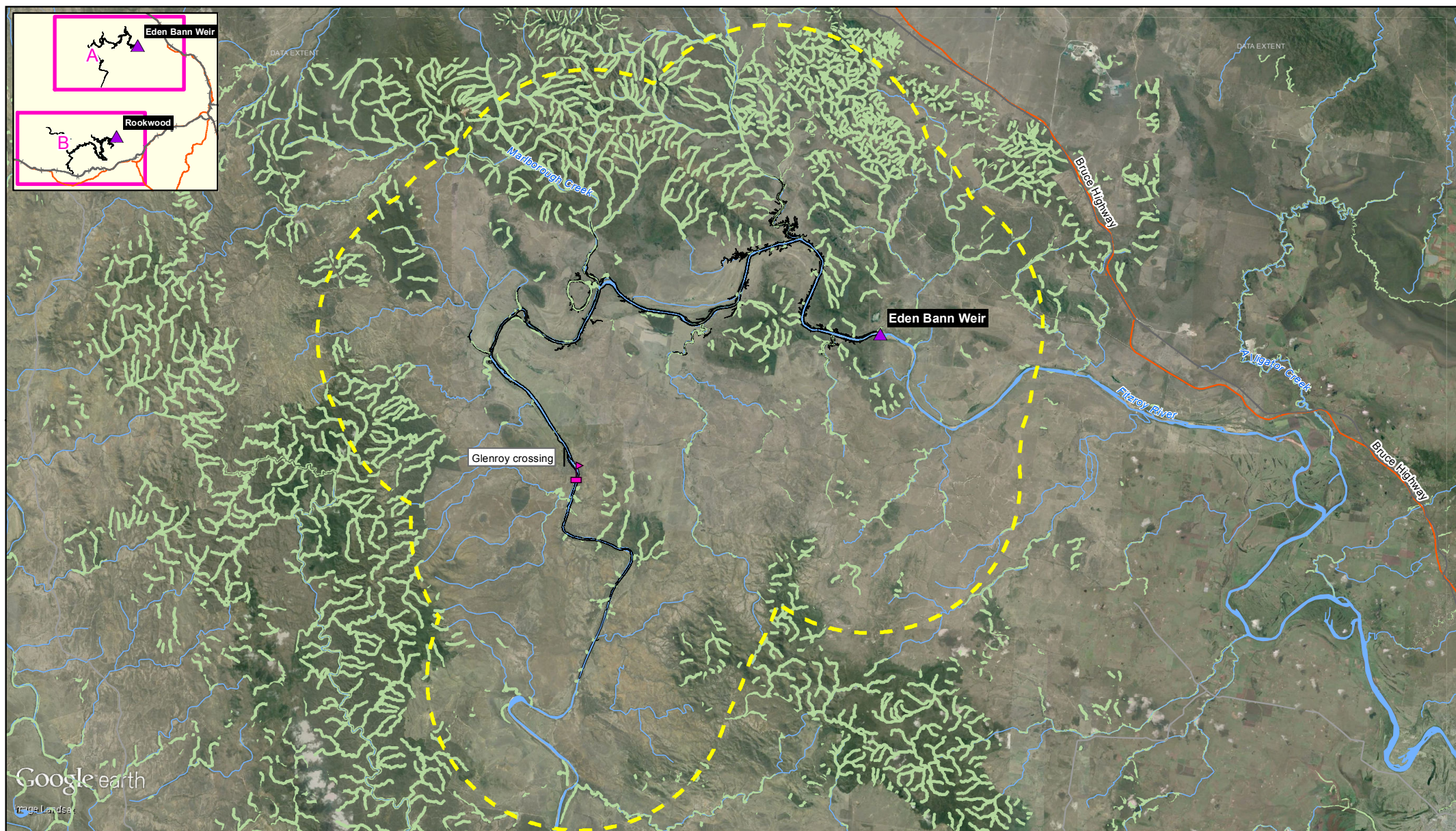
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Data source: WildNet: Powerful Owl/2009; GHD: Weir Location, River Crossing, 10km Buffer/2015, Potential Habitat/2015, Impoundment/2013; Google Earth Pro: Image extracted 14/12/2015. Created by: MS

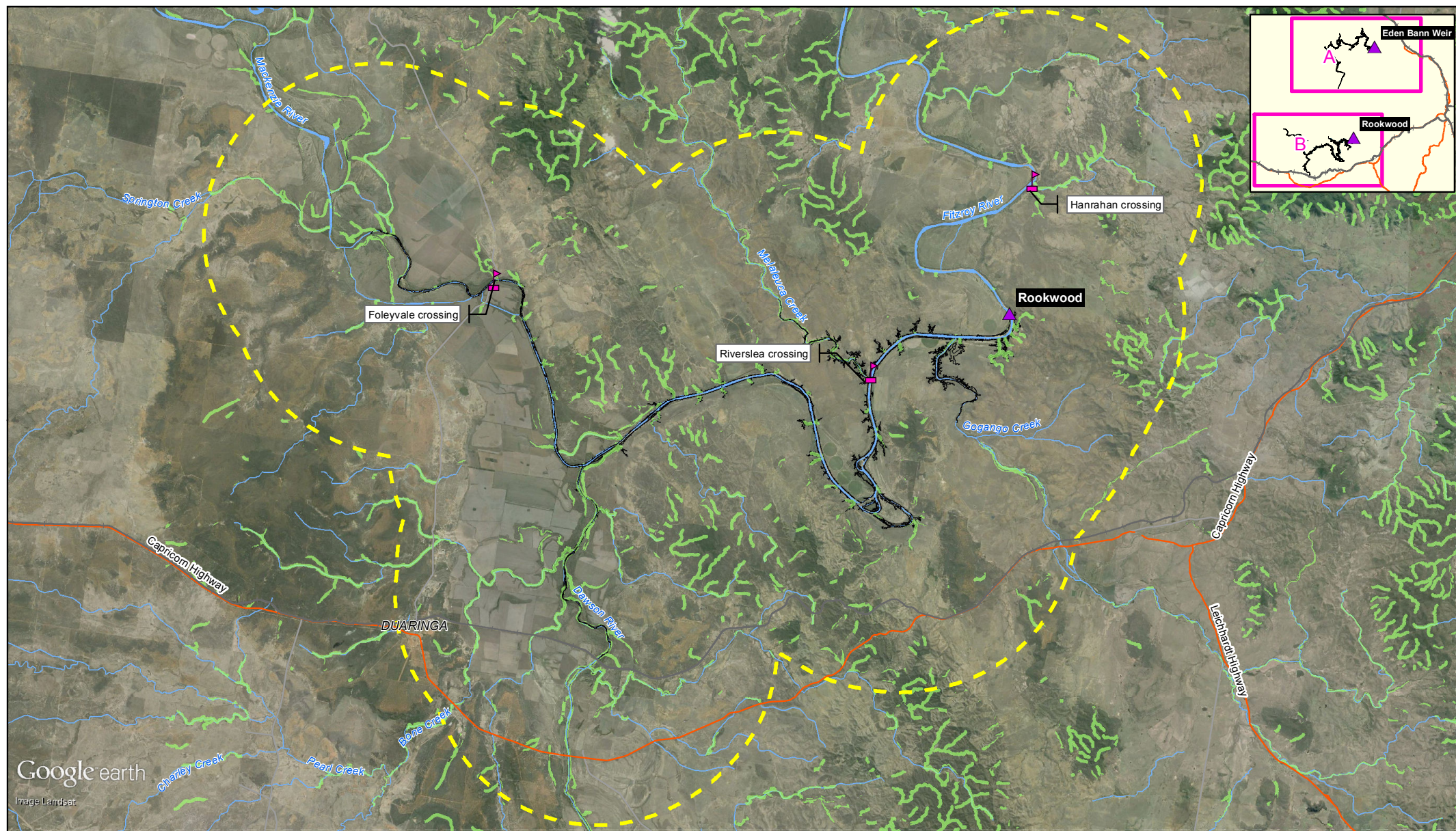














Loss of potential powerful owl nesting habitat is estimated to be 512 ha:

- Eden Bann Weir Stage 3 impoundment: 205 ha
- Rookwood Weir Stage 2 impoundment: 307 ha.

This represents 1.9 per cent of the potential nesting habitat available within a 10 km radius (25,994 ha).

### 6.2.3 Significance assessment

The powerful owl is listed as vulnerable under the NC Act. The Queensland Government SRI Guideline - SP Act (DSDIP 2014) was adopted in the draft EIS for the assessment of the significance of residual impacts on the powerful owl. The SRI Guideline - SP Act (DSDIP 2014) is consistent with the current (December 2014) Queensland Environmental Offsets Policy, Significant Residual Impact Guideline (December 2014) for an activity prescribed in the EO Regulation that requires an approval in relation to a MSES under the NC Act (amongst others).

The assessment has been reviewed with consideration of the literature review and habitat assessment as presented above and is presented in Table 6-2.

It is not considered that the Project is likely to have a significant impact on the powerful owl and offsets are not proposed. Notwithstanding this it is noted in Section 8 that proposed offsets for remnant vegetation would co-locate with habitat requirements for the powerful owl and serve to further reduce potential Project impacts.

**Table 6-2 Significant impact assessment for powerful owl**

Significance criterion	Assessment
An action is likely to have a significant residual impact on habitat for an animal that is endangered or vulnerable wildlife if the action will:	
Lead to a long term decrease in the size of a local population	<p>The Project is not expected to result in a decrease in the size of the local powerful owl population. Powerful owls are not expected to experience a significant reduction in foraging and breeding success due to any increase in competition for resources.</p> <p>The Project is estimated to result in localised loss of 512 ha of potential nesting habitat. This represents 1.9 per cent of the potential nesting habitat available within a 10 km radius. Loss of potential powerful owl foraging habitat is estimated to be 1,243 ha. This represents 1.4 per cent of the potentially available foraging habitat available within a 10 km radius.</p> <p>Given the low density at which powerful owls typically occur, the availability of potential nesting habitat and the relative abundance of potential nesting habitat and foraging habitat that will remain available within their home range, competition for nesting habitat and foraging resources is expected to be low. The species is unlikely to experience a significant increase in competition for resources as a result of the Project.</p>

Significance criterion	Assessment
Reduce the extent of occurrence of the species	<p>Large areas of suitable powerful owl habitat will persist within the local area.</p> <p>The Project is estimated to result in localised loss of 512 ha of potential nesting habitat. This represents 1.9 per cent of the potential nesting habitat available within a 10 km radius. Loss of potential powerful owl foraging habitat is estimated to be 1,243 ha. This represents 1.4 per cent of the potentially available foraging habitat available within a 10 km radius.</p> <p>The project will not disrupt connectivity to the extent that movement between remnant patches will be inhibited. As such, there will be no change in the extent of occurrence of the species.</p>
Fragment an existing population	<p>The Project is not expected to result in the fragmentation of the local powerful owl population. The species is generally not susceptible to population fragmentation, given its large home range and capacity to disperse over relatively cleared landscapes (NSW Scientific Committee 2008).</p> <p>Habitat losses projected for the Project represent only 1.9 per cent of nesting habitat available within a 10 km radius. As such, these represent a relatively localised impact within the context of the species' home range.</p> <p>Given the species' large home range and capacity to disperse over relatively open landscapes, the localised losses of habitat associated with the Project are unlikely to fragment the local powerful owl population.</p> <p>This is supported by:</p> <ul style="list-style-type: none"> <li>Barrett et al. 2007 have shown the powerful owl has displayed little evidence of population fragmentation as a result of habitat clearing, with populations persisting in areas that have been cleared by 16-39 per cent in coastal bioregions, 53-58 per cent for tableland bioregions and 60-84 per cent for bioregions on slopes.</li> <li>Cooke and Wallis (2004): Historically, powerful owls have been considered dependent on old growth forests and of being susceptible to habitat modification and human induced disturbance (Fleay 1968). They have been thought to require large home ranges (about 1,000 ha per pair), and need habitat with nest hollows for their own breeding and that of their arboreal marsupial prey (Schodde and Mason 1980). However, habitat and dietary studies on the powerful owl have found that it is more numerous, flexible and tolerant of low level disturbance with a wider habitat, altitudinal and dietary tolerance than formerly believed (Debus and Chafer 1994).</li> <li>Cooke and Wallis (2004): The powerful owl was once considered to be a specialist in ecological terms because of its apparent restricted habitat and dietary requirements (Fleay 1968; Seebeck 1976), indicating that it is vulnerable to habitat modification and that it has specific conservation needs. However, later studies have contested those earlier findings and have questioned the degree to which the powerful owl is vulnerable to habitat modification and disturbance (Debus and Chafer 1994; Kavanagh and Bamkin 1995; Pavey et al. 1994; Cooke et al. 1997; Cooke et al. 2002).</li> <li>Higgins (1999): The species may require large tracts of forest (Loyn 1985, Kavanagh 1997) but sometimes occur in fragmented landscapes, for example open areas adjoining forest, such as farmland, parkland, or suburban development; remnant patches of forest or woodland surrounded by open habitat; and mosaics of logged and unlogged forest (Hughes and Hughes 1984; Evans 1986; Chafer 1992; Pavey 1994; 1995; Kavanagh and Bamkin, 1995).</li> </ul>

Significance criterion	Assessment
Result in genetically distinct populations forming as a result of habitat isolation	Given the species capacity to fly over cleared areas, the Project is unlikely to disrupt movement of powerful owls such that it would result in the formation of genetically distinct populations.
Result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species habitat	Invasive pest species such as foxes, cats and dogs represent a potential threat to powerful owl fledglings (McNabb 1987; Gibbons 1989). The Project area already supports foxes, cats and dogs. The implementation of the Weed and Pest Management Plan will help in limiting the impact that these species have on the local powerful owl population.
Introduce disease that may cause the population to decline	Recognised threats to powerful owl do not include diseases. It is however not expected that the Project would result in the introduction of disease.
Interfere with the recovery of the species	Given the relative abundance of suitable habitat remaining within the region, the Project is not expected to interfere with the recovery of the species.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	Habitats within the Project footprint will be important for foraging and breeding, however, they are part of a broader area of habitat within the floodplain that will be utilised by the species.



## 7. Fitzroy River turtle and white-throated snapping turtle

Additional information to the draft EIS submissions addressed in this section include those from:

- DE – submissions #10.3, #10.4, #10.5 and #10.6
- DEHP – submission #11.3.

### 7.1 Offset proposal

The Project has made commitments with regard to the implementation timeframe of the nest offset management plan for the Fitzroy River turtle and white-throated snapping turtle in Appendix G (section 2.2.2, Table 2-3) of the additional information to the draft EIS. The timeframes committed are as follows:

- The Fitzroy River turtle and white-throated snapping turtle populations in the vicinity of the monitoring areas will be monitored annually for a period of five years from the implementation of the offset management plan.
- The success of the offset management plan will be evaluated annually with regard to the suitability of the management actions and assess the requirement for adaptive management in light of new information and developments in technology
- At the end of the five-year period the success of the offset management plan together with the realised impact of the Project on nests will be evaluated and ongoing implementation requirements determined in consultation with DEHP and DE.

The proponents consider it appropriate that when it can be shown that the nesting banks within the inundation zones have re-established and that the Fitzroy River turtle population has recovered and has viable recruitment into the population, the program will re-assessed for relevance under the adaptive management approach. It is therefore reasonable to assign an evaluation period, nominated at five years from when the nest offset management plan commences its implementation. In consultation with DEHP and DE the offset management plan may be extended in its current form or amended to account for learnings and actions providing better environmental outcomes for the species.

The offset management plan will be finalised in accordance with anticipated conditional approval requirements (Section 8) and relevant to each Project development stage. Commitments made in the Fitzroy River turtle and white-throated snapping turtle species management program (SMP) (Appendix E, additional information to the draft EIS) include surveys to verify populations within Project areas, and the development of environmental management plans to address (amongst others) feral animals. In addition, implementation of the turtle movement study (as committed in the SMP) will further inform the finalisation of the staged nest offset management plan. Land access and funding requirements will be confirmed within future plans.

Potential constraints to land access are noted. Nest protection areas are largely outside of private landholders, being on the river banks. Access via the river and public places (bridge crossings) is feasible for the majority of potential nest protection sites. Alternatively, there are known publicly accessible aggregated nesting areas that can be utilised, for example Alligator

Creek area where nest protection programs are being undertaken but are limited in extent and subject to ad hoc funding.

No further updates are proposed at this time.

## **7.2 Turtle movement and monitoring**

### **7.2.1 Aims and objectives**

Sufficient baseline data exists to inform the development of the turtle movement study as presented in the draft EIS (Volume 3, Appendix L Fitzroy River turtle (*Rheodytes leukops*) technical report) and additional information to the draft EIS (Appendix E Fitzroy River turtle and white-throated snapping turtle species management program). The baseline data presented is a collective of surveys and investigations done within the catchment by others and within the Project areas by others and the proponents.

The turtle movement study objective is to further inform knowledge about the movement habits of the Fitzroy River turtle and white-throated snapping turtle. The turtle movement study aims to inform movement habits not only in river and in the vicinity of the weir site but also across the floodplain. Actions in the SMP together with the turtle movement study will be used to establish (in consultation with DEHP and DE) evaluation criteria for the turtle monitoring program.

During weir operations the turtle monitoring program will be implemented. The turtle monitoring program's objectives are to monitor and evaluate the use of the turtle passage and the movements of Fitzroy River turtle and white-throated snapping turtle at the weir itself (separately to the turtle movement study). The turtle monitoring study will be undertaken for at least five years.

The monitoring program will be reviewed after five years and ongoing monitoring and management requirements identified for incorporation into weir operational plans as considered necessary and applicable. In consultation with DEHP and DE the offset management plan may be extended in its current form or amended to account for learnings and actions providing better environmental outcomes for the species.

### **7.2.2 Scope of works**

Recent commitments made by the Commonwealth Government with regard to advancing its Northern Australia agenda and promoting the regional economy, and in particular the provision of investment funding for water infrastructure under the National Water Infrastructure Development Fund, may enable the Project to realise a commencement trigger earlier than previously expected.

Consideration of this is required with regard to implementation of the turtle movement study. An expanded program may be required to account for a reduced pre-construction period and to accommodate the study in non-disturbed locations over a longer period overall. That is more locations targeted for sampling (including within and upstream and downstream of the direct Project areas) and an increased number of Fitzroy River turtle and white-throated snapping turtles targeted for tracking.

Together with the ability to readily adapt turtle passage infrastructure at the weir site (during design and into operations), implementation of the turtle movement study concurrently with construction in undisturbed areas is considered feasible. Implementing the turtle movement study concurrently with construction would still achieve the objective of informing the knowledge

of turtle movement habits, in particular to inform the knowledge of turtle movement across the floodplain and outside of the main river channels.

It is considered that minimum implementation requirements can be included as conditions of approval and that further engagement with DEHP be undertaken in this regard.

### 7.3 Water resources and weir operations

The ability (or not) to manage the impoundments in response to Fitzroy River turtle and white-throated snapping turtle nesting requirements has been discussed previously with OCG and DEHP and reported in the additional information to the draft EIS (Chapter 5, section 5.3).

DEHP acknowledge that it is unlikely that the Project can feasibly manage water levels to avoid or minimise impacts on nesting habitat.

Releases from Fairbairn Dam to the proposed Rookwood Weir are not feasible. Water supplied from Fairbairn Dam is fully allocated. Further Rookwood Weir is proposed at adopted middle thread distance (AMTD) 265.3 km and Fairburn Dam is at AMTD 685.6 km. Transmission losses incurred would make the releases unviable.

Notwithstanding DNRM's requirements under the *Water Act 2000* with regard to the taking of water, the proponents commit to the following in regard to operational regimes as proposed by DEHP:

- For downstream flows - subject to compliance with the Water Resource (Fitzroy Basin) Plan 1999 (Fitzroy WRP) and Fitzroy Basin Resource Operations Plan (Fitzroy ROP), water release volumes and timing will consider minimisation of inundation of turtle nests downstream of the weir during nesting season
- For impoundment water level - subject to compliance with the Fitzroy WRP and Fitzroy ROP, weir storage levels will endeavour to be maintained as high as possible immediately prior to and during turtle nesting seasons to minimise the inundation of turtle nests within impoundments
- For management of pool-riffle-run habitat - subject to compliance with the Fitzroy WRP and Fitzroy ROP, the proponent will endeavour to protect and enhance natural pool-riffle-run habitat remaining between impoundments.

## 8. Environmental management and offsets

Additional information to the draft EIS submissions addressed in this section include those from:

- CCC – submission #14.4
- DEHP – submissions #10.1, #11.4, #11.5, #11.7, #11.11 and #11.12
- DNRM – submissions #16.1, #16.2 and #16.3.

Environmental management actions and offsets are proposed in the draft EIS (Volume 1, Chapter 22 Offsets and Chapter 23 Environmental management plan; and Volume 2, Chapter 13 Environmental management system and Chapter 14 Offsets) and revised in the additional information to the draft EIS (Appendix D Revised Project commitments and Appendix F Revised environmental management plan).

Offset commitments have been made with regard to the following matters:

- Matters of national environmental significance (MNES)
  - Brigalow (*Acacia harpophylla* dominant and co-dominant) (Brigalow) threatened ecological community (TEC) – up to 20 ha
  - Black ironbox – up to 100 individual trees
  - Fitzroy River turtle (and white-throated snapping turtle) nesting habitat and aquatic habitat – known and high potential nesting habitat and 942 ha of aquatic habitat.
- Matters of State environmental significance (MSES)
  - Protected wildlife habitat (protected animals) – Fitzroy River turtle and white-throated snapping turtle (nesting habitat and aquatic habitat) – as per Commonwealth offsets proposal.

Despite the assessment of impacts and conclusions presented in the draft EIS and additional information to the draft EIS, including the applicability of the *Environmental Offset Act 2014* (EO Act), the potential for significant residual impacts on the following matters have been identified by Commonwealth and State advisory agencies:

- MNES
  - Red goshawk nesting habitat – the assessment presented in the draft EIS, the additional information to the draft EIS and Section 5.3.1 conclude no significant residual impact.
- MSES
  - Regulated vegetation – exemptions apply under Schedule 24 of the SP Act for land with community infrastructure designation which the Project will seek
  - Protected wildlife habitat (protected animals): powerful owl nesting habitat – the assessment presented in the draft EIS, the additional information to the draft EIS and Section 6.2.3 above conclude no significant residual impact
  - Connectivity – under the provisions of the EO Act the absence of a prescribed activity in relation to the matter is noted.

Notwithstanding the above, the proponents recognise that the Coordinator-General may impose and/or make recommendations with regard to mitigation, management and offsets in relation to MSES as follows:

- MNES: red goshawk nesting habitat – up to 972 ha of potentially suitable nesting habitat
- MSES: Regulated vegetation – up to 26 ha of endangered RE and up to 240 ha of concern RE
- MSES: Protected wildlife habitat (protected animals): powerful owl nesting habitat – up to 512 ha potentially suitable nesting habitat
- MSES: Connectivity – up to 1,947 ha of remnant vegetation (endangered, of concern and least concern REs).

In the event that the Coordinator-General uses his discretionary powers under the SDPWO Act offsets will be required to compensate for MSES to the extent that the significant residual impacts are not compensated through offsets required by the Commonwealth. With regard to the Project it is considered that offsets proposed (and imposed or recommended) under the EPBC Act will contribute to State offset requirements.

It is considered feasible that environmental management and/or offset commitments, as well as actions benefiting Reef 2050 Plan targets, can be considered as part of the Project's overall offsets framework. Further it is probable that offsets for regulated vegetation, red goshawk and powerful owl nesting habitat (protected wildlife habitat) and connectivity, along with actions to benefit the Reef 2050 Plan (water quality and riparian vegetation), can be co-located.

It is considered that the Project offsets framework will be developed in consultation with State advisory agencies as part of the conditions set for the Project as follows:

- The proponent must prepare and submit an offset plan to the Coordinator General for approval of each (weir) development stage prior to impacting on the environmental values as a result of weir operations
- The proposed offset plan must include, but is not necessarily limited to:
  - An evaluation of significant residual impacts to the environmental values listed above
  - An offset to compensate for the significant residual impacts identified, to the extent that the significant residual impacts identified are not compensated through offsets required by the Australian Government. It is considered that offsets proposed under the EPBC Act will contribute to offsets under the State
  - A detailed description of the land to which the plan relates, the values affected and the extent and likely timing of impact on each environmental value
  - Evidence demonstrating the values to be impacted can be offset
  - The offset delivery mechanism(s) comprising one or more of: land-based offsets; direct benefit management plans; offset transfers and/or offset payments
  - A legally binding mechanism that ensures protection and management of the offset areas
  - A management strategy for each offset site that ensures appropriate management and rehabilitation measures are undertaken to compensate for the significant residual impact



Project commitments with regard to potential significant residual impacts on MNES may include:

- The approval holder must prepare proposed offset plan(s) to address, in accordance with the EPBC Act Environmental Offsets Policy 2012, significant residual impacts to the following as relevant to the development stage of the Project:
  - Brigalow TEC– up to 20 ha
  - *Eucalyptus raveretiana* (black ironbox) – 100 plants
  - Fitzroy River turtle – known and high potential nesting habitat areas and 942.2 ha foraging habitat.
- The offset plan(s) must be in keeping with the offset strategies proposed in the draft EIS (June 2015), Volume 2 Chapter 14 Offsets and the additional information to the draft EIS (May 2016) and developed per weir development stage, unless otherwise directed by the Minister
- Each offset plan must include:
  - A detailed description of the land and/or waters to which the offset plan relates, the values affected and the extent and likely timing of impact on MNES
  - Detailed descriptions of how significant residual impacts for the affected MNES will be offset in accordance with the EPBC Act Environmental Offsets Policy 2012
  - A management strategy for each offset site that ensures appropriate management and rehabilitation measures are undertaken to compensate for the significant residual impact.
- The approval holder must implement the offset plan(s), including purchase, obtain and secure tenure for the offsets proposed as directed by the Minister, noting the following:
  - This commitment seeks to recognise the different approach required to facilitate the offset proposal for the Fitzroy River turtle and white-throated snapping turtle as proposed in the EIS
  - The Fitzroy River turtle and white-throated snapping turtle offset proposal includes a combination of land-based activities (nesting habitat) and the provision of a financial contribution (foraging (aquatic) habitat)
  - The land-based proposal targets a key threatening process - namely the protected matter attribute 'birth rate', described as the loss of nests from predation to promote breeding success and recruitment of juveniles to the species. Nests are located on the riverbank within which tenure cannot be secured
  - The offset plan for the Fitzroy River turtle and white-throated snapping turtle will reflect timeframes as proposed in the EIS and as such can be directed by the Minister.
- The approval holder must implement the management strategy(ies) as proposed in the proposed offset plan approved by the Minister. The approval holder must submit a report to the Minister every two years, until notified otherwise by the Minister in writing, for the life of the approval on the anniversary of commencement of the project (taken to be practical completion) describing implementation of each management strategy and progress towards achieving the outcomes as defined in the draft EIS (June 2015), Volume 2 Chapter 14 Offsets and the additional information to the draft EIS (May 2016).

## 9. Consultation

Proponents have actively engaged with a diverse range of stakeholders with regard to the Project including Commonwealth and State governments, local government, community, environmental and business groups, the public in general and directly impacted landholders.

As per the additional information to the draft EIS, the proponents remain committed to engagement with stakeholders in order to manage and monitor the potential impacts and opportunities of the Project. Stakeholder consultation has and will continue following the completion of the EIS and into the Project development phase. The proponents will work with stakeholders to identify suitable communication methods and engagement processes.

To enable this, the proponents have committed to the development of a Stakeholder Engagement Plan(s):

- A Stakeholder Engagement Plan will be prepared that focuses on building the relationships established during the EIS consultation and maintaining the lines of communication
- The proponents will prepare a Stakeholder Engagement Plan(s) for each Project phase which will by necessity become more detailed in nature as a decision is made with regard to the development site and development level and the impact area is confirmed
- Stakeholder Engagement Plans will be provided to the Coordinator-General and made publicly available as follows:
  - Post-EIS approval and prior to construction – this initial plan will be prepared within three months of final (Commonwealth) EIS approval and will keep stakeholders informed of the Project's status during the 'holding period' and until such time as a Project trigger is realised
  - Construction Phase – a Stakeholder Engagement Plan will be prepared by the proponents one month prior to construction commencement
  - Operations phase – a Stakeholder Engagement Plan will be prepared one month prior to operations.
- The Stakeholder Engagement Plan(s) may include, but not be limited to, the following:
  - Project contacts (Project website, Project 1800 telephone number and Project email address)
  - Project communications (Project website and Project newsletter and/or updates)
  - Project schedules and programs, including notifications processes
  - Grievance mechanisms, complaints reporting and monitoring protocols
  - A Near Neighbour Program to specifically provide for a regular system of contact with directly impacted landholders to monitor any changes on their properties; to provide accurate and timely information; to identify decisions which need the participation of both the Project and landholders; define a process for dispute resolution between the Project and landholders.

The proponents have and will continue to have consideration of the following issues in the development of Stakeholder Engagement Plans, Land Access Strategies and Land Acquisition Strategies, as necessary and applicable:

- Loss of land and associated changes
- Access to land whether reduced, removed or changed
- Land Use and impacts on productivity
- Overall compensation issues as a result of change or loss
- Inundation and Flooding issues
- Reinstatement rehabilitation if required
- Impacts on agriculture infrastructure – pumps and fencing
- Traffic Management plans and arrangements – including updates and changes
- Outcomes of monitoring process/ results were they impact landholders.

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# LOWER FITZROY RIVER

## INFRASTRUCTURE PROJECT

## Appendix A

Additional information to the draft EIS  
submission analysis register



Lower Fitzroy River Infrastructure Project Additional Information to the draft EIS (AEIS) AEIS Submissions Analysis Register									
Sub. No.	Submitter	Issue No.	Issue - Details **	Submitter Recommendations / Suggested Mitigation	Proposed Action / Direction to Proponent	Proponent response 06/08/2016 Addendum Rev 0	Relevant Addendum to the AEIS chapter and section	Relevant draft EIS chapter and section	Relevant AEIS report chapter and section
1	Queensland Treasury (Hazardous Industries & Chemicals Branch)	1.1	Please be advised that HICB have no requirements.		Proponent to note.	Noted.	n/a	n/a	n/a
2	Ergon Energy	2.1	It is understood from the EIS that the total power requirement at Eden Bann Weir is approximately 48kW with an average maximum demand of approximately 30kW.  The total power requirement at the proposed Rookwood Weir will be approximately 60kW of total installed with an average maximum demand of approximately 30kW.	At present (in both locations) there is insufficient network capacity, however discussions have occurred between Ergon Energy and the proponents' representatives regarding connection options and costs.  Whilst relevant to the project, these ongoing negotiations are commercial and technical in nature and not considered crucial to the evaluation of this project.  Ergon Energy does not object to the Coordinator-General approving the LFRIP.  The proponents are strongly encouraged to prioritise their electricity connection application to ensure supply can be provided in a timely manner.	Proponent to note.	Noted.	n/a	n/a	n/a
3	Fitzroy Basin Association	3.1	The additional information has not addressed the potential impact of the project on the Fitzroy River Floodplain wetland.	Four other Directory of Important Wetlands are referenced in the response to our submission (refer to Appendix A, p 7, submission reference 011.07), however none of them are the wetland in question.	<b>Proponent to provide response in Addendum.</b>  Proponent to acknowledge that there is a fifth wetland ('Fitzroy River Floodplain wetland') listed on the directory of important wetlands that could be potentially affected by the project.	While not explicitly named, the extent of this wetland area is shown on an environmentally sensitive area figure and an assessment of potential indirect impacts on wetland areas is included in the draft EIS.  The Fitzroy River Floodplain wetland is located downstream of the existing Eden Bann Weir, adjacent to the Fitzroy Barrage impoundment and coincides with GBR wetland protection trigger areas as presented in the draft EIS.  It is not considered that an update is required in the addendum.	n/a	Vol 1, Ch 7, Figure 7-6, s7.2.1.3, s7.3.3.1, pg 7-65 Vol 2, Ch 8, s8.5.2, pg 8-28	n/a
		3.2	No additional information has been provided to our submission on the potential impact of the project on significant species such as koala, ghost bat and platypus (refer to Appendix A, p9, submission reference 011.18).		<b>Proponent to provide response.</b>  The Draft EIS considers that any impacts on foraging habitat for the koala and ghost bat would not constitute a significant residual impact	It is considered that assessment as relevant and appropriate is included within the draft EIS regarding impacts on terrestrial fauna species.	n/a	Vol 1, Ch 8 Vol 2, Ch 10 Vol 3, App N Vol 3, App O	n/a
		3.3	Additional Information Part 2, Ch 8 (Table 8-1, 8-2) and Ch 11 (Table 11-8) provides an assessment of the potential water quality impacts of the project and associated intensification of agricultural development on the Great Barrier Reef. It is widely acknowledged that the health of the Great Barrier Reef is in decline, and that agricultural development is a significant contributor to that decline.  The health of the Reef is reliant on significant <b>improvements</b> to water quality, rather than maintaining the current situation, as outlined in the Reef Plan 2050 and Fitzroy Water Quality Improvement Plan 2015 (WOIP:2015).	While the latest EIS assessment has concluded that negligible impacts will occur on local water quality and the Great Barrier Reef as part of the project, as the proponents, SunWater and Gladstone Area Water Board have a significant opportunity to <b>positively</b> influence the improvement of water quality in the project area and associated agricultural footprint through the provision of funding to protect and enhance the health and extent of riparian areas and wetlands, and implement best management agricultural practices that aim to improve water quality.	<b>Proponent to provide response in Addendum.</b>  OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution.	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	Ch 8, s8.2.1
4	Department of Energy and Water Supply	4.1	DEWS has no comment on the AEIS.		Proponent to note.	Noted.	n/a	n/a	n/a



Lower Fitzroy River Infrastructure Project									
Additional Information to the draft EIS (AEIS)									
AEIS Submissions Analysis Register									
Sub. No.	Submitter	Issue No.	Issue - Details **	Submitter Recommendations / Suggested Mitigation	Proposed Action / Direction to Proponent	Proponent response 06/08/2016 Addendum Rev 0	Relevant Addendum to the AEIS chapter and section	Relevant draft EIS chapter and section	Relevant AEIS report chapter and section
5	Department of State Development	5.1	DSD's Business Solutions and Partnerships section has no comment on the AEIS.		Proponent to note.	Noted.	n/a	n/a	n/a
6	Department of Agriculture and Fisheries	6.1	(Chapter 1 - Figure 2.21, pg 2-37 & figure 2.22, pg 2-38 and Chapter 3, (No Suggestions), pg 3-10) of the Draft EIS Volume 1.  It would seem that State-owned quarry material for this project is proposed to be source, using the figures, as: - Clay from within the road reserve that traverses Lot 3 on PN 106 - - Weathered rock from within Lot 11 on SP114939, which is perpetual lease, held by SunWater.  In both cases, it would seem that a sales permit under the Forestry Act may be required to source quarry material from these locations/lots. Other lots have also been identified that could be used by the project for extractive materials. The Proponent has previously noted in section 3.3.7 of the draft EIS that <i>Forestry Act 1959</i> authorisations may be required.	Proponent to note that for both identified lots, sales permits under the <i>Forestry Act 1959</i> may be required to source quarry material from these locations and that the Proponent is reminded to contact DAF before progressing arrangements to obtain extractive materials from the project area and vicinity.	Proponent to note.	Noted.	n/a	n/a	n/a
		6.2	(Appendix A - p1-3) Fisheries Queensland (FQ) have raised issues in response to the adequacy of the AEIS.	FQ are generally satisfied that the proponent has addressed the issues raised by FQ however two issues raised are not adequate for protection of fish passage. These two issues are: - the provisions of a Financial assurance (suggestions in line item 6.3 below) and - the adequacy of the Offset provision (suggestions in line item 6.4 below).	Proponent to provide response in Addendum.	Refer to line item 6.3 and line item 6.4.	n/a	n/a	n/a
		6.3	(Reference: Appendix A issue 007.04 pg2 and Appendix D, table D4, pg3)  Appendix F page 2 s2.2.2 - Responsibility - Operation; CEO:-  Final responsibility for reporting and addressing corrective actions from incidents and internal and external audits, <b>including the provision of adequate funds to report and undertake corrective actions as identified.</b>  At no other point in the documentation has the proponent referred to a financial assurance for mitigating operational, logistical and biological issues identified during monitoring and operation. As per our issue 007.04 point 3 in Appendix A.	<b>FINANCIAL ASSURANCE</b> The proponent must provide a statement confirming that a financial assurance will be set aside (prior to construction) to ensure any future maintenance or corrective action required to both of the fish passage structures (fishways) for their design life, will occur.  Without this commitment to setting aside a financial assurance, the impacts to these structure will have upon fish passage, if they are not maintained appropriately for their life span, will be significant and will cause a barrier to fish passage for an indeterminate period whilst the proponent seeks funds	Proponent to provide response in Addendum.	A response is provided in the addendum.	Ch 4, s4.1	n/a	App D, Table D-4

Lower Fitzroy River Infrastructure Project										
Additional Information to the draft EIS (AEIS)										
AEIS Submissions Analysis Register										
Sub. No.	Submitter	Issue No.	Issue - Details **	Submitter Recommendations / Suggested Mitigation	Proposed Action / Direction to Proponent	Proponent response 06/08/2016 Addendum Rev 0	Relevant Addendum to the AEIS chapter and section	Relevant draft EIS chapter and section	Relevant AEIS report chapter and section	
		6.4	(Appendix A - issues 007.05, 007.07, 007.08 and Chapter 3, 3.1, pgs 31 to 34).  FQ are dissatisfied with the adequacy of the offset requirement to offset the Significant Residual Impact (SRI) works will have upon fisheries habitat: (adequate mitigation has been discussed for fisheries connectivity/passage)	<b>OFFSET PROVISION</b>  NOTE: FQ is satisfied that, should the proposed fish passage structures provide for adequate fish passage, then those works will effectively be mitigated against the SRI for fish passage.  We are dissatisfied however, that the proponent has mitigated the SRI the works will have upon fisheries habitat. The proponent has identified that the works are likely to have a SRI as they will result in the permanent modification or fragmentation of fish habitat including but not limited to instream vegetation, snags and woody debris, substrate, bank or riffle formation necessary for breeding and/or survival of native fish species.  The SRI caused by the permanent modification of fish habitat upstream of the weirs (i.e. new inundation areas) has not been considered as being avoided, mitigated or offset. As the works are for the purposes of impounding waters, these impacts need to be offset as per the SRI guidelines and Environmental Offsets Act 2014.  We do not consider the provision of fish passage to be adequate mitigation for the new inundation area and modification of habitat as, the fish passage structures are the mitigation for the construction of the barrier (and not the permanent modification of habitat) The proponent must provide an offset for the new inundation areas that will appropriately modify fisheries habitat.	<b>Proponent to provide response in Addendum.</b>	A response is provided in the addendum.	Ch 4, s4.2	Vol 1, Ch 7, s7.3.3.4	Ch 3, s3.1.2, Table 3-1, pg 36	
		6.5	(S4.2 pg43) in reference to Appendix A - EIS submission analysis register - 007.12 (DAF) <b>Agriculture</b> DAF is generally satisfied with the proponent's response to issues raised from the EIS regarding: - the unmitigated loss of availability and utility of loss of agricultural (Class A&B) within the impoundment area; - fragmentation of Class A&B land due to construction of the road; - the expansion of the Fitzroy Agricultural Corridor through ongoing water availability for agriculture as a priority.	As a consequence of DAF's continued discussions and information sharing with the proponent as part of the Growing Central Queensland project, it is acknowledged that the value of producers of road and river crossing upgrades and the water supply opportunities resulting from the project will sufficiently mitigate the potential loss of 102 hectares of agricultural land.	<b>Proponent to note.</b>	Noted.	n/a	n/a	n/a	
		6.5A	Forestry (S4.2 3 pg 53-54) it is noted that "DNPSR submission (020.02, 202.02) relate to inundation impacts on the Aricia State Forest and the need for further consultation with DNPSR and DNRM in this regard". - DAF has an interest in the timber and other forest products owned by the State under the authority of the Forestry Act 1959, relating to these inundation impacts on Aricia State Forest.	The Proponent is requested to contact DAF (Forestry business unit) when consulting with agencies about inundation impacts.	<b>Proponent to note.</b>	Noted.	n/a	n/a	n/a	
		6.6	In Appendix F Revised draft EMP Section 4) (SQ., pg 26, 5th dot point) The draft plan states: "As per agreement with DAF harvesting of forestry timber products as appropriate and necessary in accordance with the requirements of the Forestry Act 1959 (Qld) will be undertaken where such activities would not cause adverse environmental impacts".  There is not formal agreement with DAF, which could be implied.	Forestry Qld suggests that the wording be altered to: "DAF will be contacted with regard to the harvesting of forestry timber products as appropriate and necessary in accordance with the requirements of the Forestry Act 1959 (Qld) where such activities would not cause adverse environmental impacts".	<b>Proponent to provide response.</b>  To confirm if amendment was made.	The text was amended as per previous comments on the draft EIS.	n/a	n/a	App F, s4.3 Nature conservation management programme, Implementation strategy, Terrestrial flora	

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		6.7	The proposal will have to meet the requirements within the State Development Assessment Provisions, particularly Module 5.2 which deals with waterway barrier works. The conditional requirements (found opposite) are likely to be recommended for the proposal and they include but are not limited to:	<ul style="list-style-type: none"> <li>- Up and downstream passage must be provided across both the waterway barriers.</li> <li>- The fish passage provided must cater for the whole fish community taking into account species, size classes, life stages and swimming abilities as well as the seasonal and flow related biomass of the fish community</li> <li>- The waterway barrier(s) and any associated infrastructure including, but not limited to intakes, walls, access structures, pipeworks, spillways and dissipation devices are to be designed, constructed and maintained to avoid fish injury, mortality and/or entrapment.</li> <li>- a person or entity that is suitably qualified and experienced in fish passage biology and fish passage design and construction, must supervise the construction of the approved works. The person or entity who supervised the approved works must prepare and submit a report detailing how supervision was provided and the extent to which the 'as constructed' fish way(s) complied with the approved fish way/s design and the level to which the 'as constructed' fish way/s is/are expected to provide the fish passage claimed in the development application</li> </ul>	Proponent to provide response.	Noted. It is not considered that further responses are required at this time. An assessment against the SDAP Module 5.2 was included in the draft EIS. Module 5.2 is a requirement of the WWBW development approval that the project will need to obtain.	n/a	Vol 3, Appendix X, App A	n/a
7	Department of Health (Queensland Ambulance Services)	7.1	Please be advised that QAS is satisfied with the additional information included in the AEIS Appendix A (004.01) - Hazards and Risk category.		Proponent to note.	Noted.	n/a	n/a	n/a
8	Department of Infrastructure, Local Government and Planning	8.1	DILGP's Planning Group has provided a NIL response.		Proponent to note.	Noted.	n/a	n/a	n/a
		8.2	DILGP's Policy and Legislation section has provided a NIL response.		Proponent to note.	Noted.	n/a	n/a	n/a
9	Great Barrier Reef Marine Park Authority	9.1	<p>The AEIS has concluded that there will be an increase in nitrogen input into the Great Barrier Reef as a result of facilitated impacts. The AEIS concludes that, as the Fitzroy Region is not a priority area for nitrogen reduction, further assessment of the impact of the increased nitrogen against the Reef 2050 targets is not required.</p> <p>Brodie et al (2013) Assessment of the relative risk of degraded water quality to ecosystems of the Great Barrier Reef - which informed the Reef 2050 Long-term Sustainability Plan and prioritisation of regions - stated there was a high risk to the Great Barrier Reef from nitrogen release in the Fitzroy Region. However, insufficient knowledge of the sources of nitrogen in the Fitzroy Region limited the ability to recommend management priorities.</p> <p>In addition, the Reef Water Quality Plan 2013 - which informs the Reef 2050 Long-term Sustainability Plan - states that water quality improvement, is critical across all regions, not just those listed as priority regions. While reporting against targets will occur for all of the Great Barrier Reef regions, increased focus will be on the priority areas</p>	Therefore, the Great Barrier Reef Marine Park Authority (GBRMPA) requests information is provided on how the proponent will address the increased loads of sediment, nutrients and pesticides to ensure that the Reef 2050 targets are met	<p>Proponent to provide response in Addendum.</p> <p>OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution.</p>	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	Ch 8, s8.2.1

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		9.2	<p>The method for calculating the potential increase in sediment, nutrient and pesticide loads is not comparable to the estimates for the Fitzroy Basin modelled loads. The method employed relies on a proportional export contribution and an estimated volume of river flow past the development area. The GBRMPA requests that the proponent use the same modelling approach (e.g. source catchments, RUSLE, GRASP, HowLeaky) to estimate the potential change in contaminant loads.</p> <p>Indicative proportional increases in contaminant loads based on data provided in the document are as follows:</p> <table><tr><td></td><td>Median</td><td>Mean</td><td>90th percentile</td></tr><tr><td>TSS</td><td>1.8x</td><td>1.2x</td><td>1x</td></tr><tr><td>TN</td><td>5.9x</td><td>5.2x</td><td>7.4x</td></tr><tr><td>TP</td><td>1.6x</td><td>1.4x</td><td>1.6x</td></tr></table> <p>Pesticides ?</p> <p>These calculations do not include any discharges from either groundwater (principle source of contaminants during dry weather flows) and cattle feedlots. Addition of these contaminant sources would give a true estimate of the likely increases in contaminants facilitated by this development.</p>		Median	Mean	90th percentile	TSS	1.8x	1.2x	1x	TN	5.9x	5.2x	7.4x	TP	1.6x	1.4x	1.6x		<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution.</p>	<p>The assessment approach is summarised in the addendum and actions to address Reef Plan 2050 targets are proposed.</p>	Ch 3, s3.1	n/a	Ch 11s, s11.3
	Median	Mean	90th percentile																						
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TN	5.9x	5.2x	7.4x																						
TP	1.6x	1.4x	1.6x																						
		9.3	<p>The Queensland Department of Environment and Heritage Protection's Environmental Emissions profile states that for cattle feedlots with greater than 10,000 cattle, TN discharge loads of up to 10 tonnes per year to water and 100 tonnes per year to land can be expected. These additional loads have not been considered by the proponent and should have been included in this analysis.</p> <p>Batley et al recommended that when comparing modelled loads for TSS, TN and TP that the 90th percentile value be used as it only has an 8% error compared to the measured loads. The use of mean concentrations is therefore not supported when comparing these results to those generated through the source catchments modelling.</p> <p>No calculation of the increase in pesticide loads associated with the facilitated land use changes has been presented and is a significant omission.</p> <p>Assessment of the potential impacts associated with the export of nutrient from feedlots has not been possible given that the cited document was not publicly available at the time of review.</p>		<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution.</p>	<p>The assessment approach is summarised in the addendum and actions to address Reef Plan 2050 targets are proposed.</p> <p>It is not clear as to what cited document is being referred to that was not available at the time of review. The AEIS included the assessment of nutrient export from feedlots, irrigated broad acre and irrigated horticulture land uses.</p>	Ch 3, s3.1	n/a	Ch 11, s11.2																
10	Department of Environment	10.1	<p>The AEIS states that 972 ha of nesting habitat for the red goshawk will be lost due to inundation. Although no goshawks were found during surveys, more intensive surveys would be required to rule out the presence of the red goshawk in the area.</p>	<p>On this basis, the Department considers that an offset is required for loss of red goshawk nesting habitat.</p>	<p><b>Proponent to provide response.</b></p> <p>OCG to work with the proponent, DE, EHP and DNRM to work out offset requirements.</p> <p>OCG to work with the DE in developing a recommended offset condition for the red goshawk for the Commonwealth Minister's consideration.</p> <p>Proponent to clarify data as per requested by email from Maxine Hunter on 27 June 2016.</p>	<p>A response is provided in the addendum.</p>	Ch 5, s5.1 Ch 8	Vol 1, Ch 8 Vol 3, App N Vol 3, App O	Ch 6, s6.1																



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		10.2	<p>The AEIS has concluded that there will be an increase in nitrogen input into the GBR as a result of facilitated impacts. The AEIS concludes that, as the Fitzroy region is not a priority area for nitrogen reduction, further assessment of the impact of the increased nitrogen against the Reef 2050 targets is not required.</p> <p>Brodie et al (2013) Assessment of the relative risk of degraded water quality to ecosystems of the Great Barrier Reef - which informed the Reef 2050 long-term sustainability plan and prioritisation of regions - stated there was a high risk to the GBR from nitrogen release in the Fitzroy region. However, insufficient knowledge of the sources of nitrogen in the Fitzroy region limited the ability to recommend management priorities.</p> <p>In addition, the Reef Water Quality Plan 2013 - which informs the Reef 2050 long-term sustainability plan - states that water quality improvement is critical across all regions, not just those listed as priority regions. While reporting against targets will occur for all of the GBR regions, increased focus will be on the priority areas.</p> <p>While the Department notes that the AEIS concludes a limited contribution (0.05 - 1.7% increase) to end of system nitrogen loads may result from facilitated agricultural development, the plan, supported by state and commonwealth governments, is to reduce the impact of nitrogen and other contributing factors that have a detrimental effect on the Great Barrier Reef.</p>	Therefore, the Department requests information be provided on how the proponent will address the increased nutrients to ensure that the Reef 2050 targets are met.	<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution.</p>	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	n/a
		10.3	The AEIS states that the nesting habitat offset will be funded for 5 years as this is the time in which it is expected that ecological benefit will be achieved. The Department considers it likely that if the offset project ends after 5 years the turtle population will decline again due to the presence of feral animals and cattle.	The Department considers it necessary to increase the duration of the nesting habitat offset program for the Fitzroy River turtle.	<p><b>Proponent to provide response in Addendum.</b></p> <p>OCG to work with the proponent, DE and EHP to work out a more suitable timeframe for nest protection (i.e. for the life of the project).</p> <p>The offset plan should be updated to reflect DE's requirements.</p>	A response is provided in the addendum.	Ch 7, s7.1	n/a	App G (s 2.2.2, Table 2-3)
		10.4	<p>The offset plan states - the birth rate and nesting success of the species will be monitored and reviewed over time. When it can be shown that the nesting banks within the inundation zones have re-established and that the Fitzroy River turtle population has recovered and has viable recruitment into the population, the program will cease.</p> <p>There are a number of risks with the offset program, such as unwillingness of landholders to participate, failure to achieve long-term exclusion of stock and feral animals, the population may decline when the protection of nests ends. The offset plan must include monitoring for the success of the program and include adaptive management strategies for if a viable population of the Fitzroy River turtle is not achieved.</p>	The Department considers it necessary for the offset plan to aim to maintain a viable population of Fitzroy River turtles in the Fitzroy River for the duration of the project. Therefore, the offset plan needs to define what a viable population is and how it will be maintained for the life of the project.	<p><b>Proponent to provide response in Addendum.</b></p> <p>OCG to work with the proponent, DE and EHP to work out a more suitable timeframe for nest protection (i.e. for the life of the project).</p> <p>The offset plan should be updated to reflect DE's requirements.</p>	A response is provided in the addendum.	Ch 7, s7.1	n/a	App E, s6.2, s6.3

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		10.5	<p>The numbering in the footnotes of Table 2-2 appear to be incorrect.</p> <p>The Department considers the Confidence in results of 90% used in the offset calculator does not take into consideration factors such as:</p> <ul style="list-style-type: none"> <li>• will all the landholders allow access to the riverbanks?</li> <li>• will there be long-term funding for the project?</li> <li>• will the population decline immediately once the project ends?</li> </ul> <p>The Department considers it necessary for these risks to be considered when planning how the offset plan will maintain a viable population for the duration of the project.</p>		<p><b>Proponent to provide response in Addendum.</b></p> <p>OCG to consult with DE for clarification regarding confidence score calculation.</p>	A response is provided in the addendum.	Ch 7, s7.1	n/a	App E, s6.2, s6.3
		10.6	<p>Appendix E - SMP - states that a turtle movement study will be implemented on commencement of a project trigger. The Department would expect sufficient baseline data to inform the turtle movement study and does not consider implementation of the movement study on commencement of a project trigger will provide sufficient time to undertake good baseline data surveys?</p> <p>The turtle movement study will continue through the five year turtle monitoring program period (as a minimum) to evaluate the performance of the turtle ramps at each weir. The Department does not consider 5 years a sufficient period of time to gain pre-construction surveys, construction of the weirs (both) and operational surveys.</p> <p>The aim of the turtle movement study is to determine the effectiveness of the turtle-ways at the weirs. The study needs to state what will be done if it determines the turtle-ways are not effective including what adaptive management strategies will be implemented and what will be done if turtle movement is permanently restricted by the weirs.</p>	The Department requires longer-term monitoring of turtle movement that includes baseline data.	<p><b>Proponent to provide response in Addendum.</b></p> <p>Proponent to note DE's issue with the duration of turtle movement studies. EHP has agreed that at least 18 months (at least two wet seasons) is a suitable timeframe to collect baseline information about turtle movement.</p> <p>This would mean at least 18 months of data would need to be collected after commencing the project trigger and prior to construction.</p> <p>EHP has also agreed that the monitoring program would need to continue (to evaluate the performance of the passageways) for a period of 20 years.</p>	A response is provided in the addendum.	Ch 7, s7.2	n/a	App E, s6.3, pg 47 and s6.4, pg 50.
		10.7	<p>Ensure the current version of Threat Abatement Plans are referenced in the species management plan and offset plan.</p> <p>For example; Australian Government Department of the Environment (2015). Threat abatement plan for predation by feral cats. Commonwealth of Australia, Canberra. Available from: <a href="http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats">http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats</a></p>		<p><b>Proponent to provide response.</b></p> <p>Proponent to update the SMP to reflect requirements of the threat abatement plans (TAPs) for the Fitzroy River turtle. The Fitzroy River turtle is listed as a species that may be adversely affected by feral cats in the TAP for the feral cat and a species affected by the European red fox in the TAP for the European red fox.</p>	<p>The SMP already commits to the development of a Feral Animal Control Program in accordance with approved conservation advice and threat abatement plans (feral cats, European red fox and feral pigs).</p> <p>Given that the project has no defined trigger or start date it is considered that the reference to these resources is adequate (regardless of the date) as it is likely that newer versions of these plans will be published over time and will need to be included within the construction and commissioning plans and ongoing operational management plans accordingly.</p>	n/a	n/a	App E, s6.3, pg 43 (construction and commissioning) App E, s6.4, pg 49 (operations)

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11	Department of Environment and Heritage Protection	11.1	<p>In previous submissions EHP recommended that the EIS should demonstrate how the increase in water use in the catchment from facilitated development, particularly for agriculture, will deliver outcomes for water quality and other matters consistent with the objectives of the Reef Water Quality Protection Plan 2013 and the Reef 2050 Long-Term Sustainability Plan.</p> <p>Table 11-7 in the response provides some detail about predicted increases in total suspended solid (TSS), nitrogen (TN) and phosphorus (TP) levels from the current land use to the facilitated development scenario. The figures for the Fitzroy catchment indicate that in an average year there would be a 0.13% increase in N against the monitored load and a 0.46% increase against the modelled load. However, these figures only present average loads, not peak loads.</p> <p>EHP notes that between 2009 and 2014, particulate nitrogen and phosphorus loads were reduced by 3.0% and 6.5 % respectively in the Fitzroy River catchment (<a href="http://www.reefplan.qld.gov.au/measuring-success/report-cards/2014/catchment-loads/">http://www.reefplan.qld.gov.au/measuring-success/report-cards/2014/catchment-loads/</a>). The report cards regarded these reductions as 'very poor' progress towards the target to achieve a 20% load reduction by 2020. Similar small reductions were achieved for sediment and pesticides.</p> <p>Given the relatively poor performance in achieving nutrient load reductions in the Fitzroy catchment, and the loss of riparian vegetation due to the project, the project has the potential to increase TSS, TN and TP in the Fitzroy River, and make whole-of-government Great Barrier Reef water quality targets harder to achieve, unless management practices are put in place to reduce the discharge of pollutants.</p>	Agricultural developments resulting from the increase in water supply from the proposed project should apply best management practice to minimise the impact of increases in total suspended solid, nitrogen, phosphorus, and other pollutant inputs to the Fitzroy River. This will assist in delivering outcomes for water quality and other matters consistent with the objectives of the Reef Water Quality Protection Plan 2013 and the Reef 2050 Long-Term Sustainability Plan.	<p><b>Proponent to provide response in Addendum.</b></p> <p>OCG to work with the proponent and Agencies to come to a resolution. Possible condition requiring the proponent to provide funding towards reef fund program to offset the impacts or develop a strategy to work with clients that would receive water from the weirs for agricultural use in developing strategies to manage sediment and nutrient runoff from their activities</p>	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	Ch 8, s8.2.1
		11.2	The EIS states that the Queensland offsets policy financial settlement calculator has been used to calculate an offset for project impacts on 942.2ha of in stream foraging habitat of the Fitzroy River turtle and the white-throated snapping turtle. The results should be included in the final EIS and conditions of project	EHP recommends that the proposed financial settlement offset for impacts on aquatic habitat of the Fitzroy River turtle and the white-throated snapping turtle must be stated and included as a condition of the project's approval.	<p><b>Proponent to provide response.</b></p> <p>OCG to work with EHP in developing a condition of approval to address this offsets.</p>	<p>Noted.</p> <p>The draft EIS and AEIS commit to the provision of a financial offset for the impact to 942.2 ha of in-stream aquatic habitat and commit to using the State's financial offsets methodology.</p> <p>It is expected that this will be a condition of approval or that the EIS will be approved and thus commitments in the EIS are binding.</p> <p>The offset is proposed to be staged (as the impact is realised across the development stages) however and conditions will need to reflect this.</p> <p>It is noted that the loss of in-stream aquatic habitat and the proposed offset applies to all aquatic species combined.</p>	n/a	Vol 1, Ch 22, s22.3.3 Vol 2, Ch 14, s14.2.3	App G, Ch 2, s2.3

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		11.3	<p>In previous submissions, EHP recommended that water levels in impoundments, and the timing and rates of downstream releases of water, should be managed to minimise flooding of turtle nests during nesting periods, while also achieving water supply and environmental flow objectives defined by the Fitzroy Basin Water Resource Plan (WRP). This would require a catchment approach to managing storage levels.</p> <p>The conclusion in section 5.3 states that the project cannot feasibly manage water levels to a nominated level in order to effectively avoid or minimise impacts on existing turtle nesting habitat in impoundments.</p> <p>However, information presented in that section suggests that water levels can be managed by releases from upstream impoundments, although EHP acknowledges that this would not be possible every year. For instance, the water level in Eden Bann is high at the start of the turtle nesting season in most years (Fig 5-1 and 5-2). The text states there is potential to keep it high with releases from Rookwood. Presumably the same may be true for releases from Fairbairn Dam to manage levels in Rookwood when it is completed.</p> <p>The project will affect the recovery of the species because habitat will be permanently lost as a result of flooding. Management of water levels and flows will help to mitigate the impacts. As these endangered species are not ecological assets in the WRP, and there are no specific rules in the ROP for their management, the commitments to mitigation in the EIS EMP should be conditions of project approval.</p>	EHP recommends that the proponent's commitments to water level and water release management in the EIS draft Environmental Management Plan should be included as conditions of the project's approval. Suggestions for conditions are provided in the attachment to these comments.	<p><b>Proponent to provide response in Addendum.</b></p> <p>- confirm whether releases from Fairbairn Dam (as suggested by EHP) can be controlled to regulate water levels in Rookwood. If not, explain why.</p> <p>- confirm whether releases from Rookwood Weir to control water levels in Eden Bann weir could be done some of the time. If so the proponent should make a commitment to control water levels in Eden Bann weir, where it is possible to do so.</p>	A response is provided in the addendum.	Ch 7, s7.3	n/a	Ch 5, s5.3 Ch 7, s7.2.2	
		11.4	<p>In previous comments, EHP provided the following interpretation of EIS data and ecological characteristics of the red goshawk that are relevant to assessment of impacts and offsets. However, the proponent's response did not refer to, or take account of, EHP's interpretation.</p> <p>Impacts on red goshawk</p> <p>Using the information provided in the EIS EHP analysed potential project impacts on red goshawk nesting habitat within a more ecologically meaningful buffer around the project site. A buffer of 1km was selected because literature on the red goshawk indicates that in inland areas preferred nesting habitat is larger trees close to major waterways. The use of a 1km buffer 'dilutes' the estimate of the impacts by making the loss of relevant vegetation appear to be a smaller proportion of the available habitat.</p> <p>A total area of about 4000ha of habitat occurs within a 1km buffer for the entire project area. Using the full supply level mapping provided in the EIS, EHP estimates that the area of nesting habitat that will be inundated by the project is about 795ha (the EIS states that the area of nesting habitat is 972ha). This amounts to about 17% of habitat in the Rookwood area and 27% of the Eden Bann area.</p>	EHP recommends that an imposed condition under the <i>State Development and Public Works Organisation Act 1971</i> be applied to the project for significant residual impacts on red goshawk habitat. The condition should be similar to that imposed by the Coordinator-General for impacts on matters of state environmental significance in relation to the Emu Swamp Dam project. A draft condition is provided in the attachment to these comments. However, that condition will not be necessary if the Commonwealth Department of Environment decides to impose an equivalent condition on the approval under the EPBC Act.	<p><b>Proponent to provide response.</b></p> <p>See line item 10.1. OCG to work with the proponent, DE, EHP and DNRm to work out offset requirements.</p> <p>Proponent to clarify data as per requested by email from Maxine Hunter on 27 June 2016.</p>	A response is provided in the addendum.	Ch 5, s5.1 Ch 8	Vol 1, Ch 8 Vol 3, App N Vol 3, App O	Ch 6, s6.1	



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		11.4 cont'd	<p>The EO Act significant impact guidelines state that an action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:</p> <ul style="list-style-type: none"> <li>- lead to a long-term decrease in the size of a local population</li> <li>- interfere with the recovery of a species</li> <li>- cause disruption to ecologically significant locations (e.g. nesting sites) of a species.</li> </ul> <p>EHP concludes that the removal of 20% (total) of the preferred nesting habitat of the red goshawk along a 120km stretch of a major river satisfies all three criteria. EHP agrees with the AEIS that the project 'may reduce the capacity for the species to establish new breeding territories and increase its local density of occurrence..' and 'will result in a localised loss of potential nesting...'</p> <p>However, EHP does not agree that these outcomes may be considered to be insignificant. EHP considers that the project will interfere with the recovery of an endangered species.</p>		Proponent to provide response in line item 11.4 (above).	A response is provided in the addendum.	Ch 5, s5.1 Ch 8	Vol 1, Ch 8 Vol 3, App N Vol 3, App O	Ch 6, s6.1
		11.5	<p>In previous comments, EHP provided the following interpretation of EIS data and ecological characteristics of the powerful owl that are relevant to assessment of impacts and offsets. However, the response did not refer to, or take account of, EHP's interpretation.</p> <p>Impact on powerful owl EHP considers that the assessment has underestimated the scale of impacts on powerful owl habitat. The NSW Recovery Plan for Large Forest Owls states that nesting habitat for the powerful owl is within 100m of streams or minor drainage lines, rather than the 50 m used by the proponent.</p> <p>Given this information, the best available habitat in the area will be the larger trees that occur along major waterways, similar to that of the red goshawk. The regional ecosystems that are red goshawk habitat are a subset of those identified as powerful owl habitat.</p> <p>Using the regional ecosystem information provided in the EIS EHP analysed project impacts on powerful owl nesting habitat within a more ecologically meaningful buffer around the project site. A buffer of 1km was selected because EHP considers that the potential habitat along streams and permanent water is more significant than vegetation along minor drainage lines.</p> <p>A total area of about 11,000ha of habitat occurs within a 1km buffer. Using the full supply level mapping provided in the EIS, EHP estimates that the area of potential nesting habitat that will be inundated by the project is about 1300ha. This amounts to about 14% of habitat in the Rookwood area and 10% of the Eden Bann area.</p>	EHP recommends that an imposed condition under the State Development and Public Works Organisation Act 1971 be applied to the project for significant residual impacts on powerful owl habitat. The condition should be similar to that imposed by the Coordinator-General for impacts on matters of state environmental significance in relation to the Emu Swamp Dam project. A draft condition is provided in the attachment to these comments.	<p>Proponent to provide response.</p> <p>See line item 10.1. OCG to work with the proponent, DE, EHP and DNR to clarify/determine offset requirements.</p> <p>Proponent to clarify data as per requested by email from Maxine Hunter on 27 June 2016.</p>	A response is provided in the addendum.	Ch 6 Ch 8	Vol 1, Ch 8 Vol 3, App N Vol 3, App O	Ch 6, s6.2
		11.5 cont'd	<p>Applying the EO Act significant impact guidelines for the powerful owl as was done for the red goshawk, EHP concludes that the removal of 12% (total) of the preferred nesting habitat of the powerful owl along the 120km length of the Fitzroy River and tributaries satisfies the criteria for a significant residual impact.</p> <p>While the EIS concludes that the project would not have a significant impact on the species, EHP considers that that it would have a significant residual impact on the MSES because it would interfere with the recovery of a vulnerable species.</p>		Proponent to provide response in line item 11.5 (above).	A response is provided in the addendum.	Ch 6 Ch 8	Vol 1, Ch 8 Vol 3, App N Vol 3, App O	Ch 6, s6.2

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		11.6	<p>In the previous submissions, DSITI commented that the project will result in a range of ecological impacts as a result of the following changes to flow regimes:</p> <ul style="list-style-type: none"><li>- reduction in the magnitude of flood events and delayed flows</li><li>- reduction in the frequency and magnitude of small to medium downstream flood flows</li><li>- increased downstream water flows during the dry season</li><li>- decreased frequency and duration of no-flow periods.</li></ul> <p>The EIS relies on achieving the Fitzroy Basin Water Resource Plan (WRP) environmental flow objectives (EFOs) to manage flow related risks to aquatic ecosystems. Section 7.3.7.2 of the EIS states that 'Achievement of the WRP objectives regarding environmental flows is expected to effectively mitigate impacts related to flow regimes.'</p> <p>However, section 9.3.2.5 of the EIS states that the Fitzroy Basin WRP's existing seasonal base flow objectives, which are non-mandatory, would not be met at EB1 between May to August and September to December (representing up to 66 % of the year). This suggests the proposed mitigation measure to achieve WRP objectives will not be met either in the base case or development scenario</p> <p>EHP previously requested that the EIS describe the operational rules controlling the volume and timing of water releases that will be used to mitigate or prevent impacts on ecological assets. However, EHP considers that the response did not adequately address the request.</p>	<p>EHP recommends that the proponent should review the suitability of EFOs to mitigate or prevent impacts on ecological assets, and describe how management rules for operation of the weirs will mitigate risks on ecological assets.</p> <p>Additional information should be provided to substantiate the claims made by the proponent that the mitigation measures proposed for managing flows will result in all (mandatory and non-mandatory) WRP objectives being met.</p>	<p><b>Proponent to provide response in Addendum.</b></p> <p>Also see DNRm's submission in line item 16.19.</p>	<p>EFOs are defined within the WRP by the State.</p> <p>The suitability of EFOs and ecological assets identified within ecological risk assessments undertaken by the State for the revision of the Fitzroy WRP were included in the draft EIS.</p> <p>Ecological assets identified in the State's environmental assessment included river turtles as riverine and flow-reliant fauna. Riffles were included as low flow dependent habitat. This will be improved downstream as explained in the AEIS.</p> <p>It is not considered that further updates in the addendum are required.</p>	n/a	Vol 1, Ch 7, s7.1.2.4, s7.1.2.5 Vol 1, Ch 9, s9.1.3.2 Vol 3, App L, s4.3.3 Vol 3, App P, s5.1	Ch 7, s7.4.2	
		11.7	<p>In response to the Reef 2050 plan target (WQT2) to increase the extent of riparian vegetation by 2018, the EIS states that vegetation will grow back, and that the proponents are contributing to monitoring programs that promote stewardship actions that include restoring riparian areas. In spite of this optimistic prediction, the riparian vegetation that will be flooded will not be replaced in the time frame of the reef plan targets. The project will result in a decrease in the extent of riparian vegetation in the Fitzroy catchment and EIS should state how the project will contribute to meeting targets in the current GBR policies.</p>	<p>The EIS should demonstrate how the project will meet current GBR policies relating to retaining and increasing the extent of riparian vegetation.</p>	<p><b>Proponent to provide response in Addendum.</b></p> <p>This reduction in riparian vegetation could be addressed through any potential offsets for connectivity, regulated red goshawk, powerful owl which would require rehabilitation/revegetation of riparian vegetation.</p> <p>OCG to work with the proponent, EHP and DE to work out offsets conditions.</p>	<p>Actions to address Reef Plan 2050 targets are proposed in the addendum.</p>	Ch 3, s3.2 Ch 8	n/a	Ch 11	

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		11.8	<p>In previous submissions , EHP recommended that the species management program should include objective commitments for the management, research and monitoring of <i>Rheodytes leukops</i> and <i>Elseya albagula</i> populations.</p> <p>The current species management program has background information on the species, threats and general information about nesting locations in the river.</p> <p>The document includes the following management plans: -Planning and design management - Construction and commissioning management plan - Operation management plan.</p> <p>These management plans contain some detail for the planning and construction phases. However, the purpose of proposed turtle research and monitoring is not clearly articulated so there are no clear objectives and methods. The management plan needs this specific information before EHP can approve it.</p>	<p>EHP recommends that the species management program should include objective commitments for the management, research and monitoring of Rheodytes /leukops and Elseya albagula populations including, but not necessarily limited to, the following matters: - recognised management strategies for achieving recovery and maintenance of sustainable populations - specific information on the location and scope of impacts of the project on turtle breeding places - research into the use of foraging and nesting habitat within the impoundments, and downstream to the tail-waters of the next impoundment; the research should include: - passive integrated transponder (PIT) tagging of turtles prior to completion of construction (as proposed by the draft species management program, Volume 3 Appendix M) - GPS satellite telemetry studies to identify habitat use and movement during a range of stream flow events - nest site location, height above water, and characteristics. - modelling of the management of impoundment levels, and the timing and rates of downstream releases with regard to minimising the drowning of turtle nests during the nesting and hatching periods while also achieving water supply and environmental flow objectives defined by the Fitzroy Basin Water Resource Plan - developing measurable and auditable actions for managing impoundment levels and the timing and volumes of water releases to minimise flooding of turtle nests</p>	<p><b>Proponent to provide response.</b></p> <p>Proponent to update the SMP to include these commitments.</p>	<p>This has been discussed previously with DEHP and noted that the SMP will be subject to future revisions as the outcomes of the turtle movement study etc are available.</p> <p>This information is largely already included in the SMP as presented in the draft EIS and again in the AEIS and can be defined as conditions of approval for inclusion in the final SMP.</p>	n/a	n/a	App E, Table 2-2, Table 5-1, s6.2, s6.4	
		11.8 cont'd		<p>-developing objective commitments for monitoring and managing nest sites including: - defining GPS locations of nest sites and/or reaches of the catchment to be managed (reaches may be defined by reference to the Adopted Middle Thread Distance) and the number of nests to be protected to adequately offset the impact defining the period of monitoring and management, e.g. from May to December each year for a minimum number of years (normally equivalent to age at first breeding plus 50% of the adult life expectancy-EHP considers that a minimum period of 20 years would be adequate) objectives for nesting success, injury and mortality specific actions for weed management at nest sites , specific actions for managing predation of nests. details of commitments for monitoring and management of turtle passage in both directions past the impoundment walls, including: objectives for measuring passage success with respect to turtle injury and mortality proposed corrective action where objectives are not achieved. the parties responsible for management actions approval of programs by EHP before implementation peer review of research and monitoring programs by external, appropriately qualified and experienced experts - reporting and contingency planning, including publishing of monitoring programs and monitoring reports on a website. The final species management program should be submitted to EHP</p>	<p><b>Proponent to provide response in line 11.8 above.</b></p>	<p>This has been discussed previously with DEHP and noted that the SMP will be subject to future revisions as the outcomes of the turtle movement study etc are available.</p> <p>This information is largely already included in the SMP as presented in the draft EIS and again in the AEIS and can be defined as conditions of approval for inclusion in the final SMP.</p>	n/a	n/a	App E, Table 2-2, Table 5-1, s6.2, s6.4	
		11.9	<p>The overview identifies nest predation as a key threatening process.</p> <p>However, the EIS should state, for the purposes of transparency, that the cumulative loss of habitat caused by modification of waterways from dam and weir construction in the Fitzroy catchment is potentially a bigger problem for turtle species in the long term. That is because nest predation can be managed by intervention, but habitat loss is potentially irreversible.</p>	<p>EHP recommends that the species management plan overview contain a complete summary of threats to both turtle species.</p>	<p><b>Proponent to provide response in Addendum.</b></p>	<p>This is included in the SMP already as revised for the AEIS.</p> <p>It is not considered that further response in the addendum is required.</p>	n/a	n/a	App E, Table 4-1	

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		11.10	<p>Table 4-1 provides information on loss of habitat resulting from activities in the entire catchment. Analysis suggests that the project will inundate about 60% of the habitat between the Eden Bann weir and the confluence of the Dawson, Mackenzie and Fitzroy rivers.</p> <p>The EIS estimates an area of aquatic habitat that will be inundated by the project in order to calculate a financial offset. It would provide a more complete assessment of project impacts if it also included an estimate of the percentage of habitat that will be affected, i.e. the area of inundation as a percentage of the total area of habitat available between Eden Bann weir and the upper limit of the project area.</p> <p>EHP recommends that the area of inundation of aquatic habitat should be presented as a percentage of the total area of aquatic habitat in the rivers where both projects are proposed, for instance</p>	EHP recommends that the area of inundation of aquatic habitat should be presented as a percentage of the total area of aquatic habitat in the rivers where both projects are proposed, for instance between Eden Bann Weir and the upper limit of the project footprint.	Proponent to provide response.	The offset calculator requires a hectare value and that is what has been calculated and on what the offset is based.	n/a	n/a	App G, Ch 2m s2.3
		11.11	<p>The offset proposal in its current form has no estimate of the impact on turtle populations, and no estimate of how a nest protection program would provide an 'ecological benefit'. For example, a benefit would accrue if the number of protected nests compensated for the impact of potentially irreversible loss of nesting habitat.</p> <p>The term ecological benefit is not defined in the EIS, so the time to success of the offset cannot be set at this stage. There is no evidence in the EIS to support the conclusion that the proposed hypothetical offset scenario will provide a successful offset (ecological benefit) in 5 years. A true time horizon for this type of offset for an impact on an unknown area of nesting habitat is one where a positive change in the age structure of the turtle population is demonstrated, and that could not be done within 5 years.</p> <p>Page 9 Paragraph 2 states that 'with protection and the implementation of management measures proposed, the future value of the FRT birth rate is predicted to improve (rating 95 out of 100).' An improvement like this has been observed from nest management at Alligator Creek. However, in the context of the offset proposal, an improvement that provides an adequate offset will only occur if enough nests are protected and the nest management is continued for a long time. Details need to be provided about both these aspects of offset proposal, i.e. the number of nests protected and timeframe to success.</p> <p>EHP considers that it is not possible at this early stage to state a time to reach an ecological benefit, and that the nest protection activities should continue for the life of the project.</p> <p>The details of the proposed offset need to be approved by DOTE and</p>	<p>As the offset proposal for the Fitzroy River turtle relates to a matter of national environmental significance, the requirement for an offset management plan for project impacts on this species, containing detailed commitments and success criteria, should be addressed by recommending a condition, or conditions, to be attached to the Commonwealth's approval of the project under the EPBC Act.</p> <p>The situation is different for the white-throated snapping turtle, as offsets for impacts on that species apply under the Queensland Environmental Offsets Act. Consequently, EHP recommends that an imposed condition under the State Development and Public Works Organisation Act 1971 be applied to the project for significant residual impacts on the white-throated snapping turtle. The condition should be similar to that imposed by the Coordinator-General for impacts on matters of state environmental significance in relation to the Emu Swamp Dam project. A draft condition is provided in the attachment to these comments.</p> <p>EHP recommends that the proponent prepare an offset delivery plan with mandatory information under the Queensland Environmental Offsets Policy (Refer to EOD2 - Environmental Offsets Delivery Form 2 - Offset Delivery Plan Details)</p>	<p>Proponent to provide response in Addendum.</p> <p>See line item 10. 5. OCG to work with the proponent, DE and EHP to work out a more suitable timeframe for nest protection (i.e. for the life of the project).</p> <p>OCG to work with the DE in developing a recommended offset conditions for the Fitzroy River turtle for the Commonwealth Minister's consideration.</p> <p>OCG to work with the EHP in developing offset conditions for the for the white-throated snapping turtle.</p>	<p>The offset proposal is subject to finalisation as an offset plan.</p> <p>Finalisation of the offset proposal to satisfy both Commonwealth and State environmental offset requirements is appropriate as an approval condition.</p> <p>A response is provided in the addendum.</p>	Ch 8	n/a	App G



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		11.12	<p>The EIS states that a prescribed activity under the Environmental Offsets Act does not apply to the total project footprint, and that impacts of the project on landscape connectivity should only be considered in the areas where prescribed activities will be undertaken e.g. environmentally relevant activities. As this would be a small area, the EIS concludes that the project would not have a residual impact on landscape connectivity.</p> <p>EHP assessed the project across the entire footprint in order to provide advice to the Office of the Coordinator-General about impacts of the project on matters of state environmental significance, including connectivity areas. As stated in previous advice, EHP determined that the project will cause a significant residual impact on connectivity, based on calculations using the Landscape Fragmentation and Connectivity Tool that supports the Queensland Environmental Offsets Policy.</p> <p>Notwithstanding the fact that a prescribed activity under the EO Act does not apply to the broader footprint of the project, the overall residual loss of connectivity would be sufficient to require an offset. Furthermore, the State Development and Public Works Organisation Act 1971 provides the power for the Coordinator-General to impose a condition, such as one that requires an offset. Consequently, EHP recommends that offsets for loss of connectivity should be imposed by the Coordinator-General's report.</p>	EHP recommends that an imposed condition under the <i>State Development and Public Works Organisation Act 1971</i> should be applied to the project for significant residual impacts on connectivity areas. The condition should be similar to that imposed by the Coordinator-General for impacts on matters of state environmental significance in relation to the Emu Swamp Dam project. A draft condition is provided in the attachment to these comments.	<p><b>Proponent to provide response.</b></p> <p>See 10.1. OCG to work with the proponent, DE, EHP and DNRM to clarify/determine offset requirements.</p>	A response is provided in the addendum.	Ch 8	n/a	App C
12	Department of National Parks, Sport and Racing	12.1	The EIS does not detail their methodology for how they determined the extent of land lost in Aricia State Forest due to inundation. The EIS estimates that approximately 4 ha of the State forest will be inundated, however mapping at the 20 m contour (based on a maximum FSL of the Eden Bann Weir of 20.2 m) estimates that approximately 7.5 ha of the State forest will be inundated. Mapping using a spatial layer provided by the proponent estimates that approximately 6.4 ha of the State forest will be inundated.	NPSR recommends that the EIS provide details of the methodology used to estimate the inundation footprint of the entire project.	<p><b>Proponent to note.</b></p> <p>The AEIS sufficiently explains the methodology used to determine inundation footprint, and NPSR is satisfied with the proponent's commitment to survey the high and low bank areas to inform land acquisition requirements, which will include the inundated section of Aricia State forest.</p>	Noted.	n/a	n/a	n/a
		12.2	The EIS states that 'water storage easements' will be negotiated with landholders affected by the weir impoundments, including the inundation of a section of Aricia State Forest by the raising of Eden Bann Weir. A water storage easement is a public utility easement under s362 and 369 of the Land Act 1994, which can be created for 'land upstream of the weir and within or outside the storage area at full supply'. However a water storage easement cannot be authorised over Aricia State Forest due to s26(1A) of the Forestry Act 1959 (FA), which states that land on State forests must be used in accordance with provisions of the FA, which do not include easements of any kind. Easements for other public infrastructure can be authorised in State forests through specific sections of other legislation. For example, sections in the Electricity Act 1994 and Petroleum and Gas (Production and Safety) Act 2004 override s26(1A) of the FA, thereby allowing easements for electrical or petroleum and gas pipelines to be authorised respectively. No such overriding legislation exists for water storage easements	NPSR requests that the proponent undertake further negotiations with NPSR and the Department of Natural Resources and Mines (DNRM) to determine the most appropriate method of addressing the impacts. Given that the area of Aricia State Forest will be permanently inundated by the Eden Bann Impoundment, revocation of the inundated area and a buffer area from the State forest may be required. This will require resurveying of the boundary between the State forest and the watercourse, and may require compensation to be paid to NPSR for the loss of the area.	<p><b>Proponent to note.</b></p> <p>NPSR is satisfied with the proponent's commitment to undertake further negotiations with NPSR and DNRM regarding the loss of land within Aricia State Forest.</p> <p>The proponent should also note that there is a Land Act 1994 (LA) grazing rolling term lease over Aricia State Forest. Revocation of part of the State forest will also require realignment of the boundary of the lease. NPSR recommends further consultation with NPSR and DNRM to resolve this issue.</p>	Noted.	n/a	n/a	n/a
13	Public Safety Business Agency	13.1	PSBA maintains its advice from consultation on the Environmental Impact Statement. The bushfire site assessment to be conducted as part of the Emergency Management Programme should inform bushfire mitigation measures and guide adherence requirements to the draft model code.		<p><b>Proponent to note.</b></p>	Noted.	n/a	n/a	n/a

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	Queensland Fire & Emergency Services	13.2	Section 20.2.2. The two paragraphs in this section do not clarify the current situation, which is that EMQ and SES are now part of QFES.	Amend to read: The Queensland Fire and Emergency Services (QFES) operates its Central Region from Rockhampton and incorporates Emergency Management (EM) and State Emergency Services (SES) , Rural Fire Service Queensland (RFSQ) , Queensland Fire and Rescue Service (QFRS).	Proponent to provide response.  Minor text amendment.	Noted. Emergency services are adequately covered in the Project's EMP facilitate communication and liaison with all relevant and representative agencies, individually or combined.  It is not considered necessary to reproduce the chapter to reflect this amendment.	n/a	n/a	App F
	Queensland Fire & Emergency Services	13.3	There were a number of comments, in the submission by QFES dated 8/12/14 to the draft EIS Hazard Risk Assessment tables, Chapter 20. These comments related to various risks and the appropriate response measures, which have been addressed appropriately in the current draft EIS	No further comment required.	Proponent to note.	Noted.	n/a	n/a	n/a
	Queensland Fire & Emergency Services – Community Safety Capability Branch	13.4	QFES notes the project progression as depicted by the included table below from the Department of State Development website. QFES notes the designation of Community Infrastructure Development in the additional chapters to the draft EIS.	The earlier consultation provided by QFES to the draft EIS and its chapter additions is still considered to be relevant to the project.	Proponent to note.	Noted.	n/a	n/a	n/a
14	Capricorn Conservation Council	14.1	CCC's main concern relates to the ecological impact of another 140k of altered riverine habitat and natural flow which would result from the project. The additional EIS fails also to take into account 100s of side gullies and flood runners/anabranches which will hold high nutrient/warmer still water, encouraging aquatic weeds, eutrophication, low dissolved oxygen anoxic bacterial contamination, and blooms of cyano-bacteria.  Lion Creek (and others like Limestone, Ramsay Creeks) within the Fitzroy Barrage impoundment is a classic example of such 'backwater' conditions which will be replicated right through the impoundment areas. These creeks are usually only flushed through heavy localised storms. The majority of the time these backwaters collect aquatic weeds flushed downstream during river flows and floods. Due to low localised flows the creeks become choked as living plants and seeds propagate (e.g., Hyacinth, Salvinia, Water Lettuce, Hymenachne) and dead vegetative matter rots. When these stagnant side streams, kept artificially wet from impoundments rather than having a natural cycle of dry-seasonal/storm flow-dry, are eventually flushed out the risk of massive fish kills and reduced water quality in greatly increased.		Proponent to provide response in Addendum.	Water quality is assessed in the draft EIS with commitments to managing water quality included in the Project's EMP to address, weed and pest management, blue green algal blooms, etc.  It is not considered necessary to address this further in the addendum.	n/a	Vol 1, Ch 11	App E, s4.4, s5.2

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		14.2	<p>Table 3-1 Significant residual impact assessment</p> <p>3.2 Water resource planning Figure 4.4 (illustrates example of extensive gully inundation)</p> <p>(a) The operation of the weirs is also likely to result in a reduction in the frequency and magnitude of small – medium downstream flood flows. The increase in flows during the dry season has the potential to improve the quality of aquatic habitat downstream by reducing the duration and severity of pool isolation and prolonging the presence of flowing riffles zones and runs.</p> <p>(b) Fish lock arrangements will facilitate upstream and downstream movement at low and high reservoir levels, provide passage for most flows and cater for small and large bodied fish.</p> <p>Figure 5-1 Eden Bann Weir Stage 3 storage levels</p> <p>Under a full project development scenario (i.e. with all stages in place), inflows to Eden Bann Weir can potentially be managed to some degree through releases from Rookwood Weir (as is demonstrated to occur under the modelled operating scenarios) until such time as Rookwood Weir has been drawn down. It appears from the modelled storage levels that, in general terms FSL (or near to), is established ahead of the nesting seasons, however there remains no way of 'topping up' Eden Bann Weir should Rookwood Weir become empty and 5.3.4 Summary Project cannot feasibly manage water levels to a nominated level in order to effectively avoid or minimise impacts on existing nesting habitat within the proposed impoundments.</p>	The failure to acknowledge the potential for species decline or possible extinction is exemplified in paragraph 5.3.4	Proponent to note.	Noted.	n/a	n/a	n/a
		14.2 cont'd	<p>Continued...</p> <p>EIS statements 'inflows...managed to some degree' and 'there remains no way of 'topping up Eden Bann' along with the highly variable, unpredictable river flows, and as yet unassessed water take (GAWB, and local irrigation) make any suggested mitigation or offset investments far to risky for a species already 'critically endangered'. The proper application of the precautionary principle regarding the two vulnerable or threatened endemic turtle species suggests that unknown and unknowable consequences of the weirs; inundation of nesting habitat, loss of natural more highly oxygenated water flows, impoundments altering water physio-chemical properties and biota productivity (trophic food web, turtle food sources), increased injury and death despite turtle-ways, possible competitive pressure for food e.g. if the impoundments increase native catfish and invasive Tilapia which are more likely to benefit from altered aquatic environment than native migratory fish. The failure to acknowledge the potential for species decline or possible extinction is exemplified in paragraph 5.3.4.</p>		Proponent to note in line item 14.2 as above.	Noted.	n/a	n/a	n/a
		14.2 cont'd	<p>Appendix G - Offset proposal for the FRT and WTST.</p> <p>2.4 Summary --'monitoring actions and potential nest habitat areas identified' &amp; 'provision of a financial contribution'</p> <p>LFIP will alter around 140 kilometres of riverine habitat. No amount of increased monitoring and offset investment can replicate this habitat given the (turtles are) riffle zone specialist, the species also inhabit pools, runs and creeks. However, deep water areas (&gt; 5 m) of pools are largely uninhabitable to the turtle species due to reduced oxygen levels, limited light penetration and lower temperatures. (2.3 Aquatic habitat 2.3.1 Impact calculation, p. 14).</p>		Proponent to note in line item 14.2 as above.	Noted.	n/a	n/a	n/a

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		14.3	<p>The EIS while assessing the nesting a foraging impacts to these species does not assess potential impacts of intensification of irrigated agriculture such as further loss of habitat/habitat connectivity, increased competition from opportunist species like Black Kites which benefit from human activities (waste dumps), road kill, cropping land.)</p> <p>If studies yet to be undertaken demonstrate a business case for irrigated agriculture in the Lower Fitzroy there will also need to be risk assessments on the Red goshawk and Powerful owl from potential pesticides (directly or indirectly e.g., Warfarin rodent poison accumulation from eating affected prey).</p> <p>These matters are obviously outside the current limited scope of the EIS but it is critical to determine the threat to biodiversity compared speculated „greater community benefit“ with a thorough cost/benefit, cost/risk analysis before any decision is made to proceed with the weirs. The constraints of soils (Forster &amp; Sugars, 2008, DRN), and the EIS to date suggests less than 4% of the Lower Fitzroy soils are highly suitable for economic agriculture. The dominant soil classification is Agricultural Land Class:C2 -Pasture Land -native pastures; Generic Soil Group: Friable non-cracking clay or clay loam soils - Dermosols, Ferrosols; Concept: Shallow, gravelly clay loamy or clay surface grading to a red or brown clay subsoil; occasional rock outcrop. Sodic soils <a href="https://publications.qld.gov.au/dataset/soils-lower-fitzroy-river-lfz">https://publications.qld.gov.au/dataset/soils-lower-fitzroy-river-lfz</a></p>		Proponent to provide response.	<p>Facilitated agricultural development has considered existing (pre-previously cleared and/or disturbed) agricultural land changing from grazing land use practices to alternate forms of agricultural land.</p> <p>A business case for agricultural development is (as acknowledged) not the scope of the assessment.</p> <p>It is considered that appropriate assessment in accordance with the TOR has been undertaken in this regard.</p>	n/a	n/a	Ch 11	
		14.4	<p>The Red Goshawk and Powerful Owl representing apex avian predators and thus indicators of ecosystem health have so far survived the severe alteration of habitat as illustrated in the images from Queensland Globe – Regional Ecosystem mapping. With substantial investment from NRM Groups and land managers the depleted remnants and fragmented corridors have begun a slow steady recovery though better soil health and pasture management, riparian and biodiversity protection.</p> <p>While there is some way to go there appears to be the potential for compatibility between grass fed grazing, protection of remnants and encouragement of the regrowth of important hubs and corridors</p> <p><del>important for species diversity and ultimate survival</del></p>		Proponent to provide response.	A response is provided in the addendum.	Ch 5 Ch 6 Ch 8	Vol 1, Ch 8 Vol 3, App N Vol 3, App O	Ch 6, s6.2	
		14.5	<p>The intrusion of cropping land into the already heavily cleared Lower Fitzroy will either be tiny (i.e., &lt;4% if only Class1 and Class 2 soils Figure 3) and therefore not necessarily economically viable or sufficient to justify the cost of the weirs. If irrigated cropping was extended into Class 3,4,5 soils there would likely be considerable loss of remnant habitat and reversal of any improvements coming from millions of dollars of NRM and landholders investment in sustainable grazing compatible with river and GBR health.</p> <p>If the Class 3 and 4 soils were added to the potential irrigated landscape there would need to be a substantial increase in cultivation effort, including higher water use increasing (and as yet inadequately assessed soil and water table salinity risk), greater fertiliser and pesticide use.</p>		Proponent to provide response.	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	n/a	



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		14.6	Use of flood harvest technology coupled with improved water grid infrastructure would enable growth in agriculture output without harming rivers and aquatic ecosystems. CCC submits that the patchwork of fragmented better soils in the Lower Fitzroy could become economically productive food producing land using modern best practice technologies with high value crops like those being demonstrated in Port Augusta and elsewhere in the world where water is scarce – e.g., <a href="http://www.sundropfarms.com/">http://www.sundropfarms.com/</a> .  In short the risk assessment to the Red goshawk and Powerful owl fails to take into account the eventual and accumulative impacts of the majority of the anticipated water supply of 42,000ML for "possible agricultural purposes".		Proponent to provide response.	Facilitated agricultural development has considered existing (pre-previously cleared and/or disturbed) agricultural land changing from grazing land use practices to alternate forms of agricultural land.  A business case for agricultural development is (as acknowledged) not the scope of the assessment.  It is considered that appropriate assessment in accordance with the TOR has been undertaken in this regard.	n/a	n/a	Ch 11
		14.7	Agricultural development is not the scope of the project. Regional water supply security is the focus and requires strategic, long-term planning for water storage infrastructure. Various State and regional stakeholders, including the Growing Central Queensland Initiative have and are progressing detailed analysis in this regard; refer to <a href="http://rda/cw.com.au/growing-central-queensland/">http://rda/cw.com.au/growing-central-queensland/</a> Impacts arising from potential facilitated development are assessed in the additional information to the draft EIS.		Proponent to note.	Noted.	n/a	n/a	n/a
		14.8	This response to CCC's previous comments about the lack of an effective case for the majority of the LFIP water supply or for alternatives reaffirms our view that the case for the weirs is highly speculative. Given the sound advice CCC regularly receives from water quality experts, academics and other professionals": e.g., • "the weirs and irrigated agriculture in the Lower Fitzroy will create a unacceptable risk to Rockhampton's drinking water quality" • "the reduction of natural flows adds high risk of increased blooms of toxic cyanobacteria" • "the weirs will negate the positive benefits to fish stocks resulting from the declaration of the net free zones"  The dismissal of the whole of catchment water supply and broader issues raised by CCC and narrow scope of LFIP feeds into the public, media and political speculation of "Billion dollar" food bowls. Such narrow false assessments led to ecologically harmful and economically failed Paradise dam on the Burnett River.		Proponent to note.	Noted.	n/a	n/a	n/a
15	Department of Transport and Main Roads	15.1	The Department of Transport and Main Roads (TMR) has reviewed the proponent's response regarding the issues raised in TMR's EIS submissions and is satisfied with some of the proponent's proposed intentions to update the road impact assessment, draft management plans and provide suitable mitigation measures.  However, further consultation is required regarding the issue not adequately addressed in the additional information EIS (AEIS) which are expanded on below: 1. 'Section 10.2.1.- Foleyvale Crossing' of the AEIS : further information is required regarding the impact of Rookwood Weir Stage 1 on the flood immunity of the existing Foleyvale Crossing. The assessment does not adequately establish the estimated time of closure and the impact to community. This additional information is required to be provided prior to the commencement of Rookwood Weir Stage 1 and be taken into consideration as part of the detailed bridge design for the Foleyvale Crossing.	To maintain the ongoing safety, condition and efficiency of the State-controlled road network (SCR) and in accordance with the objectives and provisions of the Transport Infrastructure Act 1994 (TIA), the Transport Operations (Road-use Management) Act 1995 (TORUM)), other relevant legislation and TMR policies and guidelines e.g. Guidelines for Assessment of Road Impacts of Development (GARID), the proponent must address the matter listed above, for TMR to support the project proceeding.  Once further design and construction details of the project including traffic generation becomes available, the proponent is required to finalise the road impact assessment (RIA), road-use management plan (RMP) and any traffic management plan/s (TMP) to clearly identify and undertake any necessary improvement works, rehabilitation and maintenance and road-use management strategies to mitigate the impacts of project traffic.	Proponent to provide response.	Noted. As discussed with TMR the Project commits to providing further information with regard to the flood immunity at Foleyvale Crossing to inform detailed bridge design for the Foleyvale Crossing and prior to the commencement of Rookwood Weir Stage 1.	n/a	n/a	n/a

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		15.2	The following road transport-related conditions/requirements are recommended for inclusion in the Coordinator-General's EIS Evaluation Report.	(Refer to the submission for condition details)	Proponent to note.	Noted.	n/a	n/a	n/a
16	Department of Natural Resources and Mines	16.1	<p>The proponents are seeking designation of the land for the project as a community infrastructure designation (CID). If the project is granted CID then the clearing of vegetation will be considered exempt development.</p> <p>Designation of land for community infrastructure (CID) under the chapter 5 of the Sustainable Planning Act 2009 requires adequate environmental assessment in accordance with the Guidelines for environmental assessment and consultation procedures for designating land for community infrastructure.</p> <p>The Minister approving the designation of land must be satisfied that the community infrastructure will facilitate the implementation of legislation and policies about environmental protection or ecological sustainability.</p>	<p>The Minister approving the designation of land should request that the proponents offset the vegetation ion clearing that will occur as a result of the project.</p> <p>The proponent needs to provide details of proposed offsets for clearing of remnant of concern and endangered vegetation that would likely be required under the Community Infrastructure Designation process. The proponents should use Module 8 of the SOAP as a guide in order to meet the public benefit test.</p> <p>No Vegetation Management Act 1999 (VMA) offsets would be required for those Regional Ecosystems that require an offset under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC). EPBC commitments are listed in Table D-3 of Appendix D - Revised Project commitments.</p> <p>For the public benefit test, consideration should be given to Section 3 of the Vegetation Management Act 1999 which states that the purpose of the Act is to conserve remnant vegetation that is an endangered regional ecosystem or an of concern regional ecosystem or a least concern regional ecosystem and prevents the loss of biodiversity.</p> <p>The project should demonstrate 'no net loss' of biodiversity by providing suitable offsets for the clearing or remnant (regulated/assessable e) vegetation.</p> <p>It is estimated that 168.6 hectares of 'Endangered' Regional Ecosystems, 1342.1 hectares of 'Of Concern' Regional Ecosystems, 91.5 hectares of 'Least Concern' Regional Ecosystems (potential to be required to be offset for Connectivity or water resource vegetation).</p>	<p><b>Proponent to provide response.</b></p> <p>OCG to advise the proponent that offsets will need to be provided for regulated vegetation and connectivity.</p> <p>Possibility for a recommended conditions requiring vegetation offsets for the Minister deciding CID to consider or proponent commitment.</p>	A response is provided in the addendum.	Ch 8	Vol 1, Ch 3, s3.3.21	Ch 3, s3.4
		16.2	It is stated that a development permit is required for the clearing of vegetation to which the Vegetation Management Act 1999 applies.	The proponents should include this statement in the Environmental Impact statement and the Minister approving the designation should request that the proponents offset the vegetation clearing that will occur as a result of the project as a project commitment.	<p><b>Proponent to provide response.</b></p> <p>OCG to work with the proponent and DNRM to address this issue. This could be potentially addressed by the commitment from the proponent to offset impacts on vegetation and/or an imposed/recommended condition requiring offsets for vegetation.</p>	A response is provided in the addendum.	Ch 8	Vol 1, Ch 3, s3.3.21	Ch 3, s3.4
		16.3	Reference to Commitments addressed in the EMP - Appendix F	Include offsets for the clearing of regulated vegetation as a project commitment, as per above advice	<p><b>Proponent to provide response.</b></p> <p>OCG to advise the proponent that offsets will need to be provided for regulated vegetation and connectivity.</p> <p>Possibility for a recommended conditions requiring vegetation offsets for the Minister deciding CID to consider or proponent commitment.</p>	A response is provided in the addendum.	Ch 8	Vol 1, Ch 3, s3.3.21	Ch 3, s3.4

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		16.4	<p>A summary of the purpose and key outcomes of the facilitated agricultural development (FAD) technical discussion paper prepared by the proponents consultant (GHD) dated 9 March 2016</p> <p>A summary of the comments/submission issues made by NRM regarding FAD concerns</p> <p>Chapter 11 discusses the potential impacts of any FAD projects, however DNRN's comments on the technical discussion paper (April 2016) have not been considered in this chapter.</p>	Not addressed.	<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRN) to come to a resolution regarding facilitated impacts of the project.</p>	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	Ch 11
		16.5	<p>Clear Acknowledgement that the history of the blue green algae (BGA) blooms in the lower Fitzroy River does require implementation of measures to manage this risk (as per NRM comments).</p> <p>Minimal comment on the algal bloom history of the Fitzroy River Barrage, which is downstream of the proposed project site is provided. The Fitzroy River Barrage is the source of drinking water for Rockhampton and has a history of BGA blooms.</p>	The amendment of the EMP to address future management is noted, but this work hasn't been comprehensively reviewed to determine the adequacy of their response in the timeframe allotted. DNRN would seek to be involved in any further work to address outstanding issues raised during the submission periods	<p><b>Proponent to provide response.</b></p> <p>Proponent to update EMP.</p> <p>Possibly update proponents' commitments to include a commitment to provide this information in the EMP.</p>	<p>The development of a water quality management plan pre, during and post-construction is a Project commitment.</p> <p>Development of the Project's operational EMP will consider land uses adjacent to the impoundment (including potentially facilitated agricultural development as it arises) and management actions will be implemented as appropriate, in consultation with Fitzroy River Water.</p> <p>Discussions with Fitzroy River Water during the additional information phase indicated that Fitzroy River Water is able to monitor and manage drinking water quality with regard to BGA blooms as required.</p>	n/a	Vol 1, Ch 23 Vol 3, App W	App F
		16.6	<p>A brief description of the regulatory system for licensing livestock feedlots that would protect against negative impacts on water quality in the Fitzroy River.</p> <p>Chapter 11, Section 11.5.2 – Impacts on World Heritage Properties and National Heritage Places (pp. 172-173).</p>	Addressed. DNRN would seek to be involved in any future assessments under the <i>State Development Public Works Organisation Act 1971</i> , or Environmental Management Plan, for any feedlot or intensive livestock development in addition to any required regulatory assessments, which would include downstream water quality impacts resulting from catastrophic failure on effluent ponds and / or irrigation scheme.	<b>Proponent to note</b>	Noted.	n/a	n/a	n/a
		16.7	<p>Highlight the proponents commitments in both the EIS and AEIS for the development of water quality management plans within the Environmental Management Plan (EMP).</p> <p>Appendix F – Revised Environmental Management Plan, section 4.4 – Water Management Programme and; Appendix F – Revised Environmental Plan, section 5.2 Water Management Programme.</p>	Addressed.	<b>Proponent to note</b>	Noted.	n/a	n/a	n/a
		16.8	<p>Discuss that close collaboration will be required between stakeholders with drinking water assets in and on the river, those contributing to water quality inputs (e.g. agriculture, mines), and end users (Rockhampton Regional Council and Fitzroy River Water).</p> <p>Section 8 discusses Fitzroy River Water's role in water quality management downstream at the Barrage. There is comment on existing water management system and plans (Chapter 8, section 8.1 – Water Quality Data and Parameters).</p>	Addressed.	<b>Proponent to note</b>	Noted.	n/a	n/a	n/a
		16.9	<p>Describe where in the AEIS, an assessment against the Reef 2050 water quality targets has been discussed.</p> <p>Chapter 8 – Water Quality, Section 8.2 Reef 2050 Assessment, Table 8-1 Water Quality Targets.</p>	Addressed.	<b>Proponent to note</b>	Noted.	n/a	n/a	n/a



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		16.10	<p>Whilst DNRM is aware that the LFRIP and the Facilitated Agricultural Development (FAD) are two different projects, DNRM still has concerns about the potential impacts of the FAD (particularly feedlots and intensive agriculture) to downstream drinking water quality. Potentially severe impacts could arise from management failure of effluent ponds, groundwater leaching and surface runoff.</p> <p>This proposal has very high impact risks due to the physical location of the site and will most likely not pass the relevant ERA assessment requirements for feedlots/intensive agriculture.</p>	<p>Rather than rely on future ERA assessment and regulation, the technical note should take into account the proximity of the FAD to the drinking water supply of Rockhampton and the Capricorn Coast in regards to risk of nutrient (nitrogen and phosphorus), antibiotics and pesticide contamination risks as per ToR sections 1.51 (b) and 1.52 (2) and (3).</p> <p>Although the ToR clearly asks for water quality risk assessment there appears to be no assessment carried out or proposed in the EIS in regards to impacts on downstream water quality for the Fitzroy River Barrage which should be included as directed in the above sections.</p> <p>A possible 1.7% increase in dissolved inorganic nitrogen is not negligible from a Great Barrier Reef perspective.</p> <p>This would add a "new" source of 1.7% of the entire Fitzroy Basins annual load of anthropogenic DIN to a point source just above the Barrage/Estuary/Keppel Bay, which is a significant amount.</p> <p>DNRM recommends that the design for upstream Facilitated Agricultural Developments be made for 1 in 1000 year flood events, or to operate at very conservative levels. This would mean a higher flood immunity than what is currently being proposed by the</p>	<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution regarding facilitated impacts of the project.</p>	<p>The determination against ERA assessment requirements is for DEHP to decide through the DA process in consideration of site specific assessments presented together with mitigation, management and offset proposals developed by others.</p> <p>The design flood event proposed is unreasonable. This would need to apply consistently to all development across the Fitzroy as a government policy.</p> <p>The national guidelines recommend a 1 in 100 year ARI flood height, some parts of the development may require more specific or different flood immunity as assessed on individual circumstances, waste utilisation areas etc.</p> <p>Actions to address Reef Plan 2050 targets are proposed in the addendum.</p>	Ch 3, s3.2	n/a	n/a	
		16.11	<p>Risks associated with potential increases in toxic Blue-Green algal blooms pose a substantial risk to health and safety.</p> <p>The response for potential increases in Blue Green Algae (BGA) blooms in the Fitzroy River Barrage which refers to Volume 1, Chapter 11, Water Quality 11.3.22 of the LFRIP EIS is inappropriate. This is primarily due to incorrect assumptions and reporting of available data for BGA blooms in the Fitzroy River Barrage. The EIS suggests that BGA blooms are not a problem in the lower Fitzroy system. For example, the following extract from Chapter 11 water quality summary, p 56 states:- "The potential for blue green algae blooms to occur within the impoundments is considered to be low. A water quality monitoring program including pre, during and post construction will be implemented and monitoring of blue green algae would be conducted."</p> <p>The desktop water quality study only included upstream impoundments and Eden Ban weir- it did not mention or include the largest storage (~80,000 ML) on the lower Fitzroy system (the Fitzroy River Barrage.) The Fitzroy River Barrage is the source of drinking water for Rockhampton and has a history of BGA blooms.</p> <p>There is a lot of freely available data (refer to previously provided attachment) in regards to the history of toxic BGA blooms in the lower Fitzroy River and it is obvious that the potential for an increase in BGA blooms due to nutrient leaks from the proposed FAD should be addressed in the EIS in accordance with the risk assessment requirements of section 1.51 (b) and 1.52 (2) and (3) of the ToR.</p>	<p>The amendment of the EMP to address future management is noted, but this work hasn't been comprehensively reviewed to determine the adequacy of their response in the timeframe allotted.</p> <p>A water quality and BGA monitoring program should be implemented before during and after any proposed FAD takes place as a minimum requirement to assess any impacts that the FAD may have on BGA blooms.</p> <p>A more detailed assessment of the potential impacts on water quality from the proposed FAD for the combined water infrastructure / facilitated agricultural project/s is required in order to take into account the risk to the health and safety to downstream water consumers.</p>	<p><b>Proponent to provide response in Addendum.</b></p> <p>Proponent to update EMP.</p> <p>Possibly update proponents' commitments to include a commitment to provide this information in the EMP.</p>	<p>The development of a water quality management plan pre, during and post-construction is a Project commitment.</p> <p>Development of the Project's operational EMP will consider land uses adjacent to the impoundment (including potentially facilitated agricultural development as it arises) and management actions will be implemented as appropriate, in consultation with Fitzroy River Water.</p> <p>Discussions with Fitzroy River Water during the additional information phase indicated that Fitzroy River Water is able to monitor and manage drinking water quality with regard to BGA blooms as required.</p> <p>It is not considered that further updates in the addendum are required.</p>	n/a	Vol 1, Ch 23 Vol 3, App W	App F	

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		16.12	<p>Comments regarding Aquatic Ecology (Vol 1 Chapter 7) were provided by DNRM on the draft Environmental Impact Statement for this project on 2211212014. The comments were as follows: While it is noted that the basis of the IQOM program used has been the supplied by DNRM, and that the project fits within the full development extent of the Fitzroy Water Resource Plan (WRP), the EIS does not appear to have conducted any ecological risk assessment for impacts by the project.</p> <p>While DNRM is satisfied with the project using the Ecological Risk Assessment in the WRP, we would recommend that the proponent conduct a full risk ecological risk assessment for the project.</p> <p>The EIS should also make reference to the work done by DNRM for the Fitzroy WRP, as the proponent is basing a lot of the impact assessment done for the project on this work.</p>	These comments have not been included in Appendix A- EIS Submissions Analysis Register included with the AEIS material.	<b>Proponent to provide response in Addendum.</b>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p> <p>It is not considered that further updates in the addendum are required.</p>	n/a	Vol 1, Ch 7, s7.1.2.4, s7.1.2.5 Vol 1, Ch 9, s9.1.3.2 Vol 3, App L, s4.3.3 Vol 3, App P, s5.1	n/a
		16.13	<p>Subsequent discussions were held between the proponent, OCG and aquatic ecologists from DNRM and responses to raised issues were received from the proponent in February and March 2015- see right hand column (in submission).</p> <p>While it is noted that some significant work has been done in terms of the Fitzroy River Turtle risks and offsets, there are a multitude of other ecological assets likely to be affected as a result of this proposal. Many of these risks have already been highlighted as part of the Fitzroy WRP Review of Ecological Assessments and therefore all the proponent would mitigate the impacts. For example, some of the fish species endemic to the Fitzroy Basin have flow-spawning triggers which these weirs will impact on.</p> <p>Not only has the proponent failed to properly recognise this work (this research has been published), but there has been no commentary about how this proposal would mitigate the impacts. I'm sure much of this will be considered when the ROP is reviewed, but consideration of these ecological requirements must be made up front to ensure that infrastructure design has the ability to pass the appropriate environmental flows (Fairbairn is an example where a dam design doesn't allow appropriate flow rates as per ROP requirements).</p>	<p>The proponent needs to consider impacts of the project on all of the ecological assets potentially affected by the development, with reference to published reports, and include measures for mitigating these impacts.</p> <p>These measures should be clearly identified as a project commitment.</p>	<p><b>Proponent to provide response in Addendum.</b></p> <p>OCG to have discussions with DNRM about whether this information needs to be provided at this stage of the process or can be provided after the CG report at the application stage. The proponent could make a commitment to provide information at the application stage</p> <p>Proponent to update commitments</p> <p>Proponent to clarify information about fish habitat impacts as per requested by email from Maxine Hunter on 23 June 2016.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p> <p>It is not considered that further updates in the addendum are required.</p>	n/a	Vol 1, Ch 7, s7.1.2.4, s7.1.2.5 Vol 1, Ch 9, s9.1.3.2 Vol 3, App L, s4.3.3 Vol 3, App P, s5.1	n/a
		16.14	<p>DNRM notes that no further information has been provided concerning groundwater (EIS Chapter 10) in the AEIS. DNRM submitted a number of comments on the Draft EIS regarding further issues to be addressed on groundwater (refer below)</p> <p>In addition, there is no mention of Chapter 10 in Appendix A, EIS Submission Analysis Register.</p> <p>The proponent provides a comment that groundwater impacts are expected to be small, and therefore there is no need for further information. Whilst the assumption that impacts will be small may be realistic, there does need to be evidence presented to support such assertion.</p>	The proponent needs to provide evidence/clarification to support the assertion that impacts of the project on groundwater are minimal for the EIS to be credible.	<p><b>Proponent to provide response in Addendum.</b></p> <p>The proponent should provide evidence/clarification to support the assertion that impacts of the project on groundwater are minimal.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p> <p>It is not considered that further updates in the addendum are required.</p>	n/a	Vol 1, Ch 10	n/a

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Sub. No.	Submitter	Issue No.	Issue - Details **	Submitter Recommendations / Suggested Mitigation	Proposed Action / Direction to Proponent	Proponent response 06/08/2016 Addendum Rev 0	Relevant Addendum to the AEIS chapter and section	Relevant draft EIS chapter and section	Relevant AEIS report chapter and section
		16.15	<p>The EIS states that: No adverse impacts are expected on the stock routes identified in the vicinity of the project. Neither of the stock routes is located within the impoundment and both stock routes already traverse the Mackenzie and Dawson Rivers, respectively.</p> <p>It is Queensland Government policy that reserves are included as part of the stock route network.</p> <p>In Tables 5-13, 5-14 and 5-15, the proponent indicates that several reserves will be impacted by inundation as a result of the project.</p> <p>It is acknowledged that the level of impact to these reserves is minor, and will not require action to mitigate impacts at this time.</p>	This section of the EIS should be modified to reflect that there will be minor impacts to the stock route network.	<p><b>Proponent to provide response.</b></p> <p>Minor text amendment.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p>	n/a	Vol 1, Ch 5, s5.5.37	n/a
		16.16	<p>Vol. 1 - Chapter 3. This section refers to the need for a Riverine Protection Permit (RPP) to excavate, place fill or destroy vegetation in a watercourse. Water Act 2000 amendments have removed the provision regulating destroying vegetation in a watercourse</p> <p>As of the document 'Riverine protection permit exemption requirements' was published.</p> <p>If the proposed activities can meet the exemption requirements which apply to a ROL holder to construct infrastructure there would be no need for a RPP. Where material that is excavated is removed and used for other purposes an RPP may be required.</p>	<p>Remove the reference to vegetation in describing the requirements for a Riverine Protection Permit. Refer to the 'Riverine protection permit exemption requirements' which exempt some works. Change the sentence to:</p> <p>A riverine protection permit may be required under the Water Act to excavate or place fill in a watercourse where works cannot meet the 'Riverine protection permit exemption requirements'. Minor works such as road augmentations and culvert installations that occur within watercourses may also be exempt if able to meet the exemption requirements</p>	<p><b>Proponent to provide response.</b></p> <p>Minor text amendment.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p>	n/a	Vol 1, Ch 3, s3.3.23.3	n/a
		16.17	<p>Vol.1 - Chapter 3. The last paragraph in this section also refers to the project triggering a requirement for a quarry material allocation notice for the removal of quarry material. Under the Water Act 2000, a quarry material allocation notice is required when material is being used for any productive purpose such as building, fill or on-sold for other commercial purposes. The paragraph as written does not explain this clearly.</p> <p>The development permit for the removal of quarry material (dredging) in a water course will be assessed by the State by the DSDIP, not DNRM.</p> <p>The proponent should note that information about how to apply for this permit can be found on the industry portal, <a href="https://www.business.qld.gov.au/industry/mining/quarries/riverine-quarrying-materials">https://www.business.qld.gov.au/industry/mining/quarries/riverine-quarrying-materials</a>.</p>	<p>Change the wording of the last paragraph to better explain the need for a quarry material allocation notice:</p> <p>Sand, gravel and rock are proposed to be extracted from the Fitzroy River immediately downstream of the Eden Bann Weir and upstream of the Rookwood Weir. Where material is to be used for productive purposes or does not meet the 'Riverine protection on permit exemption requirements' the extraction would trigger a requirement for a quarry material allocation notice for the removal of quarry material in a watercourse under the Water Act. A development permit (assessed by Department of State Development Infrastructure and Planning) would also then be required for the removal of quarry material (dredging) in a watercourse</p>	<p><b>Proponent to provide response.</b></p> <p>Minor text amendment.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p>	n/a	Vol 1, Ch 3, s3.3.23.3	n/a
		16.18	<p>The section notes that "the operation of the proposed Rookwood Weir (Stage 1 and Stage 2) will result in the inundation of one existing bore (Section 10.3.1.2)". and that "Consultation with the landholder will be undertaken in this regard".</p> <p>It is recommended that the action be more prescriptive to result in measures to restore or compensate the loss in water supply.</p>	<p>Change the wording of the last sentence:</p> <p>Consultation with landholder will be undertaken to enter into agreement on measures to restore the loss of supply.</p>	<p><b>Proponent to provide response.</b></p> <p>Minor text amendment.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p>	n/a	Vol 1, Ch 10, s10.3.2.1	n/a



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		16.19	<p>While it is noted that the basis of the IQQM program used has been the supplied by DNRM, and that the project fits within the full development extent of the Fitzroy Water Resource Plan (WRP), the EIS does not appear to have conducted any ecological risk assessment for impacts by the project.</p> <p>While DNRM is satisfied with the project using the Ecological Risk Assessment in the WRP, we would recommend that the proponent conduct a full risk ecological risk assessment for the project.</p> <p>The EIS should also make reference to the work done by DNRM for the Fitzroy WRP, as the proponent is basing a lot of the impact assessment done for the project on this work.</p>	<p>It is recommended that the proponent conduct an in-depth ecological risk assessment for the project.</p> <p>It is recommended that the Fitzroy Water Resource Plan (WRP) be referenced where required in the EIS.</p>	<p><b>Proponent to provide response in Addendum.</b></p> <p>See also line item 16.12.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p> <p>It is not considered that further updates in the addendum are required.</p>	n/a	Vol 1, Ch 7, s7.1.2.4, s7.1.2.5 Vol 1, Ch 9, s9.1.3.2 Vol 3, App L, s4.3.3 Vol 3, App P, s5.1	n/a	
		16.20	<p>There have been a number of relevant publications which have not been cited and therefore considered in this EIS, which provide significant mitigation measures with respect to environmental flows. Again these should be considered in the EIS.</p>	<p>It is recommended that the proponent review the literature in the following links, while additionally crosschecking the references within the literature to make sure all information is covered.</p> <p>Fitzroy Water Resource Plan Library (1): <a href="http://qldgov.softlinkhosting.com.au/liberty/opac/search.do?highlightTerms=wrpfitzroy&amp;includeNonPhysicalItems=true&amp;action=search&amp;operator=AND&amp;queryTerm=wrpfitzroy&amp;mode=ADVANCED&amp;_open=1">http://qldgov.softlinkhosting.com.au/liberty/opac/search.do?highlightTerms=wrpfitzroy&amp;includeNonPhysicalItems=true&amp;action=search&amp;operator=AND&amp;queryTerm=wrpfitzroy&amp;mode=ADVANCED&amp;_open=1</a></p> <p>Fitzroy Water Resource Plan Library (2): <a href="http://qldgov.softlinkhosting.com.au/liberty/opac/search.do?highlightTerms=fitzroy&amp;includeNonPhysicalItems=true&amp;action=search&amp;operator=AND&amp;queryTerm=fitzroy+WRP&amp;mode=ADVANCED&amp;_open=1">http://qldgov.softlinkhosting.com.au/liberty/opac/search.do?highlightTerms=fitzroy&amp;includeNonPhysicalItems=true&amp;action=search&amp;operator=AND&amp;queryTerm=fitzroy+WRP&amp;mode=ADVANCED&amp;_open=1</a></p>	<p><b>Proponent to provide response.</b></p> <p>Minor text amendment.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p>	n/a	Vol 1, Ch 7, s7.1.2.4, s7.1.2.5 Vol 1, Ch 9, s9.1.3.2 Vol 3, App L, s4.3.3 Vol 3, App P, s5.1	n/a	
		16.21	<p>The document could be improved by adding simple explanations of how the assessment of impacts is being undertaken.</p> <p>For example, there is no text that relays the fact that groundwater impacts can be broadly divided into two categories: (1) Impacts caused by inundation of areas upstream of the proposed weirs (2) Impacts caused by reduction of the river flow regime (and therefore potentially reduced recharge) downstream of the proposed structures.</p>	<p>Amend this section of the EIS to separate the impacts to Groundwater into two categories: (1) Impacts caused by inundation of areas upstream of the proposed weirs, (2) Impacts caused by reduction of the river flow regime (and therefore potentially reduced recharge) downstream of the proposed structures.</p>	<p><b>Proponent to provide response.</b></p> <p>Minor text amendment.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p>	n/a	Vol 1, Ch 10, s10.3.2.1, s10.3.2.2	n/a	
		16.22	<p>It is important that these impacts be divided, as upstream of the weirs, inundation can cause destruction of groundwater dependent terrestrial and riparian vegetation and flood groundwater pumping infrastructure installed by water users. Downstream of the weirs, reduced river flow has potential to reduce groundwater recharge and thus reduce groundwater levels, potentially causing impacts on GDEs and other users reliability of supply.</p> <p>The difference in impacts upstream and downstream is described under 10.3.2.3 (third paragraph), but this description also needs to be explained in more detail (see comments on Vol. 1, Ch.10, Section 10.3.2.).</p>		<p><b>Proponent to provide response in Addendum.</b></p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p> <p>It is not considered that further updates in the addendum are required.</p>	n/a	Vol 1, Ch 10, s10.3.2.1, s10.3.2.2	n/a	

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		16.23	<p>The EIS states: "No GOE vegetation reliant on groundwater is identified for the project areas"</p> <p>The statement is at odds with the reference in the document to records of high watertables in some bores. It is unclear how the proponent has identified that there are no GDE's within the project area. There is no systematic description of the types of GDE that could exist in the project area. The classes of GDEs should be described under this section. For example Stygofauna, terrestrial vegetation, wetlands, riparian vegetation etc. (see Eamus et al 2006).</p>	<p>Describe the potential GDE's, including their classes, for example Stygofauna, terrestrial vegetation, wetlands, riparian vegetation etc. That could exist within the project area.</p> <p>Provide a map of contours of groundwater depth below the surface in order that any potential GDEs be identified</p> <p>We understand there have been discussions regarding these matters between DNRM Groundwater experts and the proponent, however it is not clear where the outcome of these discussions has been reflected in the project material.</p>	<b>Proponent to provide response in Addendum.</b>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p> <p>It is not considered that further updates in the addendum are required.</p>	n/a	Vol 1, Ch 10, s10.2.3, Figure 10-4, Figure 10-5, s10.3.2, s10.3.2.1, s10.3.2.2	n/a
		16.24	<p>Impacts on GDEs under 10.3.2.4, refers to wetlands only.</p> <p>Given that there is no analytical assessment of impacts, the text needs to provide clear justification. If water table levels are not impacted downstream of the weirs, it is expected that there will be no measurable impacts on GDEs.</p>	<p>Amend this section to give context to the environmental flows being maintained in accordance with the Water Resource (Fitzroy Basin) Plan 2011 and clearly identify the link between environmental flows and GDEs.</p>	<p><b>Proponent to provide response.</b></p> <p>Minor text amendment.</p>	<p>DNRM provided these comments on the preliminary draft EIS.</p> <p>Amendments were incorporated into the draft EIS as released for public and advisory agency comments in July 2015. No further comments were received on the draft EIS.</p>	n/a	Vol 1, Ch 10, s10.3.2.2	n/a
		16.25	<p>Eden Bann Weir perpetual lease (Lot 11 on SP114939) (Figure 5-17):</p> <ul style="list-style-type: none"> <li>proposed works will extend the weir infrastructure into Lot 2016 on RP841502</li> <li>Inundation of Road Reserve/s without further tenure allocated</li> <li>Inundation of Road Reserves with further tenure/authorities allocated (ie. Road Licence/ Permit to Occupy)</li> <li>Inundation of State lands with further tenure allocated - lease.</li> </ul>	<p>There are a number of tenure issues that may arise as a result of the proposed development including impacts to roads, stock routes, and state leases surrounding the proposed development area. Consideration must be given to the impacts on State Land.</p> <p>The proponent should contact State Land Asset Management, DNRM, Rockhampton to discuss requirements on 4847 3401 prior to the lodgement of a Development Application or the commencement of works.</p>	<p><b>Proponent to note.</b></p> <p>Proponent to undertake consultation with State Land Asset Management, DNRM, Rockhampton prior to lodging their application.</p>	Noted.	n/a	n/a	n/a
		16.26	<p>Rockwood Weir located on Fitzroy River USL, adjacent FH land (figure 5-18).</p> <p>The majority of the impacts are on USL. The EIS indicates a proposal to acquire a long term lease over required area. Other issues are:</p> <ul style="list-style-type: none"> <li>Inundation of Road Reserve/s without further tenure allocated</li> <li>Inundation of State lands with further tenure allocated - lease.</li> </ul>	<p>There are a number of tenure issues that may arise as a result of the proposed development including impacts to roads, stock routes, and state leases surrounding the proposed development area. Consideration must be given to the impacts on State Land.</p> <p>The proponent may require tenure, in terms of a state lease, over banks and bed of proposed Rockwood Weir. Native Title must be and where Native Title has not been extinguished, Native Title must be resolved prior to any lease being issued.</p> <p>The proponent should contact State Land Asset Management, DNRM, Rockhampton to discuss requirements on 4847 3401 prior to the lodgement of a Development Application or the commencement of works.</p>	<p><b>Proponent to note.</b></p> <p>Proponent to undertake consultation with State Land Asset Management, DNRM, Rockhampton prior to lodging their application.</p> <p>Recommendation would be the proponent updates that project commitments list.</p>	Noted.	n/a	n/a	n/a

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17	WWF	17.1	<p>Section 4.4 of the Reef 2050 Long Term Sustainability Plan (LTSP) states the decision-making principles the Queensland and Australian Government's have adopted to guide how the GBRWHA is protected and managed. The decision-making principles includes:</p> <ul style="list-style-type: none"><li>• Maintaining and enhancing the OUV of the GBRWHA in every action</li><li>• Basing decisions on best available science</li><li>• Adopting a partnership approach to management and;</li><li>• Delivering a net-benefit to the ecosystem</li></ul> <p>As the LFRIP is located within a catchment that discharges to the GBRWHA, the proponent must be required to demonstrate how it has applied the Reef 2050 LTSP decision-making principles to the LFRIP, particularly the requirement to implement actions that delivers a net-benefit to the (GBRWHA) ecosystem.</p> <p>According to the Reef 2050 LTSP glossary, 'the purpose of net benefits is to enhance the condition of Matters of National Environmental Significance, including the Reef's Outstanding Universal Value. While offsets are focused on addressing residual impacts associated with development actions, net benefits are focused on delivering actions (above and beyond offset actions), which will restore or improve the Great Barrier Reef to a good condition'.</p>	The proponent must be required to implement actions that restores and enhances the quality of water discharged to the GBR in accordance with the Reef 2050 LTSP requirement to deliver a 'net-benefit' for the GBRWHA and other affected MNES.	<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution for addressing facilitated/consequential impacts.</p>	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	n/a	
		17.1 cont'd	As the construction, operation and use of water provided by the LFRIP will cause adverse impacts to the quality of water discharged to the GBRWHA from the Fitzroy Basin, the Coordinator-General must impose conditions on the project requiring the proponent to implement actions that restores and enhances water quality entering the GBR, including for consequent development, to ensure the LFRIP delivers a net-benefit to the GBRWHA and other MNES in accordance with Reef 2050 LTSP.		<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution for addressing facilitated/consequential impacts.</p>	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	n/a	
		17.2	<p>The GBR Water Science Taskforce was established to provide advice to the QLD Government on how to protect the GBR by reducing pollutant loads in water discharged from catchments to the GBR lagoon.</p> <p>As the regulations required to apply the GBR Water Science Taskforce recommendation to 'Establish regulations to ensure no net decline in water quality from intensification and expansion in the agricultural sector' haven't been established as of yet, the Coordinator General must require the proponent to ensure the construction, operation and use of water provided by the LFRIP does not cause a net decline of the quality of water that is discharged to the GBRWHA from the Fitzroy Basin.</p>	The proponent must be required to demonstrate how the LFRIP aligns with the GBR Water Science Taskforce findings and conditions should be applied to ensure the project does not cause a net decline of water quality.	<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution for addressing facilitated/consequential impacts.</p>	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	n/a	

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		17.3	<p>While water impacts caused by intensive agricultural, industry, urban development and other point sources are controlled under the Environmental Protection Act 1994, water quality impacts caused by irrigation and other broad- scale agricultural land uses are not regulated in this catchment under either state or commonwealth legislation.</p> <p>To address this issue, the proponent states that it 'expects' water quality impacts caused by the use of water for irrigation and other broad-scale agricultural land uses will be controlled through the adoption of industry Best Management Practices (BMPs). However as the adoption of agricultural BMPs is voluntary, the proponents claim that industry BMPs will control water quality impacts caused by the use of water provided by the LFRIP for irrigation and other broad-scale agricultural land uses is not factual. Further BMPs do not meet a standard which would result in a net benefit for water quality.</p> <p>To enable all causes of water quality impacts to be adequately controlled, the Coordinator-General must impose conditions on the LFRIP to ensure the use of water provided by the LFRIP for any purpose does not cause a net decline in water quality in order to achieve the objectives of the Reef 2050 LTSP.</p> <p>The State had previously controlled the impacts of the use of water through Land and Water Management Plans under the Water Act. A similar approach could be used in this instance.</p>	The Coordinator-General must impose conditions on the LFRIP requiring the use of water provided by the project for any purpose does not cause a net decline of water quality.	<p><b>Proponent to provide response in Addendum.</b></p> <p>See line item 9.1. OCG to work with the proponent and Agencies (GBRMPA, EHP, DE and DNRM) to come to a resolution for addressing facilitated/consequential impacts.</p>	Actions to address Reef Plan 2050 targets are proposed in the addendum.	Ch 3, s3.2	n/a	n/a