LOWER FITZROY RIVER
INFRASTRUCTURE PROJECT

Appendix Q1

Traffic and transport supporting material

Part 1

Proposal for raising Eden Bann Weir and construction of Rookwood Weir: an assessment of impacts on access roads (KBR 2007)

SunWater
MAKING WATER WORK

Gladstone Area Water Board

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Part 1 - Proposal for raising of the Eden Bann Weir and construction of Rookwood Weir: An assessment of impacts on access roads (KBR 2007)

1.1 Overview

The study undertaken by KBR (2007) was commissioned by the Department of Natural Resources and Water for the Department of Infrastructure and Planning to provide preliminary assessment of the impacts of the proposed development of Rookwood Weir and Eden Bann Weir on access roads and river crossings; to identify and assess alternative access options; and to provide concept level cost estimates for the Lower Fitzroy River Infrastructure Project (Project).

KBR 2007 assumed and examined two scenarios:

- Scenario 1 – Eden Bann Weir at FSL 18.5 m AHD and Rookwood Weir at FSL 47.0 m AHD (approximate to the current proposed Eden Bann Weir Stage 2 and Rookwood Weir Stage 1)
- Scenario 2 – Eden Bann Weir at FSL 20.5 m AHD and Rookwood Weir at FSL 49.0 m AHD (approximate to the current proposed Eden Bann Weir Stage 3 and Rookwood Weir Stage 2).

Twenty-one potential crossings were identified for both scenarios. Traffic volumes at these crossings varied from a few vehicles a year to approximately 70 vehicles per day. Vehicle types using the crossings also varied, including private cars, light trucks, B-doubles, farm machinery, and so on. KBR 2007 identified that existing crossings are generally single lane, low level causeways with poor flood immunity, with even the highest crossing un-trafficable for several months of the year (drought conditions excepted).

KBR 2007 has been used to inform the traffic and transport assessment undertaken for the environmental impact statement (EIS) for the Project. Importantly not all recommendations and/or preferred options have been adopted for the Project. Current Project costs estimates are provided in Volume 1 Chapter 2 Project description and Volume 1 Chapter 19 Economics.

Information that is confidential in nature has been withheld. Extracts of KBR 2007 as relevant to the current Project are provided below. Written requests for further information pertaining to KBR 2007 will be considered.

1.2 Report extracts

1.2.1 Objective and scope

The Central Queensland Regional Water Supply Study (CQRWSS) has identified that the Lower Fitzroy region is in need of significant water infrastructure development owing to industrial expansion, population growth, farming and livestock development and the need to provide a more efficient and reliable water supply. A number of water supply options were identified by the CQRWSS including the construction of Rookwood Weir and/or the raising of Eden Bann Weir. The government has announced its intention to proceed with the development of these two structures, and has commissioned a number of studies into various issues associated with these proposals.

This study [KBR 2007] was commissioned by the Department of Natural Resources and Water (NRW) to provide an assessment of the impacts of the proposed development of Rookwood Weir

and Eden Bann Weir on access roads and river crossings, to identify and assess alternative access options, and to provide concept level cost estimates.

At this concept stage, the scope of the project is limited to road and/or stock crossings over the Fitzroy River or its major tributaries that connect different properties, and that are affected by the full supply level inundation of the constructed weirs or operational releases between Rookwood Weir and Eden Bann Weir. In addition to crossings that meet this definition, some specifically identified additional crossings were included in this study.

Rail or river transport, crossings wholly internal to properties and the potential impacts of the weirs on flood inundation are not generally within the scope of this study. However, some information on these issues is included in this report to provide a more complete picture of the potential access issues and costs, and for consideration in future studies.

Consultation during the project was limited to identified landholders riparian to the two proposed weir ponds and key government agencies. The identified landholders have been involved in extensive consultation, previous to this study, regarding a range of issues associated with the Eden Bann Weir and Rookwood Weir proposals. While other landholders are also likely to be affected by the potential access issues caused by the weir developments, it was considered that the consulted landholders would identify the majority of the potential issues. In addition, feedback from Councils enabled potential impacts on the wider community to be assessed at a concept level in this study.

1.2.2 Study area

The [KBR 2007] study area stretches from the upstream end of the proposed Rookwood Weir pond on the Mackenzie River (AMTD 336 km) and Dawson River (AMTD 16 km), down to the existing Eden Bann Weir wall at AMTD 141.2 km. The study area and surrounding features of interest are shown on Figure A.1 in Appendix A.

The Fitzroy River in this area has a wide channel, is subject to large floods and presents a significant transport barrier. The closest high level bridges over the Fitzroy River for north-south traffic are located in Rockhampton, with the Capricorn Highway Bridge over the Dawson River providing high level access for east-west traffic. However, even these high level crossings or their approaches are presently un-trafficable in larger floods.

The area is rural in nature with beef cattle grazing the predominant land use. Properties are generally served by unsealed roads, often single lane, branching from the major arteries of the Bruce and Capricorn highways. Five low level shire road crossings span the main Fitzroy/Mackenzie/Dawson Rivers in the study area; the very low Boolburra and Hanrahan Road crossings and the low Foleyvale, Riverslea and Glenroy crossings. These crossings are regularly cut by floods, with even the highest un-trafficable for several months in most years.

The major centre for services is Rockhampton to the east, with the smaller centres of Duaringa to the south-west and Marlborough to the north. The left (western) bank of the Fitzroy River (upstream of around AMTD 170 km) has particularly poor access to Rockhampton, owing to the high frequency with which the river crossings are inundated. When the crossings are cut, some local residents can access Rockhampton via private and shire roads through Marlborough, although these alternatives involve considerable extra travel time. Others cross the river by boat, stationing a car on either bank. Access is thus a significant issue for local residents, many whom have long sought improved levels of flood immunity for their access roads.

1.2.3 Review of previous reports

There are a number of previous studies and reports that were relevant to this study. Some of these were known at the commencement of this study and others were identified during the process, primarily through consultation with the identified agencies. These reports were reviewed to identify aspects relevant to access issues.

The key findings from the review of these reports are presented below:

- The Fitzroy River Weir Study (June 2004) provides a concept level evaluation of weir sites on the Fitzroy River. The raising of Eden Bann Weir and the construction of a weir at Rookwood were among the options examined. This report provides an overview of issues associated with each option, including: previous investigations, geology, preliminary design and costing, upstream property impacts, impacts on access roads and crossings and environmental and social aspects. Regarding access, the report offered the best information on crossings in the study area available at the commencement of this study. It identified the majority of the major crossings affected, provided a description of their current usage, proposed which crossings should be replaced and supplied cost estimates. The Fitzroy River Weir Study was a key reference for this study
- A number of social, cultural and economic assessments have been undertaken on the proposed weir developments (in Cook et al 2007, Western et al 2005, Keane 2004, and Hyder 1999). These studies found no cultural significance associated with any of the existing crossings. The studies identified potential impacts from loss of crossings: longer journey times, increased transport costs, increased risks for stock, difficulties in mustering stock and moving machinery, social isolation, difficulties with school access, loss of discretion over marketing decisions, restriction of emergency access and a general reduced quality of life. Higher flood immunity crossings are greatly desired by landholders, some of whom cross by boat during floods as there is no viable alternative. The hazards of these boat crossings are highlighted for children and the elderly
- The Fitzroy Industry and Infrastructure Study (FIIS) identified an agriculture corridor around the Fitzroy River from upstream of the Fitzroy Barrage to the junction of the Dawson and Mackenzie Rivers. Preferred development includes feedlots, horticulture, and piggeries in nine identified potential development areas (PDA). Although no PDAs are currently proposed for the western bank of the river, it is acknowledged that improved access would increase the feasibility of intensive livestock developments on the western bank
- A nickel mine is proposed for land riparian to the Fitzroy River near AMTD 170–180 km. A slurry pipeline is planned to cross the Fitzroy River upstream of its junction with Marlborough Creek (approximately AMTD 171 km) to deliver the ore to Gladstone. The pipeline is planned to be laid below the bed of the river. The majority of the mine traffic is planned to access the site from Marlborough; however, some of the mine and pipeline construction and operational traffic is likely to cross the river, with Glenroy Crossing the most plausible route
- The KBR report on Riverslea Crossing (Dec 2003) provides a preliminary design and costing for a new bridge at this site. It indicates the existing crossing at Riverslea, one of the highest crossings in the area, would have been impassable for an average of 46 days per year since records commenced in 1922. A replacement bridge at deck EL 53 m, estimated to be the one in 5-year ARI flood level, is costed at $5 million
- The Department of Main Roads (MR) investigated upgrade proposals for the Foleyvale Crossing in 1989. The report identified a significant debris problem on the existing structure. It

also identified that the current crossing is often submerged; for example the crossing was un-trafficable for 72 days in 1983 and for 160 days in 1988–1989. MR examined options to build up the existing causeway but ruled these out due to debris issues. The recommended option was to build a new bridge at RL 55.6 m at a cost of $1.65 million, plus an optional $0.65 million for straightening the approach alignment

A more detailed summary of the information in each of these reports, relevant to this study, is included in Appendix B.

A number of the reports identified crossings that potentially could be affected by the weir proposals. The crossings identified at the commencement of the study are listed in Table 1-1, and their locations are shown on the maps in Appendix A. Further details about these crossings are presented later in this report. Note that each crossing has been assigned a unique ID number for ease of reference.

Table 1-1 Known crossings

ID	Crossing name	ID	Crossing name
1	Glenavon Access Track	14	Smith Road Crossing
2	Glenroy-Marlborough Road: Green Creek	15	Island Camp Island
3	Glenroy-Marlborough Road: The Islands	18	Separation-Slatey Creek Crossing
4	Glenroy-Marlborough Road: Ten Mile Creek	19	Foleyvale Crossing
5	Redbank Crossing	21	Boolburra Crossing
7	Glenroy Crossing	34*	Islands between AMTD 281 and 282
8	Craiglee Crossing	35*	The Pocket Island
9	Hanrahan Road Crossing	36*	The Pocket Point Island
11	Rookwood Crossing	38*	Slatey Creek Island
12	Riverslea Crossing	40*	Central Railway Crossing
13	The Pocket 4WD Access		

* These crossings were known about at the start of the study, but were outside the study's scope.

1.2.4 Consultation

1.2.3.1 Introduction

The objectives of the consultation associated with this project were to:

- Identify any crossings in the study area not previously known
- Identify the current usage of existing crossings in the study area, the purpose for these trips and the likely impact if some crossings were not available
- Obtain available information on crossings such as general arrangement plans, deck levels and flood immunity
- Identify the alternate routes taken when existing crossings are un-trafficable owing to flooding
- Acquire information on future plans, desires and requirements for transport/access in the area.

This information will feed into the options development and traffic analysis phase of the project.

Consultation was undertaken in two major parts:

- Consultation with the identified riparian landholders
- Consultation with government agencies and other institutions.

These two components of the consultation process are described in the following sections.

1.2.3.2 Landholder consultation

The methodology used for the landholder consultation component of the study was as follows:

- Establishment of consultation contact list
  - NRW provided two lists of landholders—one targeting riparian and near-riparian landholders whose properties may be impacted by the raising of the Eden Bann Weir (20 landholders) and the other targeting riparian and near-riparian landholders whose properties may be impacted by the construction of the Rookwood Weir (30 landholders). The landholders on these lists have been involved in extensive previous consultation regarding a range of issues associated with the Eden Bann Weir and Rookwood Weir proposals in the past. The properties whose owners or operators were consulted are shown on the Figures A.2 to A.11 in Appendix A
  - It is noted that access issues will impact on a wider audience than the landholders immediately adjacent to the two weir ponds, including: those adjacent to the river between Rookwood and the upstream extent of Eden Bann, those located upstream and downstream of the study area, and non-riparian landholders (particularly those on the western bank). Many of these landholders are likely to use the crossings within the study area. For the purposes of this study, it was assumed that these users would only use the major public crossings in the area and that an appreciation of the traffic volume would be obtainable from Councils. However, it is recommended that consultation with a wider range of landholders be considered as part of any future studies.
- Preparation of landholder phone questionnaire
  - A single standard questionnaire was used for all landholders to ascertain their crossing usage pattern and desired future access and transport solutions
  - The questionnaire incorporated general questions about the property and its purpose, and then went into more specific questions about the frequency, purpose and alternative travel options for the crossings potentially affected by the weir proposals. The questionnaire was designed to take no longer than 30 minutes to complete
  - A copy of the landholder questionnaire can be found in Appendix C. Note this questionnaire only includes those crossings known at the commencement of the study, although space was included in order to record additional crossings identified by the landholders
  - For some landholders (Gladstone Pacific Nickel and the Woorabinda Pastoral Company) the agency questionnaire was also used.
- Development and distribution of project information package for landholders
  - A project information package was prepared for all landholders on the consultation list. The purpose of the information package was to: inform landholders about the study, inform landholders that they would be contacted via phone for consultation in the near future, and

provide landholders with GIS maps of their property to aid them in their preparation for the questionnaire

  - The project information pack consisted of an introductory letter to landholders, a regional map of the area and GIS map/maps of the landholders' individual properties and the area surrounding it.
  - The GIS maps depicted the main known crossings, the weir sites and the estimated extent of inundation. The GIS maps provided to landholders were similar to the maps included in Appendix A. A template of the introductory letter is provided in Appendix C.

- Formal phone interviews with landholders
  - Formal phone interviews commenced one week following the distribution of the landholder information package. The success rate of the telephone consultation was 47 out of 50 or 94% of targeted landholders contacted. The three landholders who were not able to be contacted were due to the following: one contact number could not be obtained, one contact number was disconnected (according to a neighbour the landholder was no longer at the address), and one landholder was unreachable during the consultation period.

A key limitation of the consultation process was the restriction of the consultation to telephone contact. Via telephone, it was often difficult to ascertain the area on the map the landholder was discussing when referring to internal crossings. Telephone consultation also requires the respondent to provide answers in an immediate fashion with little time for analysis of their actual situation. This can result in answers based on perception, recent experience and/or 'guessing'. It is likely that a number of the responses submitted are not accurate reflections of each property's crossing usage or flooding frequency; rather they are reflective of the respondents individual recent usage and experiences.

Another limitation of the consultation was the misinterpretation of the names of river crossings. On a number of occasions landholders knew the crossings by alternative names and thus had difficulty in identifying the crossings being discussed.

A further limitation to the consultation component was the difficulty landholders had in identifying crossings over small local gullies. These are not likely to be recognised as formal crossings since many of them have no current culvert, embankment or bridge. Notwithstanding this, the majority of these crossings would not fall within this project's scope so this is considered a minor limitation.

Addressing these limitations would likely involve interviewing each landholder on their property and physically inspecting each potential crossing site accompanied by good quality survey and flood modelling information. This level of detail is beyond the scope of this study.

It is considered that the information obtained in the consultation process is of sufficient quality to support this concept level study.

The crossing traffic derived from the consultation process for those crossings known about at the start of this study is summarised in Table 1-2. Other information obtained through the consultation process is reported in the following sections.

Glenavon access track

Number of landholders identified using the crossing = 1

- Crossing is the primary road access point to Glenavon property
- Landholder indicated that the crossing is currently un-trafficable approximately two to three weeks at a time during the wet season, although noted that this was less in drought conditions
- Landholder indicated no alternate vehicle access to the property and that horseback was used when the crossing was un-trafficable
- Landholder stated he had discussed a desired solution for the crossing with NRW at an earlier stage of the weir planning and the only solution was for NRW to resume the property. Ideally, the landholder would like to see NRW 'leave the property alone' since if the crossing was to be inundated it would be unworkable. Landholder stated that he thought a bridge over the current crossing would be unfeasible due to costs
- Landholder believes their property will be the most affected by the weir raising.

Table 1-2 Consultation crossing traffic—known crossings

		Number of respondents using	Total frequency of use by landholders (trips/month)*				Typical alternate route (if crossing is untrafficable)		
ID	Crossing	Crossing	Car/4WD	Trucks	Stock/walking	Overall		Vehicles utilised	Notes
1	Glenavon Crossing	1	64	As Required	0	64	Nil	Car and trucks, including heavy cattle and grain trucks	The landholder didn't specify how often they take trucks over this crossing.
2	Glenroy-Marlborough Road: Green Creek	1	5	5	0	10	Nil	Cars and light trucks	The usage of this river crossing is best ascertained by referring to traffic counts, as many respondents appeared to use the Glenroy-Marlborough Road but do not recognise this as a crossing.
3	Glenroy-Marlborough Road: The Islands	0	0	0	0	0	Nil	nil	The usage of this river crossing is best ascertained by referring to traffic counts, as many respondents appeared to use the Glenroy-Marlborough Road but do not acknowledge this as a crossing.
4	Glenroy-Marlborough Road: Ten Mile Creek	0	0	0	0	0	Nil	nil	The usage of this river crossing is best ascertained by referring to traffic counts, as many respondents appeared to use this road but not acknowledge this as a crossing.
5	Redbank Crossing	1	10	10	4	24	Glenroy Crossing	Cars, light and cattle trucks and mustering cattle	

		Number of respondents using	Total frequency of use by landholders (trips/month)*				Typical alternate route (if crossing is untrafficable)		
ID	Crossing	Crossing	Car/4WD	Trucks	Stock/walking	Overall		Vehicles utilised	Notes
7	Glenroy Crossing	10	237	78	4	319	Glenroy-Marlborough Rd & Bruce Highway	Cars, heavy cattle (including B-Doubles) and grain trucks	One landholder only used this crossing in the month that their internal crossing was un-trafficable.
8	Craiglee Crossing	2	32	4	1	37	Glenroy Crossing	Cars, cattle trucks and mustering cattle	
9	Hanrahan Road Crossing	1	62	3	Unspecified	65	Nil	Cars, cattle trucks, visiting campers also use this crossing	Recreational users also use this crossing—however frequency was not specified
11	Rookwood Crossing	4	65	Unspecified	0	65	Riverslea Crossing	Cattle 16-tonne truck, car	One landholder stated he used this crossing 'when it was low enough' but did not give a more specific timeframe, so was excluded from frequency. One landholder stated they took 16-tonne trucks across this crossing—but did not specify frequency.
12	Riverslea Crossing	17	297	34	0	331	Nil - boat access	Cars, cattle trucks, grain truck	One landholder stated he took 16-tonne tucks across this crossing—but did not specify frequency. The landholder also stated they have taken stock across this crossing in the past but not in the past 12—24 months.

		Number of respondents using	Total frequency of use by landholders (trips/month)*				Typical alternate route (if crossing is untrafficable)		
ID	Crossing	Crossing	Car/4WD	Trucks	Stock/walking	Overall		Vehicles utilised	Notes
13	The Pocket 4wd Access	2	156	8	0	164	Smith Rd	Cars, fuel and cattle trucks	Landholders consider this crossing is the primary access road to *The Pocket.*
14	Smith Road Crossing	1	31	Unspecified	0	31	Nil - boat access	Cars, 16-tonne trucks	One landholder stated they took trucks across this crossing—but did not specify frequency.
15	Island Camp Island	1	62	Unspecified	62	124	Nil	Cars, cattle and heavy trucks	Landholder stated they took 'heavy trucks' across this crossing—but did not specify frequency.
18	Separation-Slatey Creek Crossing	2	24	19	Unspecified	43	Foleyvale & Capricorn Highway	Cars, heavy machinery, stock	One landholder used the crossing at higher frequencies during farming periods.**
19	Foleyvale Crossing	4	129	15	1	145	Duringa-Apis Ck Rd, Bruce Highway, & Capricron Highway	Cars, cattle trucks and stock	An additional landholder, outside of the consultation list, advised they were planning to use this crossing up to 4 times a day in future. This landholder's figures are not included in the values to the left.
21	Boolburra Crossing	6	52	27	0	79	Capricorn Highway	Cars, grain trucks, heavy machinery such as ploughs	One landholder used the crossing at higher frequencies during farming periods.**

* *The number of trips/month shown is for an average month in the year. When a landholder stated the number of days or times they used a crossing (rather than individual trips)—this response was assumed to equate to two trips. The percentage and total frequency were rounded to the nearest whole number.*

** *When a landholder stated they used the crossing at a certain frequency 'during farming times', this was assumed to be three months in a twelve month period.*

Glenroy–Marlborough Road crossings—Green Creek/The Islands/Ten Mile Creek

The Green Creek crossing was the only one of these three Glenroy–Marlborough Road crossings identified as being used by a landholder in the study. No landholder mentioned use of any of the other Glenroy–Marlborough Road crossings.

It could be extrapolated that while many landholders in the area use this road, they do not identify these low lying crossings as actual river crossings. Thus the traffic volumes for the Glenroy–Marlborough determined from the landholder consultation are not likely to be representative of actual traffic volumes. Councils were contacted to obtain traffic count data, however there were no data available for this road.

The Green Creek and Ten Mile Creek crossings are shown in Figure 1-1 and Figure 1-2.

Redbank Crossing

Number of landholders identified using the crossing = 1

- Crossing is used to work the property, which extends over both sides of the river
- Landholder indicated that the crossing is currently un-trafficable two to three months per year
- The alternate route to Redbank Crossing is the Glenroy Crossing, which the landholder stated was an approximately an extra 30 km each way, or in higher floods, more than 200 km via Marlborough/Rockhampton
- Landholder was concerned that if the crossing was permanently inundated they would be required to truck cattle back and forth across the Glenroy Crossing (approximately 12–13 trips each 60 km) since they currently muster cattle across the Redbank crossing
- The landholder's desired solution was to build a bridge/causeway over the crossing, although he didn't feel this would be feasible due to the high cost involved. Landholder instead suggested compensation for having to use the Glenroy Crossing
- The landholder indicated that the foundation at Redbank Crossing consists of deep gravel beds. Also, the landholder indicated it would be better to build a bridge downstream of the existing ford to avoid the requirement for a second bridge over a tributary on the west bank.

Redbank Crossing is shown in Figure 1-3.

Figure 1-1 Glenroy-Marlborough Road – Green Creek Crossing

Figure 1-2 Glenroy-Marlborough Road – Ten Mile Creek Crossing

Figure 1-3 Redbank Crossing

Glenroy Crossing

Number of landholders identified using the crossing = 10 (approximately 37 residents in addition to occasional contractors and visitors).

- This crossing is used for multiple purposes, with the most common purpose being to access/work property on the other side of the river. It is only listed as the primary road access for two of the nine landholders. However, this is the main access to Rockhampton for a number of properties on the western side of the river
- Landholders indicated the Glenroy Crossing is un-trafficable around six weeks a year dependant on the seasons.
- Alternate access to Rockhampton for this crossing is via Marlborough, which landholders indicated adds more than 200 kilometres to their journey (up to an extra two and a half hours)
- All but one landholder (whose property is located on the eastern side of the Fitzroy River) indicated a desire to see an improved crossing at Glenroy. Reasons given included: providing all weather access to Rockhampton, for emergency access, and to improve the safety of using the crossing.

Glenroy Crossing is shown in Figure 1-4 and Figure 1-5.

Figure 1-4 Glenroy Crossing

Figure 1-5 Glenroy Crossing aerial view

Craiglee Crossing

Number of landholders identified using the crossing = 2

- Crossing is an internal property access for land on western side of river. The crossing is used by the second landholder to retrieve cattle that crossed the river into neighbouring properties
- Landholders indicated that the crossing is currently un-trafficable approximately six to eight weeks of the year during the wet season, 'only when the river's up'
- Craiglee landholder said there is no alternate vehicle access to the property on that side of the river and they would use a boat to cross, but if taking a vehicle they would use Glenroy Crossing which is approximately 40 minutes (40 km) extra each way
- When queried regarding their desired solution for the crossing, the Craiglee landholder stated they needed to keep the crossing, and that it would be very inconvenient to have to travel to Glenroy to access part of their property. The second landholder said their mail delivery would be cut off from their property without this crossing and that a new crossing at Craiglee would be required if the weir inundated the current crossing.

Craiglee Crossing is shown in Figure 1-6.

Figure 1-6 Craiglee Crossing

Hanrahan Road Crossing

Number of landholders identified using the crossing = 1(10 residents over three properties)

- Crossing is main property access
- Landholder indicated that the crossing is currently un-trafficable 'a few weeks a year' and in the past has been cut off for four or five months
- Landholder indicated no alternate vehicle access to the property and that occupants would boat across if the crossing was inundated, or follow tracks through neighbouring properties (adding approximately two hours to the journey in each direction)
- Landholder was concerned about the effect the loss of Hanrahan Road Crossing would have on their ability to run their property effectively
- The landholder's desired solution was to build a causeway or small bridge at the crossing site. The deck level of the crossing should be raised by an amount equal to the water level rise should the weir be raised. Would be happy to have the same accessibility as currently, but would not like the crossing to be un-trafficable any more than at present.

Hanrahan Road Crossing is shown in Figure 1-7 and Figure 1-8.

Rookwood Crossing

Number of landholders identified using the crossing = 4 (approximately 9 residents)

- Work is the primary purpose for the use of this crossing, with two landholders using it to access their property (or a neighbouring property) and one landholder using it to retrieve cattle that cross the river when low into neighbouring properties. The final landholder only used the crossing for social purposes
- One landholder stated that the crossing was un-trafficable up to eight months a year, dependent on season. Others suggested that in the past 12 months the crossing was un-trafficable approximately two to four months
- Riverslea Crossing is the alternate access for Rookwood Crossing; however, two landholders suggested that they would reschedule their journey if this crossing was un-trafficable
- The desired solutions offered by landholders for this crossing included:
  - Retention of the crossing for private access to the Weir Park property, which crosses the river
  - Construction of a road across the Rookwood Crossing, but this may be unlikely due to cost
  - Something put in place at the bottom of the weir (landholder indicated they had no need for the Rookwood Crossing should the weir be constructed).

Rookwood Crossing is shown in Figure 1-9.

Figure 1-7 Hanrahan Road Crossing

Figure 1-8 Hanrahan Road Crossing aerial view

Figure 1-9 Rookwood Crossing

Riverslea Crossing

Number of landholders identified using the crossing = 17 (approximately 72 residents + occasional contractors and visitors)

- This crossing is used for multiple purposes, with the most common purpose being to access workplace/property on the other side of the river. It is listed as the primary road access for six of the seventeen properties—it is also the main access to Rockhampton for a number of properties on the western side of the river
- Landholders indicated the Riverslea Crossing is un-trafficable up to three months a year, but a few suggested it was more like two to four weeks during the recent drought
- Most landholders do not have alternate access to Rockhampton for this crossing and boat across or use non-shire tracks through neighbouring properties when the crossing is flooded. Some properties can travel via Marlborough; however, it was highlighted that this alternate route is too long to be feasible
- Landholders indicated a strong desire to see an improved crossing at Riverslea if the weir is raised:
  - One landholder would like to see a bridge over Riverslea that was passable even in flood conditions
  - One landholder said it was not an issue as long as a crossing to Rockhampton with the same flood immunity as the Riverslea has currently is retained

- One landholder said NRW was aware that they will have to upgrade the crossing and would like to see this done
- One landholder said the Riverslea Crossing must be maintained to current accessibility level once weir goes in
- One landholder proposed that a bridge at roundabout (Riverslea Crossing) should be 15–20 m high (approximately 60 feet)
- 'Have a bridge over Riverslea or another major access for other properties around Rookwood Weir'
- 'I would like to see a usable crossing maintained at Riverslea. If the weir goes in and Riverslea crossing is flooded, every time we go to town we would need a boat'.

Riverslea Crossing is shown in Figure 1-10 and Figure 1-11.

The Pocket 4WD Access

Number of landholders identified using the crossing = 2 (eleven residents):

- Crossing is primary road access point to The Pocket property
- Landholders indicated that the crossing is currently un-trafficable approximately two to three months a year or less
- Landholders stated their alternate access was via Riverslea Crossing, approximately 17 km extra distance each trip
- One landholder's desired solution was to maintain access across the crossing, as it is inconvenient to travel around via Smith Rd to Riverslea. The second landholder said they would like to keep the crossing but doesn't see it happening.

The Pocket 4WD Access is shown in Figure 1-12.

Smith Road Crossing

Number of landholders identified using the crossing = 1 (eleven residents).

Despite being a shire road crossing, this crossing was only identified by one landholder in the course of consultation.

Like the Glenroy—Marlborough Road crossings, it is possible that this crossing was not highlighted by landholders as they do not acknowledge this as a Fitzroy River crossing as the crossing is located some distance up Melaleuca Creek. Also, the potential users of this crossing seem to use The Pocket 4WD access as their main access as it is a significant short cut:

- Landholder indicated that the crossing is currently un-trafficable approximately three weeks to a month per year
- Landholder stated their alternate access was via the Rookwood or Riverslea crossings, approximately 10 minutes extra travel time each trip
- Landholder seemed satisfied that this crossing would be required to be maintained as it is located on a shire road.

Smith Road Crossing is shown in Figure 1-13.

Figure 1-10 Riverslea Crossing

Figure 1-11 Riverslea Crossing aerial view

Figure 1-12 The Pocket 4WD access

Figure 1-13 Smith Road Crossing

Island Camp Island

Number of landholders identified using the crossing = 1 (8 residents):

- Crossing is used to access grazing land on the Island Camp property
- Landholder indicated that the crossing is currently un-trafficable approximately three months a year, up to six months dependent on season
- Landholder stated there was no alternate access for this crossing
- Landholder would like to see the internal crossings (there are a number of small islands on the property, as well as Island Camp Island) built up as business and lifestyle would be affected if the property could not use these crossings to access paddocks with vehicles.

Separation-Slatey Creek Crossing

Number of landholders identified using the crossing = 2 (7 residents + occasional contractors):

- Crossing is used for share-farming and to traffic heavy machinery between Separation and Slatey-Creek properties
- Landholders indicated that the crossing is currently un-trafficable one to two months per year
- Landholder stated their alternate access was via Foleyvale Crossing through Duaringa
- In regards to a desired solution for this crossing, both landholders suggested that it would be preferable to keep the crossing but unfeasible to build a bridge or causeway over the crossing and that if the crossing was cut off ‘they just wouldn’t be able to use it’. One landholder suggested they may lose out financially from the land that was cleared but they still wanted to see the weir go ahead.

Foleyvale Crossing

Number of landholders identified using the crossing = 4 (approximately 24 residents in addition to occasional contractors):

Note that one of the landholders does not currently use the Foleyvale Crossing, however is investigating share farming with the Foleyvale property and provided answers according to expected crossing usage.

- This crossing is the primary road access for the Foleyvale and Stoney Creek properties, and is used for work related purposes for the other landholders
- Foleyvale property landholder stated that the crossing was un-trafficable ‘whenever there is heavy rain’—two or three times a year for up to eight weeks. Other landholders supported that this crossing can be untrafficable for between one and three months a year
- Three landholders stated that alternate access for the Foleyvale crossing is via the Riverslea crossing and through Marlborough (approximately 1 hour extra travel time each trip); however, one landholder stated they had to use a boat if the Foleyvale Crossing was unavailable
- Landholders expressed their desire to see the Foleyvale crossing raised should the weir be built. One landholder also stated that it would be good if they opened a road up from Riverslea crossing to the Foleyvale crossing as it would significantly reduce travel for people in that area. He indicated that there is currently a track through there but it hasn’t been up kept by the Council.

Note: One landholder outside of the core consultation scope sourced the consultation contact details from a neighbour and contacted us to discuss their usage of Foleyvale crossing.

This landholder stated that they would be using this crossing up to four times a day from 2008, and that the crossing was their main access to town and to their working property. An alternate route is via Riverslea crossing; however, the landholder indicated that if Foleyvale Crossing is un-trafficable Riverslea is un-trafficable a short time after, which leaves the Duaringa-Apis Creek Road to the north as the only access. The landholder stated that this detour was not a long term viable option as it is a significant distance to travel (approximately three hours extra travel time each way). The landholder stated the 'most practical outcome would be to combine the Riverslea and Foleyvale crossings into one good high-level crossing'.

This landholder also expressed concern that they, as members of the community outside of the consultation scope, would not be involved with the project planning even though the potential inundation of the crossing could impact their future business planning.

Foleyvale Crossing is shown in Figure 1-14.

Figure 1-14 Foleyvale Crossing

Boolburra Crossing

Number of landholders identified using the crossing = 5 (approximately 17 residents in addition to occasional contractors):

- This crossing was stated as having been used primarily for work purposes by landholders, including travelling to and from work in Duaringa or to access other properties owned by the landholders
- Landholder's responses to the untrafficability of this crossing owing to flooding were particularly variable, from a couple of times per year up to six months of the year dependant on season and climate
- Alternate access for this crossing is via the Capricorn Highway, which runs parallel to the road on which the crossing is located (10–15 km difference in distance)
- Five landholders expressed their desire to see the Boolburra crossing raised or a culvert put in place should the weir be raised, although one said they were indifferent as long as their internal crossing was not affected by the weir raising. The final landholder said not having the Boolburra crossing wouldn't have a significant effect on their property.

Boolburra Crossing is shown in Figure 1-15. Note the high level railway crossing (ID 40) in the background.

Figure 1-15 Boolburra Crossing

Other crossings identified by landholders

There were a number of other internal crossing identified by landholders, however most of these were over creeks or gullies within properties and were outside the scope of this project. Details of other crossings identified by individual landholders are summarised in the table below.

Note that there were a small number of 'crossings' that were identified from previous studies, but did not fall within this project's scope. These included the Pocket Island, the Pocket Point Island, Slatey Creek Island, Central Railway Crossing and Islands between AMTD 281 and 282. None of these crossings were mentioned by landholders during the consultation phase for this project.

Of the crossings in Table 1-3 it was considered that Melrose Bottom Crossing, the Yarra-Tarawong Crossing and the Mourangee Dawson River Crossing, due to their similarities to the Redbank, Craiglee, and Separation-Slatey Creek crossings, were within the project's scope. Consequently, these crossings were considered in the options analysis stage.

Table 1-3 Consultation results—unknown crossings

Property	Crossing identified	Usage	Purpose	Frequency crossing un-trafficable	Alternate route	Additional time/ distance/cost	Details
EDEN BANN WEIR							
Marble Ridges	Wattlebank (ID23)	Very occasionally	Only when cattle need to be retrieved from other side of river.	Not offered	Via Rockhampton	A few hours (100+ km)	Located approximately 1 mile south of weir. Landholder stated that this crossing would not be an issue as stock would not be able to cross the river once weir was raised.
Eden Bann	Embankment on 5 small gullies running between 143 and 151 AMTD (ID 25)	30 times a year (~ twice a month)	To poison noxious grasses in gullies to prevent spread.	Not at all during drought, only when water reaches over 2 metres in weir.	No vehicle route; alternate horseback/walking access around top of property along electrical lines clearing then along minor watercourse (finishing at 151 AMTD)	Extra distance	The only access to the area to poison the weeds—would adversely affect the property if they could not access these gullies to poison. When the weir is full the gullies are all still accessible but are underwater during heavy flooding.
	Internal access road from Eden Bann property to Eden Bann Weir (ID 24)	Once every 2 months	Sun Water employee access to weir.	2 to 3 times a year (wet season)	No alternate route	Reschedule trip	Used by Sun Water employees only, not Eden Bann property landholders.
Glenavon	Crossing over lower section of Boggy Creek (ID 27)	3 to 4 days per week	To access parts of property for work.	Can be out for two or three weeks at a time during the wet season.	No alternate access for vehicles (horseback)	Not offered	Basic concrete culvert located where the Glenavon track meets Boggy Creek. Currently, when weir is full this crossing is trafficable.
	Crossing over Princhester Creek (26)	3 to 4 days per week	To access parts of property for work.	Can be out for two or three weeks at a time during the wet season.	No alternate access for vehicles (horseback)	Not offered	Road over dirt—located upstream from the Glenavon Access Track and is used when the Glenavon Access Track is flooded.

Property	Crossing identified	Usage	Purpose	Frequency crossing un-trafficable	Alternate route	Additional time/ distance/cost	Details
Mt Fairview (top property)	Two crossings—at AMTD 163 and between AMTD 161 and 160 (ID 28)	12 times a year	Primary road access to property (no shire road access).	Up to a week per year—seasonally dependent.	No alternate route	Not offered	Low level road on dirt crossing. Major gully at AMTD 160-161 and minor gully at 163. If these crossings are inundated there will be *no vehicle access to the property*. Landholder suggested that the desired solution would be to create an alternate access route at a higher point on the property.
Coorumburra	Crossings on the horseshoe lagoon (ID 29)	1 day per week	To access paddocks in this area of property.	A month to three weeks a year (drought year)	Nil	Nil	Embankment pushed up on western side of lagoon (off track).
	Internal Marlborough Creek crossing (ID 30)	Twice a day	General access to property.	A month to three weeks a year (drought year)	Nil	Nil	Cleared road across creek. Currently, this crossing is approximately 1 to 2 metres higher than water level when dam is full.
Melrose	'Bottom Crossing' (ID 6)	Twice a year	Used to track cattle and bull dozer across the river.	1 to 2 months a year maximum.	Glenroy crossing—however would normally avoid taking cattle across Glenroy crossing	Not a significant time or distance, really just an inconvenience	Natural ford approximately 1 1/2 kilometres north of the Glenroy Crossing. Usually a few inches deep with water—rarely flooded. When the weir is full (as it is currently), crossing is accessible for both cattle and bull dozer. So long as can get across Glenroy Crossing, losing access to the Bottom Crossing is not a significant issue—however having Bottom Crossing affected would be an inconvenience and an expense.

Property	Crossing identified	Usage	Purpose	Frequency crossing un-trafficable	Alternate route	Additional time/ distance/cost	Details
ROOKWOOD WEIR							
The Ranch	Two internal crossings at north and south areas of property (ID 31)	4 to 5 days per week	To access paddocks across the east side of the river.	Up to a week a year.	No alternate route	Nil	Low level crossing—road over dirt. Property has pumps on both sides of the creek.
Riverview	2 tributary crossings on north section of property (ID 32)	Once a month	To check fences in northern section of property.	Never un-trafficable	Nil	Nil	Northern crossing is laneway with trough and pipeline. Landholder stated that NRW proposed that they would put in a bank if crossing were inundated and the bank would service both northern and southern parts of property.
	Tributary crossing on south of property (ID 32)	1 to 2 days per week	To check fences and access lower paddock.	Never un-trafficable	Nil	Nil	
Fitzroy Pocket	Melaleuca Creek crossing within property (ID 33)	Once a month	To kill noxious weeds on river bank and check cattle.	Approximately 50 days per year—less in drought conditions	No alternate for this purpose	No alternative for this purpose	No description offered. Landholder expressed concern that once weir is raised, this crossing may be inundated and they will not be able to access country across the other side of Melaleuca Creek.
Island Camp	Series of internal gully crossings to the west of the property (AMTD 287—290) (ID 37)	Most days (3 to 4 days per week)	To access grazing land and to check on cattle	3 months to 6 months a year. Seasonal.	No alternate access for vehicles—have to use horseback or go through other property.	Nil available (horseback).	Landholder stated that at 50 to 55 feet of water all these crossings are out. Landholder would like to see these internal crossings retained as their business and lifestyle would be affected if they couldn't use these crossings to access paddocks with vehicles.

Property	Crossing identified	Usage	Purpose	Frequency crossing un-trafficable	Alternate route	Additional time/ distance/cost	Details
Yarra	Internal crossing (ID 17)	8 trips per week	To manage share-farming on property south of river.	2 to 4 weeks per year	Riverslea Crossing	Extra hour and a half approximately	This crossing is located over the Fitzroy River between the Yarra and Tarrawong properties at around AMTD 296. It was described as a low lying road over dirt approximately 100 metres wide. Landholder said it would likely be too costly to place a bridge over the crossing, instead suggesting compensation as the only option if the crossing was inundated.
Duaringa Station	Internal crossing over Bone Creek, parallel to boundary between property 8KM36 (ID 39)	2 or 3 times a week while farming the area	To access property below Bone Creek.	Only in serious downpour (once in four years)	Via Aroona Road	Extra half an hour	Gravelled road over dirt crossing that is at least 90 foot wide (the width of the machinery transported over it).
Mourangee	Internal crossing (ID 20)	Once or twice a year (for a month)	To shift grain within property.	Twice a year approximately	Boolburra Crossing	Extra half hour each way	Crossing is pipes in the creek—low lying. Located between Mourangee and property number 1k405. Half a meter of water in crossing and it is un-trafficable.

Other landholder comments

Landholders raised a number of issues during the consultation phase that did not relate purely to access issues for the crossings within this study's scope. Landholders were advised that these issues would be passed to NRW for consideration. Landholders were also advised to speak to NRW if they wished to discuss these issues further. Issues raised issues included the following:

- A number of landholders were concerned about inundation of their land, particularly low lying river frontage and land along gullies. One landholder had serious concerns that they would lose 'half their property (under 40–50 ft of water) if the weir goes in'. Other landholders said it would create significant areas of the property that would be flooded depending on the height of the weir, and that raising the weir would affect the workability of property, particularly for the low-lying country that fronts the river
- A number of landholders raised concerns about flooding of internal property gullies (rather than river crossings) isolating sections of their property, causing additional work during the harvest season, or affecting the property's general entry
- Two landholders expressed concern that watering of cattle may be affected by raising the weir, for example reduction in access to gentle slopes/shallow depths for easy access. Gravel ramps or offstream watering points have apparently been raised as possible solutions in the past
- One landholder was worried about mud on riverbanks when water is let out of the weir; that the raising of weir will create a more significant problem of cattle trying to reach the river to drink, bogging in the river banks and crocodiles eating them
- One landholder said Thirsty Creek Road should be improved as is dangerous in its current state
- Some landholders expressed support for the weir raising.

1.2.3.3 Agency consultation

A number of agencies with significant interest or knowledge of access issues in the study area were approached as part of this project. The agencies contacted as part of this study are:

- Fitzroy Shire
- Livingstone Shire
- Duaringa Shire
- Woorabinda Pastoral Company
- Gladstone Pacific Nickel Limited
- Department of Main Roads
- Department of State Development
- Department of Infrastructure (now Department of Infrastructure and Planning)
- Department of Primary Industries and Fisheries.

The last three were particularly identified because of their involvement in the Fitzroy Industry and Infrastructure Study.

A standard set of questions were asked of each agency, as shown below (Figure 1-16).

Figure 1-16 Agency survey template

1. Traffic Plans/Studies and/or Development Plans/Studies

Do you have any plans or studies that have been undertaken related to transport, or development that has transport implications, in the area potentially affected by these weir developments?

2. Traffic data

Do you have any traffic counts or estimates for the roads potentially affected?

3. Crossing data

Do you have plans of existing crossings in the area, or records of deck levels? Have you undertaken any studies looking at crossing upgrades? Are the any other crossings in your area not shown on the map?

4. Flooding data

Do you have any information on the closure of crossings/roads (timing, duration, frequency) owing to flooding in the Mackenzie/Dawson/Fitzroy?

5. Current transport issues

Are there any current transport issues in the area? For example, access by emergency services, mining and industry development, etc.

6. Desired transport options

What do you see as being the desired development of road transport in the area? e.g. desired new crossings? improved flood immunity, etc.

7. Other

Are the any other transport related issues you can think of potentially related to these weir developments?

Each agency was asked these questions in a phone interview. In some cases follow up phone calls, emails, or meetings were used to confirm and expand the information provided. The key findings from the agency consultation are presented below:

- Fitzroy Shire Council indicated they would not support any decrease to the current level of service provided by the roads due to increased flooding or inundation from the weir proposals without extensive community consultation
- None of the Councils had traffic studies or development plans for the study area. Capital works programs included minor allowances for paving small sections on shire roads in the study area
- Traffic data on the main highways and some of the major shire roads was available
- MR provided plans of the major highway crossings. Plans of the existing shire crossings were rare
- Flooding information and road closure information was not generally available, other than the records available from the Riverslea Gauging Station
- Fitzroy Shire maintains property access roads on the western side of the river, but does not maintain the connecting roads from Foleyvale Crossing to Riverslea Crossing and to Glenroy Crossing on the western side of river
- A recognition of strong community desire for improved flood immunity for crossings. A high level bridge would be a big improvement in the standard of living
- Woorabinda Pastoral Company intends to develop their properties and indicated their use of the Foleyvale Crossing will significantly increase. In the past the Woorabinda Pastoral Company has suffered losses due to lack of road access for grain trucks, with the harvested grain rotting while the Foleyvale Crossing was un-trafficable. They expressed a strong desire to see the crossing upgraded
- Gladstone Pacific Nickel Limited plans to develop a haul road crossing within the Coorumburra property over Marlborough Creek from some of the mining pits to the beneficiation plant. A slurry pipeline is planned under the bed of the Fitzroy River. They are concerned about the impact of the weir on the internal property crossing to Horseshoe Lagoon and about the need for Coorumburra Road (the Glenroy–Marlborough Road) to be upgraded for heavy traffic. They also expressed a desire to see Glenroy Crossing and crossings on Glenroy–Marlborough Road improved
- MR indicated there are issues with periodic (20 year) major flood events at the Fitzroy River Floodplain just to the south and west of Rockhampton. Rockhampton also has looming capacity issues with the Bruce Highway through the city and the bridges. A third crossing, in addition to the two in Rockhampton, is necessary to cope with traffic growth. One possible location for a crossing of the Fitzroy River would be just downstream of the Eden Bann Weir near Canoona (approximately AMTD 121). MR recommends considering this option as an alternate to replacing Glenroy Crossing
- MR is concerned about the effect Rookwood Weir may have on the flood immunity of the Dawson Bridge of the Capricorn Highway (shown in Figure 1-17). They are also concerned about the potential impact of water pipeline corridors on road corridors. They also state that construction traffic for the weir proposals needs analysis

- The Department of State Development, Department of Primary Industries and Fisheries and Department of Infrastructure provided details on the Fitzroy Industry and Infrastructure Study. Current crossings of the river are not reliable enough for intensive agriculture to expand on the western side of the river, even though there are appropriate soils. Intensive agriculture requires good access for the delivery of inputs (such as grain) and for transport of their product to market. (Further details on this study are included in Section 2.1 and in Appendix B.)

Figure 1-17 Capricorn Highway Crossing of the Dawson River

The full responses by each agency are included in Appendix C.

1.2.3.4 Consultation conclusions

The major conclusions drawn from the consultation phase of the project include:

- Based on the consultation with landholders and agencies, there is a very strong desire for the raising of the major bridges in the area, Riverslea, Glenroy and Foleyvale and to a lesser extent for Boolburra
- Most crossings are used for farm management purposes, including journeys between properties, within properties, and between properties and services in Rockhampton. Reduction in the serviceability of these crossings will have significant farm management consequences. These consequences include: additional time and costs, increased stress and risk to stock, safety risks in increased boat crossings, difficulties in mustering stock and moving machinery, difficulty in moving products to market, difficulties for accessing services (shops, schools, mail, emergency services), and restriction of social activities
- Recollections of the frequency of crossing inundation varied between landholders. However, it is apparent that most of the main river crossings in the area are inundated on a semi-regular basis, typically for a number of months in most years
- There was a strong desire to continue to be involved in future consultation processes for the weir developments, both from landholders and some of the agencies. There appears to be desire from landholders from outside the riparian zone to be involved in consultation

- Consultation with the Department of State Development, the Department of Primary Industries and Fisheries and the Department of Infrastructure (and the review of relevant reports in Appendix B Section 3) indicates that the proposed developments in the FIIS will involve a significant increase in the traffic in the area. The proposed development areas are mostly on the eastern side of the river due to the poor flood immunity of the river crossings. It is expected that if the crossings over the Fitzroy River were improved, then a significant proportion of this development could occur on the western bank (perhaps 25–50 %)
- A significant number of additional crossings were identified through the consultation process. While most of these crossings are low-level internal crossings over creeks and gullies, they may in total result in a significant additional cost.

At the completion of the data review and consultation phases of the project, 21 crossings had been identified that fell within the scope of the study. Details of these crossings sourced from the data review (particularly from Keane 2004), the consultation process and the site inspection are summarised in Table 1-4.

1.2.5 Road network and traffic analysis

1.2.5.1 Existing conditions

To ensure the local and strategic importance of each crossing could be correctly evaluated, a basic review of the existing road network and traffic volumes was undertaken.

The existing road network in the region is largely controlled by Fitzroy Shire Council, with the exception of private access roads, the Aroona Road/Boolburra-Edungalba Road in Duaringa Shire and the state controlled Duaringa-Apis Creek Road (Rd 5101). Two state controlled highways bracket the study area, the Capricorn Highway (Rd 16A) to the south and Bruce Highway (Rd 10F) to the north-east. A site visit to the region confirmed that the road network is generally composed of unsealed rural roads, with poor horizontal and vertical alignment. The condition of these roads is typically such that vehicles could not travel safely over a speed of approximately 60 km/h. A typical shire road is shown in Figure 1-18.

Figure 1-18 Typical shire road

Table 4.1 Crossing details

ID	Crossing Name	Owner	Watercourse	Fitzroy R AMTD (km)	Description/Dimensions	Serves	Alternate (Existing)	Previously Proposed Solution	Other Details
1	Glenavon Access Track	Private	Princhester Creek	153.5	Concrete culvert	Internal property access	none	New alternate track (up to $1.5m Keane s8.10)	Existing culvert was constructed when Eden Bann Weir was built.
2	Glenroy-Marlborough Road: Green Creek	Fitzroy Shire	Green Creek	180-183	Earth embankment, no culvert	Journeys north to Marlborough. Alternate route to Rockhampton for west bank.	none	New culverts (or shift road west)	
3	Glenroy-Marlborough Road: The Islands	Fitzroy Shire	The Islands floodrunner	180-183	Earth embankment, no culvert			New culverts (or shift road west)	
4	Glenroy-Marlborough Road: Ten Mile Creek	Fitzroy Shire	Ten Mile Creek	180-183	Concrete causeway			New culverts (total for 3 $0.32m)	
5	Redbank Crossing	Private	Fitzroy River	183.3	Ford - stabilised with 30m line of sheet piling.	Internal property access	Glenroy Crossing - ~30kms extra one way; for higher floods, via Marlborough/Rockhampton, 200kms one way.	R+I17emediation ~$0.3m	Stabilised river ford provided for existing Eden Bann. Also involved stabilisation of ford across Ten Mile Creek.
6	Melrose Bottom Crossing	Private	Fitzroy River	191.5	Natural ford	Internal property access, cattle & bulldozers	Glenroy crossing a short distance upstream (not preferred for cattle).		
7	Glenroy Crossing	Fitzroy Shire	Fitzroy River	193	190 m causeway, 4.9m wide, 2x 3.6x2.4mculverts, 20x1.2 diameter pipes + a number of smaller pipes	12-14 properties access to Rockhampton	Via Marlborough - 2.5 hrs extra one way.	Raise with box culverts or new bridge (preferred) ~$3.2m	
8	Craiglee Crossing	Private	Fitzroy River	205.2	Low level concrete crossing, ~70m long across low flow part of river, appears to have good rock foundation.	access between two neighbouring properties (Craiglee & Homehill), cattle retrieval, mail delivery	Glenroy Crossing - 30kms extra one way, for higher floods, via Marlborough/Rocky, 200kms one way.	Small impact - no action	
9	Hanrahan Road Crossing	Fitzroy Shire	Fitzroy River	248.7	600m along bed of river, concrete causeway over low flow.	Legal access to 2 properties, visiting campers	Access through neighbouring properties.	Small impact - no action	
10	Thirsty Creek Road	Fitzroy Shire	Fitzroy River gullies	265-268	Proposed Access to PDA 7. Access to several properties, and likely construction road for Rookwood Weir.	PDA 7	Access through neighbouring properties may be possible.		
11	Rookwood Crossing	Private	Fitzroy River	266	Natural ford	Camping reserve, internal property access	Riverslea Crossing	No replacement, no compo	Right bank land is leased from government. Usage of crossing mostly private in nature
12	Riverslea Crossing	Fitzroy Shire	Fitzroy River	276	120m gravity causeway, bridge over low flow.	Only legal access to 11 properties	Through neighbour's private tracks, or by boat.	New bridge, 4m above FSL, ~$5m	60 vehicles/day. Locals are very keen on a new bridge here.
13	The Pocket 4WD Access	Private	Melaleuca Creek	276.5	Rock bar, site inspection indicates ordinary car could cross.	Short-cut access to 2 properties	Smith Road Crossing, extra ~15 kms.	none	
14	Smith Road Crossing	Fitzroy Shire	Melaleuca Creek	276.5	Bridge	5 properties	Property tracks from Foleyvale	none	
15	Island Camp Island	private	Fitzroy River	283-285	200ha island, cleared and developed.	internal property access	none	200m causeway, $0.11m (Keane s23.4)	Already isolated by moderate floods.
16	Jackson Road	Fitzroy Shire	Fitzroy River gullies	286-292	Proposed Access to PDA 9. This road does not currently extend to the area area of the gullies near the Fitzroy R, although there is a road reserve.	PDA 9			Part of this road may overlap with the private road for ID 37.
17	Yarra - Tarrawong crossing	Private	Fitzroy River	296	Low lying road over dirt, 100m wide across river.	Share farming between Yarra and Tarrawong properties	Riverslea Crossing - extra 1.5 hrs	Landholder proposes too costly for bridge, suggests compensation	
18	Separation-Slatey Creek Crossing	Private	Fitzroy River	307.5	Low crossing	Share farming across river	Foleyvale Crossing	No replacement, no remediation	
19	Foleyvale Crossing	Main Roads	Mackenzie River	323.5	18 semi-circular arches, 1.8m diameter with causeways either side.	A number of properties	Private tracks to Riverslea	Upgrade private tracks to public access - not costed	Main Roads investigated replacement bridge in 1985.
20	Mourangee Dawson River Crossing	Private	Dawson River	10	Low lying crossing over pipes in the river, between Mourangee and RP 1K405.	Neighbours use crossing to shift grain	Boolburra Crossings is a few kms upstream, extra half hour.		
21	Boolburra Crossing	Duaringa Shire	Dawson River	15.8	Earth track across stream, single pipe below poorly maintained concrete causeway.	Between local properties, railway workers	Capricorn Highway	none	

Appendix D contains traffic network plans for the study area, with roads classified into highways, regional roads, district roads, and access roads. A brief description of this road classification is as follows:

- Highways and regional roads: These roads are state controlled and serve to link major centres. They primarily carry high volumes of through traffic and have limited access points
- District roads: These roads provide links to access roads and primarily carry through traffic. In some instances, direct property access off these roads may occur
- Access roads: These roads provide direct access to properties and are controlled by the relevant local council.

The traffic figures shown for each of the 21 crossings on the plans in Appendix D were derived from community consultation, and the Average Annual Daily Traffic (AADT) values shown on roads were obtained from the local Councils and Department of Main Roads. The mean monthly traffic volumes indicated on the crossings are thus likely to be low, as the actual amount of crossing traffic will be significantly higher due to regional traffic movements, particularly for the shire and state controlled roads. These plans illustrate the limited nature of the road network on the western side of the Fitzroy River.

The traffic volumes in the region are quite low, with AADT's numbering around 60 vehicles. There are expected to be significant fluctuations in the traffic volumes from seasonal effects, particularly since nearly all of the riparian crossing users are primary producers.

The Glenroy, Glenroy-Marlborough, Riverslea and Rosewood Wycarbah roads were considered to be district level roads and as such, any crossings located on these roads are of significant strategic importance. Whilst the AADT traffic volumes are below the volume normally expected for district level roads, they serve the purpose of district roads for the regional network of this area.

Glenroy Road connects to Glenroy–Marlborough Road, providing a route north to the township of Marlborough. The crossing volumes indicated by the community consultation are significantly lower than the expected amount of traffic on the Glenroy–Marlborough Road, and no Council traffic counts were available. Glenroy-Marlborough Road does provide an important connection, being the only road access to many properties on the western bank of the Fitzroy River in times of flood.

The Foleyvale Crossing is located on the state controlled Duaringa-Apis Creek Road, and is also considered to have significant strategic importance, providing the first significant north-south link between the Capricorn Highway and the Bruce Highway/Marlborough-Sarina Road west of Rockhampton. Therefore, it is considered important to maintain or improve the level of service at this location.

Boolburra Crossing is located on the Duaringa Shire Road of Aroona Road/Boolburra-Edungalba Road. A traffic count in the vicinity of the crossing of 15 vehicles per day was provided by Duaringa Shire. Additional information would be required to correctly establish the position of this road on the hierarchy. For the purposes of this study it was estimated to be an access road.

Thirsty Creek Road, Smith Road and Hanrahan Road are also owned and maintained by Fitzroy Shire Council and are considered to be access roads.

1.2.5.2 Considerations for future traffic growth

From the review of previous studies and the agency consultation, two developments which could significantly increase the traffic volumes in the region were identified. These are the Marlborough Nickel Mine to the north of the Fitzroy River and the Potential Development Areas (PDA) indicated in the Fitzroy Industry and Infrastructure Study.

The Marlborough Nickel Mine is expected to create significant additional traffic on the Glenroy–Marlborough Road and traversing Glenroy Crossing. Traffic on the Glenroy–Marlborough Road could be even further increased if the option to transport the ore by truck to Marlborough and then by train to Gladstone is selected over the currently preferred slurry pipeline option.

The PDAs are expected to contain feedlots, horticulture, and piggeries. A considerable amount of traffic will be generated by vehicles required to operate these industries. The existing roads in the study area identified as likely to carry this additional traffic include:

- Jackson Road
- Riverslea Road
- Thirsty Creek Road
- Rosewood Wycarbah Road
- Atkinson Road.

Further details on these potential developments can be found in the report reviews in Appendix B of this report.

The aforementioned developments were taken into account in evaluating the strategic importance of these crossings, and have provided additional support for the replacement of the identified crossings. However, for the purposes of this study, no additional costs have been included solely to meet the requirements of these potential future developments.

Synergies between potential future developments in the area and the construction of the weirs should be sought in future investigations, with the aim of minimising costs and ensuring that an appropriate level of flood immunity is achieved.

1.2.6 References

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1.2.7 Appendices

1.2.7.1 Appendix A Maps

- Figure A1: Regional map
- Figures A2 – A11: Detailed maps

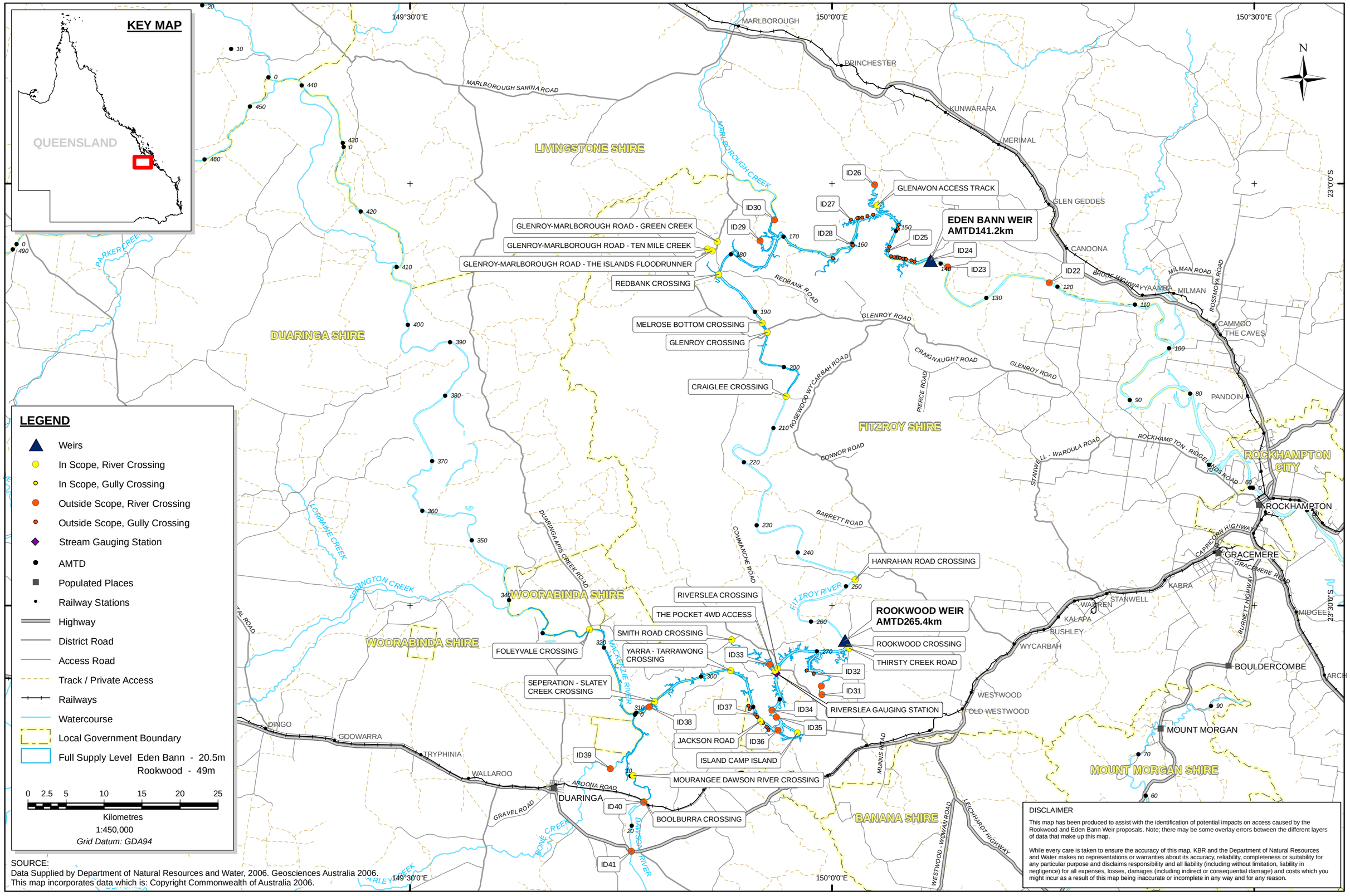

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Figure A.1
REGIONAL MAP

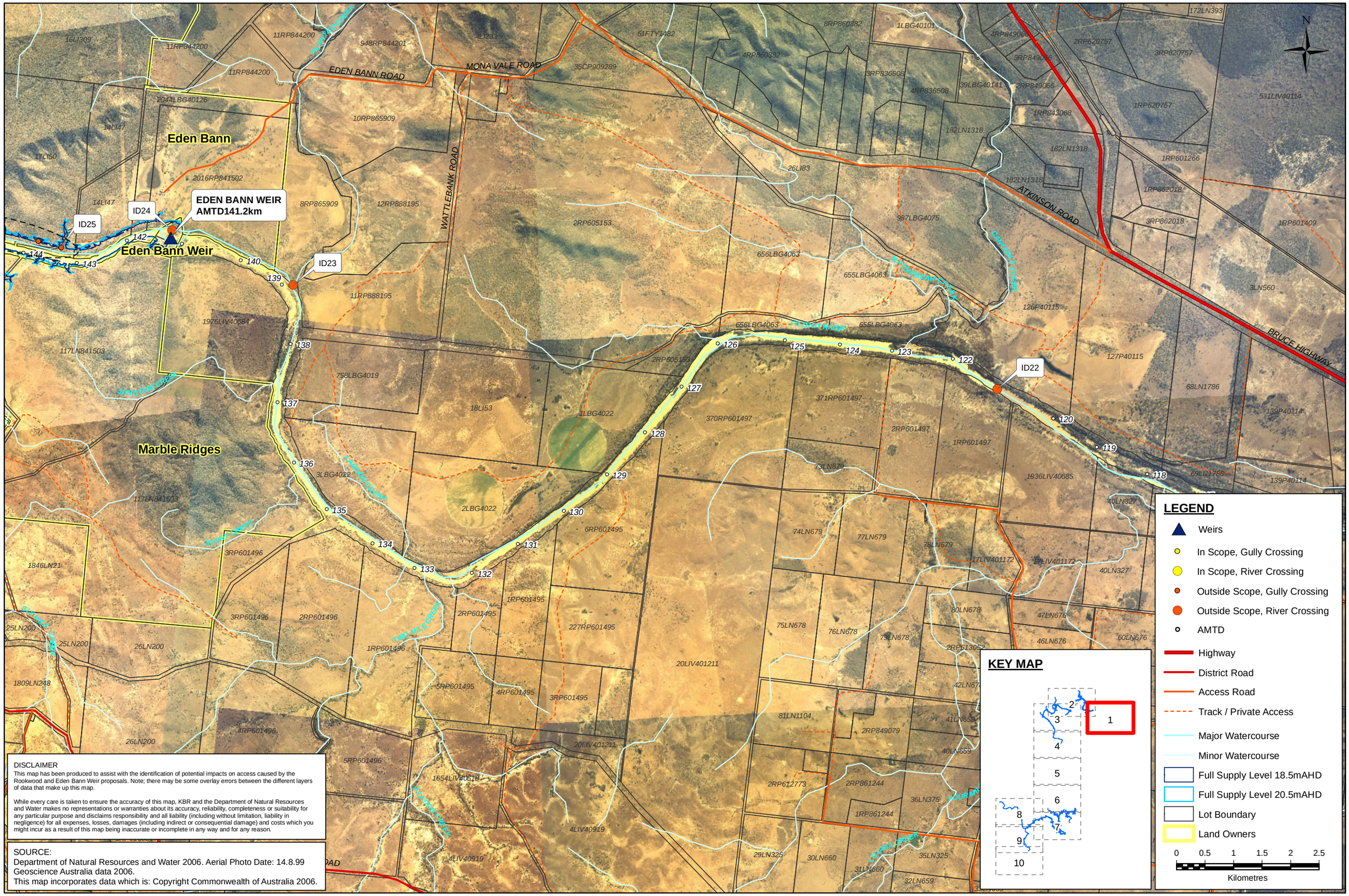

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Figure A.2
EDEN BANN WEIR
SHEET 1 OF 10

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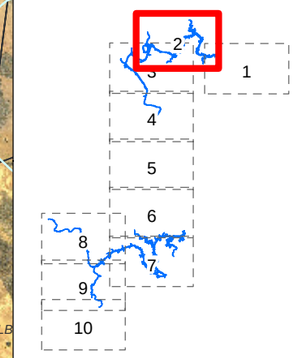
KEY MAP



LEGEND

- Weirs
- In Scope, Gully Crossing
- In Scope, River Crossing
- Outside Scope, Gully Crossing
- Outside Scope, River Crossing
- AMTD
- Highway
- District Road
- Access Road
- Track / Private Access
- Major Watercourse
- Minor Watercourse
- Full Supply Level 18.5mAHD
- Full Supply Level 20.5mAHD
- Lot Boundary
- Land Owners

0 0.5 1 1.5 2 2.5
Kilometres

Coorumburra
Glenavon
Mt Fairview
Eden Bann
Bannockburn
Aricia State Forest
Redbank
Marble Ridges
Eden Bann Weir

ID24 ID25 ID26 ID27 ID28 ID29 ID30

GLENAVON ACCESS TRACK

EDEN BANN WEIR
AMTD141.2km

CORRUMBURRA ROAD
REDBANK ROAD
FAIRVIEW ROAD
EDEN BANN ROAD

MOUNTAIN HUT CREEK
HAWTHORN CREEK
BOOBY CREEK
SIX MILE CREEK

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Figure A.3
EDEN BANN WEIR
SHEET 2 OF 10

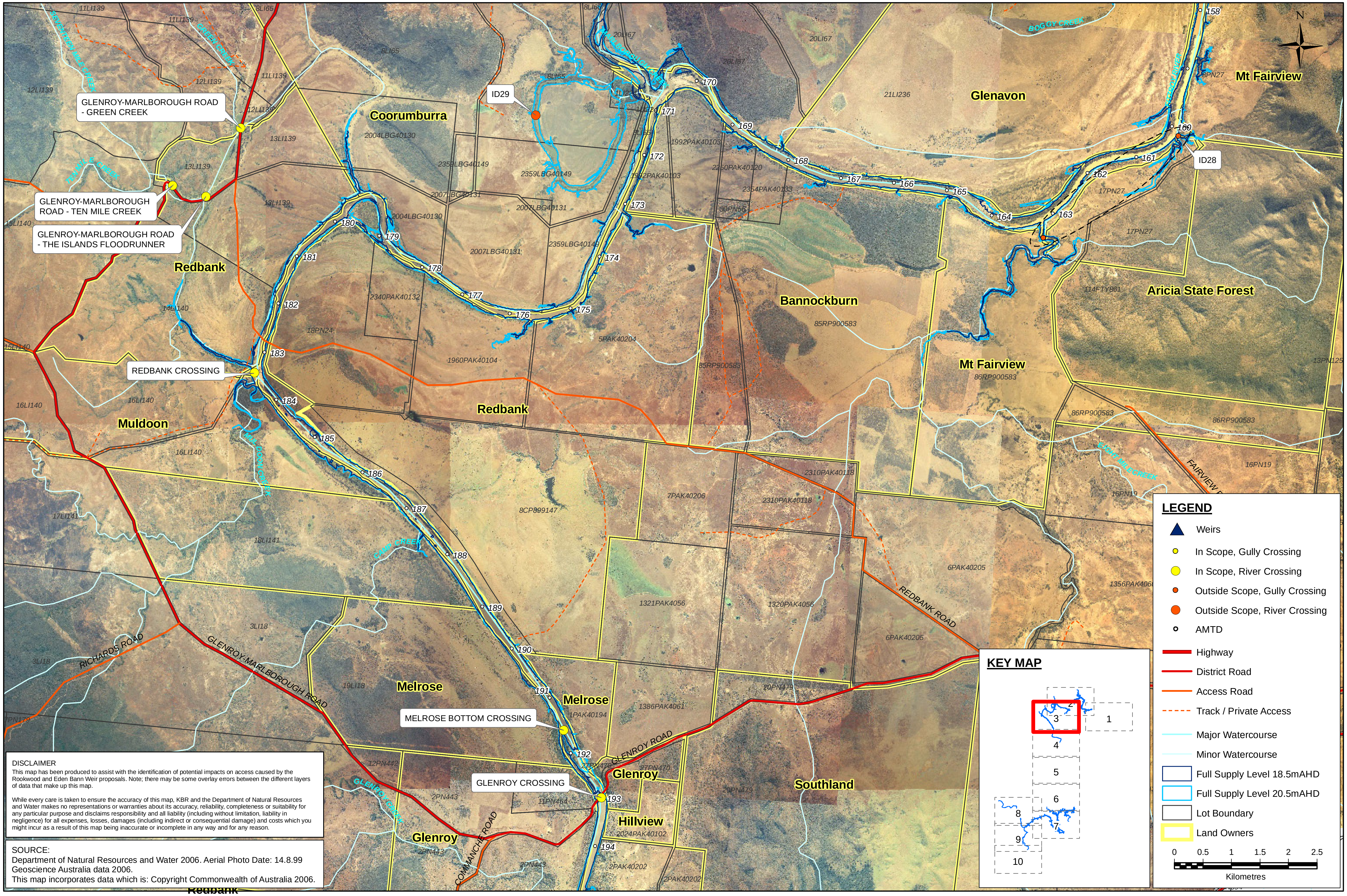

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Figure A.4
EDEN BANN WEIR
SHEET 3 OF 10

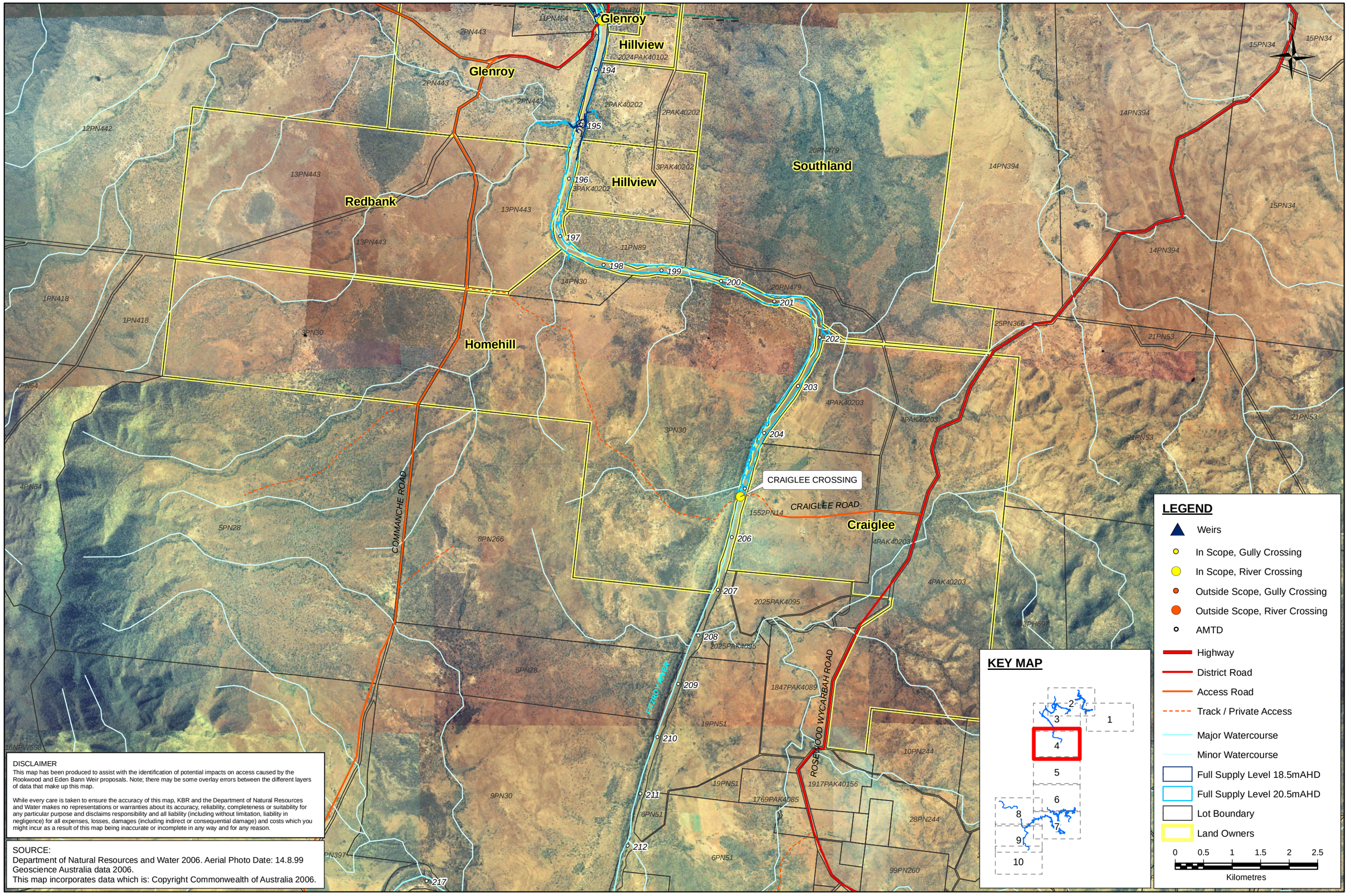

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Figure A.5
EDEN BANN WEIR
SHEET 4 OF 10

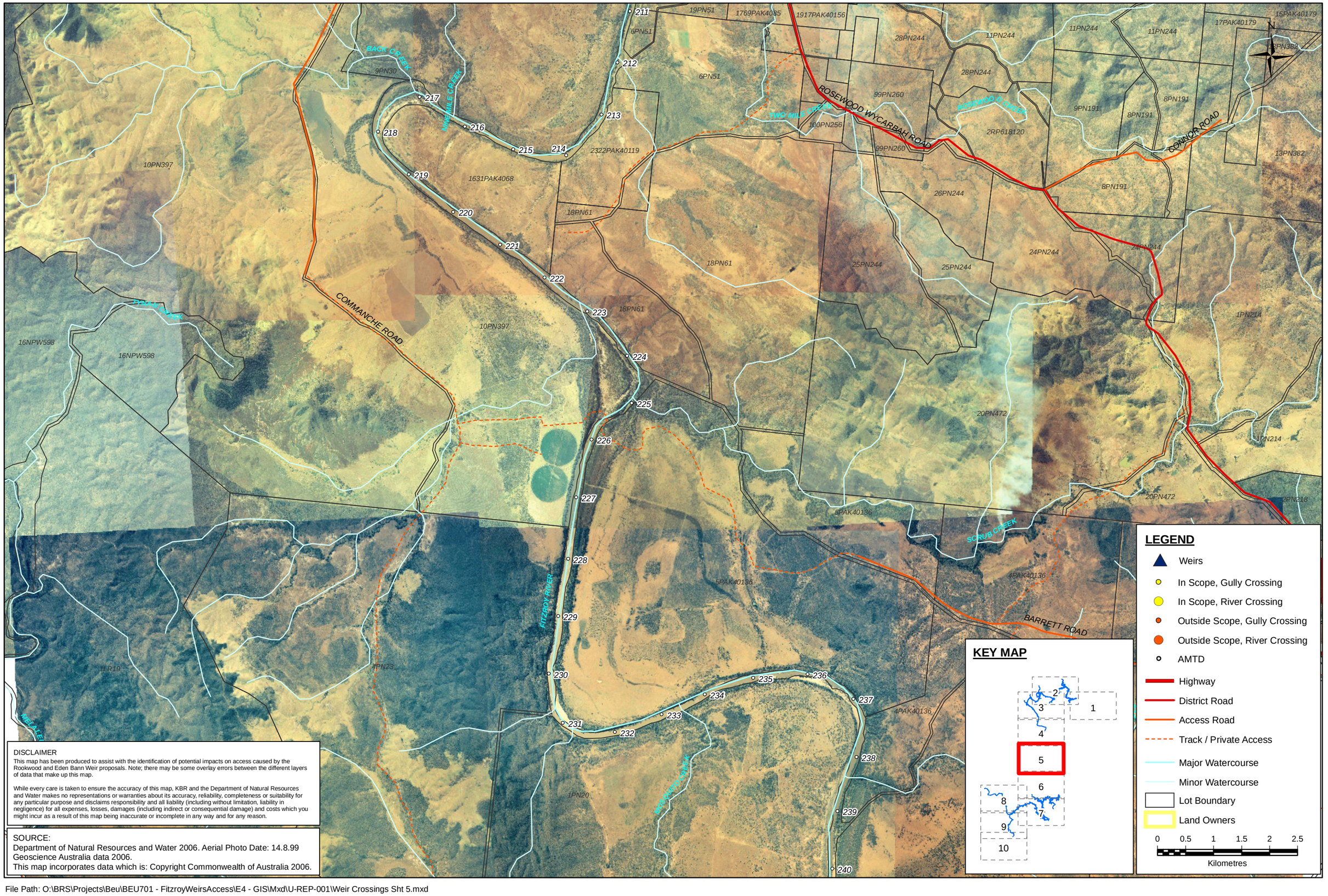

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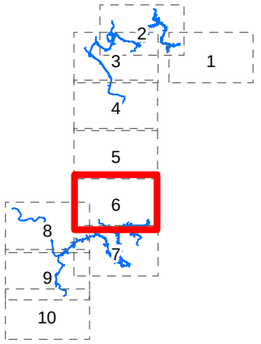
Figure A.6
EDEN BANN WEIR / ROOKWOOD WEIR
SHEET 5 OF 10

LEGEND

- Weirs
- In Scope, Gully Crossing
- In Scope, River Crossing
- Outside Scope, Gully Crossing
- Outside Scope, River Crossing
- AMTD
- Highway
- District Road
- Access Road
- Track / Private Access
- Major Watercourse
- Minor Watercourse
- Full Supply Level 47mAHD
- Full Supply Level 49mAHD
- Lot Boundary
- Land Owners

0 0.5 1 1.5 2 2.5
Kilometres

KEY MAP



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Geoscience Australia data 2006.
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N

HANRAHAN ROAD CROSSING
ROOKWOOD WEIR
AMTD265.4km
ROOKWOOD CROSSING
SMITH ROAD CROSSING
THIRSTY CREEK ROAD

COMMANCHE ROAD
MOSQUITO CREEK
HANRAHAN ROAD
MELALEUCA CREEK
SMITH ROAD
YARRA ROAD
ROOKWOOD ROAD
WEIR PARK ROAD
THIRSTY CREEK ROAD
FITZROY RIVER

Melaleuca
Llandilla
Yarra
Fitzroy Pocket
Riverslea
Coolabah
Weir Park

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Figure A.7
ROOKWOOD WEIR
SHEET 6 OF 10

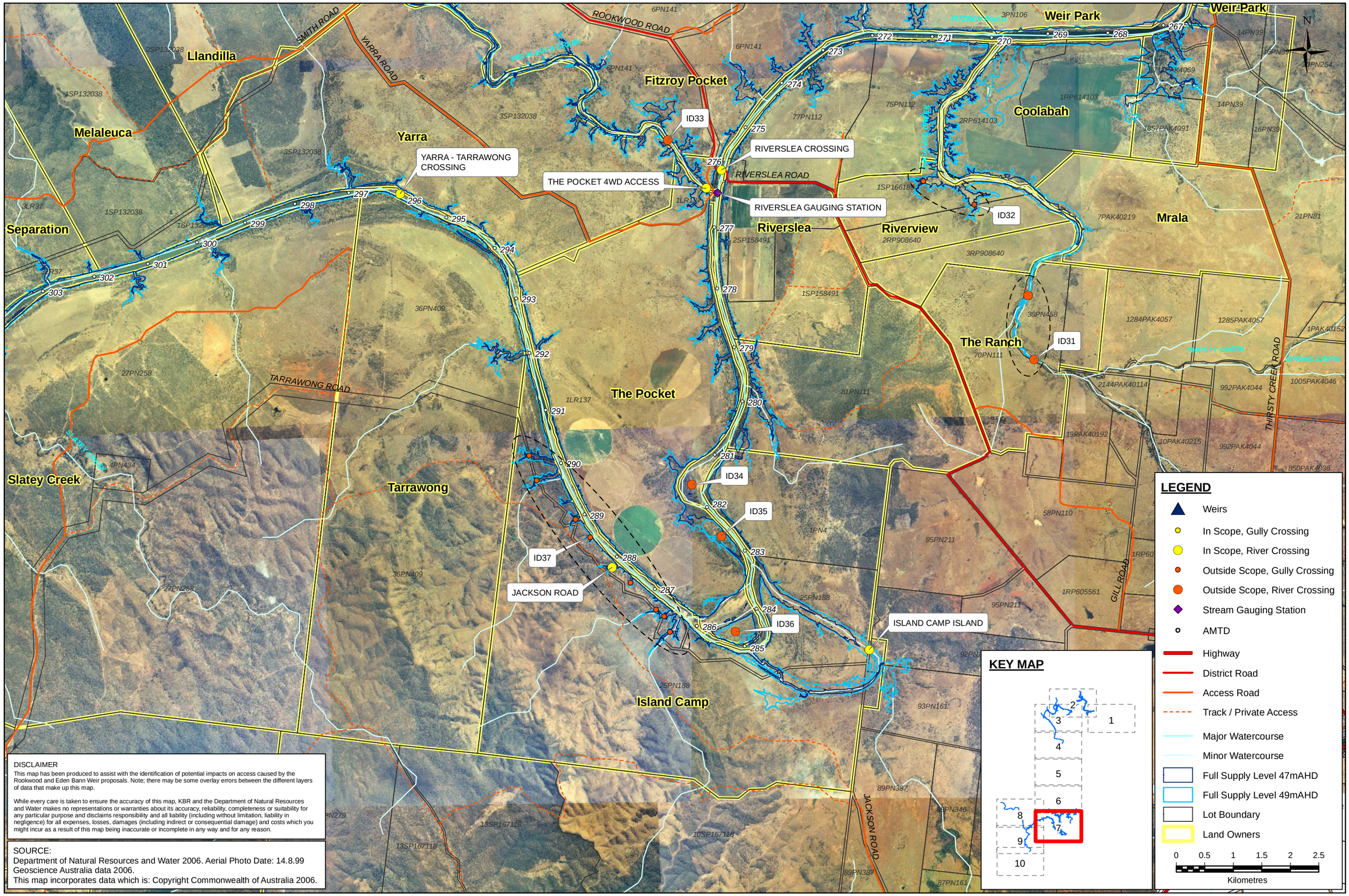

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Figure A.8
ROOKWOOD WEIR
SHEET 7 OF 10

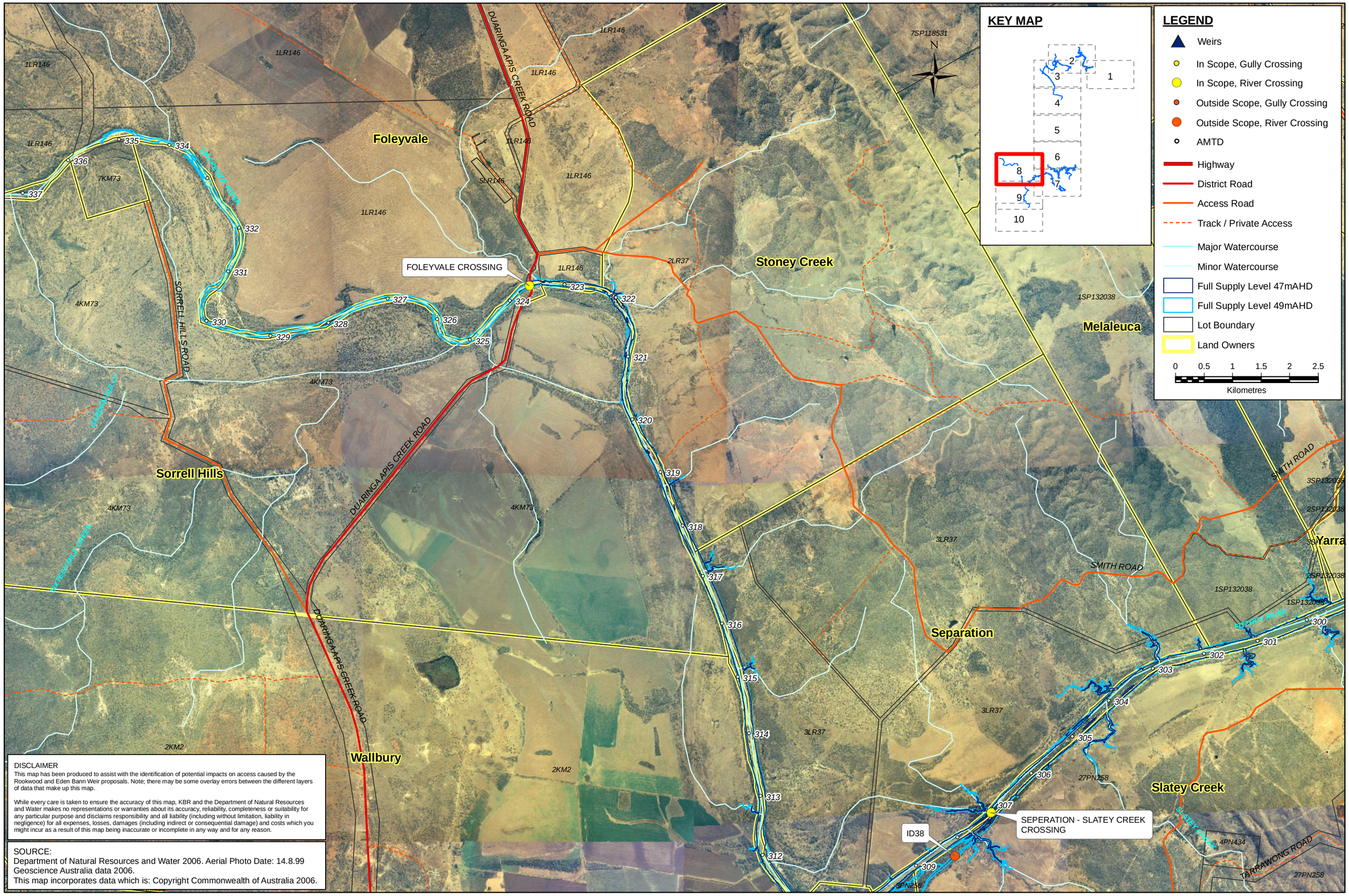

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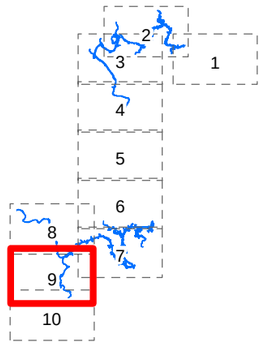
Figure A.9
ROOKWOOD WEIR
SHEET 8 OF 10

LEGEND

- Weirs
- In Scope, Gully Crossing
- In Scope, River Crossing
- Outside Scope, Gully Crossing
- Outside Scope, River Crossing
- AMTD
- Highway
- District Road
- Access Road
- Track / Private Access
- Major Watercourse
- Minor Watercourse
- Full Supply Level 47mAHD
- Full Supply Level 49mAHD
- Lot Boundary
- Land Owners

0 0.5 1 1.5 2 2.5
Kilometres

KEY MAP



SEPERATION - SLATEY CREEK CROSSING

ID38

ID39

MOURANGEE DAWSON RIVER CROSSING

ID40

BOOLBURRA CROSSING

Separation

Slatey Creek

Donovan's Block

Duaringa Station

Mourangee

Glencoe

Ilbury

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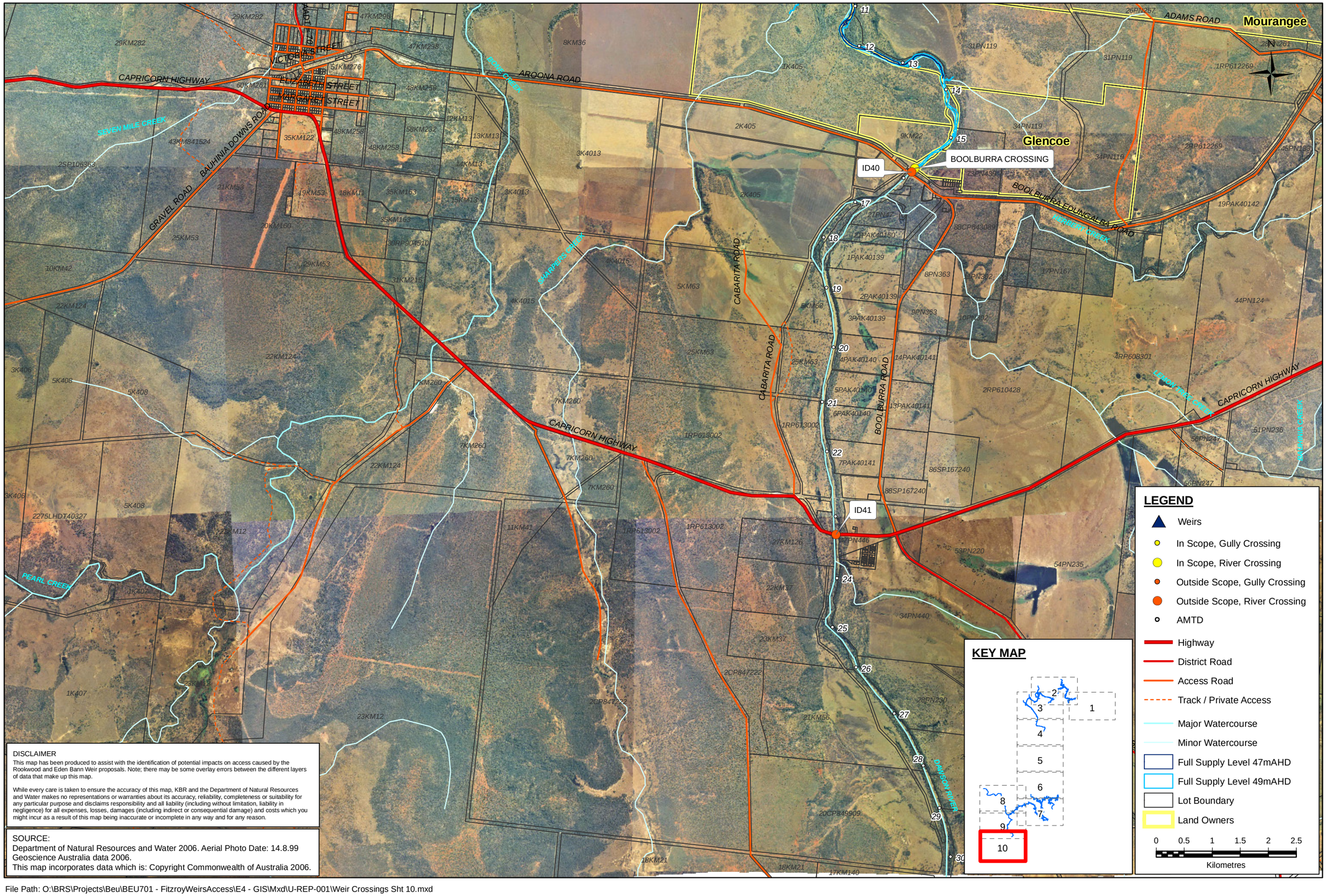

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Figure A.11
ROOKWOOD WEIR
SHEET 10 OF 10

1.2.7.2 Appendix B Previous report reviews

- Marlborough Nickel Project (1999 – 2007)
- Assessment of potential social and non-indigenous cultural heritage impacts of proposed new water infrastructure on the Lower Fitzroy River (M Cook et al, Jan 2007) (Draft)
- Fitzroy Industry and Infrastructure Study (The Coordinator-General, 2005-6)
- Final combined report – pre-feasibility comparison of the Central Queensland Regional Water Supply Study options (Western M et al, Sept 2005)
- Capricornia Integrated Regional Transport plan 2004-2030 (Qld Transport and Main Roads, 2004)
- Fitzroy River Weir Study (ML Keane, June 2004)
- New bridge over the Fitzroy River at Riverslea Preliminary Design report (KBR, Dec 2003)
- Initial environmental evaluation – Lower Fitzroy River Weirs and Mt Bridget Dam, Connors River (Hyder, July 1999)
- Fitzroy River Weir Study HEC-RAS Analysis (NR&W 1998)
- Planning report – upgrading proposals for Mackenzie River bridge and approaches (Main Roads July 1989).

Appendix B
Previous Report Reviews

1. MARLBOROUGH NICKEL PROJECT (1999-2007)

A number of reports related to this project have been reviewed, as detailed below.

Gladstone Nickel Project - Environmental Impact Statement (URS, April 2007)

This EIS is for a Nickel/Cobalt Refinery near Gladstone. It includes a 180km slurry pipeline from the mine site near Marlborough. Details from this EIS of note include:

- The slurry pipeline is planned to tunnel below the Fitzroy R just upstream of its junction with Marlborough Ck (~AMTD 171 km).
- An alternative to the pipeline is to transport the ore by truck north to Marlborough and then by rail to Gladstone. While the slurry option appears to be preferred, the rail option has not been ruled out.
- The traffic attributable to pipeline construction will have no significant (less than a 5% impact) on road pavements. 300 Workers will be housed at 3 worker village sites with one near the Fitzroy River. Pipes will be delivered to the sites by semi-trailer (2600 truck trips, each 22t, over 8 months = 10-17 truck trips/day). Local traffic estimated at 30 4WD trips/day. A further 200 truck trips will be required for mobilisation and demobilisation together with 100 semi-trailer trips to establish the workers villages. While not clear in the report, some of this construction traffic is likely to cross the river, possibly via the Glenroy Bridge.
- Traffic associated with the refinery neat Gladstone is also detailed.

This report does not discuss traffic associated with the mine site, rather, this is included in the reports below.

Marlborough Nickel Project - Environmental Management Overview Study (Marlborough Nickel Pty Ltd 1999)

This document was prepared to meet the requirements of the Mineral Resources Act 1989, and covers the mine and refinery. At the time this report was prepared the refinery was proposed to be sited at the mine (rather than near Gladstone as in the 2007 report). The report indicates the mine has an estimated life of 25 years, and covers an area of about 77 km^2 near Marlborough Ck. Other details of note in this study include:

- The short term construction workforce is estimated to peak at 1200 workers, with construction over 14 months, with workers housed near the site.
- The operational workforce is estimated to be 200 workers over 20 years.

These figures include workers for the refinery co-located at the mine, and thus the current proposed workforce is likely to be less.

Marlborough Nickel Project - Addendum to Environmental Impact Statement (Lagoon Hill Nickel Oct 1998)

This report was produced subsequent to the EIS for this project, and addresses a number of issues that were raised following the EIS. Details of note in this study include:

- Construction traffic will use Coorumburra Rd (also known as the Glenroy Marlborough Rd), and consequently will not cross the Fitzroy R.
- Of the 1265 construction workforce, 10-15% are expected to travel outside the site daily. Most workers will leave the site on Saturday and return on Sunday/Monday. The report estimate trips as 330 on weekdays and 1900 on weekends.
- Construction traffic estimated at 20-40 trucks/day.
- 250 person normal operational workforce. 130 expected to travel to site in company buses each day.

These figures also include workers for the refinery co-located at the mine, and thus the current proposed workforce is likely to be less.

Marlborough Nickel Project - Environmental Impact Statement (Lagoon Hill Nickel May 1998)

The EIS for the mine site, which also included an on-site refinery, contains the following additional details of note for this study:

- Indicates a rail spur may be built north to Marlborough for transport of bulk reagents and the product, however trucks may be used for the first 18 months while the spur line is constructed
- Road access to the site is proposed via the existing Coorumburra Rd (also known as the Glenroy Marlborough Rd) Upgrades to this road are proposed, including some realignment, although it will remain a gravel road.

2. ASSESSMENT OF POTENTIAL SOCIAL AND NON INDIGENOUS CULTURAL HERITAGE IMPACTS OF PROPOSED NEW WATER INFRASTRUCTURE ON THE LOWER FITZROY RIVER (M COOK ET AL, JAN 2007) (DRAFT)

This study, commissioned by NRW, identifies the significant social and non-indigenous cultural heritage issues, assesses their magnitude, and develops strategies to deal with the impacts. It provides a historical account of the development of the region.

The report identifies Glenroy Crossing and Riverslea Crossing, but does not find any cultural significance associated with these crossings.

The report identifies the following social issues relating to crossings:

- Inundation of Glenroy Crossing and Riverslea Crossing - causing longer journey times, increased transport costs, difficulties in mustering stock, and restriction of emergency access.

- Creation of islands - causing difficulties in moving stock and machinery. One landholder states that the increased difficulties in mustering cattle will make their property non-viable.
- Inundation of informal crossings - adding time and cost to cattle movements.

The report states that there are no significant social issues associated with the weir proposals on a macro scale, other than a collective apprehension about the weir projects. The report recommends consultation and the provision of information to alleviate these concerns.

3. FITZROY INDUSTRY AND INFRASTRUCTURE STUDY (THE COORDINATOR GENERAL, 2005-6)

This study has involved the identification of potential development sites in the Fitzroy area and the necessary infrastructure needed to ensure their successful implementation. Two main development sites have been identified:

- An industrial corridor along the Capricorn Highway between Gracemere and Stanwell. Preferred development for this area is light metals and rural processing.
- An agriculture corridor around the Fitzroy River from upstream of the Fitzroy Barrage to the junction of the Dawson and Mackenzie Rivers. Preferred development in this area is intensive animal husbandry.

The agricultural corridor is thus of great interest to this study. A map showing the development areas, courtesy of DIP, is shown on the following page.

Three reports emanating from this study have been reviewed, as detailed below.

Infrastructure Requirements Draft Report (October 2006)

This report discusses the likely common user infrastructure requirements for the identified industries. In the agricultural corridor the identified industries include feedlots, horticulture, and piggeries in 9 Potential Development Areas (PDAs).

Details of note in this study include:

- Each agricultural PDA has the potential to generate 170-510 truck trips/week (2 way). (One 15,000 head cattle feedlot is estimated to generate 170 truck trips per week.) Total number of trips estimated to be about 2480 trips/week (2 way). The report indicates the current transport network is unlikely to be able to meet this additional demand.
- The sequence of development starts with the north eastern part, PDA's 3, 4 and 5. PDA's 1, 2, and 9 are the last to be developed owing to the lack of existing road infrastructure.
- The total proposed development includes
  - 10-12 cattle feedlots capacity 15,000 head each
  - 20 to 30 large piggeries producing a total of 6,750,000 Standard Pig Units
  - Fodder crops - 3,750 to 4,500 ha (25-30 ha/head of cattle)
  - Horticultural crops - 3,500 ha

- Current 'design' speeds of existing gravel roads are about 60 km/hr. Most roads are single lane (3.5-5m wide), with some short wider sealed sections. Almost all culverts and bridges are low level, and subject to flooding. The condition of culverts and bridges are generally average, but quite a few show signs of rot and damage to abutments. Sub-standard visibility is common near culverts and bridges. Road drainage appears not to meet latest standards. Owing to this, the report concludes roads should be costed as new construction rather than a road upgrade. The report gives some specific comments on selected roads such as Riverslea Rd, Thirsty Ck Rd, Hanrahan Rd, and Ridgelands Rd.
- Costs of road development total $290 million. This cost based on a new trunk road (9m wide sealed carriageway) at $1300/m, new feeder road (6m wide sealed, 2x1m unsealed shoulders) $1,100/m. Costs includes a new bridge over the Fitzroy River below Eden Bann to access PDA 5. The construction cost of this bridge is approximately estimated at $3.4M, scaled to $5.4M including preliminaries and contingency. This new bridge is described as part of a new high level trunk road west of Rockhampton, joining the Atkinson Rd/Bruce Highway intersection with the Capricorn Highway near Stanwell.
- The proposed access to PDA 1 crosses Princhester Ck, in approximately the location of the Glenavon Access Track crossing. ("Un-named Road" in Figure 17 of the report).
- A number of other proposed access roads go close to the river and may cross gullies affected by ponding or flood effects. This includes:
  - Thirsty Ck Rd is nominated as the access for the southern part of PDA 7
  - Jackson Rd for PDA 9 (Road near the Fitzroy River appears to not exist at present)
- A ground truthing survey and photos of existing road conditions is presented in Appendix D and E.

Land Suitability Study (April 2006)

This report identifies areas to the west of Rockhampton that are suitable for agricultural development. Points of relevance to this study include:

- It identifies the 9 PDAs that are also used in the Oct 2006 report, although it is noted that some of the PDAs (PDA 7 & 8) are shown in the April 2006 report as extending slightly to the western side of the river, which would require the use of Riverslea and Hanrahan Rd Crossings.
- For feeder routes, such as would apply to the Riverslea and Hanrahan Rd Crossings, initial construction proposed is an 8m formation (unsealed), followed by 2 x 3m sealed lanes, and finally an 8.5m wide sealed carriageway.

FITZROY INDUSTRY AND INFRASTRUCTURE STUDY

NOT GOVERNMENT POLICY

FOR DISCUSSION PURPOSE

CONCEPT PLAN

Areas of greatest suitabilty for intensive livestock and horticultural developments

AGRICULTURAL CORRIDOR

INDUSTRIAL CORRIDOR

1

2

3

4

5

6

7

8

9

Bruce Hwy

Capricorn Hwy

Fitzroy River

Eden Bann Weir

Proposed Rookwood Weir

Glen Geddes

Rossmoya

Yaamba

The Caves

Rockhampton

Stanwell

Gracemere

Wycarbah

Westwood

Mount Morgan

Gogango

Grantleigh

Duaringa

0 15 30

kilometres

- The report examines a host of criteria, including: tenure, climate, environmental factors, soils, slope, flooding, water quality, and erosion risk. Initially the assessment appears to look at both sides of the river, but part way through the report the western side appears to have been dropped. (From consultation with DSD it is understood this refocus occurred because of the lack of road access to the western bank.) From an examination of the material presented it appears that, except for access, land on the western bank is just as suitable for feedlot development as that identified on the eastern bank.
- Appendix C of this report covers roads and access, with a detailed survey of the selected existing roads provided. Much of this appears to be updated and re-presented in the Oct 2006 report.

Transport and Access Report (May 2005)

This report documents earlier work on transport and access requirements for the FIIS. Much of the information in it is summarised and updated in the Oct 2006 report. Addition points of note include:

- Riverslea Rd, Thirsty Ck Rd, Rosewood Rd and Hanrahan Rd are all marked as "Feeder Routes" to the PDAs east of the Fitzroy River. Atkinson Rd is also marked as a feeder route to a potential development site to the north.
- This report classifies "Trunk Routes" as roads that provide the highest level function within the study area and a reasonably high-level of accessibility to the wider network. They are also expected to cater for slightly higher traffic volumes than other levels of the road hierarchy. One crossing of the Fitzroy River is identified as a trunk route, a high level crossing proposed downstream of Eden Bann Weir.
- "Feeder Routes" are classified as roads secondary to the Trunk Routes which provide access to the agricultural development areas from the Trunk Routes.
- "Access Routes" are classified as roads that provide the lowest function within the road network and will only carry very small levels of traffic and will not be constructed to a very high standard. The Access Routes were not identified nor costed within the Transport and Access Report.
- No consideration for development of the land to the west of the Fitzroy River is given in this report, and no feeder routes or access routes are identified as crossing the river within the study area, although some may cross affected gullies.
- Traffic volume assumptions were made, but they are not road specific. There is no breakdown between Trunk Routes and Feeder Routes for traffic volumes.

4. FINAL COMBINED REPORT - PRE-FEASIBILITY COMPARISON OF THE CENTRAL QUEENSLAND REGIONAL WATER SUPPLY STUDY OPTIONS (WESTERN M. ET AL, SEPT 2005)

This report, prepared for NRW, presents a result of a socio-economic and cultural pre-feasibility comparison of proposed water supply options in the Central Queensland Regional Water Supply Strategy. Sites examined include Eden Bann Weir and Rookwood Weir.

The report identifies that:

- Rookwood Weir will inundate the existing Riverslea Crossing. and that the likely replacement by a higher flood immunity crossing is greatly desired by landholders.
- Eden Bann Weir will impact on Redbank, Craiglee, Glenroy, Princhester, Boggy and Ten Mile Ck crossings.
- Social isolation, impacts on property management, and increased risk to stock as potential impacts from reduced access.
- Existing shire roads surrounding Rookwood would require upgrading from shire roads to formed roads for construction purposes
- Rookwood Crossing is unlikely to be replaced, as it only provides occasional access to one property.
- Rookwood Weir would create 6 isolated islands covering 287 ha.
- Eight families (34 individuals) currently lose river crossings during floods. These families have a vehicle parked each side of river and cross by boat.

The report advises the consideration of the changes that might occur in the usage of the crossings as a result of the weir construction, and current and future public transport routes.

5. CAPRICORNIA INTEGRATED REGIONAL TRANSPORT PLAN 2004-2030 (QLD TRANSPORT & MAIN ROADS, 2004)

The Capricornia Integrated Regional Transport Plan was developed by Queensland Transport and the Department of Main Roads in partnership with Fitzroy, Livingstone and Mount Morgan Shire Councils and Rockhampton City Council. The plan aims to help meet the emerging transport needs of the Capricornia region, in response to growth in population, employment and industry within the region.

Regarding the road network around the Fitzroy River, the plan notes: -

"there may be significant increases in the volume of traffic on roads servicing agricultural developments around the Lower Fitzroy River from Ridgelands to Rookwood-Riverslea"

The plan also records an action for relevant agencies to: -

"Consider the transport implications of current industry development and infrastructure planning studies associated with the Stanwell Industrial Corridor and agricultural areas along the Fitzroy River."

6. FITZROY RIVER WEIR STUDY (KEANE, JUNE 2004)

The Fitzroy River Weir Study, by the (then) Department of Natural Resources, Mines, and Energy, is a study which provides a concept level evaluation of a number of different weir sites on the Fitzroy River. Raising of Eden Bann Weir and a weir at Rookwood are among the options examined.

The report provides an overview of many issues associated with each option, including previous investigations, geology, preliminary design and costing, upstream property impacts, impacts on access roads and crossings, environmental issues, and social aspects.

Regarding access, the report provided the best information on the crossings available at the start of this study. It identifies the majority of the major crossings affected, provides a description of their current usage, proposes which crossings should be replaced, and provides some ballpark cost estimates. This report was a key reference for this study.

7. NEW BRIDGE OVER FITZROY RIVER AT RIVERSLEA - PRELIMINARY DESIGN REPORT (KBR, DEC 2003)

This report presented the results of a preliminary design and costing for a new bridge at Riverslea, carried out for the Department of Natural Resources in Rockhampton.

It gives the existing level of the bridge at Riverslea at EL 36.8m AHD, about 2m above bed level, and that an analysis of flood records indicates the existing crossing would have been impassable for an average of 46 days per year since records commenced in 1922. The report states the current traffic volumes are around 60 vehicles per day.

Two raised bridge deck levels were examined, at EL 47.0 and 53.0, which is stated to be the 1 in 2 and 1 in 5 year ARI flood levels. Sound rock for foundations was assumed at EL 34.0. The bridge was designed to be submerged and for debris loads. Drawings of the concept design are included in the report. Some details of the two levels of bridge are described in the following table.

	Deck Level EL 48 m AHD	Deck Level EL 53 m AHD
Length	207m	276m
Width	8m	8m
No of Spans	6 x 34.5m	8 x 34.5m
Cost (Dec 2003)	$3.6 million	$5.0 million

8. INITIAL ENVIRONMENTAL EVALUATION - LOWER FITZROY RIVER WEIRS AND MT BRIDGET DAM, CONNORS RIVER (HYDER, JULY 1999)

This study was undertaken for the Department of Natural Resources to identify key issues related to the raising of Eden Bann and a number of weir options in the Riverslea area, including Rookwood Weir. It included community consultation, data review, and a number of component studies on flora, fauna, cultural heritage, biophysical assessment, and socioeconomic assessment.

In relation to access issues, points of relevance include:

- For Eden Bann Weir, it identifies impacts on Redbank, Craiglee, Glenroy, Princhester, Boggy and Ten Mile Ck crossings.
- For Rookwood Weir, it identifies impacts on Riverslea Crossing, and the local landholder's desires for an improved crossing.

- It indicates social isolation, increased operation costs, longer on-farm access routes and loss of discretion over marketing decisions as impacts. High prices may be missed due to inability to offer products to market in a timely fashion. Difficulties for school access and social contact may be experienced, and reduced quality of life.
- The Riverslea Crossing was constructed in 1966, and upgraded in 1989.
- Access is lost across Riverslea Crossing on average 46 days/a since 1922, with this increasing to more than 100 days/a in wet years.
- 8 families (34 individuals) currently lose river crossings during floods - have a vehicle parked each side of river and cross by boat in these conditions. The report notes this is hazardous for children and older people.
- It contains a landsat image of the 1988 flood, EL 58.6 at Riverslea GS, showing the extent of inundation.

9. FITZROY RIVER WEIR STUDY HEC-RAS ANALYSIS (NR&W 1998)

NRW have undertaken HEC-RAS flood modelling for a number of cases involving Rookwood and Eden Bann Weir, but unfortunately no report was produced on this work, although some output files were available. Interpretation of this information was not included within this study.

This work may be of some benefit in future analysis of the weirs potential effect on the flood inundation of crossings. However it is understood that this modelling did not explicitly model the effect of the crossing structures on flooding, which is likely to be important when evaluating floods at or near deck level.

10. PLANNING REPORT- UPGRADING PROPOSALS FOR MACKENZIE RIVER BRIDGE & APPROACHES (MAIN ROADS JULY 1989)

This report investigates upgrading proposals for the crossing of Mackenzie River on the Duaringa-Apis Ck Rd, also known as Foleyvale Crossing. It includes drawings of the existing structure, hydrology at the site, and preliminary design and costing. Points of relevance from this report include:

- Traffic volumes are given as 80 vehicles per day, 45% commercial vehicles.
- Existing structure deck level at RL 49.0m. Significant debris problem on existing structure.
- Current crossing often submerged, for example, for 72 days in 1983, and for 160 days in 88-89.
- Options to build up existing causeway examined, but ruled out owing to debris problems.
- Construction of a bridge on a new alignment for 4 RLs from RL53 to RL63 costed.
- Recommended option at RL 55.6, $1.65 million, plus an optional $0.65 million for straightening the approach alignment.

1.2.7.3 Appendix C Consultation

- Landholder survey template
- Landholder letter
- Agency consultation response – Fitzroy Shire
- Agency consultation response – Livingstone Shire
- Agency consultation response – Duaringa Shire
- Agency consultation response – Woorabinda Pastoral Company
- Agency consultation response – Gladstone Pacific Nickel Limited
- Agency consultation response – Department of Main Roads
- Agency consultation response – Department of State Development
- Agency consultation response – Department of Infrastructure
- Agency consultation response – Department of Primary Industries and Fisheries

Landholder Name:	
Property Name:	
Telephone Number:	
Interviewer:	
Interview With:	
Date	
Did they have the maps on hand?	

	Category	Comment
Property Type:	Stock	
No of Residents/Staff:		

Notes ***-Inform interviewee that we would like their answers to cover themselves, their family, and employees, and, for internal crossings, other users such as neighbours, tourists, extractive industry, fishermen, etc***
-Ask which crossings are used first, then ask about frequencies, purpose, etc for those crossings only
-Add any extra, unknown crossings to the bottom of the table
-For non-shire/state crossings, particularly previously unknown ones, locate the crossing on the map, obtain a brief description of the crossing, and, if possible, identify the EL of the crossing deck

No	Crossing	Used?	Current Usage - Frequency (Use / Month)				Purpose: Category	Purpose: Description	Frequency Crossing Untrafficable	Alternate Route	Additional Time/ Distance/ Cost	Comments/Other Details/Crossing Description
			Car	Truck	Stock	Walking/Other						
Main Crossings												
1	Glenavon Access Track											
2	Glenroy-Marlborough Road: Green Ck											
3	Glenroy-Marlborough Road: The Islands											
4	Glenroy-Marlborough Road: Ten Mile Ck											
5	Redbank Crossing											
6	Glenroy Crossing											
7	Craiglee Crossing											
8	Hanrahan Rd Crossing											
9	Rookwood Crossing											
10	Riverslea Crossing											
11	The Pocket 4WD Access											
12	Smith Road Crossing											
13	Island Camp Island											
14	Separation-Slatey Ck Crossing											
15	Foleyvale Crossing											
16	Boolburra Crossing											
Other Crossings												
17	The Pocket Island											
18	The Pocket Point Island											
19	Slatey Ck Island											
20	Central Railway Crossing											
21	Islands between AMTD 281 and 282											
Extra Crossings												
22												
23												
24												
25												
26												

What do you see as being the desired solution for crossings on your property?

Desired solution for crossings on your property	

What do you see as being the desired solution for crossings in the general region?

Desired solution for crossings in the region	

Did you have any further comments or issues you would like to mention?

Any other comments/issues	

BEU701-C-S0003

4 July 2007

<Landholder Name>
<Property Name>
<Property Address>
<Phone Number>

Impacts on access from the proposed construction of Rookwood Weir and raising of Eden Bann Weir

Dear <Landholder Name>,

As you may be aware the Central Queensland Regional Water Supply Study (CQRWSS) has identified the need for additional water resources within the Lower Fitzroy Region. A number of water resource development options have been identified by CQRWSS, including:

- the raising of Eden Bann Weir, and
- the construction of a new weir at the Rookwood site.

A number of studies have been undertaken on these development options, and you may have been previously consulted with on issues such as potential cultural heritage or vegetation impacts. In this study, Kellogg, Brown & Root Pty Ltd has been engaged by the Department of Natural Resources and Water to consult with you and other stakeholders in order to determine the potential impacts on access that may eventuate as a result of the proposed projects. This study is focused on the potential impacts on transport across the river and tributaries, how these impacts might affect your family or business, and what options are available to address these impacts.

We intend to contact you by telephone in approximately one week's time in order to conduct a short questionnaire. The questionnaire will take a few minutes of your time to complete and will focus on the following areas:

1. Your current transport patterns (including those of your family and employees)

- The frequency that you use each river, creek, or gully crossing that may be impacted by the weir proposals.

- The destination and reasons for your journeys, for example, to Rockhampton for schooling.

- The alternate routes you take when low level crossings are closed owing to flooding.

2. Your desires for the development of transport options in the study area.

In order to help us with this questionnaire, and address your access requirements, please take a moment to think about your current use of river crossings in preparation for our call.

We have included regional and individual area map/s with this letter that shows the river crossings we are aware of in the study area, as well as the weir sites and the estimated extent of inundation, which should aid our discussion.

Please note that the focus of this survey is only on the impact of the weir proposals on access. Any concerns on other issues related to these weir proposals should be directed to Craig Gordon of the Department of Natural Resources & Water on 07 4938 6735.

The contact details we have for you are shown at the top of this letter. Please contact us if your contact details have changed, or if you have any concerns regarding this process.

Yours sincerely,

<signed>
<name>
Kellogg Brown & Root
<phone number>

3. AGENCY CONSULTATION RESPONSE - FITZROY SHIRE

As an overall comment, Fitzroy Shire Council indicated they would not support any decrease to the current level of service provided by the roads due to increased flooding or inundation from the weir proposals without extensive community consultation.

Responses to the survey questions are as follows:

1. Traffic Plans/Studies and/or Development Plans/Studies

No plans for this area, other than the 5 year capital works program. This program indicates some projects to pave sections of Riverslea Road and Glenroy Road:

- Glenroy Rd, $150,000 in 2008/09 & $200,000 in 2009/10, scope will be upgrading gravel section of the road to a bitumen standard, location yet to be confirmed.
- Riverslea Rd, $200,000 in 2009/10, scope will be upgrading gravel section of the road to a bitumen standard, location yet to be confirmed.

2. Traffic data

Available Data

- Riverslea Rd approx AADT = 71
- Glenroy Rd approx AADT = 53

No data available for Hanrahan or Smith Rd crossings.

3. Crossing data

Available data:

- We have a plan of the Glenroy crossing structure, however arbitrary level data relative to a TBM on a tree are used.
- We are unable to locate plans of Riverslea crossing at this stage. We know that the deck level is approximately 3.0m relative to the heights provided by the gauging station.
- As a guide, when Riverslea gauging station indicates a flow at 2.0m, Glenroy crossing is about to go under.
- The Pocket 4WD access is considered a substantial shortcut by locals - 2 houses use it. Used to have pipes, but these have washed away.
- Shire does not maintain connecting roads on western side of river. Plans of the Shire maintained roads provided.

No plans available for Smith Rd Crossing or Hanrahan Rd Crossing.

4. Flooding data

Riverslea GS the best source - the height on the gauge that causes inundation of Riverslea and Glenroy it goes out is as above.

5. Current transport issues

See the Fitzroy Industry and Infrastructure Study (FIIS). Further information can be obtained at www.infrastructure.qld.gov.au/fiis

It is important that you are aware of the study. A transport study was completed as part of the FIIS.

Marlborough Nickel is fairly advanced in their planning, and have apparently designed the pipeline to Gladstone, which is planned to tunnel under the river.

6. Desired transport options

Community desire for improved flood immunity for crossings. Note Riverslea has stairs constructed so residents can cross by boats when the crossing is out - no alternative access. A high level bridge would be a big improvement in the standard of living

Glenroy has alternate road access, but does take considerably longer.

7. Other

Council receives many requests to seal various sections of roads in the Shire.

4. AGENCY CONSULTATION RESPONSE - LIVINGSTONE SHIRE

The responses from Livingstone Shire are shown below

1. Traffic Plans/Studies and/or Development Plans/Studies

No plans available for this area - it is principally a rural area.

2. Traffic data

No traffic data available for affected roads. Marlborough Nickel may have some traffic data.

3. Crossing data

No affected crossings in Livingstone Shire, and hence no data on this.

4. Flooding data

We don't have any records when Apis Ck Rd is closed, but I can only remember a few times over the last five years when it was closed.

5. Current transport issues

No current issues.

6. Desired transport options

No particular desired options. Advised to speak to the locals.

7. Other

No other issues.

5. AGENCY CONSULTATION RESPONSE - DUARINGA SHIRE

The responses from Duaringa Shire are shown below

1. Traffic Plans/Studies and/or Development Plans/Studies

None undertaken in this area.

2. Traffic Data

Aroona Road - nil available

Boolburra-Edungalba - March 2006 - Average Daily 15V.P.D, Commercial 21% CV

3. Crossing Data

The Aroona Road/Boolburra Road crossing of the Dawson River is an unconstructed track across the bed of the stream. Used by locals as an alternative access form Boolburra Road to Duaringa. Often cut by flooding.

No plans available.

The Apis Creek Road crossing of the Mackenzie River is a constructed low level crossing not infrequently inundated. This is a declared Main Road; the Department should have information and drawings of this crossing.

4. Flooding Data

No reliable information.

5. Current Transport Issues

Apis Creek Road regularly cut by flooding at the Mackenzie River, but also untrafficable at times because of washouts at local creeks and gullies.

6. Desired Options

Raising of the Mackenzie River crossing on Apis Creek Road.

7. Other

There may be issues for local accesses on properties in the Boolburra area (East of the Dawson River) which I am unaware of at this stage.

6. AGENCY CONSULTATION RESPONSE - WOORABINDA PASTORAL COMPANY

The responses from Woorabinda Pastoral Company are shown below

1. Traffic Plans/Studies and/or Development Plans/Studies

No specific studies, however Woorabinda Pastoral Company has lodged an application with the shire council for further water allocation. When this is approved, their intention is to greater develop the properties they hold (Stoney Creek and Foleyvale) and use the Duaringa/Apis Creek Road and Foleyvale Crossing in a significantly increased capacity.

2. Traffic data

Not applicable to this agency.

3. Crossing data

Not applicable to this agency.

4. Flooding data

Respondent was not aware of any road closures on the Duaringa/Apis Creek Road in the past 12 years, but the crossing has flooded during this period.

5. Current transport issues

Transport issues with the flooding of the Foleyvale Crossing and the transport of grain around the region. Woorabinda Pastoral Company respondent said he had written in the past to the council and Department of Main Roads about a bridge over Duaringa/Apis Creek Rd (Foleyvale Crossing) with no response received.

Respondent said that in the wet season approximately seven to eight years ago the Woorabinda Pastoral Company lost hundreds of thousands of dollars in profits due to lack of road access for grain trucks; with the harvested grain rotting due to heavy rain while the Foleyvale Crossing was untrafficable.

6. Desired transport options

Respondent strongly indicated that the company would like to see an improved bridge over the Foleyvale Crossing.

7. Other

Would be quite happy to see the weir go in. They would prefer the inundation level to come over the current Foleyvale Crossing so that a new bridge would be required and the current crossing replaced.

7. AGENCY CONSULTATION RESPONSE - GLADSTONE PACIFIC NICKEL LIMITED

The responses from Gladstone Pacific Nickel Limited are shown below

1. Traffic Plans/Studies and/or Development Plans/Studies

Plans exist to develop a haul road crossing within the Coorumburra property over Marlborough Creek from some of the mining pits to the beneficiation plant. A slurry pipeline is planned to go under the bed of the Fitzroy River. No current public reports available, however advised to review the 1999 Marlborough Nickel Environmental Impact Statement (see Appendix B).

In planning the location of the haul road it would be advantageous (for the company) to know the area and level of inundation the weir will result in. Respondent also said they would be trying to keep the haul road within the road reserve area. Construction to sections of the haul road is planned to commence within 18 months.

2. Traffic data

None available; there is need to update traffic counts (from what can be found in the 1999 EIS). Respondent indicated they hadn't reached this stage in planning the haul road yet.

3. Crossing data

Concerned about the internal property crossing to Horseshoe Lagoon as there is an existing bank to access the Lagoon. Respondent had spoken to the previous property owner of Coorumburra who said the bank would probably be inundated at the levels proposed on the maps.

4. Flooding data

None available

5. Current transport issues

Concerned that Coorumburra Road takes lots of heavy traffic. Respondent said it was indicated to him that the Coorumburra Road was scheduled for an upgrade, and the impacts of constructing the new haul road would bring a further need for that.

Glenroy Crossing highlighted as a 'weak link in the area'.

6. Desired transport options

Glenroy Crossing is the prime crossing for western access and should be improved. Crossings on Glenroy-Marlborough road - three low level slab crossings - should be improved as well if the weir goes in as they will likely be affected.

7. Other

Nil mentioned

8. AGENCY CONSULTATION RESPONSE - DEPARTMENT OF MAIN ROADS

The responses from the Department of Main Roads are shown below.

1. Traffic Plans/Studies and/or Development Plans/Studies

Referred to the Capricornia Integrated Regional Transport Plan - on web under QT (Reviewed in Appendix B)

Also referred to the Fitzroy Industry and Infrastructure Study. GHD has looked at internal roads to service 9 agricultural areas as part of this study, including the required upgrades and costing. Contacts in DSD and GHD provided.

2. Traffic data

MR does have traffic counts for highways. Most roads are local government roads. The GHD study report may have guesstimates of traffic on local roads (much less traffic).

Traffic count data provided.

3. Crossing data

MR provided a 1989 MR report looking at the upgrade of the Duaringa-Apis Ck Rd crossing of the Mackenzie R (Foleyvale Crossing). This report has a plan of the existing crossing (dated 29/1/65) and indicates the current deck level is at RL 49.0.

MR provided plans of the Capricorn Highway Bridge and a number of smaller crossings along the Capricorn and Bruce Highways.

4. Flooding data

Capricorn Highway Bridge was closed owing to flooding for 5-7 days just after it opened in 1976.

Some historical flood levels provided on crossing plans.

5. Current transport issues

There are issues with periodic (20 yr) major flood events of the Fitzroy River floodplain just to the south and west of Rockhampton. Rockhampton also has looming capacity issues with the Bruce Highway through the city and the bridges. A third crossing is necessary to cope with traffic growth. Rockhampton City Council (with Main Roads involvement and funding) are current carrying out traffic studies and modeling. Preliminary steps have been taken to instigate studies with respect to bridge crossings, raising the road across the flood plain, the Capricorn Highway/Bruce highway intersection and an alternative flood free route to the west of Rockhampton.

Traffic growth has been strong on both the Capricorn and Bruce highways in recent years on account of strong economic activity and population growth. The second stage of the Yarwun Refinery in Gladstone has just been announced. The Dept of State development is planning for major industrial and agribusiness type growth in the Stanwell- Gracemere- Fitzroy area.

Various major industry and infrastructure projects are planned for the Rockhampton/Gladstone hinterland.

6. Desired transport options

One possible location for an upstream crossing of the Fitzroy River would be just downstream of the Eden Bann Weir near Canoona (approx AMTD 121). No specific investigations have yet been undertaken. Any raising of the road over the Fitzroy floodplain south of the Capricorn Highway will be very expensive as a bridge structure would be required to avoid acerbating flooding of Rockhampton, including the airport.

7. Other

Issues include:

- The potential impact of pipeline corridors delivering water from Rookwood Weir on road corridors – possible future pipeline direct from Rookwood to the Stanwell-Gracemere industrial precinct and linking with the pipeline planned as apart of the recently planned multi-user corridor Rockhampton/Stanwell – Gladstone. Possible issues include occupying valuable road corridor space, crossing of roads, drainage impacts, and construction impacts.
- Some concern that water from the Rookwood Weir could cause issues related to back-up in times of major floods and affect the Dawson Bridge and Capricorn Highway.
- Recommend considering alternatives in relation to a replacement bridge for the Glenroy crossing given the high cost of bridges in the current construction industry climate. A new bridge below Eden Bann which would have wider road network advantages and serve potential agricultural areas identified south of the Fitzroy River as part of the Dept of State Development/Dept of Infrastructure work in relation to future intensive agribusiness activities. Wider benefits may encourage other stakeholders and a collaborative approach.
- Construction traffic to the weir proposals needs analysis, and the proposed junction upgrades, etc. provided to MR for review.

9. AGENCY CONSULTATION RESPONSE - DEPARTMENT OF STATE DEVELOPMENT

The responses from the Department of State Development are shown below.

1. Traffic Plans/Studies and/or Development Plans/Studies

The Fitzroy Industry and Infrastructure Study. Most of the components of this study have been completed. Area of the study is from the junction with the Dawson down to Eden Bann Weir, so directly overlaps with the area impacted by the weirs. (See review in Appendix B)

GHD has undertaken a review of the infrastructure for this study, including roads. GHD study updated last year. An earlier study was focused just on roads. It included modeling of traffic flows, and Atkinsons Rd, Riverslea Rd, and Glenroy Rd were looked at.

Summary reports are available on the study as well. Summary reports and traffic reports provided (See review in Appendix B). Website at:

www.infrastructure.qld.gov.au/fiis.

2. Traffic data

None available (other than what might be in the GHD report for the FIIS)

3. Crossing data

None available (other than what might be in the GHD report for the FIIS)

4. Flooding data

None available (other than what might be in the GHD report for the FIIS)

5. Current transport issues

- Current crossings of the river are not reliable enough for intensive agriculture to expand on the western side of the river, even though there are appropriate soils. Hence FIIS does not recommend intensive agriculture in this area. The crossing flood immunity is the controlling factor on development on the west bank. One existing feedlot on the western bank wants to expand, but will not invest until the access is improved. Improved access across the river would allow feedlots or support industry (grain, etc) to be undertaken on the western side of the river.
- Closures of access past 2 or 3 days are an issue for feedlots - if so feedlots will require larger grain storage facilities, etc, to cope with supply interruptions.
- MR is looking at the flood immunity for the Bruce Highway from Brisbane to Cairns. Area around Rockhampton is low and can be cut, isolating communities. MR just starting to look at high level crossing to the west of Rockhampton near Canoona.
- Gladstone Pacific Nickel (Marlborough Nickel) are looking at a slurry pipeline to Gladstone. Construction will require access for workers and pipes.
- Enertrade are looking at the CQ Gas Pipeline, which will cross the river somewhere in this area (perhaps near Thirsty Ck?) Will also need access for workers and pipes.

6. Desired transport options

See Q5

7. Other

Nil

10. AGENCY CONSULTATION RESPONSE - DEPARTMENT OF INFRASTRUCTURE

The responses from the Department of Infrastructure are shown below.

1. Traffic Plans/Studies and/or Development Plans/Studies

The Fitzroy Industry and Infrastructure Study - reports as provided by DSD.

In Mar 2007 Main Roads looked at grade separated access for road/rail at Gracemere - This is close to Rockhampton - so unlikely to have much influence on river crossings in the Eden Bann/Rookwood area.

2. Traffic data

None available (other than what might be in the GHD report for the FIIS)

3. Crossing data

None available (other than what might be in the GHD report for the FIIS)

4. Flooding data

None available (other than what might be in the GHD report for the FIIS)

5. Current transport issues

Improved access to the western side of the river will be of benefit

6. Desired transport options

Improved flood immunity access to western side, through provision of a road across the top of the weir or similar.

7. Other

Nil

11. AGENCY CONSULTATION RESPONSE - DEPARTMENT OF PRIMARY INDUSTRIES AND FISHERIES

The responses from the Department of Primary Industries and Fisheries are shown below.

1. Traffic Plans/Studies and/or Development Plans/Studies

The Fitzroy Industry and Infrastructure Study - reports as provided by DSD.

KPMG undertook a global market analysis for what might be suitable for the area - report dated April 03 - identified light metals, intensive agriculture & meat processing.

2. Traffic data

None available (other than what might be in the GHD report for the FIIS)

3. Crossing data

None available (other than what might be in the GHD report for the FIIS)

4. Flooding data

None available (other than what might be in the GHD report for the FIIS)

5. Current transport issues

- Northern side of river will benefit enormously from improved flood mitigation, both at Riverslea and Glenroy.
- Will eventually get a large energy user near to Stanwell Power Station- wholesale rates for electricity. - however this is unlikely to have much impact on the traffic over the crossings in the study area. (Could be magnesium processing, coking coal, etc)
- Horticulture - companies are looking for suitable sites to provide geographic diversity for food supplies (particularly given Cyclone Larry). Will requires a significant transport hub with refrigeration - will need this in the infrastructure corridor.
- Soils suitable for intensive agriculture on northern/western bank, but crossings are the constraint. Grain needs to be trucked in and cattle out.
- Existing feedlot on western bank. Crossing under water 60 days/year, and tends to be in a single block of time - can't get grain in or cattle out without a much longer trip. Trip is longer, slower, and bumpier - causes bruising and heat stress, particularly for very fat cattle. Also an animal welfare issue - stressed cattle may have to be put down, and is a reportable incident under animal welfare legislation. Difficult to meet contract conditions for product delivery

6. Desired transport options

Raising Riverslea and Glenroy crossings to get improved flood immunity - get down to 10-15 days per year rather than 60-100.

7. Other

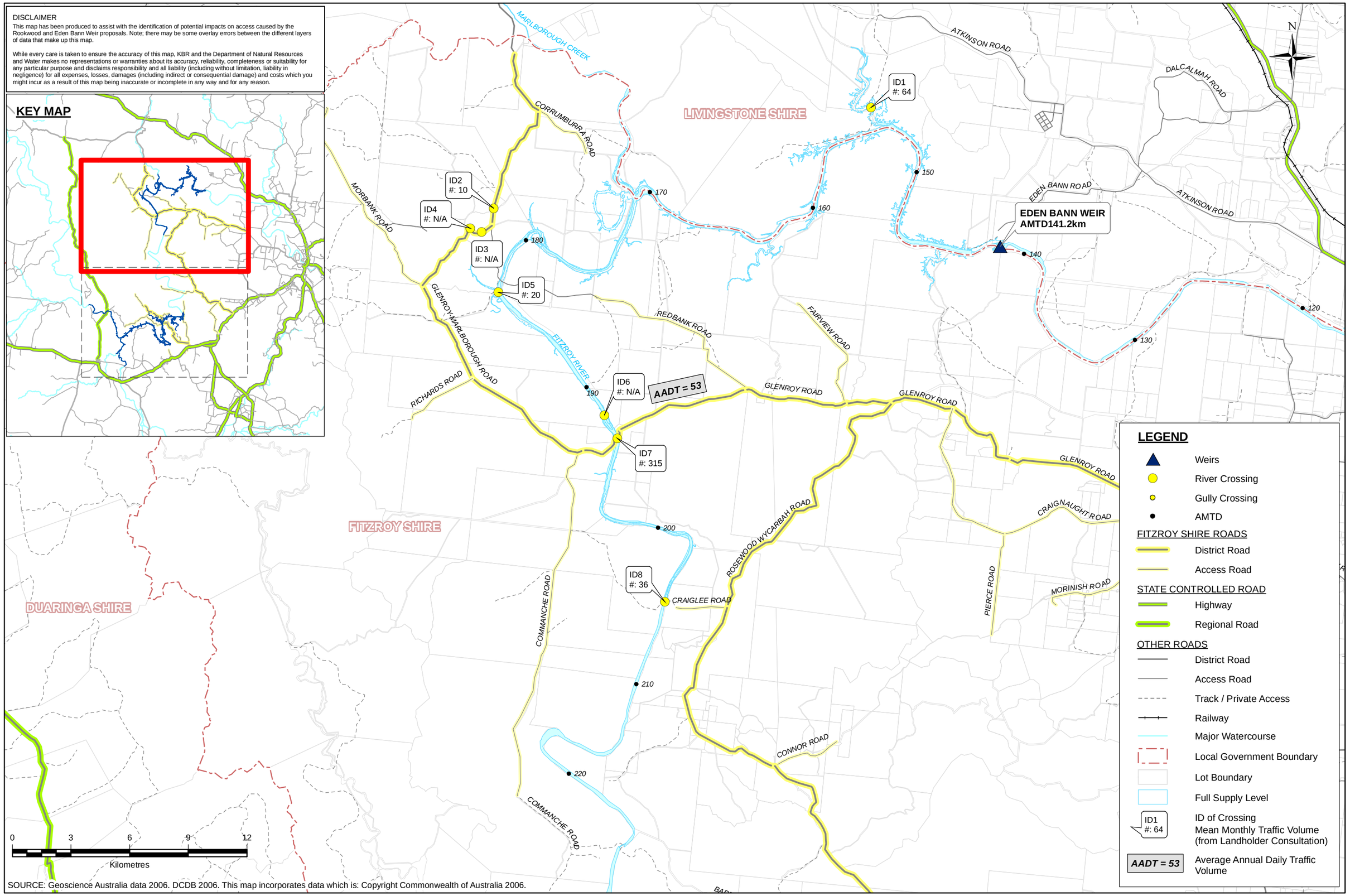
Nil

1.2.7.4 Appendix D Traffic network plans

DISCLAIMER

This map has been produced to assist with the identification of potential impacts on access caused by the Rookwood and Eden Bann Weir proposals. Note; there may be some overlay errors between the different layers of data that make up this map.

While every care is taken to ensure the accuracy of this map, KBR and the Department of Natural Resources and Water makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of this map being inaccurate or incomplete in any way and for any reason.



LEGEND

- Weirs
- River Crossing
- Gully Crossing
- AMTD

FITZROY SHIRE ROADS
- District Road
- Access Road

STATE CONTROLLED ROAD
- Highway
- Regional Road

OTHER ROADS
- District Road
- Access Road
- Track / Private Access
- Railway
- Major Watercourse
- Local Government Boundary
- Lot Boundary
- Full Supply Level
- ID1 #: 64 — ID of Crossing Mean Monthly Traffic Volume (from Landholder Consultation)
- *AADT = 53* — Average Annual Daily Traffic Volume

SOURCE: Geoscience Australia data 2006. DCDB 2006. This map incorporates data which is: Copyright Commonwealth of Australia 2006.

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Figure D.1
TRAFFIC NETWORK PLAN
SHEET 1 OF 2

DISCLAIMER

This map has been produced to assist with the identification of potential impacts on access caused by the Rookwood and Eden Bann Weir proposals. Note; there may be some overlay errors between the different layers of data that make up this map.

While every care is taken to ensure the accuracy of this map, KBR and the Department of Natural Resources and Water makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of this map being inaccurate or incomplete in any way and for any reason.

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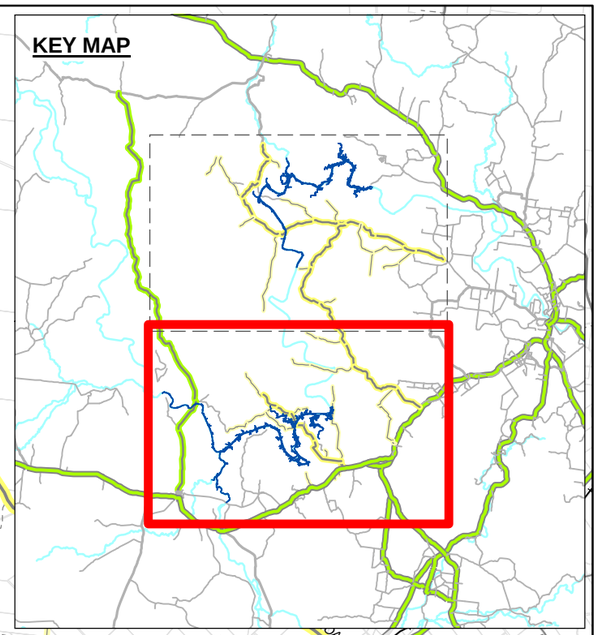
KEY MAP



WOORABINDA SHIRE

FITZROY SHIRE

DUARINGA SHIRE

BANANA SHIRE

BARRETT ROAD

ROSEWOOD WYCARBAH ROAD

HANRAHAN ROAD

ROOKWOOD ROAD

WEIR PARK ROAD

FITZROY RIVER

SMITH ROAD

YARRA ROAD

RIVERSLEA ROAD

THIRSTY CREEK ROAD

GILL ROAD

SUGARLOAF ROAD

SORRELL HILLS ROAD

DUARINGA APIS CREEK ROAD

TARRAWONG ROAD

JACKSON ROAD

CAPRICORN HIGHWAY

DUMP ROAD

LEICHHARDT HIGHWAY

AROONA ROAD

GRAVEL ROAD

WESTWOOD - WOWAN ROAD

230 240 250 260 270 280 290 300 310 320 330 340 0 10 20

ID9 #: 65

ROOKWOOD WEIR AMTD265.4km

ID10 #: N/A

ID11 #: 65

ID12 #: 331

ID13 #: 164

ID14 #: 31

ID15 #: 62

ID16 #: N/A

ID17 #: 35

ID18 #: 43

ID19 #: 144

ID20 #: N/A

ID21 #: 81

AADT = 71

AADT = 70

AADT = 15

0 3 6 9 12 Kilometres

LEGEND

Weirs

River Crossing

Gully Crossing

AMTD

FITZROY SHIRE ROADS

District Road

Access Road

STATE CONTROLLED ROAD

Highway

Regional Road

OTHER ROADS

District Road

Access Road

Track / Private Access

Railway

Major Watercourse

Local Government Boundary

Lot Boundary

Full Supply Level

ID1 #: 64 — ID of Crossing; Mean Monthly Traffic Volume (from Landholder Consultation)

AADT = 53 — Average Annual Daily Traffic Volume

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Figure D.2
TRAFFIC NETWORK PLAN
SHEET 2 OF 2