Krystal Kirkman

From: DCS - Oliver Pring <oliver.pring@carpentaria.qld.gov.au>
Sent: Thursday, 10 September 2015 3:02 PM
To: 2015-16CRF
Subject: CSC Application - Part 1
Attachments: csc_logo®lowres7d412a.jpg; 201516 CRF Glenore Weir - Certification Form.pdf; 201516 CRF Glenore Weir - Application.pdf; CRF_Supporting_Docs_1.zip

Categories: Green Category

Please find attached Carpentaria Shire Councils application towards the 2015/2016 Community Resilience Fund – Part 1 (additional supporting documentation to be as Part 2)

Any queries please contact me on the details listed below

Regards

Oliver

Kind regards

Oliver Pring
Director Corporate & Community Services
CARPENTARIA SHIRE COUNCIL
Ph:

PO Box 31, NORMANTON QLD 4890
oliver.pring@carpentaria.qld.gov.au
www.carpentaria.qld.gov.au

Find us on Facebook

2015-16 Community Resilience Fund (CRF)

Certification Form

To be completed, signed, scanned and submitted with each application for funding

Organisation name	Carpentaria Shire Council
Project title	Glenore Weir Raising Project

All sections of the application are completed and attached

- ☒ Certification form
- ☒ Section 1 Applicant and project overview
- ☒ Section 2 Project details
- ☒ Section 3 Proposed project budget
- ☒ Section 4 Breakdown of project costs
- ☒ Section 5 Supporting documents

I certify that:

- I am authorised by Council to submit this application for funding
- I have read the program guidelines
- I understand that submission of an application does not guarantee funding approval for either all or part of the funding being sought
- Council has endorsed this application for funding
- the details in this application, including any attachments, are true and correct
- all supporting documents listed in Section 5 are attached to the application
- Council will deliver the project within the required timeframe
- the project will comply with all relevant Acts, Laws, Regulations, State or Commonwealth policies and Industrial Agreements and Awards
- the project is financially sound, includes demonstrated value for money and a plan for the viability of the project (i.e. the ongoing operation, maintenance, management and replacement costs for the project will be met by the organisation)
- Council consents to the release of information in this application (excluding personal details) for non-commercial public information purposes
- should this application be successful, I confirm that the project will not commence until after funding has been approved and a funding agreement has been executed with the department.

Mayor	Given name	Fred	Surname	Pascoe
	Phone		Mobile	
	Signature	[redacted]	Date	09-09-2015

CEO	Given name	Robert	Surname	Owen
	Phone		Mobile	
	Email	ceo@carpentaria.qld.gov.au		
	Signature		Date	09-09-2015

Scan this signed certification form and email with your completed application form and supporting documents to 2015-16CRF@dilgp.qld.gov.au by the closing date.

2015-16 Community Resilience Fund

Application Form

July 2015

Instructions

To submit and application for CRF funding for a project, please email the following for each project to 2015-16CRF@dilgp.qld.gov.au by the closing date:

- An electronic copy of the application form;
- A scanned copy of the signed certification form; and
- Named and numbered supporting documents for the application.

All applications for - 2015-16 CRF funding must complete the following sections of the application form:

Section 1 – Application and project overview
Section 2 – Project details
Section 3 – Proposed project budget
Section 4 – Breakdown of project cost
Section 5 – Supporting documents.

Eligible applications will be assessed against how the proposed project meets the 2015-16 State's funding priorities, how it aligns with the relevant guiding principles of the *Queensland Strategy for Disaster Resilience* and the aims and objectives of the program.

Further information may be requested from an applicant during the assessment process.

Note: submit only one project application and supporting documentation per email.

Departmental contacts for 2015-16 CRF inquiries are detailed in Appendix 3 of this form.

Section 1 - Applicant and project overview

To be completed and submitted for each Project.

1.1 Organisation details	
Council Name	Carpentaria Shire Council

1.2 Principal contact person (This person will be contacted about the application)			
Title:	Mr	Given Name:	Oliver
Surname:	Pring	Position:	Director Corporate Services
Phone:	[redacted]	Mobile:	[redacted]
Email:	oliver.pring@carpentaria.qld.gov.au	Fax:	

1.3 Project title (Maximum 10 words)

Glenore Weir Raising Project

1.4 Project description (Summarise the main features, activities and outputs – maximum 60 words)

This project seeks to address the critical and dangerous annual water shortages in Carpentaria Shire. The project proposes to raise the Glenore Weir, (upon where the townships of Normanton and Karumba derive their water supply from) to ensure a safe and reliable water supply for the regions in order to provide sustainable economic development opportunities, as well as improved amenity, quality of life, growth and prosperity.

1.5 Project priority (If more than one application being submitted in this funding round, enter the priority for this application below e.g. 1 of 3 applications)

☑ Yes – priority 1 of 1 applications
☐ No

1.6 Project location actual site address			
Street number/location		Street name	
Town/Suburb	Normanton	Post code	QLD 4890
State electorate	Mt Isa	Federal electorate	Kennedy
Real property description of the project site details are provided below:			
Lot number	8	Parish	Clarina
Registered plan	NM142	County	Norman
Title reference			

1.7 Project type

- ☐ new infrastructure
- ☐ upgrade to existing infrastructure
- ☒ replacement of existing infrastructure
- ☐ other specify:

1.8 Which best describes the proposed project?

- ☐ Flood mitigation – e.g. levees, detention basins, floodgates, diversion channels, bridges
- ☐ Flood mitigation to manage overland water flow – e.g. backflow devices, drainage management pump stations
- ☐ Flood mitigation to protect essential infrastructure – e.g. relocating electrical components of treatment plants
- ☐ Replacement of existing infrastructure – eg. upgrades to existing road networks, floodway culvert upgrades, major drain widening, bridge/road raising, embankment stabilisation
- ☐ Bushfire mitigation infrastructure – construction/maintenance of fire trails, erection of Fire Towers
- ☒ other disaster-related infrastructure: provide details

Raising of Glenore Weir to increase capacity of usable stored water to supply the townships of Normanton and Karumba and mitigate reliance on annual monsoonal rains to replenish supplies. Providing for, in conditions of drought sustainable supply of potable water for the communities of Normanton and Karumba

Section 2 – Project Details

2.1 Provide details of how the project supports the 2015-16 CRF objectives.

This project supports the Community Resilience Fund (CRF) objective "to support at risk local governments that are faced with significant funding challenges and have restricted capacity to fund fund critical infrastructure" Carpentaria Shire Council is a Category 3 Council with currently around 2,500 population base and 900 rateable property base. This project total is around triple the annual revenue attributed to General Rates (prior to discounts and remissions) and poses a huge financial impost to Council to fund 100%. However in order for the longevity and prosperity of the Shire, this project has been deemed imperative and fully endorsed by the Council and community alike to be undertaken.

Carpentaria Shire Council has a vast array of un-tapped opportunities, with its location and existing facilities (Karumba Port, key agricultural lands), however in order to realise these opportunities and attract further investment, having adequate water supply is the key.

2.2 Explain how council determined that the project is a priority need and why this project is the preferred option. (Demonstrate if a decision making framework has been undertaken. Include as attachments, information from documents referenced).

The recent drought conditions experienced in the Gulf of Carpentaria have highlighted the issue of a low degree of security of water supply for Normanton and Karumba. The townships rely heavily on a single source of supply, namely the Glenore Weir on the Norman River. The water from the river can be supplemented by ground water but this is limited due to poor water quality.
Normanton and particularly Karumba experience an influx of visitors during the dry season. This influx is placing an increasing load on the already stretched water supply system. In order to meet current demands, cater for future growth and provide a more secure water supply that makes provision for drought periods it is necessary that additional water yield be accessed. A review of growth and water consumption has indicated that a steady rate of growth / demand has taken place over recent years.

The township of Normanton (and Karumba) is supplied with reticulated water from a common system based on a weir (Glenore Weir) on the Norman River.
Previous water supply arrangements included a bore field extracting ground water. The volume of water used from this source is a small percentage only of total usage used due to issues with water quality.
The current water supply system relies predominantly on surface water harvesting from the Norman River (Glenore Weir), treatment at Normanton and then reticulation to both communities. Recent years has seen an increasing pressure being placed on the water supply, particularly during the "dry" season when an influx of tourists and others into the area see a large increase in demand during that period, particularly at Karumba.
The existing weir on the Norman River and its yield is currently considered to be at its limit in terms of supplying the needs of the communities. Failure of a "wet" season to realise adequate flows in the Norman River results in the need to implement water restrictions for the area. There is currently no alternative source of supply for Normanton (and Karumba) and no provision for being able to maintain supply should consecutive "wet" seasons fail. Normanton (and Karumba) are totally reliant on a single source of supply that relies on the occurrence of a climatic event (the "wet" season) on an annual basis.
Failure of the 2012/2013 "wet" season to replenish flows in the Norman River has highlighted the tenuous position for Normanton and Karumba and their dependency on a single source of supply that relies on an annual event.
Recent activity to help extend the yield from the existing Glenore Weir includes using portable pumps to transfer water from nearby downstream pools back into the weir pool. This yields a low volume of water only and is both expensive and time consuming to carry out. The water quality in these pools is impacted on by the inflow of poorer quality water when peak tides extend up the Norman River.
It is likely that over time further growth in the community can be expected, particularly in the area of tourism. Council has also identified the need to attract industry to the area. A suitable industry will require a secure water supply, which places a further load on the already stretched system. It is evident that to cater for both current and future water demands and provide a higher level of security of supply an upgraded water supply system is required and is seen as being pivotal to supporting development in this area.
Due to its location in the "Gulf", Normanton (and Karumba) can become isolated for long periods of time once the "wet" season commences. This is also the time when the rivers in the area flow and the Glenore Weir on the Norman River is normally replenished. However, the "wet" season conditions also make access to the key elements of the water supply system such as the raw water delivery pumps and pipeline and the Karumba supply main more difficult.

Further information contained in the attached document CRF_Water_Supply_Upgrade_Options_Study_SMEC (section 3 "Growth and Water Demand")

2.3 Summarise the nature and history of the natural disaster event and the identified need being addressed by this project. Include identified need (quantify scale of need); incidence and severity of past events (damages and losses incurred); likelihood of recurrence; and source (e.g. catchment, storm surge, overland flow, flash flooding and past bushfire events)

The project will address ongoing critical water shortages at Normanton and Karumba. The current water supply has only enough capacity generally to last from one wet season to the next wet season. The permanent population of Normanton is approximately 1600 people. This increases during the dry or tourist season to approximately 2200 people at any one time. The permanent population of Karumba is 600 people but this number increases dramatically to 4000 to 4500 people at any one time during the tourist season.
The existing weir was constructed in 1965 and catered for a much smaller population. It is now past its "use by" date given the increase in tourism and in mining activities. The weir was never designed to take into account the very large increases in tourist numbers. In addition, the main mining activity at Karumba uses on average a total of 100 000 megalitres per day from the towns' water supply.
In 2012/2013, the town water supply was nearly depleted as a result of a poorer than usual wet season. Council imposed very severe water restrictions for the entire following year which were well supported by the community. If another poor wet season had ensued, the towns would have run out of water. The consequences of that situation arising would have been catastrophic to the population and the future of the Shire. There are no alternative sources of water in the vicinity of the Shire's towns. As each town uses approximately 1 000 000 litres of water per day, it would not have been possible to truck sufficient water to the towns for them to survive. In addition, there are no suitable groundwater supplies in the region to provide water. The only option would have been to evacuate the towns which would have caused irreparable damage to the economic and social fabric of the Shire. It was a situation that would have placed the ongoing sustainability and viability of the Shire in grave doubt. An upgraded water supply would ensure that such circumstances could not arise again.

2.4 Outline how the proposed project will build resilience, help to reduce the impact of future natural disaster events and benefit the community? Include how the proposed project will assist, if the project is an element of a larger mitigation activity, details of complementary measures planned and for studies and research projects, proposed methodology and outputs.

The project will address the current problem, need and opportunity by ensuring adequate water supplies are available to the two main towns within Carpentaria Shire of Normanton and Karumba.
While it is not possible to quantify the extent of any new jobs or investment created as a result of the improved infrastructure, it is certainly possible to conclude that there will be job losses and no investment without an upgraded water supply. Council cannot currently cater for existing demand and unless the proposed new infrastructure is constructed, the situation will only get worse. The economy cannot thrive without additional water. In the recent past, Council had to withdraw from a study into the establishment of an abattoir in the Gulf region simply because it could not supply the water. This was a lost opportunity as there was real potential to export the beef to Asian markets through the Port of Karumba.
Council imposes strict year-round water restrictions which limit watering of gardens. Even at the time of writing, Council is considering a total ban on watering as the level of the weir has dropped dramatically over the past month. Even with controlled and regulated water use, the weir loses on average three metres of water per annum through evaporation. This situation can only be improved by the construction of a raised weir. The current weir has a storage capacity of 960ML while the raised weir would have a storage capacity of 2 200ML. More critical is the Maximum Annual Safe Yield (MASY). The existing weir has a MASY of 310 ML/year. This project in raising the weir wall by 1.2 metres would see the MASY rise to 1 250 ML/year; thereby quadrupling the MASY.

2.5 Details of catchment-wide considerations incorporated into the proposed project. Include details of catchment-wide consultation undertaken and the resulting considerations, strategies and evidence of support from catchment partners.

This report has confirmed that the "safe" yield from the existing Glenore Weir is unable to meet demands during drought or dry conditions, particularly if the annual wet season fails and the weir fails to fill annually. The other infrastructure associated with the existing Glenore Weir including the pump off-take structure and the delivery mains to Normanton are known to be in poor condition and in need of upgrading or replacement.
Raising the existing Glenore Weir will provide sufficient yield to meet increasing demands for nearly the next 30 years (subject to upper and lower bound demands), but will require providing a fish passage on the raised weir. Sunwater have previously examined this option and concluded that the site is suitable for raising the height of the weir crest by approximately 1.2 metres.

Further information can be sourced from the attached document
CRF_Water_Supply_Upgrade_Options_Study_SMEC

2.6 Provide details of any existing works, measures or related activities that address natural disaster mitigation risk. For example, research activities, planning measures and controls or existing mitigation structures. Include comments on their effectiveness taking into account issues such as capacity and limitations, age, state or repair. Also provide information about existing emergency management measures (e.g. evacuation routes, refuge areas, evacuation / emergency management plans)

Council recently upgrade its reservoirs in Normanton to allow for extra storage capacity in stored potable water. Currently reservoirs in Normanton and Karumba allow for continued supply for 3 days and 7 days respectively, should water supply at the source be interrupted.

Council also implements stringent water restrictions when water supplies are reaching critical levels, this enables supply to continue in the hope that subsequent seasonal rains will replenish supplies.

2.7 Please detail any community, economic, environmental or other benefits that will be delivered as a result of this project.

The upgraded water supply provides opportunities for economic development, especially in relation to tourism, agriculture and resource activities. Without expanding the existing capacity of the Carpentaria Shire water supply, there is no further opportunity to:
1. Cater for the expanding tourism market;
2. Supply water to any more mining projects;
3. Expand the Port of Karumba which has been identified as critical to the development of agriculture in Northern Australia through the development of infrastructure to support access to markets;
4. Encourage development of any type, including residential and rural residential housing.

Economic infrastructure such as the water supply project enhances productivity, underpins industry growth and opens up potential new markets; for example, by allowing for expansion at the Karumba Port for the export of minerals. Transhipment of minerals from Karumba Port has been successfully demonstrated for over 15 years, but the capacity to expand is limited by shortages of water at the Port. The Port of Karumba provides the greatest foreseeable economic development opportunity for the Shire, but without an upgraded water supply, its potential will not be realised.

Part of attracting and retaining people in regional Queensland is ensuring that townships are green, clean and healthy places for both individuals and families to stay. While the recreational and work opportunities in the Shire are diverse, the atmosphere and ambience of the townships could be improved greatly by making them more attractive with plantings of trees and gardens, and the establishment of parks. In terms of lifestyle, Carpentaria Shire would have so much more to offer with a water supply that could ensure the development of attractive, landscaped towns. Council has for some time had master plans for the beautification of the streetscapes at both Normanton and Karumba, but has not been able to implement them due to ongoing critical water shortages.

The importance of water infrastructure is identified as being essential for the long term development of regional Queensland. In summary, this water supply project satisfies the priority action areas of the framework of:
1. Growing regions: capitalising on economic drivers;
2. Infrastructure services for regional growth; and
3. Attracting and retaining people in regional Queensland.

2.8 Provide details of community and / or regional support for the project. (Include results of community/regional consultation. Please attach evidence. For online evidence, provide relevant hyperlinks).

Various public consultation meetings and workshops were held in both Normanton and Karumba to outline the findings of the study and to go through in-depth the various options available. Participants were provided opportunity to"vote" on what they thought was the most appropriate options for Council to further pursue and provide financial forecasts on.

Details of these meetings contained in the documents attached - CRF_Public_Consultation_and_Results

2.9 Is the proposed mitigation infrastructure supported by a flood management study / community risk assessment?

☑ Yes
☐ No - please outline the reason for this:

2.10 Previous studies undertaken. Use the table below to provide details of studies or research previously undertaken into the flood risk / proposed project.

Title	Author	Year	Attached	Explain how the study supports the proposed project
Normanton & Karumba Water Supply Upgrade Options Study	SMEC & PDR Engineers	February 2014	■	Provided detailed modelling on various possible options that could be investigated further

2.11 Detail the criteria that Council will use to measure success of the project. (Including, but not limited to, linking outcomes of the 2015-16 CRF objectives)

Outcome	Estimated Change	Details of Proposed Outcome
e.g. Inundation of houses	*-50%*	*It is estimated that 50% fewer houses will be flooded during a 1:100 year event due to this project*
e.g. Employment	*100 FTEs*	*It is estimated that there will be 100 new jobs created from the project*
Continued reliable source of water supply	Retain population numbers	maintains livability aspects of both Normanton and Karumba
Continued reliable source of water supply	Attract further investment into the communitys	attract further business ventures to harness the opportunities associated with the Karumba Port
Employment	x FTEs	New opportunities will require additional population to staff and maintain operations

2.12 Proposed project delivery timeframe	
What stage has the project reached?	
■ detailed design	
■ tender stage	
■ contractual stage	
■ ready to commence	
other (specify):	
Proposed project commencement date	August/September 2015
Proposed project completion date	April 2016
If the project being applied for will take longer than 12 months to deliver, provide reasoning below:	

2.13 Does this project link to Council's corporate and forward planning processes or regional plans? (eg. including engagement with the community such as briefings or presentations, council's capital works program)

☑ Yes (please provide details, including title and relevant reference page number/s in the space provided)

☐ No

Details:

Long Term Financial Forecasting as well as inclusion in the 2014/2015 Carpentaria Shire Annual Budget

2.14 Confirmation of commitment to the ongoing operation and maintenance of the proposed infrastructure project, post completion.	
Will the completed infrastructure project be included in the organisation's asset management plan where relevant?	☑ Yes ☐ Not applicable
Will recurrent operation and maintenance costs for the completed project be included in annual budgets?	☑ Yes ☐ Not applicable

2.15 Project plan. Complete and attach your plan. (refer to the project plan outline at Appendix 1)

☑ Yes, documents are attached

2.16 Provide details of land tenure where the project will be located?

☑	Applicant
☐	Queensland Government – Specify the agency responsible for the land or the type of land (e.g. Crown, road reserve): CRF_Glenore_Weir_Map Attach supporting documentation
☐	Other – details:

If applicant does not own the land, provide details (e.g. land acquisition by purchase, land use through lease or deed, or permission from owner/s etc.):

Existing site and surrounds owned by Council

Attach supporting documentation

2.17 Have native title and/or cultural heritage considerations been addressed?

☑ Yes provide details:

Council has completed a cultural heritage assessment which consists of engaging the services of an archaeologist in consultation with traditional owners. Not significant cultural heritage issues were identified that would affect the project.

☐ No provide details:

☐ Not applicable (specify):

2.18 Details of approvals and/or licences required for this project (e.g. any approvals, licences etc. required from other State or Commonwealth agencies)

List approvals and/or licences required to deliver this project and indicate current status

Licence/approval required	Regulatory agency	Current status		Comments
		Approved	Not yet approved	
Development Application	Carpentaria Shire Council	■		CRF_Development_Decision_Notice

Section 3 - Proposed project budget

3.1 Proposed project budget that needs to include all funding contributions to the proposed project (all figures to be GST exclusive)		
Total project cost	**A**	$ 11,000,000.00

Other funding contributions (Not council revenue)

Source	Program title/description	ApprovedYes/ No	Amount	
			$	
			$	
			$	
			$	

Total other funding contributions	**B**	$ 0.00
Total ineligible costs (excluding other funding contributions)	**C**	$ 1,000,000.00
Total eligible project cost (A - B - C)	**D**	$ 10,000,000.00
Subsidy percentage sought (note: CRF provides 40% subsidy of the eligible project cost, however an increased subsidy rate may be considered by the Minister)	**E**	40.00 %
Total subsidy requested (D x E)	**F**	$ 4,000,000.00

3.2 How have costs been determined for this project and detail how is this project value for money?
(Demonstrate if a project decision making framework has been undertaken)

Costs estimates have been provided for (for each option) by consulting engineers along with flood modelling for possible land acquisition requirements. These details can be found in the attached document CRF_Water_Supply_Upgrade_Options_Study_SMEC

3.3 Has the Queensland Government previously funded any component of this project?

☐ Yes (Specify the department / agency, the funding was provided by, program, amount, date approved, purpose)

☒ No

Section 4 - Breakdown of project costs

(All costs to be GST exclusive)

Project items	Funding sought	Own source contribution	Other contributions	Total item cost
Project implementation				
Mobilisation, site establishment, detailed investigations & approvals	$ 400000	$ 200000	$	$ 600000
	$	$	$	$ 0
Project management				
PDR Engineers - Engineering Supervision and Project Management	$ 100000	$ 500000	$	$ 600000
	$	$	$	$ 0
Wages (project personnel only)				
Council	$	$	$	$ 0
Contractor	$	$	$	$ 0
	$	$	$	$ 0
Construction				
Council	$	$	$	$ 0
Contractor	$ 3500000	$ 4800000	$	$ 8300000
	$	$	$	$ 0
Professional fees				
	$	$	$	$ 0
	$	$	$	$ 0
Statutory fees and charges				
	$	$	$	$ 0
	$	$	$	$ 0
Contingency (allow maximum of 15%)				
	$	$ 1100000	$	$ 1100000
	$	$	$	$ 0
Other				
De-mobilisation and clean up	$	$ 200000	$	$ 200000
Electrics and controls	$	$ 200000	$	$ 200000
Total project cost	**$** 4000000	**$** 7000000	**$** 0	**$** 11000000

Section 5 - Supporting documents

List all supporting documents attached to this application. To be completed and submitted for each application for funding.

Number and name of each supporting document	Attached
1. Project plan *(use outline at Appendix 1)*	■
2. CRF_Water_Supply_Upgrade_Options_Study_SMEC	■
3. CRF_Development_Decision_Notice	■
4. CRF_Detailed_Project_Plan	■
5. CRF_Public_Consultation_and_Results	■
6. CRF_CSC_10_Year_Budget	■
7. CRF_Glenore_Weir_Map	■
8. CRF_Letters_of_Support_(NSRF)	■
9.	□
10.	□

Appendix 1 - Project plan outline

The applicant's project plan is to include the following:

- Project title
- Executive summary
- List of technical terms and acronyms
- Project scope of works including:
  - outputs (list items that will be produced by the project)
  - outcomes (what the project aims to achieve)
- Project management, including:
  - key project personnel
  - project manager, including their expertise, skills and contact details
  - specialist expertise
  - project constraints
  - key performance indicators
  - project deliverables and expenditure milestones provided
- Required project budget (including assumptions) for construction period and initial operating period
- Required project cash flows
- Project risk management plan – identify and describe how project risks will be mitigated or managed
- Reference materials, where relevant, such as site designs, maps and photos.

Appendix 2 - Applicant checklist

Certification form	■	Certification completed and signed in the space provided by delegated officer
	■	Scanned signed certification page attached to completed application email
Section 1 - Applicant and Project Overview	■	Organisation details provided
	■	Project prioritised
	■	Applicant overview provided
Section 2 - Project details	■	Project need demonstrated
	■	Evidence of support from catchment partners attached (if relevant)
	■	Project evaluation – proposed outcomes and benefits provided
	■	Project Plan completed and attached (refer outline sample Appendix 1)
		Flood mitigation infrastructure projects only: ☐ Flood management study attached ☐ Land ownership supporting documents attached ☐ Evidence of support for the proposed project - attached
Section 3 - Proposed Project Budget	■	Funding contributions provided
	■	Value for money information provided
Section 4 - Breakdown of Project Costs	■	Project cost breakdown completed
Section 5 – Supporting documents	■	All supporting documents listed All supporting documents attached to application
Appendix 1	■	Project plan completed and attached.
	■	Email the follow for each project to 2015-16CRF@dilgp.qld.gov.au by the closing date: • An electronic copy of the application form • A scanned signed certification form • Named and numbered supporting documents for the application.

Note: only one application and supporting documentation per email

Appendix 3 – Contacts for councils by DILGP local government region

Northern Region **Telephone:** (07) 4758 3421			
Aurukun Shire Council	Cook Shire Council	Livingstone Shire Council	Pormpuraaw Aboriginal Shire Council
Banana Shire Council	Croydon Shire Council	Lockhart River Aboriginal Shire Council	Richmond Shire Council
Burdekin Shire Council	Douglas Shire Council	Mackay Regional Council	Rockhampton Regional Council
Burke Shire Council	Doomadgee Aboriginal Shire Council	Mapoon Aboriginal Shire Council	Tablelands Regional Council
Cairns Regional Council	Etheridge Shire Council	Mareeba Shire Council	Torres Shire Council
Carpentaria Shire Council	Flinders Shire Council	McKinlay Shire Council	Torres Strait Island Regional Council
Cassowary Coast Regional Council	Gladstone Regional Council	Mornington Shire Council	Townsville City Council
Central Highlands Regional Council	Hinchinbrook Shire Council	Mount Isa City Council	Whitsunday Regional Council
Charters Towers Regional Council	Hope Vale Aboriginal Shire Council	Napranum Aboriginal Shire Council	Woorabinda Aboriginal Shire Council
Cloncurry Shire Council	Isaac Regional Council	Northern Peninsula Area Regional Council	Wujal Wujal Aboriginal Shire Council
	Kowanyama Aboriginal Shire Council	Palm Island Aboriginal Shire Council	Yarrabah Aboriginal Shire Council

Southern Region **Telephone:** (07) 3452 6762			
Balonne Shire Council	Diamantina Shire Council	Maranoa Regional Council	Somerset Regional Council
Barcaldine Regional Council	Fraser Coast Regional Council	Moreton Bay Regional Council	South Burnett Regional Council
Barcoo Shire Council	Gold Coast City Council	Murweh Shire Council	Southern Downs Regional Council
Blackall-Tambo Regional Council	Goondiwindi Regional Council	Noosa Shire Council	Sunshine Coast Regional Council
Boulia Shire Council	Gympie Regional Council	North Burnett Regional Council	Toowoomba Regional Council
Brisbane City Council	Ipswich City Council	Paroo Shire Council	Western Downs Regional Council
Bulloo Shire Council	Lockyer Valley Regional Council	Quilpie Shire Council	Winton Shire Council
Bundaberg Regional Council	Logan City Council	Redland City Council	
Cherbourg Aboriginal Shire Council	Longreach Regional Council	Scenic Rim Regional Council	

Account	Description	2013/2014 Adopted Budget	2013/2014 Revised Budget	2014/2015 Proposed Budget	2015/2016 Estimated Budget	2016/2017 Estimated Budget	2017/2018 Estimated Budget	2018/2019 Estimated Budget	2019/2020 Estimated Budget	2020/2021 Estimated Budget	2021/2022 Estimated Budget	2022/2023 Estimated Budget	2023/2024 Estimated Budget
	Percentage Increase Revenue	5%	5%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
	Percentage Increase Expenditure	4%	4%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
	Percentage Increase Wages	4%	4%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
	Depreciation	4%	4%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
4800-0002-0000	Water												
4810-0003-0000	Water Rates & Charges												
4810-1000-0000	Rates and Charges												
4810-1000-0001	General Charges												
4810-1000-0002	Excess Water												
4810-1000-0003	Rates Discount												
4810-1000-0004	Council Pensioner Rate Rebate												
4810-1600-0000	Interest on Rates												
4820-0003-0000	Water Operations												
4820-1100-0000	Ntn Water Supply Augmentation (S)												
4820-1101-0000	Ntn Water Fluoridation QFCAP (S)												
4820-1400-0000	Fees and Charges												
4820-1400-0002	Connection Fees												
4820-1400-0003	Potable Water Sales												
4820-2000-0000	Operating Expenses												
4820-2000-0001	Operations												
4820-2000-0002	Upgrade Water Service Connections												
4820-2000-0003	TMP Development												
4820-2100-0000	Loan Interest - Ntn Water Supply												
4820-2400-0000	Minor Assets												
4820-2600-0000	Depreciation - Water Operations (W)												
4800-0002-0000	Water	1,036,709	(838,914)	505,584	478,611	464,686	449,510	432,777	414,568	394,252	372,210	352,900	331,730
4900-0002-0000	Sewerage												
4910-0003-0000	Rates & Charges - Normanton Sewerage												
4910-1000-0000	Rates and Charges												
4910-1000-0001	General Charges												
4910-1000-0002	Sewerage Rates Discount												
4910-1000-0003	Pensioner Rate Rebate												
4910-1600-0000	Interest on Rates												
4920-0003-0000	Normanton Sewerage Operations												
4920-1400-0000	Fees & Charges - Normanton Sewerage												

Equity | Cash Flow | Profit & Loss | GenFund Plan | Business Acts | Labour Budgeting | **Budget Worksheet** | Misc

CARPENTARIA SHIRE

Outback by the Sea®

Raising of Glenore Weir water storage for Normanton and Karumba Project

PROJECT PLAN – February 2015

Table of Contents

1. Executive summary

A project to address the critical and dangerous annual water shortages in Carpentaria Shire.

The project seeks to raise the Glenore Weir, which supplies water to the townships of Normanton and Karumba in Carpentaria Shire, to ensure a safe and reliable water supply for the region in order to provide sustainable economic development opportunities, as well as improved amenity, quality of life, growth and prosperity.

2. Technical terms and acronyms

Council means Carpentaria Shire Council, ABN 59 242 797 822 of 29-33 Haig Street Normanton QLD 4890

Contractor means the party whose Contract Offer to supply the Goods and/or Services is accepted by Council (by Purchase Order)

GST has the meaning set out on *section 195-1* of the *GST Act*

Milestone means a stage of completion of the project, as specified in *5.5 Project deliverables* and milestone

Other Contribution means financial or in-kind resources attributed to the project other than funding

PDR means PDR Engineering

Purchase Order means the purchase order for the Goods and/or Services placed by Council with the Supplier under terms of the Contract

Project means the Raising of the Glenore Weir water storage for Normanton and Karumba identified in this document

Project Completion Date means the date specified in *5.5 Project deliverables and milestone*, which is the date the project is completed

3. Project scope

3.1. Project site

The Raising of the Glenore Weir water storage for Normanton and Karumba is to be constructed at the existing site where the current Glenore Weir is located on the Norman River.

Lot:	8
Registered Plan:	NM142
Parish:	Clarina
County:	Norman
Title Reference:	49020779
Longitude:	17°51’38.99”E
Latitude:	141°07’48.84”E

3.2. Land ownership

The land is a Local Government Reserve for Water Supply and is under the trusteeship of Carpentaria Shire Council.

Council have endorsed the project to be constructed at this site.

3.3. Scope of works

- Geotechnical investigations, designs and approvals
- Site preparation
- Weir raising construction works
- Pump off-take structure construction
- Fish-way construction
- Site clean up and commissioning

4. Project management

4.1. Project delivery

Council have engaged the consultancy firm PDR Engineers to facilitate the community consultation, site and geotechnical investigations, design and project manage the construction of the project.

Upon finalisation of the design, PDR will conduct the tender process for the construction works as well as act as Council's Project Manager. Where possible (and practicable) Council will encourage the use of local contractors to be part of the project to minimise impact of mobilisation costs (given that the location of the site is considered a remote location)

4.2. Project constraints

- Development Applications and Environmental approvals required for structures
- Project variations leading to increase in project costs
- Geotechnical reports identifying issues with ground conditions
- Early wet season may delay project completion date
- Specialist equipment required may not be readily available at time required

4.3. Regulatory requirements

Licence/permit/ development approval	Regulatory agency	Approval status	Details
Development Application (MCU)	Carpentaria Shire Council	Approved	October 2014
Operational Works Approval	Department of Agriculture, Fisheries and Forestry	Pre-lodgement meeting held. Application will be lodged when fish passage design is finalised.	Approval for waterway barrier
Referral	Environmental Protection and Biodiversity Conservation Act (Cth)	Being drafted	
QLeave	Building and Construction Industry	To be submitted prior to works commencing	Upon submission of final designs and applications

4.4. Key personnel

Full Name	Date of birth	Role
Robert Malcolm Owen	05/07/1960	Chief Executive Officer
Summary of Skills and Experience		
Legal Practitioner, Bachelors of Laws (Hons) Former solicitor with expertise in Planning and Environment and Local Government Law Experienced project manager Qualified mediator		

Full Name	Date of birth	Role
John Duncan Teague	24/02/1960	Director of Engineering (Council)
Summary of Skills and Experience		
RPEQ registered engineering with over 30 years experience in Local Government in both Queensland and Victoria. Extensive experience in design, administration and project management of large scale projects both civil and construction.		

Full Name	Date of birth	Role
Oliver Pring	10/12/1976	Director Corporate Services (Council)
Summary of Skills and Experience		
Finance and accounting background with 10 years experience in Local Government. Managed acquittals of projects as well as cost monitoring and feedback.		

4.5. Special expertise

Council have engaged [redacted] (Principal Engineer) of PDR Engineers to provide consultancy, design and project management services of this project.

PDR Engineers are listed as appointed suppliers in the Local Buy directory (for Engineering Consultancy Services – BUS 226-0212)

[redacted] has over 20 years experience which includes multi-disciplinary project management, civil/structural engineering design, contract administration, strategic infrastructure management, local government and community development/planning, management and implementation of major programs. Peter has also worked extensively in remote areas and indigenous communities throughout Queensland providing essential health infrastructure.

4.6. Project risk management

Following is a risk register that outlines all associated risks and proposed mitigation strategies for the *Raising of the Glenore Weir water storage for Normanton and Karumba Project*.

Royalties for the Regions - Infrastructure Project Risk Identification

Council Name: Carpentaria Shire Council

Project Name: Raising of the Glenore Weir water storage for Normanton and Karumba Project

Risk Identification - Major factors which could significantly influence the timing, cost or scope of the work.

Risk Level: High (H) Medium (M) Low (L)

Likelihood: Likely (L) Possible (P) Unlikely (U)

Risk	Risk Level	Likelihood	Mitigation Strategy
Contractor delivery	H	U	Tender process to include stringent assessment to ensure the contractor selected is experienced and competent in all components of the works. Have in place a mechanism to deal with failure to deliver by contractor and any associated damages.
Construction delay (contractor)	H	P	Ensure contractors program is with in project delivery timeframes. Reference tender documents to delay damages and penalties. Construction Manager to report on delivery time delays and process to get back on program. Project Manger to ensure monitoring and feedback.
Construction delay (weather)	H	P	The only natural event risk is wet weather so all works to be programmed around early wet and extended wet season. Construction activities to allow average number of wet weather days. Should an event eventuate provide timely advice to the Department on the possibility of seeking an extension of time.
Council capability to deliver	M	U	Sound tender process and documentation, ensure compensation for damages, ability for Council to complete works under day labour arrangements, recall tender/negotiate with other tenderer. Renegotiate with Department on possibility of seeking an extension of time.
Scope variation	M	U	Limit scope variation approvals, monitor cost implications, notify Department if impacts timeframe on seeking an extension of time. Cost increase above project budget to be funded by Council.
Cost variation	M	P	Cost increase above project budget to be funded by Council.
Operational costs	L	U	Council is aware of the operational and maintenance costs of the new weir and has budget strategies in place to cover the minor increased costs for the future.
Unsuitable soil foundation	L	U	Geotechnical investigation undertaken to reduce risk (completed), design takes into account alternative construction techniques, allowance for suitable construction time and various construction methodologies. Provide timely advice to the Department on the possibility of seeking an extension of time.
Project timeframe creep	L	U	Provide timely advice to the Department on the possibility of seeking an extension of time.
Material supply	L	U	Ensure critical materials are sourced prior to commencement of project.

5. Project budget

5.1. Project costs

Project cost is currently forecasted at $12,000,000, funding is based on confirmed contribution amount of $6,000,000 from Council and the seeking of $6,000,000 from the *National Stronger Regions Fund*

5.2. Financial contributors

Category	Funding contributor	Contribution description	Amount (ex GST)	Funding status	Funding status details
State Government	Department Infrastructure, Local Government and Planning	2015-16 Community Resilience Fund	4,000,000	Unconfirmed	
Local Govt	Carpentaria Shire Council	Sustainability Reserve	7,000,000	Confirmed	
Total contributions			**$11,000,000**		

5.3. Cost management

Council currently has in place several reporting mechanisms including those that allow the monitoring of Council's revenue and expenditure (including capital expenditure). These include:

- Monthly Council meetings: financial data as well as project status are provided to Councillors on the various works currently being undertaken as well as provision of factors affecting scope/pricing.
- Fortnightly Job Cost Reports: provided to various managers and staff within Council outlining financial data on maintenance and capital works currently being undertaken.
- Project Manager communications: regular updates provided by engaged contractors on works update and (if applicable) any concerns

Having these in place allows Council to be fully informed about the project from start to finish and allow approved remedial action to be undertaken (if necessary)

5.4. Asset management

Council will include any additional charges associated with the upgraded infrastructure as part of the overall water utility service. Charges will be based upon whole of life costing, along with full cost recovery.

Financial forecast modelling (using Queensland Treasury Corporation's *Local Government Forecasting Model*) includes provisions for revenue from above as well as maintenance and capital costs based on historic data from similar Council infrastructure.

Funding for these operations will be derived from income as part of Council's *Water Utility Charges.*

5.5. Project deliverables and milestones

Project Task	Start Date	End Date	Milestone	Estimated Expenditure
Detailed investigation and approvals	13/01/2014	15/12/2014	*Finalisation of necessary site investigation*	*$450,000*
Design and contract documentation	15/12/2014	12/05/2015	*Ready to tender design for construction*	*$363,700*
Site preparation and establishment	11/05/2015	30/05/2015	*Commence onsite works*	*$431,572*
Construction of abutment wall	25/09/2015	31/12/2015	*Construction of new abutment wall for new weir*	*$1,717,507*
Construction of side abutment walls	25/09/2015	30/11/2015	*Construction of new abutment wall for new weir*	*$944,162*
Construction of spillway	25/09/2015	26/11/2015	*Weir construction works*	*$2,966,756*
Construction of fishway	25/09/2015	30/11/2015	*Weir construction works*	*$3,046,640*
Construction of pump offtake structure	25/09/2015	31/12/2015	*Weir construction works*	*$1,257,749*
Installation of electrics and controls	02/11/2015	02/01/2016	*Set up associated electrics with pumps and intakes*	*$484,403*
Clean up, demobilisation and commissioning	04/01/2016	18/01/2016	*Site clean up and commissioning works*	*$337,511*

6. Project outcomes and benefits

The project will address ongoing critical water shortages at Normanton and Karumba. The current water supply has only enough capacity generally to last from one wet season to the next wet season. The permanent population of Normanton is approximately 1600 people. This increases during the dry or tourist season to approximately 2200 people at any one time. The permanent population of Karumba is 600 people but this number increases dramatically to 4000 to 4500 people at any one time during the tourist season.

The existing weir was constructed in 1965 and catered for a much smaller population. It is now past its "use by" date given the increase in tourism and in mining activities. The weir was never designed to take into account the very large increases in tourist numbers. In addition, the main mining activity at Karumba uses on average a total of 100 000 kilolitres per day from the towns' water supply.

In 2012/2013, the town water supply was nearly depleted as a result of a poorer than usual wet season. Council imposed very severe water restrictions for the entire following year which were well supported by the community. If another poor wet season had ensued, the towns would have run out of water. The consequences of that situation arising would have been catastrophic to the population and the future of the Shire. There are no alternative sources of water in the vicinity of the Shire's towns. As each town uses approximately 1 000 000 litres of water per day, it would not have been possible to truck sufficient water to the towns for them to survive. In addition, there are no suitable groundwater supplies in the region to provide water. The only option would have been to evacuate the towns which would have caused irreparable damage to the economic and social fabric of the Shire. It was a situation that would have placed the ongoing sustainability and viability of the Shire in grave doubt. An upgraded water supply would ensure that such circumstances could not arise again.

The upgraded water supply provides opportunities for economic development, especially in relation to tourism, agriculture and resource activities – three of the four pillars of the Queensland economy. The ability to deliver water on demand to various user groups would, as noted in the RegionsQ framework at page 18, *"[capitalise] on economic drivers by broadening and deepening regional participation in the four pillars…[and] will develop stronger and more resilient regional economies."* Without expanding the existing capacity of the Carpentaria Shire water supply, there is no further opportunity to:

1. Cater for the expanding tourism market;
2. Supply water to any more mining projects;
3. Expand the Port of Karumba which has been identified as critical to the development of agriculture in Northern Australia through the development of infrastructure to support access to markets (Gulf Rivers Agricultural Zone, RegionsQ at page 37);
4. Encourage development of any type, including residential and rural residential housing.

Economic infrastructure such as the water supply project enhances productivity, underpins industry growth and opens up potential new markets (RegionsQ at page 13); for example, by allowing for expansion at the Karumba Port for the export of minerals. Transhipment of minerals from Karumba Port has been successfully demonstrated for over 15 years, but the

capacity to expand is limited by shortages of water at the Port. The Port of Karumba provides the greatest foreseeable economic development opportunity for the Shire, but without an upgraded water supply, its potential will not be realised.

Part of attracting and retaining people in regional Queensland is ensuring that townships are green, clean and healthy places for both individuals and families to stay. While the recreational and work opportunities in the Shire are diverse, the atmosphere and ambience of the townships could be improved greatly by making them more attractive with plantings of trees and gardens, and the establishment of parks. As stated in RegionsQ, *"[r]esearch indicates many people move to regions because of job opportunities but their decision to stay is based on the enviable quality of life offered by regional locations."* (at page 21). In terms of lifestyle, Carpentaria Shire would have so much more to offer with a water supply that could ensure the development of attractive, landscaped towns. Council has for some time had master plans for the beautification of the streetscapes at both Normanton and Karumba, but has not been able to implement them due to ongoing critical water shortages.

The importance of water infrastructure is identified in RegionsQ as being *"…essential for the long term development of regional Queensland."* In summary, this water supply project satisfies the priority action areas of the RegionsQ framework of:

1. Growing regions: capitalising on economic drivers;
2. Infrastructure services for regional growth; and
3. Attracting and retaining people in regional Queensland.

The project will address the current problem, need and opportunity by ensuring adequate water supplies are available to the two main towns within Carpentaria Shire of Normanton and Karumba.

While it is not possible to quantify the extent of any new jobs or investment created as a result of the improved infrastructure, it is certainly possible to conclude that there will be job losses and no investment without an upgraded water supply. Council cannot currently cater for existing demand and unless the proposed new infrastructure is constructed, the situation will only get worse. The economy cannot thrive without additional water. In the recent past, Council had to withdraw from a study into the establishment of an abattoir in the Gulf region simply because it could not supply the water. This was a lost opportunity as there was real potential to export the beef to Asian markets through the Port of Karumba. Council imposes strict year-round water restrictions which limit watering of gardens. Even at the time of writing, Council is considering a total ban on watering as the level of the weir has dropped dramatically over the past month. Even with controlled and regulated water use, the weir loses on average three metres of water per annum through evaporation. This situation can only be improved by the construction of a raised weir. The current weir has a storage capacity of 960ML while the raised weir would have a storage capacity of 2 200ML.

More critical is the Maximum Annual Safe Yield (MASY). The existing weir has a MASY of 310 ML/year. This project in raising the weir wall by 1.2 metres would see the MASY rise to 1 250 ML/year; thereby quadrupling the MASY.

Project outcome	Benefits
Increased water storage capacity	*Ensure basic water supplies available for community*
Increased water storage capacity	*Support capacity for future growth of region*
Increased water storage capacity	*Capitalise on economic drivers in the agricultural, mining, aquaculture and tourism industries*
Increased water storage capacity	*Attract new industries to take advantage of the Port of Karumba facility*

I-0805

ID: 135406

23 October, 2013

Enquire to: Director of Engineering – John Teague
Telephone: [redacted]

Chief Executive Officer
Carpentaria Shire Council
PO Box 31
NORMANTON QLD 4090

CARPENTARIA SHIRE
Outback by the Sea

PO Box 31 Normanton Qld 4890
P 07 4745 2200 • **F** 07 4745 1340
E council@carpentaria.qld.gov.au
W www.carpentaria.qld.gov.au

Decision Notice
Sustainable Planning Act Sections 334 and 335

Proposal:	**Community Infrastructure (Raising Glenore Weir)**
Address:	**Gulf Developmental Road, Normanton**
Property Description:	**Lot 8 NM142, being Reserve 175 for Local Government Purposes;** **Lot 53 SP112715, being Reserve 44 for Strategic Land Management;** **Adjacent road reserve; and** **Part of adjacent Lot 4 NM141.**
Decision Date:	**16 October, 2014**

Dear Sir/Madam

I wish to advise that, on 15 October 2014, the above development application was –

☐ Approved in full;
OR
☐ Approved in part;
OR
☒ Approved in full with conditions. The conditions relevant to this approval are included below. These conditions are clearly identified to indicate whether the assessment manager or concurrence agency imposed them;
OR
☐ Approved in part for the following, with conditions.
OR
☐ Is a Deemed Approval under Section 331 of the *Sustainable Planning Act 2009.*
OR
☐ Refused

1. **Details of the approval -**

The following type of approval has been issued –

	Development Permit	Preliminary Approval
Community Infrastructure (Raising Glenore Weir)	☒	☐

2. **The currency period -**

☐ The standard currency periods stated in Section 341 of the *Sustainable Planning Act 2009* apply to each aspect of the development in this approval.

OR

☒ A currency period of three (3) years, from the date of this approval applies, refer to Condition 4 below.

The approved plans –

The approved plans and / or documents for this development approval are listed in the following table –

Plan Description	Reference	Date
Site Plan- Raising of Glenore Weir	Drawing No: 13270-SK1 Revision A	September, 2014.

3. **Referral Agencies –**

	Concurrence	Advice	Third Party
Nil	☐	☐	☐

4. **Other necessary Development Permits**

Listed below are other Development Permits that are necessary to allow the development to be carried out –

Application for Operational Works for Constructing or Raising Waterway Barrier Works

5. **When the Development Approval takes effect –**

This Development Approval takes effect –

- From the time the Decision Notice is given, if there is no submitter and if the applicant does not appeal the decision to the Court.

OR

- Subject to the decision of the Court, when the appeal is finally decided, if an appeal is made to the Court.

This approval will lapse unless substantially started within the above stated currency periods (refer to Sections 341 of the *Sustainable Planning Act 2009* for further details).

6. **Appeal rights –**

Attached is an extract from the *Sustainable Planning Act 2009* which details your appeal rights regarding this decision. A summary of the appeal rights is provided below for your information.

Applicant:

An applicant for a development application may appeal to the Planning and Environment Court against the following:

- The refusal, or refusal in part of the development application;
- Any condition of a development approval, another matter stated in a development approval and the identification or inclusion of a code under Section 242 of the *Sustainable Planning Act 2009;*
- The decision to give a preliminary approval when a development permit was applied for;
- The length of a period mentioned in Section 341;
- A deemed refusal of the development application.

The timeframes for starting an appeal in the Planning and Environment Court are set out in section 461(2) of the *Sustainable Planning Act 2009*.

Applicants may also have a right to appeal to the Building and Development Dispute Resolution Committee. For more details, see the *Sustainable Planning Act 2009*, Chapter 7, Part 2.

Appeals by submitters

A submitter for a development application may appeal to the Planning and Environment Court against:

- The part of the approval relating to the Assessment Manager's decision about any part of the application requiring Impact Assessment
- The part of the approval relating to the Assessment Manager's decision under Section 327.

Details about submitter appeal rights for the Planning and Environment Court are set out in Sections 462, 463 and 464 of the *Sustainable Planning Act 2009*.

Submitters may also have a right to appeal to the Building and Development Dispute Resolution Committee. For more details, see the *Sustainable Planning Act*, Chapter 7, Part 2.

ASSESSMENT MANAGER CONDITIONS

In accordance with the *Sustainable Planning Act 2009* as amended, the applicant be notified that the application for a Development Permit for a Material Change of Use – Community Infrastructure (Raising Glenmore Weir) is approved subject to the conditions detailed below:

General

1. The development shall be undertaken substantially in accordance with the Site Plan submitted with the application, except as modified by this approval:
    - Site Plan- Raising of Glenore Weir, Drawing No: 13270-SK1 Revision A, dated September, 2014.

2. Any future construction work on-site shall be carried out generally in accordance with any relevant Council and State Government requirements.

3. In accordance with the Sustainable Planning Regulations (SPR), Schedule 3, Part 1, Table 4, Item 6 no construction works are to commence on-site until an Application for Operational Works for Constructing or Raising Waterway Barrier Works has been assessed and approved by the Assessment Manager, the State Assessment and Referral Agency (SARA);

AND

Subsequent approval is issued by the Federal Government under the Environment Protection and Biodiversity Conservation Act (EPBC Act).

4. The applicant shall ensure the site is maintained, during and after development, in a clean and tidy condition at all times, to the satisfaction of the Chief Executive Officer or Delegate.

5. Any security fencing associated with the development is required to be approved by the Chief Executive Officer or Delegate.

6. Should any of the Council's assets be damaged during the construction of the works, the cost of the reinstatement of all such assets shall be met by the applicant and to the satisfaction of the Chief Executive Officer or Delegate.

7. The intersection of the Gulf Developmental Road and Glenore Road and on-site road access to the construction site is required to be upgraded, if required, to accommodate heavy vehicles accessing the site, during the construction phase and all road works are to be maintained in a safe and functional condition to facilitate future site access, to the satisfaction of the Chief Executive Officer or Delegate.

REFERRAL AGENCY CONDITIONS

Nil

APPLICABLE CODES FOR SELF ASSESSMENT:

Sustainable Planning Act 2009

Planning Scheme and Policies for Carpentaria Shire Council

Standard Building Regulation 1993

Building Act 1975

Building Code of Australia

Water and Sewerage Act 1949

PROPERLY MADE SUBMISSIONS: Nil

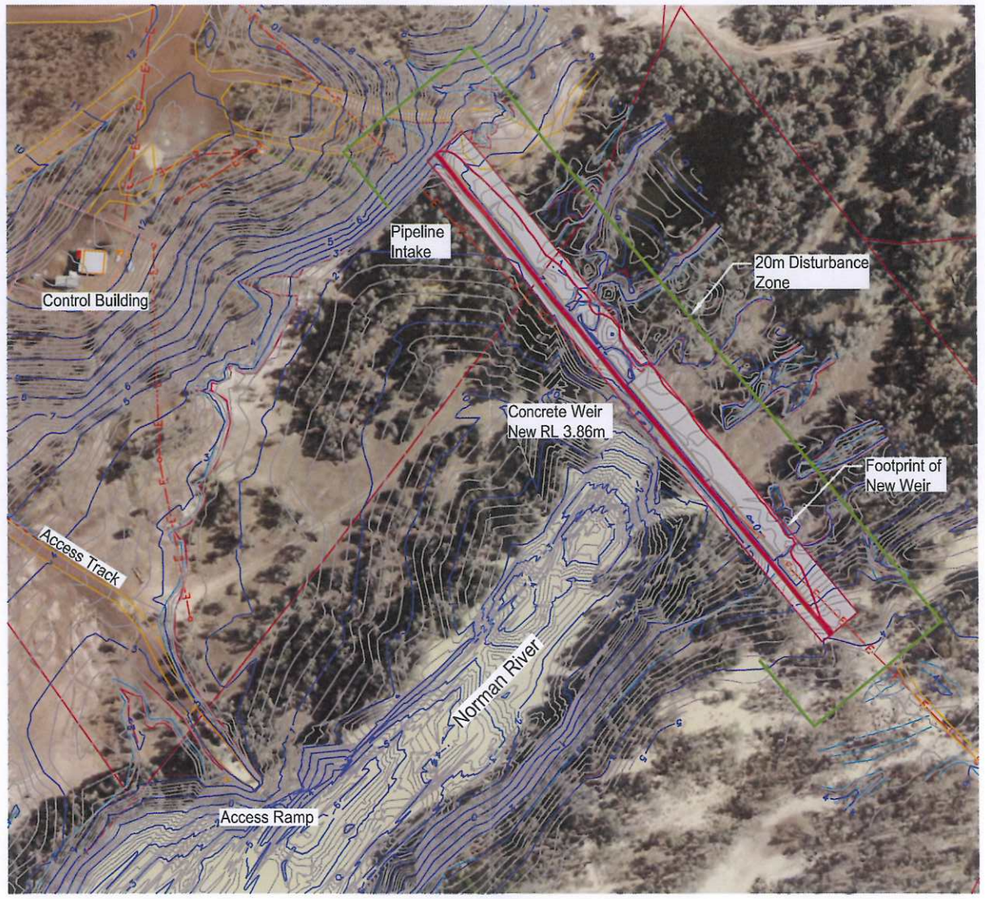
NAMES AND ADRESSES OF SUBMITTERS: N/A

If you wish to discuss this matter further, please contact Director of Engineering – John Teague on the above telephone number.

Yours faithfully,

OLIVER PRING
Acting Chief Executive Officer

SITE PLAN
SCALE 1:5000



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Issue	Description	Date
A	FOR PRELIMINARY REVIEW	05.09.14

Drawing Status: PRELIMINARY

Orig. Sheet: A1

DO NOT SCALE DRAWINGS

Scales Before Reduction

0.4 0 0.4 0.8 1.2 1.6 2.0 mm

pdr engineers
Level 1, 255 Mulgrave Road
PO Box 2551
CAIRNS QLD 4870
Ph: (07) 4051 5599
Fax: (07) 4051 5455
Email: admin@pdrengineers.com.au
A.B.N. 88 126 211 461
A.C.N. 126 211 461

Client: Carpentaria Shire Council

Project: RAISING OF GLENORE WEIR

Drawing Title: SITE PLAN

Drawn	Designed	Verified
BJR	-	-
Approved		Date
-		SEP 2014
Drawing Number		Revision
13270-SK1		A

Division 8 Appeals to court relating to development applications and approvals

461 Appeals by applicants

(1) An applicant for a development application may appeal to the court against any of the following-

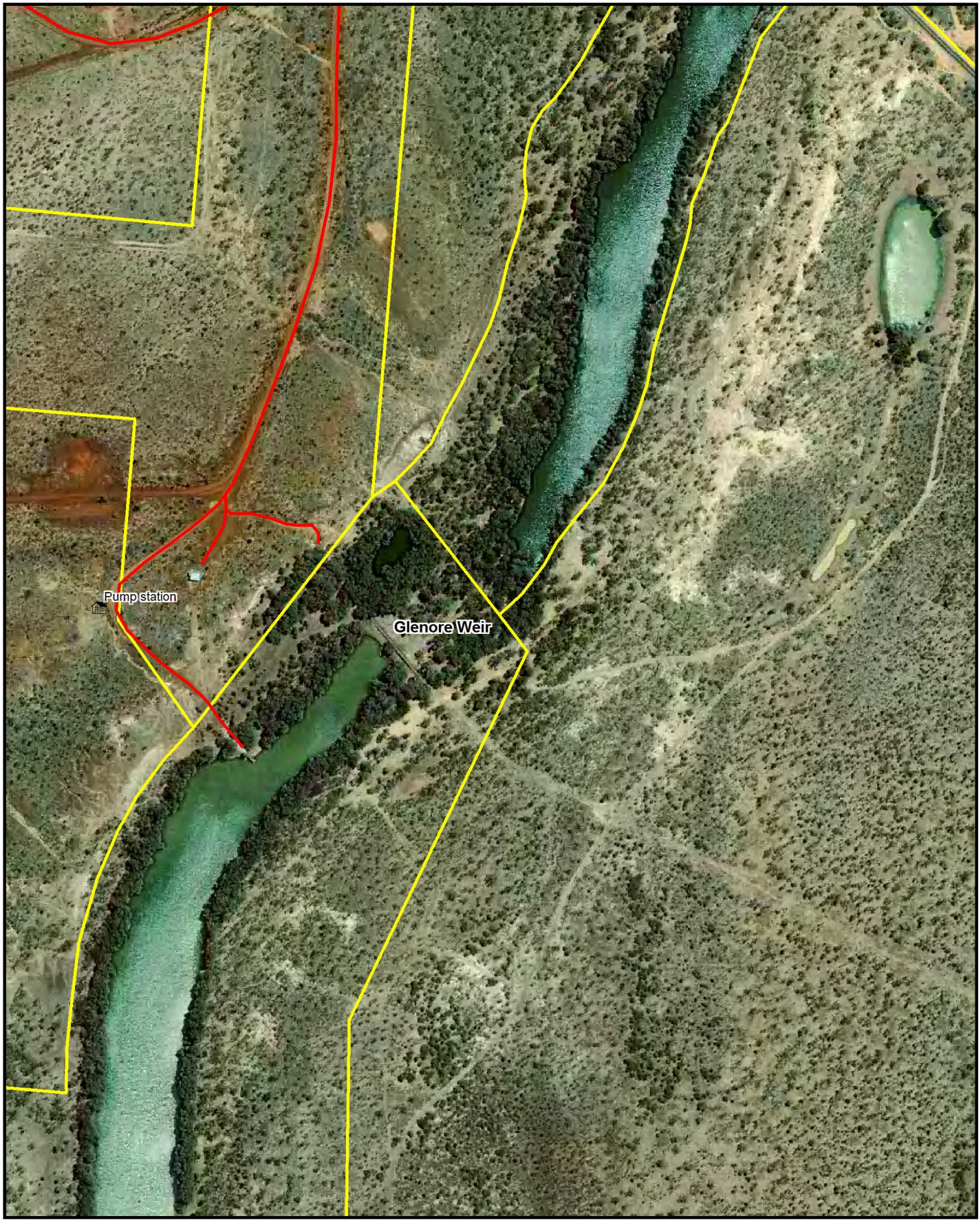
(a) the refusal, or the refusal in part, of the development application;
(b any condition of a development approval, another matter stated in a development approval and the identification or inclusion of a code under section 242;
(c) the decision to give a preliminary approval when a development permit was applied for;
(d) the length of a period mentioned in section 341;
(e) a deemed refusal of the development application.

(2) An appeal under subsection (1)(a), (b), (c) or (d) must be started within 20 business days (the ***applicant's appeal period***) after-

(a) if a decision notice or negotiated decision notice is given – the day the decision notice or negotiated decision notice is given to the applicant; or
(b) otherwise – the day a decision notice was required to be given to the applicant.

(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

Glenore Weir



CARPENTARIA SHIRE
Outback by the Sea

Scale
1cm = 50m at A4

Map Grid of Australia
Zone 54 (GDA94)

N
W E
S

PO Box 1968
Mount Isa QLD 4825

Mount Isa
74 Camooweal Street
P: 07 4743 5149
Cloncurry:
27 Ramsay Street
P: 07 4742 2530

Rob Katter MP
Member for Mount Isa

Monday 24 November 2014

RE: Carpentaria Shire Council National Stronger Regions Fund application

To whom it may concern,

I write in support of the Carpentaria Shire Council's application for funding from the National Stronger Regions fund, to increase the capacity of the Glenore Weir, which is vital for the water supply for Normanton and Karumba.

We acknowledge the great contribution in Royalties that Century Zinc Mine has made over the years with operations based in this Shire. The mine and its workers would benefit from this dam.

The tourist season, during the winter months puts added pressure on the Normanton and Karumba water supply. The Carpentaria Shire Council has a low rate base and struggles with such infrastructure needs that cater not only for its own residents, but for tourists, who are encouraged to travel to this tourist destination.

Added to this, the whole electorate is in the grip of a two year drought, which has meant a number of Shires have been challenged to ensure a more reliable and sustainable water system for their residents.

Increasing the capacity of the Glenore Weir will ensure sustainability against the risk of future water shortages, will help with the growing tourism industry, and will enable the Shire to attract more industry to their region.

Their application fits in well with the National Stronger Regions Fund's aim to help regional communities through targeted infrastructure programs.

I hope you will look favourably on their application.

Yours sincerely,

[redacted]

Rob Katter
Member for Mount Isa

Email: mount.isa@parliament.qld.gov.au
Freecall within the electorate: 1800 801 569

NWQROC
North West Queensland
Regional Organisation
of Councils
ABN 24 725 075 477

25 November 2014

National Stronger Regions Fund
Department of Infrastructure and Regional Development
PO Box 15009
CITY EAST QLD 4002

Dear Sir/Madam

CARPENTARIA SHIRE COUNCIL
NATIONAL STRONGER REGIONS FUND
EXPRESSION OF INTEREST

Please be advised that the North West Regional Organisation of Councils fully supports and endorses Carpentaria Shire Council's Expression of Interest for funding under the National Stronger Regions Fund for the following project:

Project Name	Upgraded Water Supply
Project description	Construct a new, raised weir adjacent to the existing weir at Glenore on the Normanton River
Total Project Costs	$12 million approximately
Funding Sought	$6 Million

Security of supply of water to Normanton and Karumba is required to:

- Prevent the Shire's supply to Normanton and Karumba being depleted as nearly happened in 2013
- Provide a reliable supply by increasing the safe annual yield from approximately 300ml to 1200ml, and removing the need for year round water restrictions
- Allow further growth in the Shire which will encourage economic development, including mining and tourism related activities

PO Box 31, Normanton QLD 4890 nwqroc@carpentaria.qld.gov.au
Chair: Cr Fred Pascoe, Mayor, Carpentaria Shire Council mayor@carpentaria.qld.gov.au M: 0429 960 319
Secretary: Bob Owen, CEO, Carpentaria Shire Council ceo@carpentaria.qld.gov.au M: 0428 399 115

The Shire having a small rate base does not have the means to provide such costly infrastructure of this type.

Please contact Bob Owen if you have any queries.

Yours faithfully

[redacted]

Cr John Wharton
DEPUTY CHAIR

Regional Development Australia
TOWNSVILLE AND NORTH WEST QLD

ABN 44 798 638 628

P: 07 4410 3655
F: 07 4772 7668
E: info@rdanwq.org.au
PO Box 1669
Townsville QLD 4810
www.rdanwq.org.au

27 November, 2014

Mr Oliver Pring
Director Corporate Services
Carpentaria Shire Council
PO Box 31
NORMANTON QLD 4890

Dear Oliver,

Re: Application for Funding from National Stronger Regions Fund
Raising of the Glenore Weir

On behalf of the Regional Development Australia Townsville and North West Queensland (RDA) Committee, I write in support of an application by Carpentaria Shire Council for National Stronger Regions Funding for the raising of the Glenore Weir.

We understand from information provided to us that Council is proposing to raise the Glenore Weir to provide water storage for the towns of Normanton and Karumba. The aim of the project is to ensure a safe and reliable water supply for the region, providing infrastructure services for sustainable economic development opportunities, as well as improved amenity, quality of life, growth, and prosperity, which will attract people to the region.

This project aligns with RDA's Vision to achieve a prosperous, sustainable, cohesive and liveable region. RDA prioritises investment into "Transformational Engine Starter Priorities" such as planning and solutions for water quality improvements, sustainable access to water, and its storage to expand agriculture, grazing and other industries.

This priority for infrastructure planning is particularly emphasised under Key Determinant Two – Sustainability (economically, environmentally and socially) – in accordance with the five determinants of long-term economic growth as set by the Council of Australian Governments Regional Economic Development Framework. (Refer page 16, Regional Roadmap 2013-16).

The RDA Committee encourages initiatives such as the raising of the Glenore Weir that align with the Regional Roadmap for the Townsville and North West Queensland region. We wish Carpentaria Shire Council success with their funding application.

Yours faithfully,

[redacted]

Glenys Schuntner
Chief Executive Officer

An Australian Government Initiative

60 Landsborough Street
PO Box 500
Normanton QLD 4890
Telephone: 07 4745 1000
Email: info@gulf-savannah.com.au
Website: www.gulf-savannah.com.au
ABN: 69 956 728 660

26th November 2014

Dear Sir or Madam:

Please accept my letter in support of the National Stronger Regions Fund application being submitted by the Shire of Carpentaria to increase water storage capacity at Glenore Weir.

Currently Carpentaria Shire is struggling to meet the demand for water in the communities of Karumba and Normanton and heavy water restrictions are in place. Approximately one third of Australia's water run off occurs through the Gulf of Carpentaria catchment. This run off is a seasonal occurrence due to the time frames afforded by the Wet Season and is usually only four months in duration. Therefore the lack of water availability in Carpentaria Shire is not necessarily caused by water shortage but rather a paucity of facilities to harvest and store an appropriate amount of water to meet the needs of the communities in the Shire.

Whilst drought is not a regular visitor to the Southern Gulf of Carpentaria region, for the last two years the annual Wet season has been short and this in turn has highlighted the need to mitigate for such circumstances and also provide an environment which allows the region to not only maintain its communities but allows for growth and development and therefore ensuring long term sustainability. An upgrade of the current storage options would go a long way towards delivering water security.

If the application for the upgrade is successful, Gulf Savannah Development expects there will be many benefits including growth in the community population and more economic development opportunities such as manufacturing and processing.

If I can be of any further assistance to support the Shire of Carpentaria to develop infrastructure as critical as the Glenore Weir, please do not hesitate to contact me.

Kind Regards

[redacted]

Chairman

BYNOE COMMUNITY ADVANCEMENT CO-OPERATIVE SOCIETY LIMITED

ABN 80 493 126 872

22nd September 2014

To Whom It May Concern

This is an official letter of support for Carpentaria Shire Council in their quest for funding to upgrade the Carpentaria Shire Council water supply.

After an exhaustive community consultation process the Council has decided to take the option that was supported by the majority of the Community, which is to upgrade our existing weir.

This option will double our current storage capacity.

The current infrastructure was built in the early 1960's so it is timely to upgrade, particularly given the economic development aspirations of our Shire, as water is critical to any and all Industries.

I can be contacted on [redacted] should there be any queries.

Yours Sincerely

[redacted]

President

Postal Address: P.O. Box 96, Normanton, Q. 4890
Email: bynoecacs@bigpond.com
Telephone: (07) 4745 2300
Facsimile: (07) 4745 1372

Lot 65 Musgrave St
PO BOX 90
Burketown QLD 4830
P: (07) 4745 5100
F: (07) 4745 5181
E: mayor.camp@burke.qld.gov.au
www.burke.qld.gov.au
ABN: 14 130 592 645

Office of the Mayor

Our Ref: Carpentaria Shire Council's NSRF Application

27 November 2014

Carpentaria Shire Council
PO Box 31
Normanton QLD 4890

To Whom It May Concern,

Carpentaria Shire Council's NSRF Application – Increasing Water Storage Capacity at Glenore Weir

Burke Shire Council has long been aware of the issues facing Carpentaria Shire Council regarding surety of water quantity and quality supply to its communities of Normanton and Karumba. It has also recently become aware that Carpentaria Shire Council is applying for funding to the National Stronger Regions Fund (NSRF) to raise the height of the Glenore Weir with the aim of improving that surety of supply.

Council is well aware of the vital role water surety plays in communities – not just for drinking and hygiene purposes but to provide soothing private and public green spaces. Burke Shire Council receives regular positive comments about our parks and gardens from visitors and residents including how valued they are in providing a place to relax or play a game of footy with mates. We also are able to provide a public swimming pool complex for the community's health and enjoyment.

We are in the fortunate position of having a consistent, reliable water supply as our supply for both communities – Burketown and Gregory - comes from a spring fed river source. We have also been fortunate to receive government funding to assist us in providing the necessary infrastructure to draw, treat and supply water for residential, commercial and communal needs. It would have been very difficult for Council to meet these costs without governmental support as the required infrastructure is expensive to install and then maintain and in turn this would have placed a heavy financial burden upon ratepayers. Such costs no doubt would discourage investors from moving to our region and therefore threaten the sustainability of our Shire. Council may well have to upgrade its existing infrastructure to meet future needs and external funding sources such as the NSRF will be essential to these upgrades.

We are currently finalising an ILUA between Council, Traditional Owners and the State Government for Burketown and its immediate surrounds. Once completed Council will be able to offer approximately eighty residential as well as much needed commercial blocks for sale to the public. Surety of water is vital to meet the anticipated requirements of this increased development and to attract prospective purchasers. As we have assurance in our water source and the ability to supply adequate water we can confidently create this developmental opportunity which in turn will strengthen the ongoing sustainability of our remote Shire.

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PO BOX 90
Burketown QLD 4830
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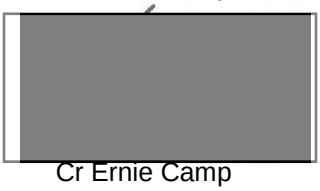
F: (07) 4745 5181
E: mayor.camp@burke.qld.gov.au
www.burke.qld.gov.au
ABN: 14 130 592 645

Access to an adequate water supply is vital to community physical, mental and social health and wellbeing. Therefore Council fully supports Carpentaria Shire Council in its efforts to source a funding partnership in order to build this vital infrastructure to increase surety of water supply quantity and quality to its communities and therefore the sustainability of these communities now and into the future.

Should you wish to speak with me further regarding this letter of support please do not hesitate to contact me on

Yours faithfully



Cr Ernie Camp
Mayor
Burke Shire Council

BYNOE COMMUNITY ADVANCEMENT CO-OPERATIVE SOCIETY LIMITED

ABN 80 493 126 872

22nd September 2014

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I can be contacted on [redacted] should there be any queries.

Yours Sincerely

[redacted]

President

Postal Address: P.O. Box 96, Normanton, Q. 4890
Email: bynoecacs@bigpond.com
Telephone: (07) 4745 2300
Facsimile: (07) 4745 1372

September 18, 2014

[redacted]
Critical Care Paramedic and Station Officer
Karumba Ambulance Station
Queensland Ambulance Service
160 Walker Street
Karumba, Queensland, 4891

Dear Mr. Owen,

I am writing this letter to support the Glenore Weir Raising Project. Having now lived in Karumba for almost a year I wholly understand the importance of water conservation and water consumption. After spending my first raining season and now moving into the dry I have a better understanding of how protecting our water supply is of the upmost importance.

After reading the council information provided to the public, experiencing the wet and dry seasons, I now see why raising the Glenore Weir should be at the forefront of our focus as a community. The recent drought conditions highlighted the issue of our low degree of security of water supply for Normanton and Karumba. Since the townships rely heavily on a single source of supply, namely the Glenore Weir on the Norman River, I believe it is paramount the weir be increased so we can store much needed water. It is stressful to think that if we experience a greater influx of visitors during our dry season our water supply could be stretched beyond capacity.

I give the proposed Glenore Weir Raising Project my fullest support. Please contact me at [redacted] if I can be of any further assistance.

Sincerely,

[redacted]
Critical Care Paramedic/ Officer in Charge

MMG Century
PO Box 8016
Garbutt Business Centre
Garbutt Queensland 4814
Australia

T +61 7 4769 5031
info@mmg.com
www.mmg.com

23 November 2014

Cr Fred Pascoe
Mayor – Carpentaria Shire Council
PO Box 31
NORMANTON Qld 4890

Dear Mayor Pascoe,

CARPENTARIA SHIRE COUNCIL – NATIONAL STRONGER REGIONS FUNDING APPLICATION

I am writing to express support the Carpentaria Shire Council's 2014 application for funding under the Federal Australian Government's *National Stronger Regions Fund* program. MMG Century understands that the Council is seeking funding for engineering works to increase the capacity of the Glenore Weir; infrastructure which is vital for Normanton and Karumba's water supply.

We believe this to be a practical initiative with long term positive implications.

Regrettably, with Century ending production in 2015, MMG is unable to commit funds to this project.

MMG Century's trans-shipping port operation is located in the Carpentaria Shire. This facility is a visible presence of MMG as a major resource company with operations in the Lower Gulf. MMG Century has approximately 80 personnel working at its Karumba operation at any one time with 30% of these employees being Karumba residents.

MMG Century is also a major stakeholder in the Carpentaria Shire, contributing over 40% of the shire's rate income. MMG's financial contribution highlights the relatively low rate base of the shire, and it highlights the challenge the council faces in funding larger infrastructure initiatives such as the proposed Glenore Weir project.

The demands on the Normanton and Karumba water supply are high, particularly during the drier cool months when thousands of tourists travel to the region. MMG understands that the fresh water supply for Normanton and Karumba is limited and over the last two years it has completed a number of projects which have reduced fresh water consumption at its port facility by 50%.

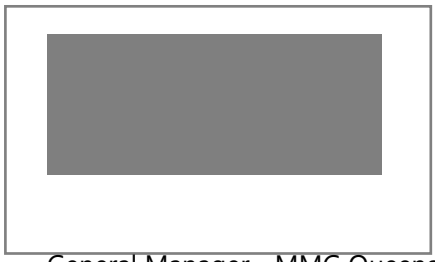
Increasing the capacity of the Glenore Weir will help mitigate the risk of future water shortages in a region that contributes significantly to the state's tourism, fishing and resource industries. MMG Century believes that by increasing the capacity of the Glenore Weir, the Carpentaria Shire will be in a more advantageous position to attract other sustainable industries to the region.

Experience at our five producing mines in Australia and overseas continues to shape our belief that local communities should share in the benefits mining brings. This is why we support the principle that a significant portion of the royalties generated in a region should be used to assist the long-term economic development of the area where the wealth is generated.

MMG Century joins other stakeholders in the Carpentaria Shire in supporting your National Stronger Regions Fund application to the Australian Federal Government. Such funding is pivotal to ensuring the continued growth of resource industry and other sectors in the Lower Gulf.

We wish your council well in its endeavours to secure Royalties for Regions funding for its Glenore Weir project.

Yours sincerely,



General Manager - MMG Queensland Operations

Cc Robbie Katter, Member for Mt Isa
Bob Katter, Member for Kennedy

QUEENSLAND POLICE SERVICE

Karumba Police Station
49 Yappar Street
P.O. Box 69 KARUMBA QLD 4891

TELEPHONE (07) 47 459 120 FACSIMILE (07) 47 459 356

Your Ref:

18th September 2014

Bob OWEN
Chief Executive Officer
Carpentaria Shire Council
Haig Street
Normanton,Qld
4890

Letter of Support for Upgrade of Water Supply

Dear Bob,

I am writing in response to your request for a letter of support re upgrading the water supply for the Carpentaria Shire.

I have been the Officer in Charge of Karumba Police for four years. During that time I have experienced substantial rainfalls allowing the community to utilise water as they require. I have also experienced times of drought and the serious water restrictions that were applied to the town last year and are continuing to a lesser extent this year.

From my perspective as the OIC of Karumba, my overall aim is to reduce and / or prevent crime ultimately making Karumba safer community for all to enjoy. I found during the drought period the demeanor of the community changed somewhat in a negative way and the normally high morale of the local residents was at the lowest level I had experienced whilst working and living at Karumba.

The geographical location of Karumba and its harsh environment makes living in the area quite challenging at times. The simple things such as being able to keep a green lawn, wash vehicle's and boats or hose off the dust on the verandahs and driveways, plays a major part in the stability of the community.

It is evident that the current supply of water within the Carpentaria Shire is insufficient to meet current demands, let alone providing the infrastructure required for a town to grow and prosper.

I support your application for funding to increase the water supply capacity and foresee if you were successful the Township of Karumba and Normanton progressing towards a better and more sustainable future.

Yours Sincerely [redacted]

[redacted]

OIC Karumba Police

CARPENTARIA SHIRE

Outback by the Sea®

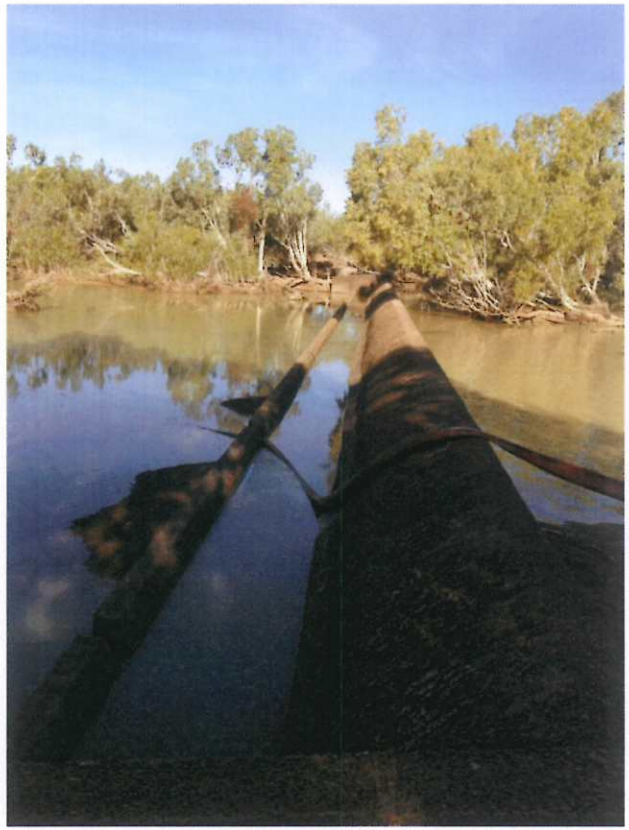
pdr engineers

NORMANTON / KARUMBA WATER SUPPLY UPGRADE PRESENTATION

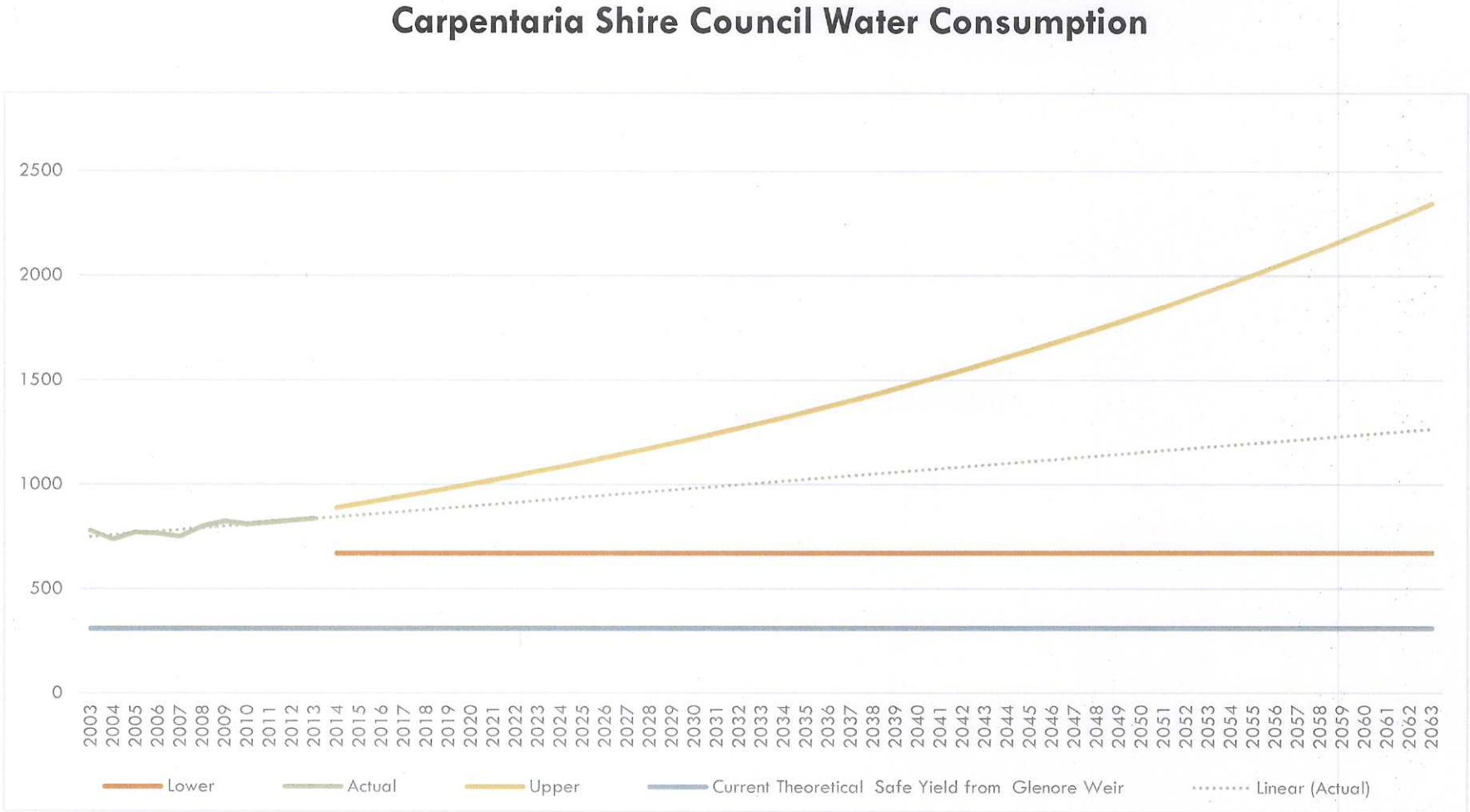
CURRENT ISSUES

- Glenore Weir current sole source of supply
- Existing system not able to reliably meet current water consumption demand
- Existing Weir and Pipeline/Pump infrastructure beginning to show signs of dilapidation
- No spare capacity to cater for any future development (urban, commercial or industrial)
- Council has an obligation to provide a safe and reliable water supply

GLENORE WEIR

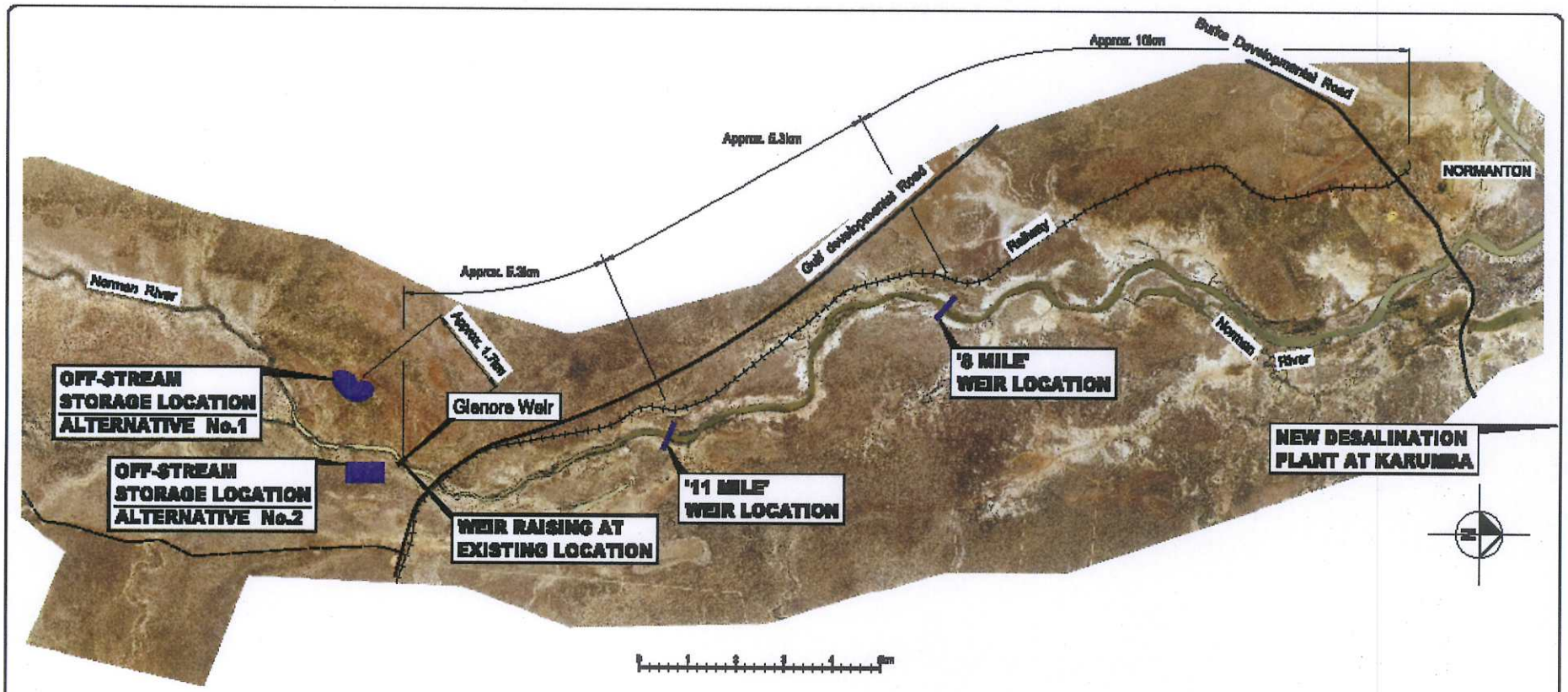


DEMAND FORECAST



POSSIBLE OPTIONS

1. Do nothing
2. Raise existing Glenore Weir
3. Construct new weir at "8 Mile"
4. Construct new weir at "11 Mile"
5. Construct Offstream Storage (lined "turkeys nest")
6. Desalination
7. Combination of two or more of above options



OPTIONS FOR INCREASED STORAGE

OPTION No.	DESCRIPTION
1	GLENORE WEIR RAISING
2	NEW WEIR AT 11 MILE BEND
3	NEW WEIR AT 8 MILE BEND
4	OFF STREAM STORAGE AT ALTERNATIVE No. 1 - APPROX. RL30 AHD
5	OFF STREAM STORAGE AT ALTERNATIVE No. 2 - APPROX. RL 8 AHD
6	NEW DESALINATION PLANT AT KARUMBA

		PRELIMINARY	SCALE 1:[illegible]	A1	pdr engineers	Carpentaria Shire Council	OPTIONS STUDY FOR AUGMENTATION OF WATER SUPPLY STORAGE	OPTION LOCALITIES
			DO NOT SCALE DRAWINGS					12276-SK1 A

DISCOUNTED OPTIONS

- Supply from Gilbert River
  - Discounted due to cost
- Development of a bore field
  - Discounted due to reliability and water quality issues
- Pump pools downstream of Glenore Weir back into existing storage
  - Discounted due to reliability

POTENTIAL ISSUES TO BE ADDRESSED

- Construction of new weir or upgrading of Glenore Weir may trigger need for fishway passage
- Impact on estuarine environment – considered high environmental value – may need to provide environmental offsets
- Downstream of Glenore is within the tidal zone – potential for salt intrusion and salt impacted soils
- Acid Sulphate soils (increases as you move downstream) – has to be treated
- Construction of weirs in a tidal zone
- Total length of weir structure – needs to extend across flats to minimise weir bypass
- Impact on flood extent and water levels

DETAILS OF EACH OPTION

Findings for each option in detail in no particular order or preference

RAISE GLENORE WEIR

- Raise weir by 1.2 metres
- Upgrade pump off take structure and pumps
- May require fish passage
- Max. Annual Yield 1,250 ML/year
- Storage 2,200 ML
- Inundated Area 155 ha
- Capital Cost $10.5 million
- O&M cost $130K/year

RAISE GLENORE WEIR CONSIDERATIONS

- Able to meet short term future demand
- No impact on Gulf Development Road and Railway line
- Some impacts on properties upstream, stock crossings and more land inundation
- Water quality is expected to be similar to that currently being experienced
- Tidal flows/impacts will be minimal
- Ready access
- River cross section and foundation geology favourable
- Increases in flood heights

NEW WEIR AT 11 MILE

- New weir (concrete structure) – approximately RL 2.26m metres high
- May require fish passage
- New off take structure, pumps and controls
- Access roads and miscellaneous works
- Max. Annual Yield 1,650 ML/year
- Storage 3,300 ML
- Inundated Area 180 ha
- Capital Cost Stage 1: $33.2M
- O&M cost $130K/year

11 Mile Bend Location

11 MILE WEIR CONSIDERATIONS

- Impact on Gulf Development Road and Railway line
- Some impacts on properties upstream, more land inundation
- Will meet demand to 30+ years
- Water quality (salinity) may be an issue
- Loss of estuarine habitat will cause environmental issues
- Tidal flows/impacts making construction difficult
- New road access required
- Further investigations required to establish foundation geology
- Alluvial plains require extensions to abutment flanks to prevent bypassing
- Increases in upstream flooding events

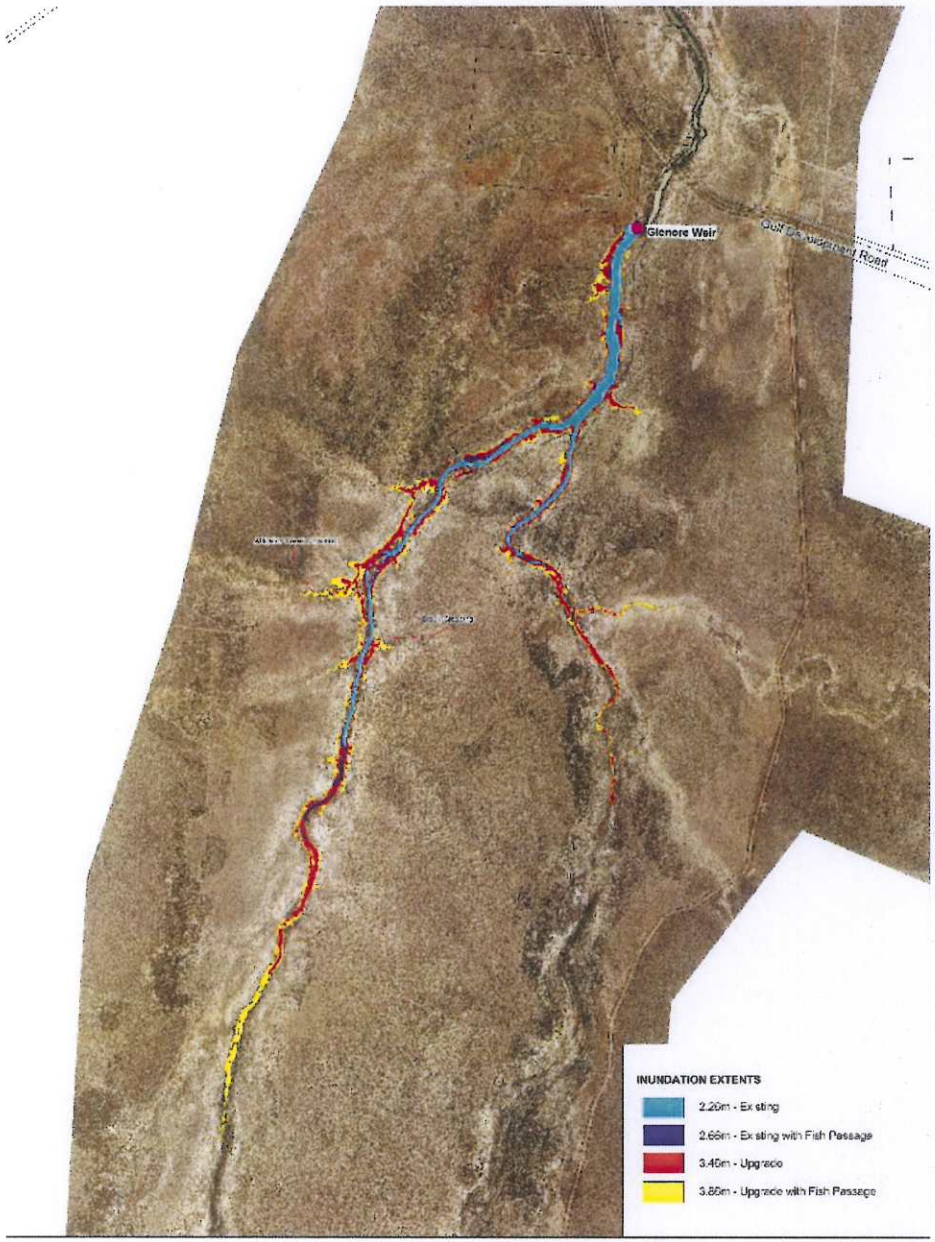
NEW WEIR AT 8 MILE

- New weir (concrete structure) – approximately RL 2.26m metres high
- May required fish passage
- New off-take structure, pumps and controls
- Access roads and miscellaneous works
- Max. Annual Yield 3,200 ML/year
- Storage 7,800 ML
- Inundated Area 360 ha
- Capital Cost Stage 1, $39.3M,
- O&M cost $130K/year

8 Mile Bend Location

8 MILE WEIR CONSIDERATIONS

- Impact on Gulf Development Road and Railway line
- Some impacts on properties upstream, more land inundation
- Meet demand for 50+ years
- Water quality (salinity) greater issue as further downstream
- Greater loss of estuarine habitat will cause environmental issues including offset provisions
- Tidal flows/impacts making construction difficult
- New road access required
- Further investigations required to establish foundation geology
- Alluvial plains require extensions to abutment flanks to prevent bypassing
- Increases in upstream flooding events



NORTH

PAGE SIZE A3

SCALE 1:40,000

COORDINATE SYSTEM: Datum: GDA94 Projection: MGA Zone 54

DRAWING NO.: 30031084-WR-MAP-001 REVISION: A

CREATED BY: B Bolt DATE: 04/12/2013

STATUS: DRAFT

FOR CLIENT REVIEW

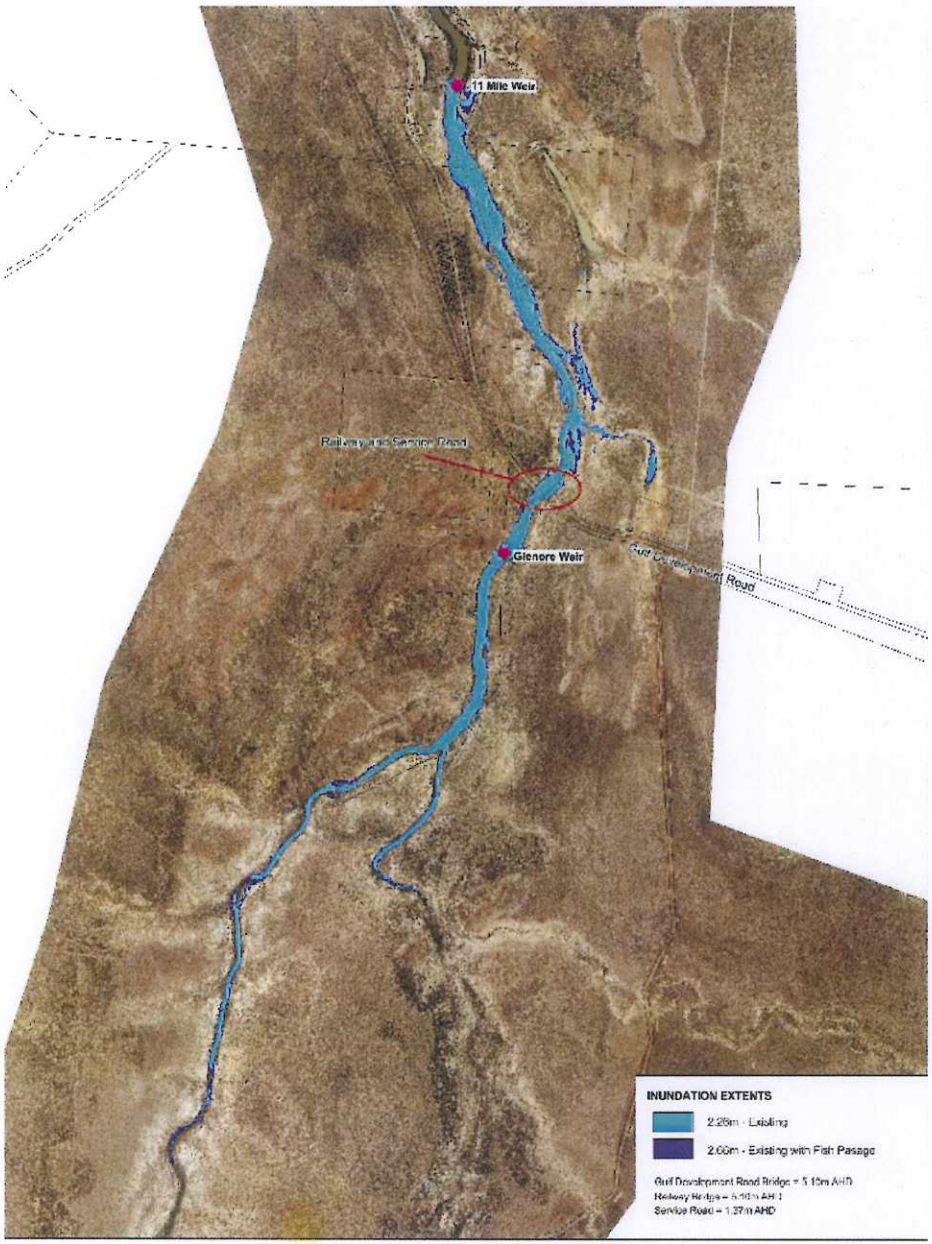
PROJECT NO: 30031084 PROJECT TITLE: NORMANTON WEIR ASSESSMENT

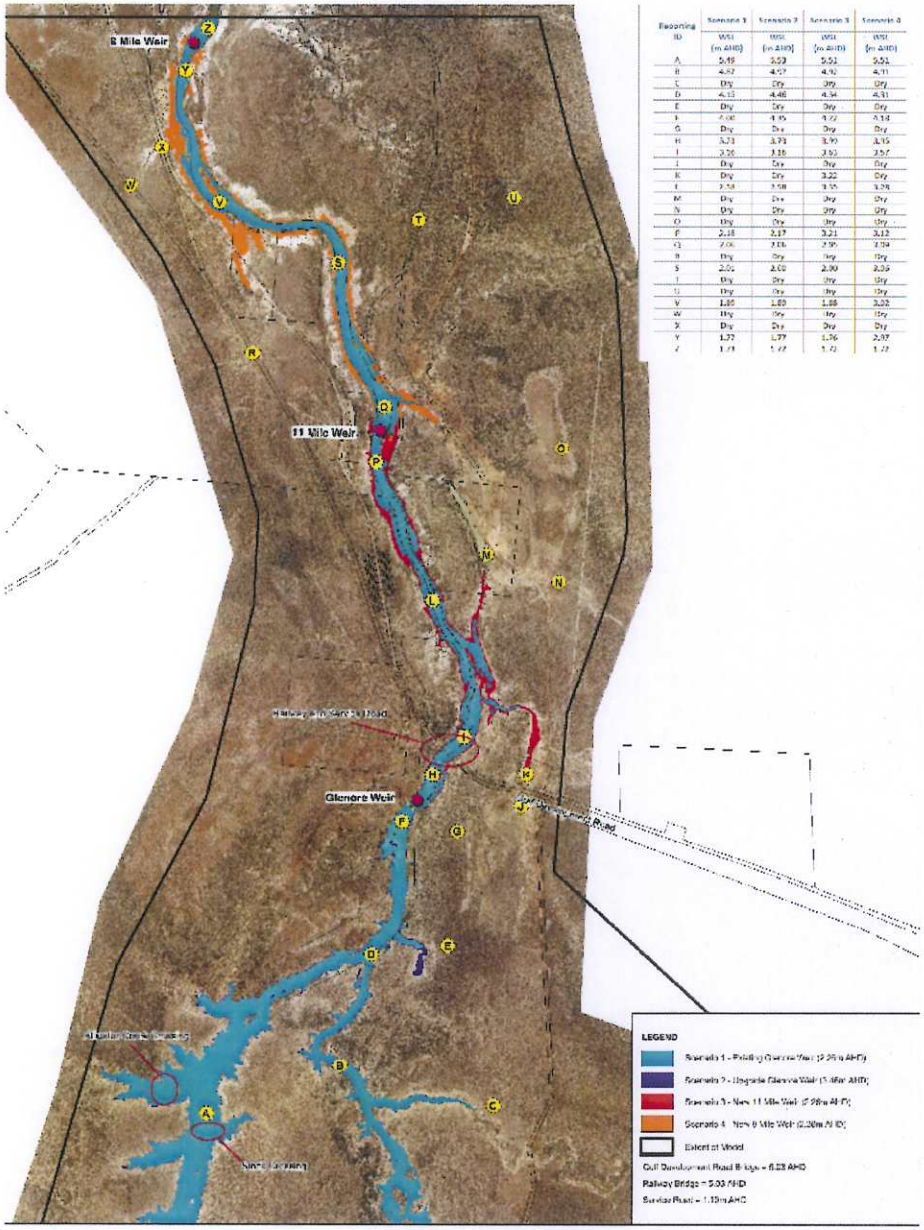
TITLE: GLENORE WEIR AND UPGRADE INUNDATION MAP

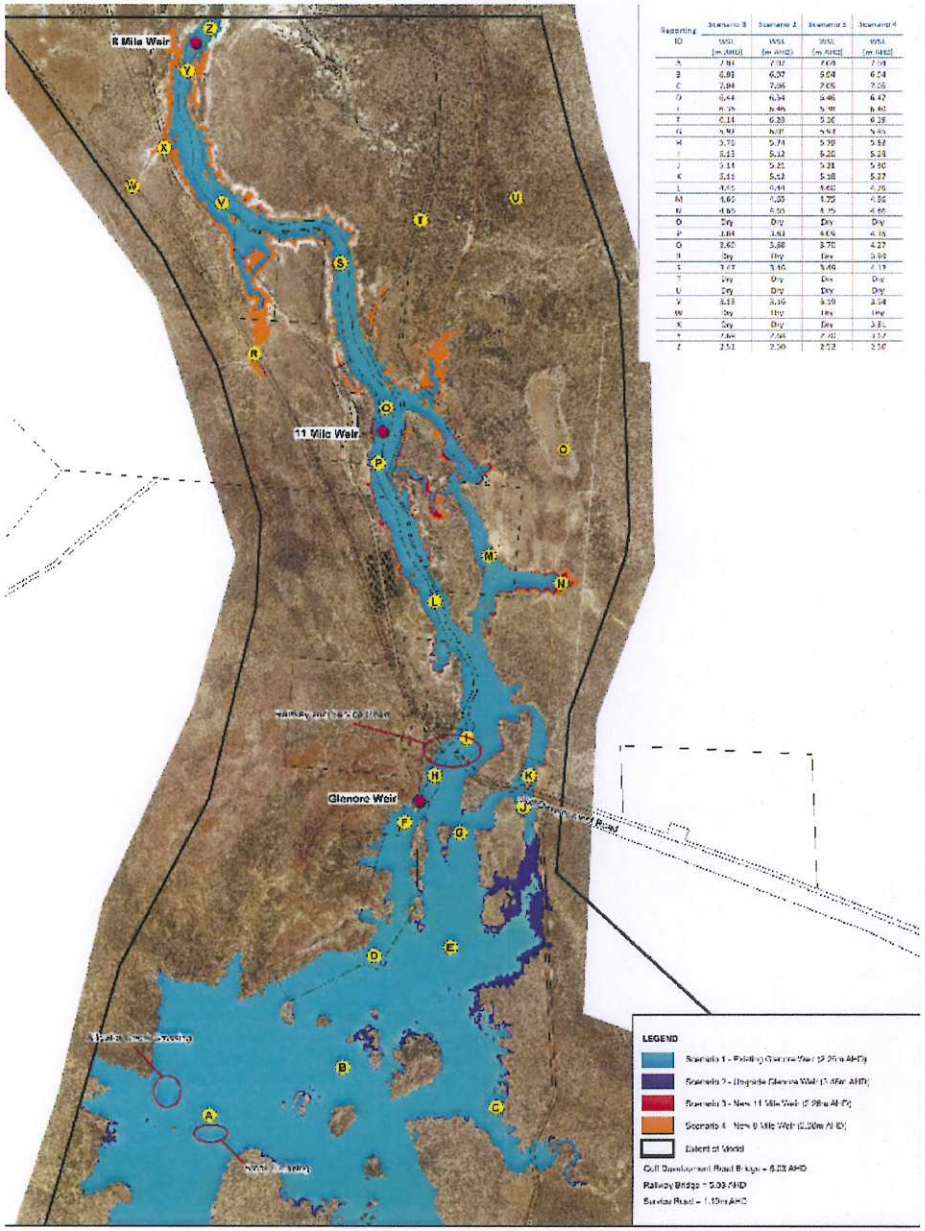
CLIENT: CARPENTARIA SHIRE

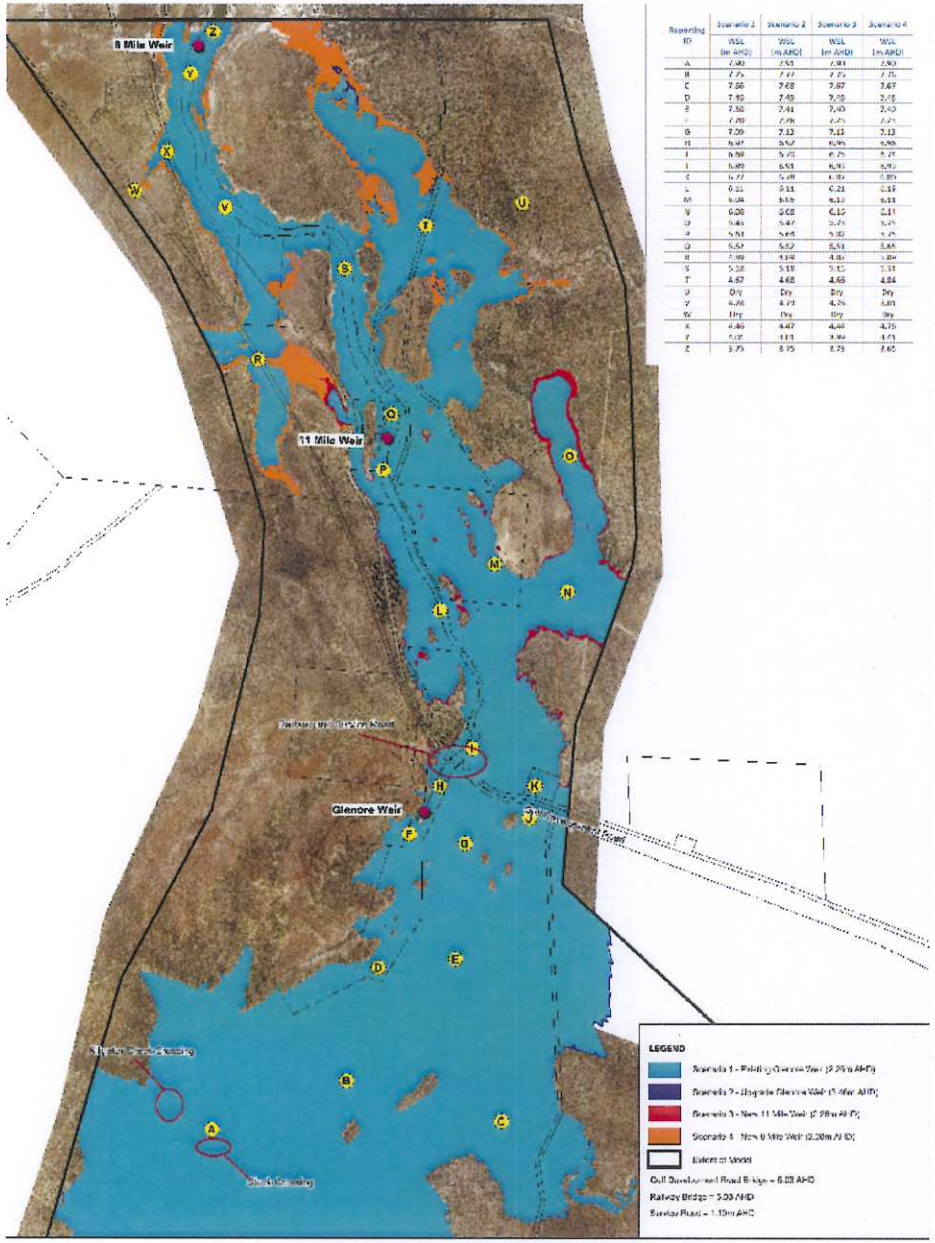
CONSULTANT: SMEC

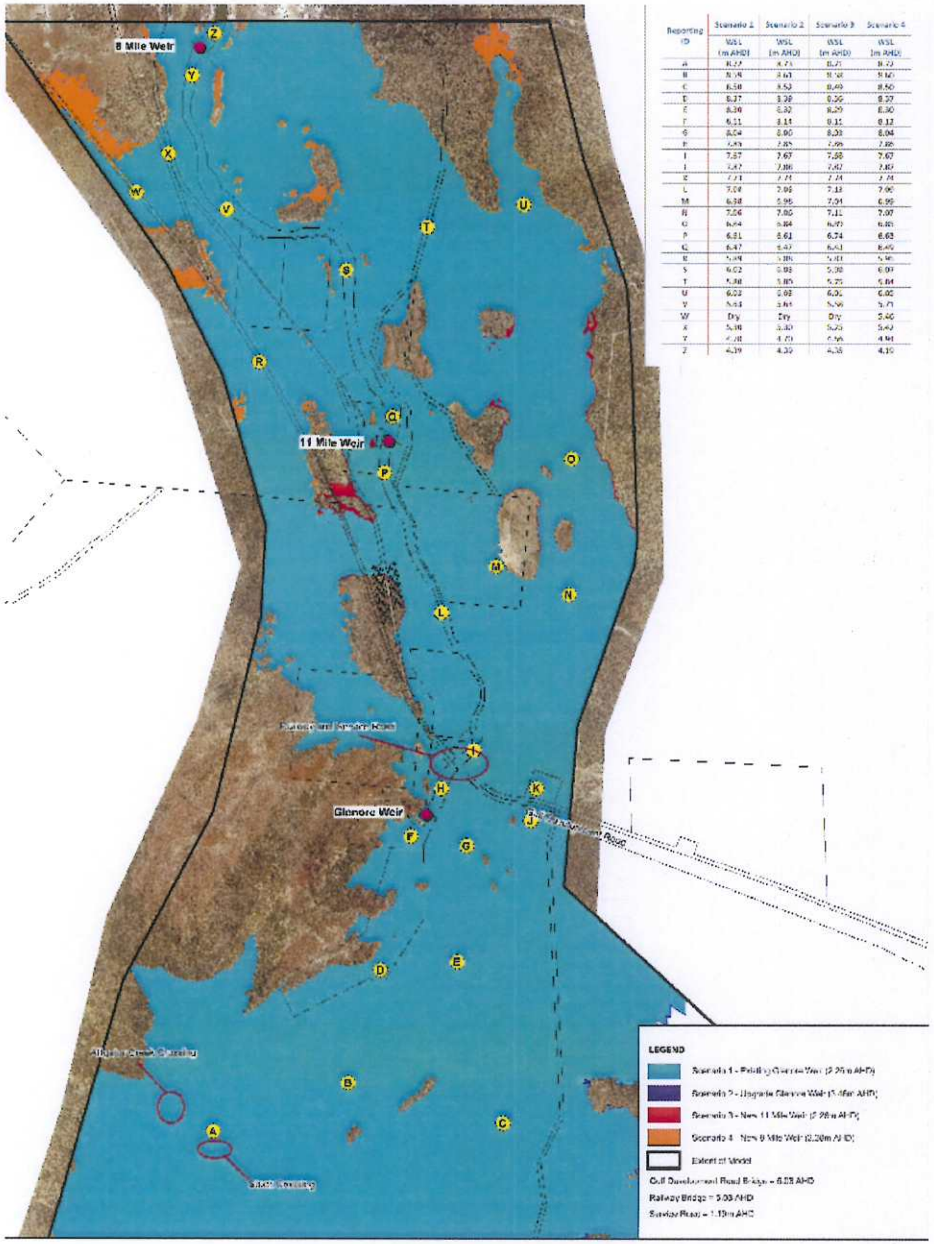
www.smec.com











Reporting ID	Scenario 1 WSL (m AHD)	Scenario 2 WSL (m AHD)	Scenario 3 WSL (m AHD)	Scenario 4 WSL (m AHD)
A	[illegible]	[illegible]	[illegible]	[illegible]
B	[illegible]	8.63	[illegible]	8.60
C	8.50	8.53	8.49	8.50
D	8.37	8.38	8.36	8.37
E	8.30	8.32	8.29	8.30
F	8.11	8.14	8.11	8.12
G	8.04	8.06	8.03	8.04
H	[illegible]	7.85	[illegible]	7.86
I	7.57	7.67	7.58	7.67
J	7.47	7.86	7.42	7.80
K	[illegible]	7.74	7.74	7.74
L	7.08	7.06	7.13	7.06
M	6.98	6.95	7.04	6.99
N	7.06	7.06	7.11	7.07
O	6.84	6.84	[illegible]	6.85
P	6.81	6.61	6.74	6.63
Q	6.47	6.47	6.41	6.49
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T	5.88	5.85	5.75	5.84
U	6.02	6.08	6.01	6.02
V	5.63	5.64	5.56	5.71
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Z	4.39	4.30	4.35	4.19

NORTH

PAGE SIZE A3

SCALE 1:50,000

COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

DRAWING NO. 30031064-WR-MAP-016 REVISION A

CREATED BY B Bolt DATE 15/01/2014

PROJECT NO 30031064 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **20 YEAR AEP FLOOD INUNDATION**

STATUS DRAFT

FOR CLIENT REVIEW

CLIENT

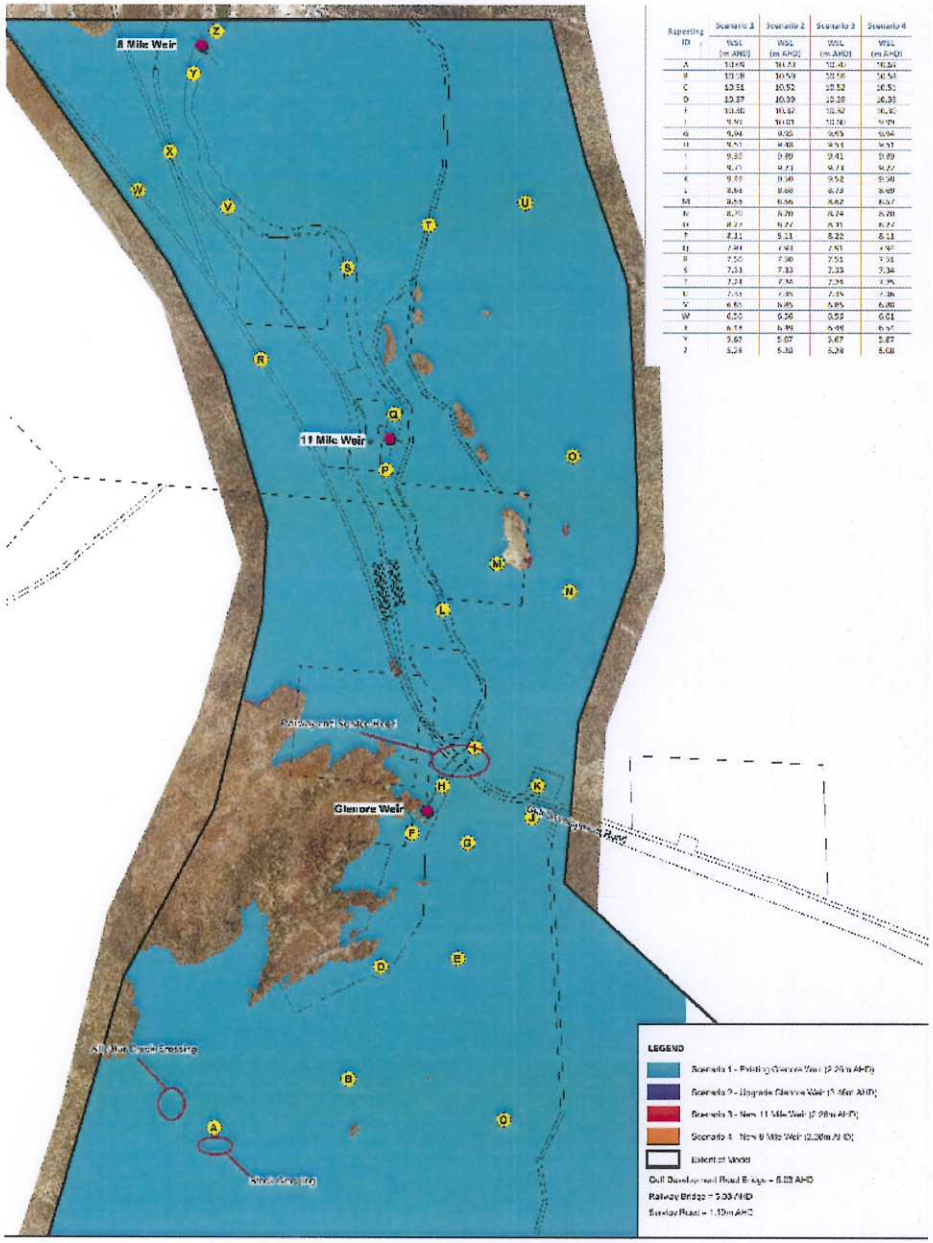
CARPENTARIA SHIRE

CONSULTANT

SMEC

SMEC Australia Ltd
Level 1, 84 Melbourne Street
South Brisbane QLD 4101

www.smec.com



FLOOD MODELLING RESULTS

- Afflux mapping indicates that for the majority of the floods and weir options, a marginal increase in flood levels for the same flood return period in the order of up to 0.2m (200mm) can be expected in the areas upstream of the weir sites
- The increase in the level of flooding diminishes as the flood flow increases
- Whilst increase is not significant it can still have a large impact on the area as the topography is relatively flat

OFF STREAM STORAGE

- Upgrade pumps at Glenore Weir
- 800-5500 ML off stream storage* (5m metre water depth, HDPE or clay lined)
- Transfer pump station
- Access roads and miscellaneous works
- Max. Annual Yield 1000 to 2500 ML/year
- Area 20-80 ha
- Capital Cost Stage 1, $18M-$57.5M
- O&M cost $130K/year

OFFSTREAM EXAMPLE

OFF STREAM STORAGE CONSIDERATIONS

- Refer concept plan
- Land acquisition and compensation issues
- Meet demand for 20+ years then can expand in future for 50+
- No impact on properties*
- No water quality issue
- No loss of estuarine habitat causing environmental issues
- New road access required
- Further investigations required to establish foundation geology
- Establish available clay sources

DESALINATION/GLENORE WEIR

- Desalination plant with offshore feed pipeline
- Plant could be located at either Normanton or Karumba but preferably Karumba
- Plant to be operated in conjunction with an upgrade to Glenore Weir
- Glenore to used for period of the year where water is plentiful, then use Desal during dry season
- Brine discharge
- Pump station and connection to system
- Max. Annual Yield staged but up to 50 year horizon
- Capital Cost Stage 1, $11.1M, Stage 2 $16.4M
- O&M cost $1.27M/year

DESAL EXAMPLE

DESALINATION/GLENORE WEIR CONSIDERATIONS

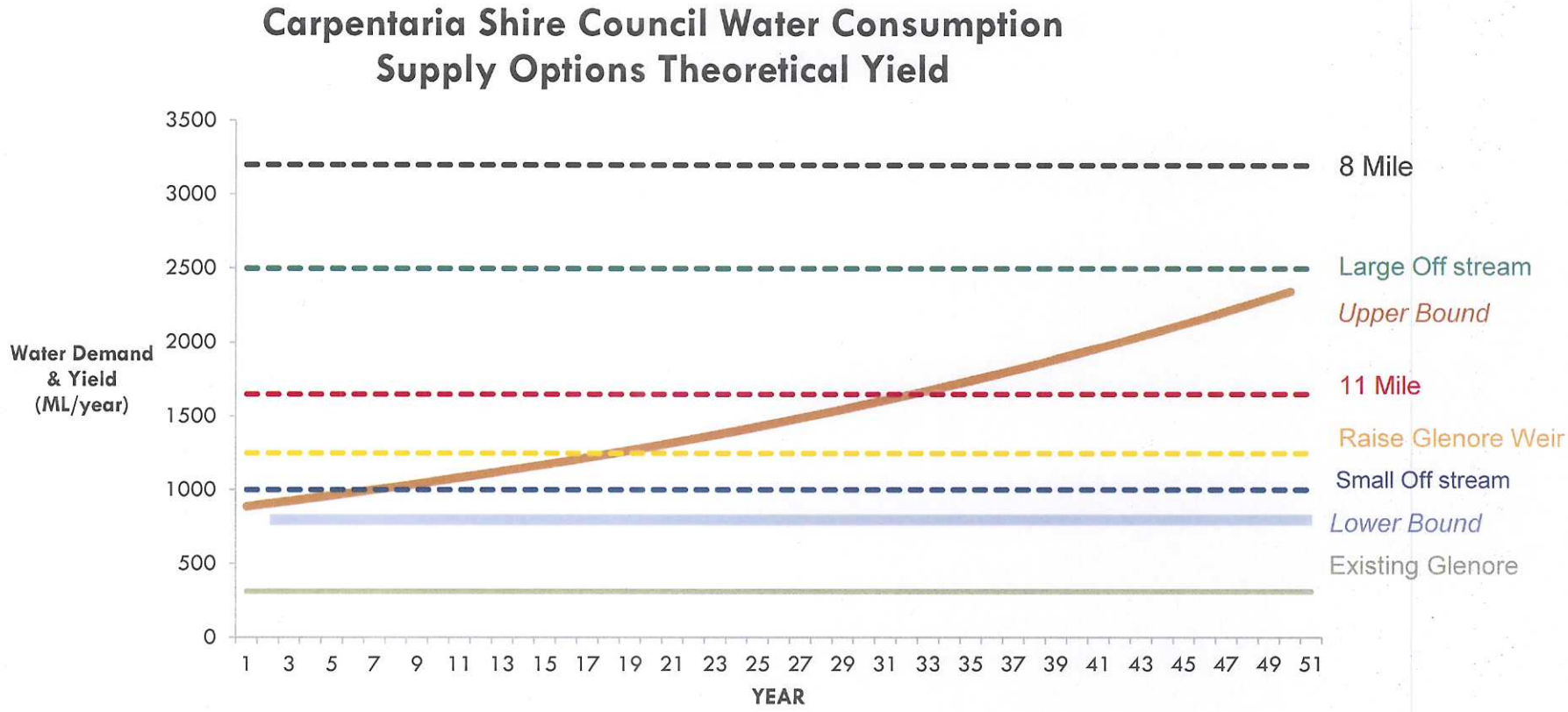
- Small land footprint required for plant
- Low capital cost but high operations and maintenance (production) cost
- No impact on properties
- No water quality issues
- No loss of estuarine habitat causing environmental issues
- System has redundancy
- Plant is modular so can be staged to suit demand

WEIR CHARACTERISTICS SUMMARY

Option	Max. Annual Yield (ML/year)
Existing Glenore	310
Raise Glenore by 1.2m	1,250
11 Mile Weir	1,650
8 Mile Weir	3,200

Option	Usable Storage (ML)	Inundated Area (ha)	Peak Evaporation (ML/day)
Existing Glenore	960	57	4
Raise Glenore by 1.2m	2,200	155	11
11 Mile Weir	3,300	180	13
8 Mile Weir	7,800	360	25

SAFE YIELD SUMMARY



NON NEGOTIABLE UPGRADES & REPAIRS

Short Term

- Repair intake and weir abutments
- Capital cost $3.7 million

Short to Medium Term

- Upgrade pipeline 500mm diametre
- Capital Cost $16.4 million

COST CALCULATIONS

	Option	Capital Cost (1)	Council Contibution $'m (4)	Borrowing Amount $'m (2)	Interest & Redemption (3)	O & M '000s	Total Annual Additional	Total Costs (30 Years WOL)	Current CSC Water Revenues $'m (4)	% Additional Income on Current Revenues
	Repair Glenore Weir (no pipeline)	$3.70	$3.70	-	-	$130	130,000	$3,900,000	$1.225	11%
	Repair Glenore Weir	$20.10	$5	$15.1	$984,809	$130	$1,114,809	$33,444,270	$1.225	91%
1	Raise Glenore Weir (no pipeline)	$10.50	$5	$5.5	$358,705	$130	$488,705	$14,661,150	$1.225	40%
1a	Raise Glenore Weir	$26.90	$5	$21.9	$1,428,299	$130	$1,558,299	$46,748,970	$1.225	127%
2	11 Mile Weir (no pipeline)	$33.20	$5	$28.2	$1,839,179	$130	$1,969,179	$59,075,367	$1.225	161%
2a	11 Mile Weir	$45.60	$5	$40.6	$2,647,896	$130	$2,777,896	$83,336,880	$1.225	227%
3	8 Mile Weir (no pipeline)	$39.30	$5	$34.3	$2,237,015	$130	$2,367,015	$71,010,465	$1.225	193%
3a	8 Mile Weir	$49.20	$5	$44.2	$2,882,685	$130	$3,012,685	$90,380,550	$1.225	246%
4	Small Off-Stream Storage 800ML (no pipeline)	$18.00	$5	$13.0	$847,848	$130	$977,848	$29,335,453	$1.225	80%
4a	Small Off-Stream Storage 800ML	$32.00	$5	$27.0	$1,960,916	$130	$2,090,916	$62,727,480	$1.225	171%
4b	Large Off-Stream Storage 5500ML (no pipeline)	$57.50	$5	$52.5	$3,434,003	$130	$3,554,003	$106,620,099	$1.225	290%
4c	Large Off-Stream Storage 5500ML	$71.50	$5	$66.5	$4,337,071	$130	$4,467,071	$134,012,130	$1.225	365%
5	Desal + Repair Glenore Weir (no pipeline)	$11.10	$5	$6.1	$397,837	$1,200	$1,597,837	$47,935,097	$1.225	130%
5a	Desal + Repair Glenore Weir	$27.50	$5	$22.5	$1,467,430	$1,200	$2,667,430	$80,022,900	$1.225	218%

1 based on 2013/2014 actuals

2 based on borrowings from QTC on 30 Year terms (requires approval from Minister terms >20 Years)

3 based on current QTC indicative borrowing rates of 5.093%

4 funded from Councils Sustainability Funds - estimates provided included no external funding (eg grants/subsidies etc)

IMPACT ON WATER CHARGES

Option	Current	Projected
Repair Existing Glenore Weir (no pipeline)	$ 819.30	$ 906.25
Repair Existing Glenore Weir	$ 819.30	$ 1,564.90
Raise Glenore Weir (no pipeline)	$ 819.30	$ 1,146.15
Raise Glenore Weir	$ 819.30	$ 1,861.52
11 Mile Weir (no pipeline)	$ 819.30	$ 2,136.32
11 Mile Weir	$ 819.30	$ 2,677.20
8 Mile Weir (no pipeline)	$ 819.30	$ 2,402.40
8 Mile Weir	$ 819.30	$ 2,834.23
Large Off-Stream Storage 5500ML (no pipeline)	$ 819.30	$ 3,196.28
Large Off-Stream Storage 5500ML	$ 819.30	$ 3,806.95
Small Off-Stream Storage 800ML (no pipeline)	$ 819.30	$ 1,473.30
Small Off-Stream Storage 800ML	$ 819.30	$ 2,217.74
Desal + Glenore Weir Upgrade (no pipeline)	$ 819.30	$ 1,887.96
Desal + Glenore Weir Upgrade	$ 819.30	$ 2,603.32

NEXT STAGES

- Community Consultation now till 28 April 2014
- Council looking to community for one preferred option
- Council decide on option by mid June 2014
- If upgrade to proceed, process of seeking State and Federal grants will commence
- To be considered in next rollout of grants, applications need to be in by 30 June 2014
- Detailed design, further investigations on preferred option, approvals/grants - end 2015
- Construction dry season following year

No.	Should Water Supply be upgraded			Comments	Preferred Options
	NO	YES	N/R		
1	1			Pump back into Glenore Weir from below the old bar	6
2		1		Water restrictions didn't affect us as we have a well, but the Railway Station garden suffered badly after 17 years of keeping it looking beautiful. Better water security would be better for tourists, for future housing etc. and to help the town grow	1
3		1		8 Mile too dear - too big an increase in rates; undecided at this stage and will check out website for more information. Better water security would mean we could actually be able to use the water allocation which we pay for now and can't use! Shire can develop	7
4		1		Restrictions made it hard to keep lawns and gardens green. Cleaning driveways and pathway areas limited. water security useful in the non-rainy times i.e. water is when tourists are in the area. They use a lot of water. The towns can be kept neat and green. In the future any commercial operations would need water.	1
5	1			Keep Sunwater away from our water supply. The Mt Isa experience has shown that engaging consultants will double the cost of water to ratepayers. We already have a reliable system. Cut unneccessary use by van parks and tourists	1
6		1		Intermittent water use. Should use more water from pump at river on flood times at old wharf. Prefer 1, then option 4 (small) & repair GlenoreWeir - Fenced to keep animals out. Better water supply means more beautiful gardens and palms, less water restrictions	1
7		1		I haven't had any impacts of water restrictions. Don't use much water. Better supply will Bring more people to the area	2
8			1	we know that at times water restrictions are unavoidable, but caravans parks should be on restrictions. No washing of cars and boats.	1
9		1		If we have water restrictions…bring them on now for our visitors too. Not like in the past "except last year" when our visitors are leaving….we locals get water restrictions. Keep Sunwater out of Glenore. As long as we have larger supply of water for some years to come.	1
10		1		Lack of water to maintain lawns to keep dust levels down.. Another option is to filter and purify sewage water, or bore water. Benefit of water supply is security of wellbeing	1
11		1		Gardens and median strips all died. Normanton Railway Gardens pitiful. Tourists complaind. Better water supply with attract more industry. Keep tourists longer and give us water security	1
12			1		1
13		1			1
14		1			1
15		1		I doubt if the towns will grow anymore, but we need to have more water for the existing population.	1

No.	Should Water Supply be upgraded NO	YES	N/R	Comments	Preferred Options
				Impact of water restrictions was having to spend hours watering my garden Invoke the 2004 Normanton-Karumba Water Supply Augmentation Concept Design Report. Cardno & Davies Engineers have drawn up tender docs. Council just has to call for tenders. If Council was to pump water back up to the weir or to town through the existing mains through a permanent set up, you would get another 10 years of the present supply. As a landholder surrounding the Glenore Weir, my family has been caused endless stress because of misinformation being fed by councillors and employers who obviously do not know the area and have other agendas	4
				or	
16			1	Off stream storage could be built at NTN or KBA as a ring tank on the common or a similar type ring tank at Two Mile (Lot 30) which we also the own but would be happy to surrender to improve water supply for the towns. If a wall was built from the back of the hospital hill to Hawkins Hill and then from a point near the 2 mile on the old croydon road to the gun club hill then from a point at that hill back to the hospital hill you would be making use of the natural rock walls in the area. Creating a large storage area and it would be only 200 metres from the river and about 2 kms from the treatment plant. It would be foolish to build a ring tank in a spot where you need to spend a further $16m to get it into town. and It would make a great water park which will benefit the townsfold and tourists alike. For Karumba with their own treatment plant and a ring tank built on Karumba Holdings to pump out of the river when it is flowing or may be even to pump from Walker's Creek straight to Karumba. This way you have two standalone systems.	
17		1		Town looking dry for a tropical place. Large trees dying which take years to grow. On water restrictions when we have a large river running past our door & water going out to sea when it could be used here. People letting gardens die because of severe restrictions. Another option is to dredge out old part for more depth with better water supply we would not have to be on severe restrictions. Would not have to let all the median strips die because not allowed to water especially the large trees.	1
18			1	Another option is to have a pump station above 9 mile	1
19		1		Water is life of everything. Lift the old weir	1
20		1		Dust pollution from water plant. Noise pollution from water tankers filling up. Dust storm from Robinson Helicopter landing in plant yard. Build water storage closer to town. Better water management required.	4
21		1		As a ratepayer we spend lots of money on plants, lawn upkeep. The last water restrictions of only hand held was not helpful to keep plants maintained and lots died and never recovered. The town looked DEAD and DRY not encouraging tourists, not encouraging residents to keep our Shire clean. No pride was encouraging by inflicting water restrictions. If we need water restrictions a little more relaxed ones would be received by residents and more would adhere to them if Council had a better water supply	3
22		1			1

No.	Should Water Supply be upgraded NO	YES	N/R	Comments	Preferred Options
23	1			None. I had enough water to drink, keep home ash my clothes and body and water plants. And so did all other residents. I appreciated no time limit of hand watering sometimes I was late at night watering but I'd would have copped it if I had to fit in certain hours or days. Education to use water wisely and value what we have. Plus the option of deepening the existing weir - the same way the town dam down from the hospital was dug out. If there was rock in the existing weir bottom, couldn't it be blasted much more cheaply than the other options, and there would be less evaporation if the weir capacity was deeper rather than wider. I have also heard a suggestion of daming part of Walker's Creek downstream to provide water for part of the year for Karumba. And a friend has said he has consistently taken water to drink from the Norman River for quite a few months of the year. Are we asking the right questions. Do we need to learn to live where we live? Not in a place where it rains everyday and we can save water for our own needs.	6
24		1		Restrictions didn't impact a lot as I am a good water manager. Refer #16 - same letter enclosed	4
25		1		My property backs onto the water treatment plant. The amount of dust that ended up in my house was disgraceful. And the amount of noise from the water trucks filling up was beyond a joke. Would like to see off-stream storage built closer to town. Better water management required.	4
26		1		Refer word file for complete comments.	4
27		1			1
28		1		Better chance of more infrastructure and growth in Shire so yards and streets look alive in towns and save Council buying trees for centre median strips to only die next year due to lack of water.	1
29		1		Monitor tourist volumes as they are ignorant to our water supply by their usage. Better water supply means less strain on locals to live in an environment where they have a garden and lawn to be able to come home to after work.	4

Summary of Feedback

Should Council investigate increasing water supply for the Shire?

No, there is no need to increase water supply	3
Yes, Council should investigate increasing water supply	22
No response	4
Water Supply Upgrade Options	
Increase Height of Glenore Weir	18
11-Mile Weir Option	1
8-Mile Weir Option	1
Off Stream Storage	6
Desalination Plant and Repair of Glenore Weir	0
Undecided	1
Other:	2

- Pump back into Glenore from the old bar
- Filter and purify sewage water, or bore water
- Pump water back into Glenore
- Have a pump station above 9 mile
- Deepen the existing weir

Total **29**

INCREASING WATER SUPPLY FEEDBACK

I would like to suggest two alternative options and raise concerns about some of the suggested options.

Firstly we can all agree that something constructive needs to be done to address the current short fall in the existing water supply. With pumping from below the weir and supplementation from the weir the current need can be met for the immediate future.

Proposal 1: Off stream storage at Normanton

> This can be achieved by using one of two suitable sites, the 2 Mile Paddock (behind the Hospital) or the Town Common. Both sites are protected from flood waters by Ironstone ridges. Both sites are clay pans which will supply the raw material to enable construction of the dams. Both sites introduce new catchment area for the filling of the proposed off stream storage. Both sites will reduce the operational costs as the storage will be closer to the treatment plant and be lower in relation to river to reduce filling costs (as opposed to being on a ridge). But the real deal clincher is that either site would be suitable as a water recreation park for Normanton. We have all seen what Water Parks have done for Croydon and Richmond. These two sites also give year round access and offer a redundancy to the water supply should something happen to the Glenore weir or the Pipeline to Normanton.

Proposal 2: Off stream adjacent to the Mouth of Walkers Creek

> A suitable site needs to be found for this proposal. This site is not as prone to flooding as it is closer to the Gulf of Carpentaria. Again this site is on a Clay Pan which will supply the raw materials required for construction. A major drawback to this option is the extra costs associated with the construction of a second water treatment plant. In the short term this is an additional cost but long term it will reduce pumping costs and operational costs. This proposal could also be used to supply Normanton in the event of pipe failure, plant failure or in the event that there are problems with Glenore Weir. Another selling point is that it extends the catchment even further capturing water from the Gilbert River, Walker Creek, Wills Creek and the Carron River.

A ring tank of 1.5km diameter and 5.5 metre high wall could be built with materials excavated from the inside of the ring tank giving a total depth of 6 metres (five metres of storage and 1m of freeboard). This would store as much water as the eight mile proposal at one tenth the cost. If the existing ridges were utilised this cost could be further reduced.

Either of these two proposals could be built in Stages to tailor the supply to the demand. This would be far kinder to the pocket of Council and the rate payer. The costs ($25/cubic metre) given to ratepayer at councils information night were grossly exaggerated and should have been more like ($6/cubic metre).

It would be foolish to think that either of these proposals would be the only supply required for the future. Glenore Weir would still be kept full by pumping over the weir to be utilised towards the end of the year.

I would like to raise some concerns about councils options listed on their feedback form.

Option 1: Increase Height of Glenore Weir

This option does increase the size weir storage but does not increase the catchment size. The Bureau of Meteorology has told us that there have been years that the river has not run over the weir. This being the case then the Glenore Weir regardless of size will not fill and this will be disastrous. This will be a case of more eggs in the same basket.

Option 2: 11 Mile Weir

Again this does increase the storage, without increasing the catchment size. This is also a case of more eggs in the same basket.

We have been told that this will only increase the flood by 0.2 metres. This is ridiculous as there has to be a 2 metre high weir wall, so it would increase minor flooding by 2.2 metres. This will increase the frequency and severity of flooding and road closures. This would hinder business, Locals and tourists.

Option 3: 8 Mile Weir

Again this does increase the storage, without increasing the catchment size. This is also a case of more eggs in the same basket.

We have been told that this will only increase the flood by 0.2 metres. This is ridiculous as there has to be a 2.5 metre high weir wall, so it would increase minor flooding by 2.7 metres. This will increase the frequency and severity of flooding and road closures. This would hinder business, Locals and tourists.

Option 4: Off stream Storage

The only options discussed were adjacent to Glenore weir. One option was unprotected in the flood path. The other option was on a porous ironstone ridge. This would require a plastic liner or imported clay both expensive solutions. The storage on the ridge would have increased operating costs due to the height of the storage above the weir.

Again this does increase the storage and without increasing the catchment. This is a case of more eggs in the same basket. It also requires the additional water stored to be pumped into Normanton increasing operational costs over off stream storage at Normanton.

Option 5: Desalination Plant and Repair Glenore Weir

Hopefully not a serious option as the operational costs are huge.

Other considerations are the pressure on business, ratepayers and Council by trying to build infrastructure for predicted demand in 50 years' time. This would be a good idea if a suitable site was available with abutments (hills) on both sides. Sadly we don't have this as an option.

Flooding and erosion caused by the construction of new weirs or increasing the height of current weir is a real concern and could lead to the river bypassing of the infrastructure rendering it useless.

The new weir options will nearly break the finances of Council and the current group of ratepayers who will spend the rest of their lives paying extravagant water rates. Business will have to carry the biggest burden of the three fold increase in water rates. This on top of $100,000 sewerage rates it will put unfair pressure on businesses in Karumba and Normanton. All this without cost blowouts and revised budgets to make matters worse.

In conclusion I believe the off stream storage at Normanton to be the most cost effective option delivering long term social and economic benefits, while enabling Council to supply Normanton and Karumba with a reliable water supply.

Residents have their say on water supply options.

Community consultation regarding water supply options for the Carpentaria Shire kicked off mid-March with information sessions in both Normanton and Karumba.

After the sessions, Council invited residents to share their opinion on the water supply options investigated, and asked for responses by 28 April 2014.

A total of 29 comments related to the water options report have been received.

Most (22) thought it was important for Council to investigate and act upon options to provide more secure water supply for the Shire. A number wrote about lawns, plants and trees dying during times of severe water restrictions and that as a result, the centres weren't as attractive.

Three did not agree commenting that there could be more education on how to use water more wisely, to reduce unnecessary use.

Of the options investigated in the report, increasing the height of Glenore Weir was selected by 16 people and Off-Stream Storage was preferred by six. With the latter, a number of sites close to Normanton were put forward.

There have also been suggestions as to an alternative design and construction method of the off-stream storage area which could potentially reduce the estimated cost of this option.

Feedback suggests that the options of building a new weir at either 11-mile or 8-mile or installing a desalination plant were simply too expensive. The 11-mile and 8-mile weirs were each preferred by just one person, and the desalination plant was not preferred by any of the people who responded to Council's request for feedback.

Other options suggested included:

- Pump water back into Glenore Weir from the old bar
- Filter and purify sewage water, or bore water
- Have a pump station above 9 mile
- Deepen the existing Weir

As a result of the feedback received thus far, Council is in the process of doing more investigation into the Off-Stream Storage option. For those who are interested, there will be a presentation at the Council meeting scheduled for 21 May at 9:15am. It will be from an engineer who has approached Council about an off-stream storage option close to Normanton.

It is a formal Council meeting where members of the public cannot speak from the floor, however Councillors are encouraging people to come along to the presentation to hear about the idea first-hand.

Council will not be making make a decision until there has been due consideration of the community's wishes. Given the presentation on 21 May, the deadline for comments has been extended to 30 May 2014.

A full copy of the Water Options Report is available for viewing at both libraries and the Council's office. In addition, a copy may be downloaded/viewed on Council's website. Copies of comments received to date, and a copy of the PowerPoint slides containing information on the impact of rates of each of the options, and feedback forms are also on the website.

Krystal Kirkman

From: DCS - Oliver Pring <oliver.pring@carpentaria.qld.gov.au>
Sent: Thursday, 10 September 2015 3:02 PM
To: 2015-16CRF
Subject: RE: CSC Application - Part 2
Attachments: csc_logo®lowres4f2768.jpg; CRF_Supporting_Docs_2.zip

Categories: Green Category

Part 2

Regards

Oliver

Kind regards

Oliver Pring
Director Corporate & Community Services
CARPENTARIA SHIRE COUNCIL

PO Box 31, NORMANTON QLD 4890
oliver.pring@carpentaria.qld.gov.au
www.carpentaria.qld.gov.au

Find us on Facebook

From: DCS - Oliver Pring
Sent: Thursday, 10 September 2015 3:02 PM
To: '2015-16CRF@dilgp.qld.gov.au'
Subject: CSC Application - Part 1

Please find attached Carpentaria Shire Councils application towards the 2015/2016 Community Resilience Fund – Part 1 (additional supporting documentation to be as Part 2)

Any queries please contact me on the details listed below

Regards

Oliver

Level 1, 154 Melbourne Street
South Brisbane, QLD 4101, Australia
(PO Box 5333, West End, QLD 4101, Australia)
T +61 7 3029 6600 **F** +61 7 3029 6650 **E** brisbane@smec.com
www.smec.com

13 February 2014

Shire Engineer
Carpentaria Shire Council
PO Box 31
Normanton QLD 4890

By Express Post (Attention: Shire Engineer)

Dear Shire Engineer,

Normanton and Karumba Water Supply Upgrade Options Study

Please find enclosed 3 copies of the report "Normanton and Karumba Water Supply Upgrade Options Study".

If you have any queries regarding this report please refer to [redacted] from PDR Engineers in the first instance, or alternatively [redacted] rom SMEC.

Yours faithfully,

[redacted]

Technical Principal Water Infrastructure - QLD/NT
SMEC Australia
[redacted]

NORMANTON & KARUMBA WATER SUPPLY UPGRADE OPTIONS STUDY

13TH February 2014

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EXECUTIVE SUMMARY

The recent drought conditions experienced in the Gulf of Carpentaria have highlighted the issue of a low degree of security of water supply for Normanton and Karumba. The townships rely heavily on a single source of supply, namely the Glenore Weir on the Norman River. The water from the river can be supplemented by ground water but this is limited due to poor water quality.

Normanton and particularly Karumba experience an influx of visitors during the dry season. This influx is placing an increasing load on the already stretched water supply system. In order to meet current demands, cater for future growth and provide a more secure water supply that makes provision for drought periods it is necessary that additional water yield be accessed. A review of growth and water consumption has indicated that a steady rate of growth / demand has taken place over recent years.

This report examines a number of options associated with the further development of water yield from the Norman River including raising the existing Glenore Weir, construction of new weirs (11 Mile and 8 Mile) and using the existing Glenore Weir as a diversion / pumping pool to fill an offstream storage and desalination.

It is recognised that other options including accessing another river (Gilbert River are also possible but have been excluded from detail examination in this report.

Raising the existing Glenore Weir has previously been examined and it was concluded that from an engineering perspective this option was feasible and presented no major issues.

Possible weir sites have been identified downstream of the existing Glenore Weir at locations known as 11 Mile and 8 Mile. Both of these sites are located within tidal zones in the river. These sites were selected due to the presence of a “rock bar” in the river. Further investigation is required to confirm the nature of the rock and suitability for founding a weir structure.

An alternative option is to retain the existing Glenore Weir and develop one or more offstream storage basins. Water is pumped into the storage basins during periods of high flow in the Norman River and the water is stored for use when the water level in Glenore Weir falls to a low level.

This report includes a preliminary assessment of the aquatic aspects of further development on the Norman River. It was concluded that raising the existing weir or construction of new weirs would require the inclusion of a fish passage at the weirs. The Norman River contains a number of species and construction of any new or raised barriers would impact on both the movement of fish but also the estuarine habitat.

The yield for each option has been assessed and modelled against future growth and demand. It was concluded that each of the options, except for repairing the existing Glenore Weir is capable of providing a secure water supply for the next 30 years subject to future demand. The options of new weirs at either 11 Mile or 8 Mile locations offer the highest levels of security and are able to meet water demands for the current growth rate well beyond the next 30 years.

Flood modelling undertaken for this report has identified that raising the existing weir or construction of new weirs would have an impact on local flooding. An increase in flood heights up to 200 mm can be expected depending on the option adopted. Whilst this increase depth of flooding is relatively small, it can have a much larger impact due to the relatively flat topography of the area.

Concept cost estimates have been developed for each of the options examined in order to provide an indication of the scale of the works and development costs. The estimates are based on limited information only and are subject to further investigation and development.

This report identified that there was not a single option that was a clear preference in that it ticked all of the boxes – low capital and annual cost, minimal design and construction issues, water quality and minimal environmental impact.

The selection of a preferred option will also need to include other factors including the ability of the option to attract funding support from Government. The most favourable options will require further work to define their issues.

1 BACKGROUIND

The township of Normanton (and Karumba) is supplied with reticulated water from a common system based on a weir (Glenore Weir) on the Norman River.

Previous water supply arrangements included a bore field extracting ground water. The volume of water used from this source is a small percentage only of total usage used due to issues with water quality.

The current water supply system relies predominantly on surface water harvesting from the Norman River (Glenore Weir), treatment at Normanton and then reticulation to both communities. Recent years has seen an increasing pressure being placed on the water supply, particularly during the “dry” season when an influx of tourists and others into the area see a large increase in demand during that period, particularly at Karumba.

The existing weir on the Norman River and its yield is currently considered to be at its limit in terms of supplying the needs of the communities. Failure of a “wet” season to realise adequate flows in the Norman River results in the need to implement water restrictions for the area. There is currently no alternative source of supply for Normanton (and Karumba) and no provision for being able to maintain supply should consecutive “wet” seasons fail. Normanton (and Karumba) are totally reliant on a single source of supply that relies on the occurrence of a climatic event (the “wet” season) on an annual basis.

Failure of the 2012/2013 “wet” season to replenish flows in the Norman River has highlighted the tenuous position for Normanton and Karumba and their dependency on a single source of supply that relies on an annual event.

Recent activity to help extend the yield from the existing Glenore Weir includes using portable pumps to transfer water from nearby downstream pools back into the weir pool. This yields a low volume of water only and is both expensive and time consuming to carry out. The water quality in these pools is impacted on by the inflow of poorer quality water when peak tides extend up the Norman River.

It is likely that over time further growth in the community can be expected, particularly in the area of tourism. Council has also identified the need to attract industry to the area. A suitable industry will require a secure water supply, which places a further load on the already stretched system. It is evident that to cater for both current and future water demands and provide a higher level of security of supply an upgraded water supply system is required and is seen as being pivotal to supporting development in this area.

Due to its location in the “Gulf”, Normanton (and Karumba) can become isolated for long periods of time once the “wet” season commences. This is also the time when the rivers in the area flow and the Glenore Weir on the Norman River is normally replenished. However, the “wet” season conditions also make access to the key elements of the water supply system such as the raw water delivery pumps and pipeline and the Karumba supply main more difficult.

This report outlines the investigations undertaken in respect to the options available in respect to increasing the yield of raw (untreated) water in order to provide an increased level of security of water supply that caters for an increased level of demand (growth). The purpose of this report is to primarily investigate the options associated with further development of infrastructure on the Norman River and to develop a long term development plan for the water supply system.

Upgrading of the reticulation and distribution system as a result of further growth is outside of the scope of this report.

This report is provided to give guidance on the preferred options for securing a water supply for Normanton and Karumba. Further investigation and reporting is required to confirm the viability of the preferred option and to examine in more detail potential staged delivery of options.

This report does not include any review of the impact of any of the options on recreational activities.

2 EXISTING SYSTEM

The existing system at Karumba consists of a number of elements as outlined below. A schematic of the existing systems is provided in Figure 1

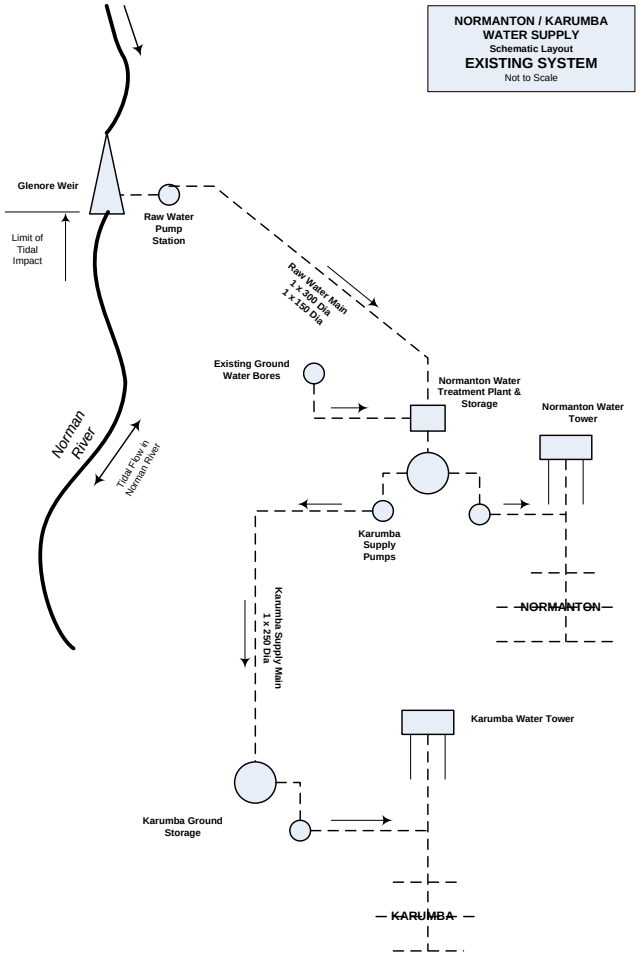


Figure 1 – Schematic of Existing Normanton / Karumba Water Supply System

The current water supply system is reliant on a single source of supply, the Norman River and Glenore Weir. Failure of the weir, raw water pumps or the supply main to Normanton (and Karumba) will have an impact on the security of supply.

2.1 Glenore Weir

The existing Glenore Weir is a concrete and stone pitched weir structure located immediately upstream of the road bridge where the Gulf Development Road crosses the Norman River (and upstream of the Normanton to Croydon rail line).

Glenore Weir is located on a rock foundation at a location where the left abutment is relatively steep and rocky and rises to an elevation above the Norman River. The right abutment of the weir stretches across a flood plain.

Glenore Weir was constructed around 1969 but limited details are available on its original construction. The weir creates a storage pool from which water is pumped and a separation barrier between the tidal area of the river and the pumping pool.

The central main overflow portion of the weir is approximately 70 metres long and consists of a concrete gravity wall with an ogee type crest and downstream flip bucket energy dissipater (refer Figure 2). Downstream of the dissipater, the water flows over the natural rock bed of the river.

Figure 2 – Ogee Crest Area of Glenore Weir viewed towards Right Abutment

The weir abutments were constructed as a narrow vertical concrete wall extending up from the foundation, with rock and rip rap infill placed on the upstream and downstream sides. The infill has been capped with stone pitching cemented in place (refer Figure 3).

Upstream and downstream of the side abutments vegetation has become established (Melaleuca's). It is likely that the roots of the established trees have penetrated into the rip rap and are causing some of the issues with the cracking of the concrete in this area.

It is also apparent that there has been a build-up of silt on the upstream side of the ogee crest and the side abutments. This is not unexpected given the volume of suspended material that the river is likely to carry during flood periods. At this time this material is not causing an issue apart from some reduction in total storage capacity behind the weir.

*Note proximity of vegetation

Figure 3 – Left Abutment of Glenore Weir

Glenore Weir is located close to the interface of the upper limit of the tidal reach and fresh water flows down the river. Tidal (saline) inflow reaches the downstream toe of the weir during peak tides which occur 2 or 3 times per year only. It is reported that peak tidal level inundates the toe of the weir in the order of 300 to 400 mm only (well short of over topping the existing weir crest). The vegetation in the river bed will minimise any wave action in this area and saline intrusion over the top of the existing weir is unlikely.

Raw water is pumped from the weir pool at a location upstream from the weir wall. A series of submersible pumps are suspended off a steel deck into a deep area in the weir pool. The electrical controls for the pumps are located in a building on the embankment above the pumps at an elevation above flood levels.

Previous investigations have identified that there are a number of issues with the existing Glenore Weir. The site inspection undertaken as part of this investigation was brief but confirmed the need to upgrade / repair the existing weir. Issues identified include:-

- Wear to the concrete on the ogee crest. The concrete in this area is showing evidence of having been eroded and exposing the aggregate in the concrete;
- Cracking of the side abutment walls. The narrow concrete walls are cracked in a number of places including some evidence of both lateral and vertical displacement. The condition of the wall is considered poor and there is an increased likelihood of it failing at a future date. Some of the cracking may be due to tree root penetration into the wall foundation area;
- The rip rap placed on each side of the wall has been cemented into place. There are areas where rip rap has been disturbed or lost and the cement infill is cracked or missing. Further loss of this rip rap will increase the pressure on the thin concrete wall and increase the potential for failure of the wall;

The offtake structure in the river supporting the pumps is aging and needs considerable maintenance work to restore its condition and stability. Alternatively the structure needs to be reconstructed or replaced.

At the current time there is no provision at Glenore Weir for the migration of fish past the weir. The weir provides a barrier to fish migration except for limited periods during the peak of the wet season

flooding when the weir may be drowned out. There are perceived benefits to be gained if fish passage past the weir can be restored.

2.2 Glenore Weir to Normanton Supply Mains

Delivery of raw water from Glenore Weir to the Normanton Water Treatment Plant is via 150 mm diameter and 300 diameter pipelines, operating in parallel. Both mains are of Asbestos Cement (AC) material.

Council reports that the both mains incur regular breaks and disruptions and that at a number of locations the mains are exposed or have very little cover. During the "wet" season access to the mains is limited due to flooding and boggy ground conditions.

Given the age of the AC material and the poor installation conditions, the occurrence of breaks and disruptions with the existing mains is likely to increase over time. The existing mains are considered to provide a low degree of security particularly when coupled with a lack of access to large lengths of the mains during the "wet" season.

The capacity of the existing raw water delivery mains is going to be limited to approximately 20 L/sec for the 150 mm diameter main and 80 L/sec for the 300 mm diameter main (a total of 100 L/sec). The existing mains have a limited capacity without substantially increasing operating pressures. An increase in operating pressure will most likely result in an increase in the frequency and number of main breaks and issues.

The main issues identified with the existing supply mains include:-

- Decreasing reliability and security of supply;
- Limited capacity and unable to supply future demands;
- Vulnerable to physical damage due to lack of cover over pipe or exposure of the pipe;
- Inability to easily access the pipe during the "wet" season;
- OH&S issues associated with the maintenance and repair of AC products.

If the existing Glenore Weir and its pumping facility are maintained in service, replacement (upgrading) of the existing AC mains at a future date will be required.

2.3 Normanton Water Treatment & Ground Storage

At Normanton the raw water pumped from Glenore Weir is treated using conventional water treatment consisting of chemical addition, flocculation, sedimentation, filtration and disinfection.

This type of technology is widely used and provides for adequate treatment. The system is easily operated and maintained and can be adjusted to suit changes in raw water quality. This type of technology is considered appropriate for Normanton given the regions remoteness and lack of ready access to technicians.

Treated water from the plant is discharged to a ground storage tank from where it is pumped to:-

- An elevated tower which provides the pressure head for distribution of water throughout Normanton;
- Karumba via a dedicated supply main.

It is evident that upgrading of the Normanton Water Treatment Plant may be required at a future date. This issue is considered to be outside of the scope of this report.

2.4 Karumba Supply Main

The supply main to Karumba consists of a single 250 mm diameter pressure main. The main follows a more direct route between Normanton and Karumba than the access road. This has resulted in the

main being laid through soft ground that is flood prone during the “wet” season. Vehicular access along the pipeline is limited to the “dry” season only.

This main offers a low security of supply Karumba given the length of the main, its location and poor access conditions and the poor ground conditions in which it has been laid.

Council has advised that there is a history of periodic breaks in this main and that during the “wet” access for repairs has required the use of helicopters.

2.5 Karumba Ground Storage

At Karumba, the supply main discharges into 2 x 2.5 ML ground storage tanks.

Pumps at the storage site transfer water into an elevated tank which provides the pressure head for the distribution of water throughout Karumba.

There are no major issues in respect to the water supply system at Karumba except for its total reliance on the long supply main from Normanton and the security of supply offered by Glenore Weir. The low security offered by the supply main to Karumba is partially offset by the total volume of water storage that has been provided at Karumba.

During the “wet” season when the Karumba supply main is at its most vulnerable, the demand for water in Karumba is at its lowest and the storage capacity at Karumba provides some capacity for the town to be supplied until repairs to the supply main can be organised and implemented. However the risk of the supply main to Karumba being disrupted for an extended period of time is considered to be a key risk for Council.

The above issues are considered to be outside of the scope of this report.

3 GROWTH AND WATER DEMAND

Future growth and water demand are outlined in detail in Section 3 of this report.

The 2 demand centres of Normanton and Karumba provide different demand and growth issues for council.

Normanton is expected to continue to have an increasing demand over time driven mainly by growth in further urban development. There is some potential for the establishment of industry in the town. Seasonal variation in demand is likely to be minimal as the population of Normanton remains reasonably static except for a slight increase in the dry season as a result of tourists passing through the town.

Karumba is expected to experience a high rate of growth due to its proximity to the Norman River, the Gulf of Carpentaria and its attraction as a developing tourist destination. The area also lends itself to some industrial development due to the potential for exports/imports through the port at Karumba.

There is considerable seasonal variation in demand for water in Karumba. During the dry season there is an influx of tourists into the township. Karumba is expected to maintain and expand its attraction for tourists associated with “sports” fishing for many years. There is the potential that facilities to accommodate the seasonal tourist influx will increase in the future.

The provision of a secure water supply to cater for the “lifestyle” of the significant numbers of tourists is a key consideration in the future development of the water supply system.

At Normanton and Karumba the required water yield (total annual volume of water required to meet demand) is most likely available from the Norman River. However this river (like all water courses in the area) provides a pattern of flow that extends from floods (and high river flow rates) in the wet season down to nil flows in the dry season. Failure of a wet season where insufficient rain falls in the Norman River catchment results in less than required flows.

Peak demand for water on an annual basis occurs in the dry season (with a large proportion of this demand driven by the influx of tourists during this period of the year).

Whilst the Norman River has the potential to provide the required yield, the main issue is that due to the variation in flow in the river, a large storage volume is required to retain sufficient volume to sustain the community during the dry period and to provide a buffer for failure of a wet season.

4 UPGRADE OPTIONS

As outlined above, the options considered in this report only cover those that provide an increased yield of water and security of supply. Options for upgrading other components of the system are outside of the scope of this report. For example, it is likely that upgrading of water treatment facilities, storage and pumps will be required to meet increased growth. These issues and the options available need to be examined separately.

This section identifies the potential options for increasing the yield and storage of water for Normanton and Karumba and provides a brief discussion on each to ensure that for completeness all options are canvassed. The sections following this summary examine in more detail the options relating to increasing the yield from the Norman River alone.

The estimated cost and economics of each of the weir options for the Norman River are provided in Section 12 of this report.

For the purposes of this report the following weir levels (over flow crest level = top water level) have been adopted

Table 1 – Weir Levels

Weir Option	Weir Crest Level	Comments
Existing Glenore Weir	2.26 m	As per DTM Survey
Raised Glenore Weir	3.46 m	DTM Survey + 1.2m
11 Mile Weir	2.26 m	
8 Mile Weir	2.26 m	

From the above table it is noted that the weirs proposed for either the 8 Mile or 11 Mile location have the same proposed crest level as the existing Glenore Weir. The level for the proposed weirs is being driven by the need to maintain a barrier against peak tides plus an allowance for storm surge and wave run-up (freeboard) as shown in Figure 11 – Variation in Water Levels on Proposed Weir. At this time, a weir crest level of at least 2.26 m is considered to be required. The final level to be adopted for these locations should one of the new weir options be adopted will be subject to further detail review and analysis.

The following options have been identified as potential additional sources of water for Normanton. The listing of the options is not any in order of preference:-

4.1 Upgrade Existing Glenore Weir

It is evident from the visual inspection of the weir and the existing offtake (pump support structure) that a general upgrade of this facility is required if Glenore Weir is to remain in service (in its current form).

For Glenore Weir to provide the ongoing level of security of supply required for a water supply system it will be necessary to undertake maintenance / repair / replacement work on the existing infrastructure at Glenore Weir. The type of works required are outlined below:-

- Detailed inspection of the weir overflow crest, side abutment walls and downstream flip bucket and apron;
- Removal of trees and vegetation in proximity to the weir wall, particularly along the abutments;
- Repair of the weir abutment walls;

- Reconstruction / upgrading of the existing offtake / pump support structure. The existing support structure is in poor condition. One option would be to construct a new structure beside the existing in order to maintain supply.
- Miscellaneous works to address localised erosion or other issues identified from the detailed inspection.

The work outlined above is not expected to make any changes that are likely to trigger the need to provide fish passage at Glenore Weir. However, consideration should be given to providing fish passage on the existing weir structure in order to demonstrate a commitment to improving the environmental conditions in the Norman River. In order to maintain the current yield and storage at Glenore Weir and to provide for fish passage it may be necessary to raise the existing overflow crest level in order to provide the required conditions to operate a fish passage.

4.2 Raise Glenore Weir

This option would see further development of the existing Glenore Weir by increasing the height of the weir.

Previous investigations[1] have considered raising the existing weir crest by approximately 1.2 metres.

Any raising of Glenore Weir would require further investigation and would require obtaining a number of permits and approvals. Conditions applied to the approvals are likely to include the provision of fish passage at this location.

This option is outlined and discussed in detail in Section 5 of this report.

4.3 Construction of a new weir at 11 Mile

Under this option, a new weir is constructed on the Norman River downstream of the Gulf Development Road Bridge and Rail Bridge at a location known as “11 Mile”. A rock bar extends across the Norman River at this location.

The selection of this site has been based on local knowledge of the existence of “rock” in this area.

Extensive investigation is required to determine the extent and suitability of the rock for the construction of a weir.

It is anticipated that conditions placed on the approvals for a weir at this site will include the provision of a fish passage.

This option is outlined and discussed in detail in Section 6 of this report.

4.4 Construction of a new weir at 8 Mile

Similar to the option for a new weir at 11 Mile, the “8 Mile” option is for a weir on the Norman River at a location where a rock bar extends across the river.

The selection of this site has been based on local knowledge of the existence of “rock” in this area.

Extensive investigation is required to determine the extent and suitability of the rock for the construction of a weir.

It is anticipated that conditions placed on the approvals for a weir at this site will include the provision of a fish passage.

This option is outlined and discussed in detail in Section 7 of this report.

[1] Refer to Draft Report, Concept Design for Raising Glenore Weir, Sunwater, December 2003, Ref: G – 80207 – 02 - 01

4.5 Offstream Storage

An offstream Storage is a constructed basin located at an elevated site away from the river or the offtake pumps. The storage basin is filled with water when excess water is available from the Norman River. The storage basin is similar to a large “turkey” nest type farm dam where earth is excavated from within the basin site to form the embankments on a “cut to fill” basis.

The shape of the storage would depend on the topography of the area with the aim of minimising the volume of earthworks required but maximising the storage capacity of the basin.

To minimise the basin’s footprint (and exposure to evaporation from the surface of the water) a basin with a design water depth at full supply in the order of 5 to 6 metres should be considered. Freeboard allowance on basins of this size is typically in the order of 1 metre.

This option would operate under the following principles:-

- When the existing Glenore Weir has filled and commences to spill, water is pumped from the weir into the offstream storage basin;
- Pumping at the weir would continue to operate until either the basin has been filled or discharges over the weir cease;
- Through the year Normanton is supplied by water pumped from either Glenore Weir or the offstream storage basin (provides flexibility in terms of where water is sourced).
- Ideally the offstream storage basin would be located part way between Glenore Weir and Normanton to minimise pipe lengths and pump sizing.

This option has a number of advantages including:-

- The works can be staged with additional offstream storage basins being constructed as growth in the system takes place. The capital costs of future stages are deferred and only implemented when supported by an increased demand or major development;
- Glenore Weir remains in service to provide the base source of water for Normanton. Restoration of the weir back to a good condition will be required;
- This option will not trigger the need to provide fish passage at Glenore Weir as no increase to weir storage capacity, weir height or major upgrade is proposed. However consideration should still be given to providing fish passage on the existing weir to improve the environmental conditions in the river;
- Improves operation flexibility as this enables supply to be maintained whilst maintenance and repairs are carried out on the pumps and electrics at Glenore Weir;
- The majority of the construction for an offstream storage can be undertaken using local resources as the majority of the work is bulk earthworks. A specialist contractor would need to be engaged to supply and install a HDPE or similar type liner;
- Construction can be undertaken and completed during a single “dry” season; and
- Minimal permits and licence issues only (reduced period to implement).

Disadvantages of developing an offstream storage basin include:-

- Locating a suitable site between Glenore Weir and Normanton that is above flood levels;
- The period available for harvesting water from Glenore Weir (when water flows over the weir) varies and is for a limited period of time each year (during the “wet” season). Available pumping periods may be as short as 30 days per year.
- Large high volume pumps will be required to transfer water from Glenore Weir to the offstream storage. For example to transfer 600 ML (approximately 6 months’ supply for Normanton / Karumba) in 30 days would require a pump and transfer main capacity of 250 L/sec;

- Increased pumping costs as a result of having to pump the water a second time as against pumping direct from a weir.

The possible system is shown schematically in Figure 4 below.

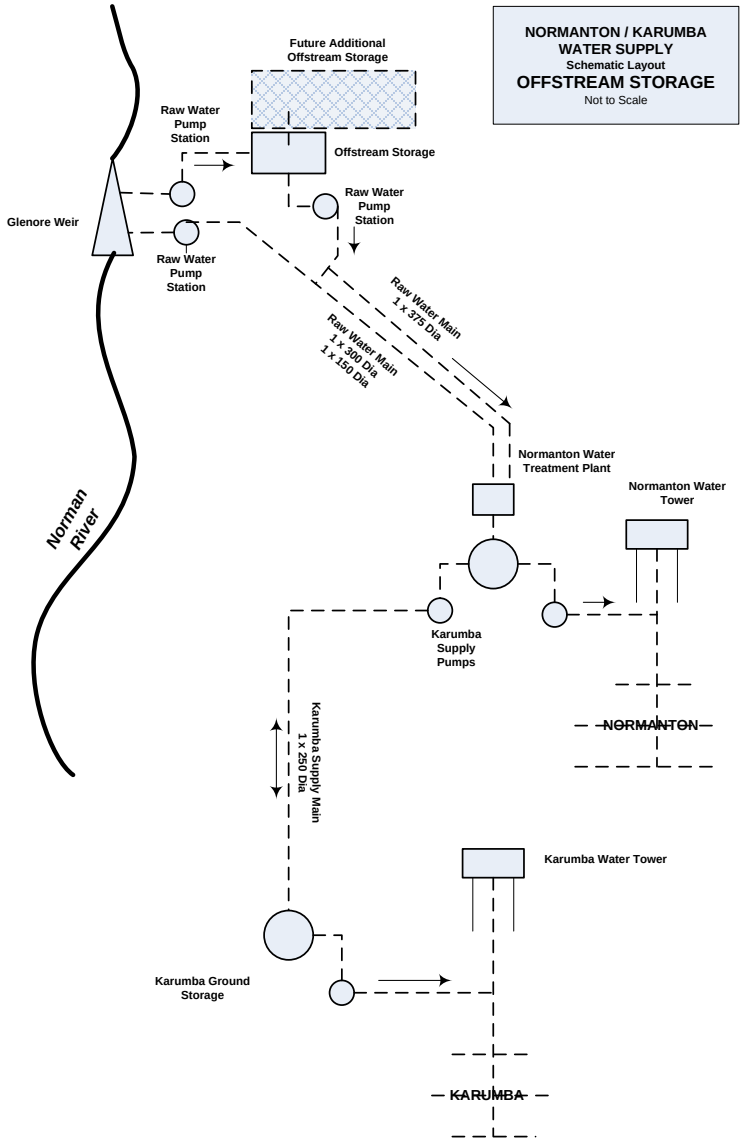


Figure 4 – Schematic of System that includes an Offstream Storage

4.6 Desalination

Desalination of water is becoming a more widely used technology, particularly in recent years where a number of plants have been constructed particularly in situations where further development of surface water resources is limited or severely drought impacted.

Desalination plants consist of a series of pumps, tanks, filtration membranes and some chemical dosing. The plants can be quickly implemented and integrated into existing systems. They have the capability to treat water of a poor quality to a very high purity.

This type of water treatment has some advantages including:-

- Can treat highly saline or sea water. At Normanton this is a readily available and unlimited source of water;
- Plants can be mobilised and implemented in a relatively short time frame. Depending on the size of plant required, there is the potential for plants to be supplied as modules that are trucked to site. This effectively minimises site works; and
- The modular design of desalination plants makes them easily expanded to meet future growth.

However, desalination is considered to have a number of disadvantages including:-

- The poor publicity that has come from plants such as Tugun (Gold Coast). The main issue relates to the high costs that are being incurred when the plants are no longer used for a period of time. It is important that desalination plants are operated on a regular basis to maintain the viability of their membranes.
- Desalination plants are expensive to operate in terms of both power costs and periodic replacement of membranes (membranes typically require replacement every 5 years);
- Desalination plants need to be operated regularly to maintain the viability of the filter membranes. To prevent premature replacement of the membranes, the plants need to operate irrespective of whether cheaper water sources are available. This may entail operating the plant for several hours every couple of days.
- The plants are typically controlled by computers and PLCs (programmable logic Controllers). Servicing of the plants requires specialised technicians to visit site;
- Due to the high water pressures required, the plants have a high power load and consumption;
- When compared to treating surface water, water from a desalination plant has a higher per unit production cost ($/Litre);

A desalination plant could be provided at Normanton with its water feed being drawn directly from the Norman River. A plant at this location would require the feed water to be pre- filtered prior to the main membranes due to the turbidity in the river at this location.

A schematic detailing how a desalination plant at Normanton would integrate into the system is shown in Figure 5.

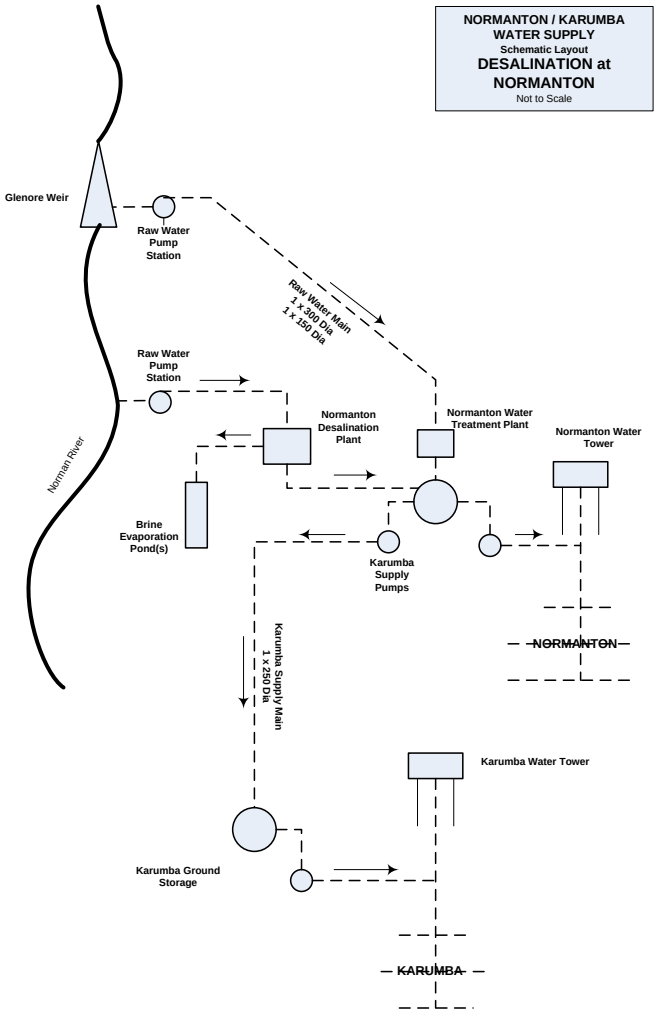


Figure 5 – Schematic of Desalination Plant integration at Normanton

The alternative approach would be to provide a desalination plant at Karumba. A plant at Karumba provides diversification of the source of supply in that Karumba would essentially have its own source of supply with the potential to feed treated water back to Normanton (increases security of supply, particularly for Karumba).

Raw water feed for a desalination plant at Karumba could be sourced either from the sea or from the Norman River. Either of these sources would provide a cleaner (less turbid) supply of raw water compared to drawing water from the river at Normanton. The cost of a desalination plant at Karumba would be marginally less due to the reduced pre-filtering requirements.

For costing and option review purposes the option of providing a desalination plant at Karumba has been used.

A schematic detailing how a desalination plant at Karumba would integrate into the system is shown in Figure 6.

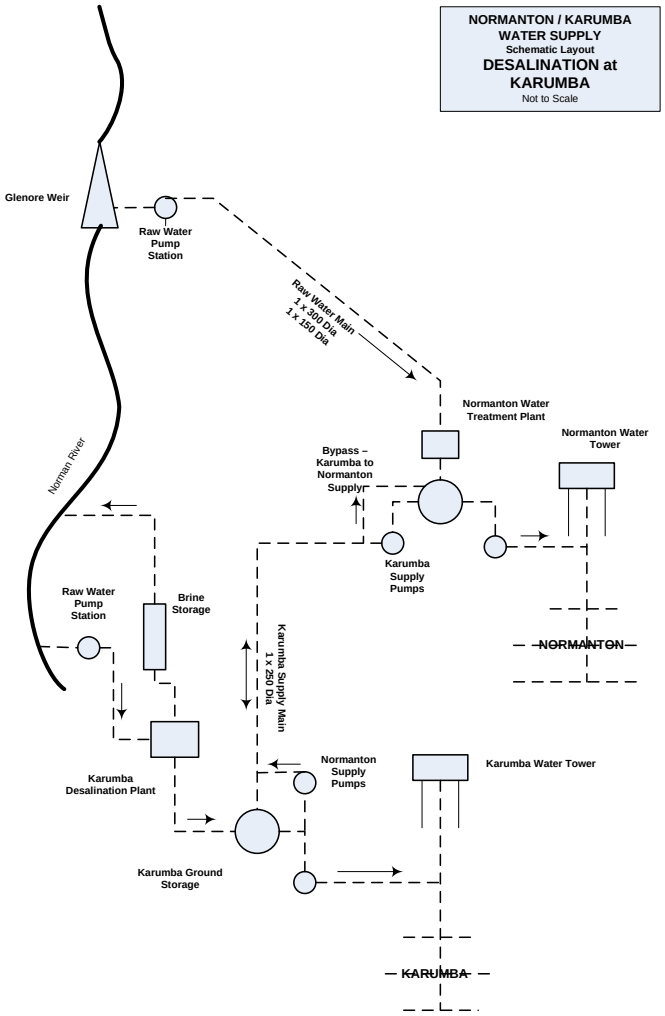


Figure 6 – Schematic of Desalination Plant Integration at Karumba

4.7 Bore Field

Normanton's water supply is supplemented to a small degree by water from ground water bores.

A possible option is the further development of a bore field (multiple bores spread over an area) that supplements the supply from Glenore Weir to a higher degree.

Access to this source of water was previously discontinued due to water quality issues. It is likely that even if new water bores were developed that water quality issues will again make this option non-viable.

Whilst this option is viewed as being very favourable in terms of capital costs and time to implement, the resulting water quality and its failure to meet health guidelines precludes this option from further consideration.

4.8 Supply from a River other than the Norman River

To diversify the surface water sources for Normanton would require development of a diversion and storage on another river system. The closest system that would be able to support Normanton and its potential for growth is considered to be the Gilbert River.

The Gilbert River is located approximately 80 km to the east of Normanton. This river system has a substantial catchment area and therefore an excellent potential for development. It is understood that there have been studies undertaken on development of this water resource, particularly for

agricultural purposes (refer to proposal by Gulf Savannah Development for the Gilbert River Irrigation Area).

To supply Normanton, substantial infrastructure development would be required including:-

- Identification and investigation of suitable weir sites or diversion sites on the Gilbert River;
- Construction of a weir or diversion works;
- Construction of a pump station and a pipeline extending to Normanton.

Whilst this option has merit in terms of the potential yield and its reliability of supply, further investigation is required to identify the scope of the works, potential infrastructure sites and pipeline routes. The development and capital costs of the project will be considerably higher than other options being considered at this time due to the pipeline length required.

Whilst this option is not considered viable at this time, changing circumstances could require this option being reconsidered as a future option following the full development of more locally based options and should there be substantial growth or increase in demand for water in Normanton (or Karumba).

4.9 Combination of Options

As outlined above one of the major issues at Normanton at the current time is its sole reliance on a single source of supply (Glenore Weir). Diversification of the source of supply will increase reliability and security of supply and increase flexibility of system operation. In order to achieve this alternative sources of supply need to be considered and developed.

One option to achieve this is adopting a combination of the identified options. This option is a long term strategy where implementation of the works is undertaken in stages to meet growth and increased demand.

Combination of possible options for the eventual system that could be considered include (not listed in any order or priority):-

- Existing Glenore Weir + Offstream Storage Basin + Desalination Plant at Normanton;
- Existing Glenore Weir + Offstream Storage Basin + Desalination Plant at Karumba;
- Raising Glenore Weir + Offstream Storage Basin + Desalination Plant (at either Normanton or Karumba);
- Raising Glenore Weir + Offstream Storage Basin + Supply from Gilbert River

Continued use of the existing Glenore Weir as part of combined option is noted. These options would require that Glenore Weir be upgraded (repaired) in order to return it to an acceptable condition and level of security of supply.

The above are some of the potential combination of options that could be considered. Further investigation would be required to define the combination of options and the timing for each stage.

5 RAISE GLENORE WEIR

5.1 Outline of Raise Glenore Weir Option

Previous studies have identified that Glenore Weir can be raised, resulting in an increase in the storage volume in the weir pool and a corresponding increase in yield.

Sunwater undertook a study in 2003[2] that proposed raising the crest of the weir by approximately 1.2 metres. The methodology proposed by Sunwater including placement of additional concrete on the upstream side of the existing central overflow section with a broad crested weir profile (as against the existing ogee type crest).

The weir abutments were to be raised by placement of a sheet pile wall on the upstream side and the placement of granular fill behind the sheet pile and a reinforced concrete apron capping together with additional downstream concrete aprons.

The arrangement proposed by Sunwater for raising the weir is queried as it will present a number of issues in respect to its construction and needing to dewater a substantial volume from the weir pool to enable works to take place on the upstream side of the existing weir (or construction of an upstream coffer dam). However this report demonstrates the feasibility of the weir raising. If this option is to be adopted a detailed investigation and design may identify improvements or changes to the arrangement outlined by Sunwater.

Sunwater (2003) estimated that the weir pool volume would increase from 1,840 ML to approximately 3,074 ML and provide a "safe" yield of 1,374 ML per annum as a result of raising the weir[3].

The Sunwater report also identified the need to construct a new pump offtake structure. The existing offtake structure is in poor condition and considered unsuitable to resurrect and extend to accommodate new pumps. It is likely that a new structure would be located adjacent to the existing offtake in order to access the same deepened area of the weir pool and minimise the pipeline distance and enable use of the existing building housing the electrics.

Sunwater proposed the development of a pump arrangement that includes the ability to draw water from different water levels. Raising the weir crest and therefore increasing the depth of the weir pool may result in the water column in the pool stratifying whereby water in the lower levels has low dissolved oxygen content and poor water quality. Provision of a multi-level offtake arrangement enables water to be drawn from close to the water surface irrespective of the weir pool level.

Raising of the existing Glenore Weir has some advantages in terms of it being an existing site and its location is sufficiently elevated for tidal impacts on the construction and operation of the upgraded weir to be minimal.

The Sunwater report notes the potential presence of low level bypass channels on the right bank of the river. These will require further investigation and may require an engineering solution to ensure that they do not develop into a permanent feature that can impact on the weir pool.

5.2 Raised Glenore Weir Inundation

Raising the existing Glenore Weir will inundate an increased area of river profile upstream of the weir. The extent of further inundation associated with a raised top water for the weir is not extensive in that it will continue to cover mainly the area within the existing river banks, extending the weir

[2] Draft Report, Concept Design for Raising Glenore Weir, Sunwater, December 2003, Ref: G – 80207 – 02 - 01
[3] The increase in storage volume and yield are apparently figures obtained from a 2002 planning report.

pool in depth and further upstream. Figure 7 below provides an indication of the inundation area for various weir heights associated with the normal operation of the weir.

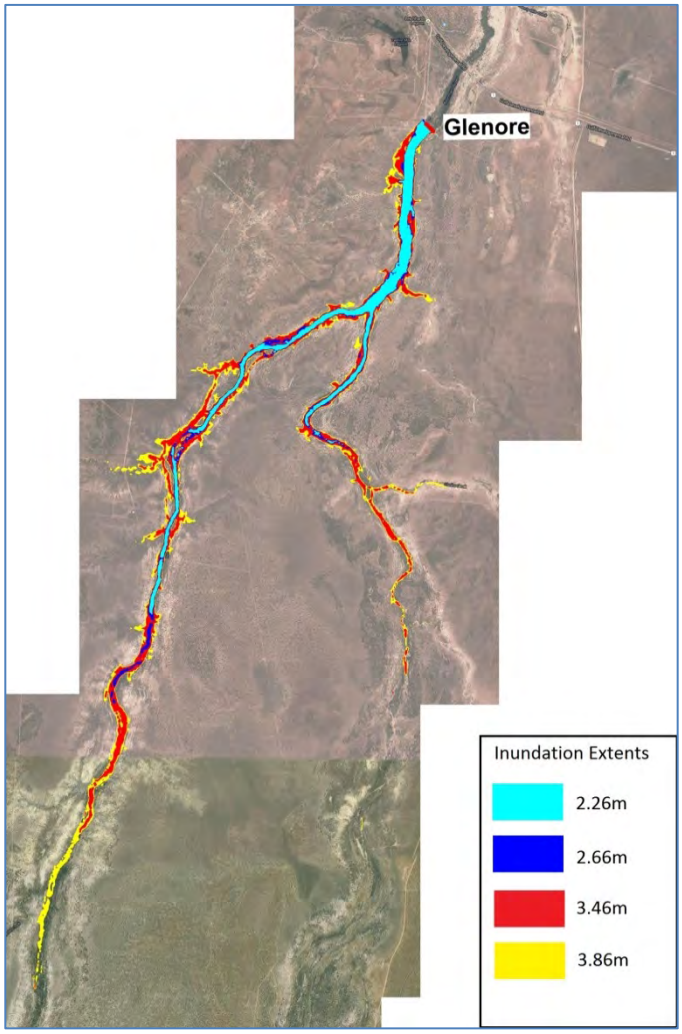


Figure 7 – Inundation Area with Raising the Existing Glenore Weir

The existing Glenore Weir inundation area is shown in light blue (2.26m) in the above figure. Raising the crest of the existing weir by 1.2 metres (to 3.46m) results in the additional areas highlighted in red in Figure 7 being inundated.

5.3 Raised Glenore Weir Water Quality

The water quality that can be expected from a raised Glenore Weir will be the same as that obtained from the current weir Glenore Weir. Raising the weir is not expected to change the raw water quality or change the degree of treatment required.

Issues identified with the existing weir include increased levels of turbidity associated with flood inflows to the weir.

5.4 Raised Glenore Weir Engineering & Constructability

From an engineering and construction perspective the existing Glenore Weir site has a number of advantages including:-

- Ready site access from the Gulf Development Road. A short access road already exists into this site. Minor upgrading of the road would be required for the construction program;
- A proven weir site in terms of stability and foundation issues. This weir has operated successfully for a number of years with only few issues in terms of repairs and maintenance;
- Tidal flows will have minimal impact on any construction activities. The weirs location is such that tidal inflow only reaches the toe of the weir several times each year.
- The existing weir structure can be used as a foundation from which to extend the new works. It is evident that the existing weir structure can be incorporated into the proposed raising, saving on the volume of concrete required.

The profile of the river cross section at this location is favourable with a "rocky" bank extending to an elevation on the left abutment and a flatter alluvial flood plain on the right abutment. Extension of a cut off wall into the right alluvial flood plain will be required whilst raising (and structural strengthening) of the existing wall only will be required on the left abutment.

Construction of the weir will be limited to a period during the "dry" season when access to the site can be maintained and flows in the Norman River drop to the level where flow ceases over the central weir section. The construction season is estimated to be between May and October only.
The Sunwater report included some geotechnical investigation of the foundation material at Glenore which concluded:-

"The existing weir spillway concrete gravity section is founded on duricrust, a ferruginised colluvial or residual soil.

The cementing process that formed the duricrust has resulted in material with rock-like properties at the ground surface. Nevertheless, it may become weaker with depth and may also be quite permeable."

and

"The foundation is suitable for the raised structure as proposed".

As geotechnical information on this site is limited, further investigation should be undertaken to confirm the Sunwater findings should this option be adopted.

Raising of Glenore Weir will trigger a number of Environmental actions including needing to:-

- Undertake an Environmental Impact Statement (EIS); and
- Provide for fish passage past the weir.

The inclusion of a fish passage is common to the other weir related options included in this report and is discussed in detail in Section 11.

6 "11 MILE" WEIR

6.1 Outline of 11 Mile Weir Option

Council has identified a potential weir location on the Norman River (downstream of Glenore Weir) at a location known as "11 Mile" and is shown in Figure 8. The site is downstream of Glenore Weir and the Gulf Development Road Bridge.

Figure 8 – 11 Mile Weir Site Viewed Looking Downstream from Right Bank

A rock bar exists in the river at this location. At the time of the site inspection (18th June 2013) short sections only of this rock bar were visible above the water level. The exposed rock sections appeared to run at an angle starting on the left bank angling at approximately 45 degrees in an upstream direction towards the right bank. Whilst a rock bar exists at this location, the orientation of the rock bar needs to be confirmed by further investigation. The condition of the rock, rock type and underlying strata is to be confirmed by detailed investigation.

There was no evidence of the rock day-lighting in the area moving away from the river on the left bank. All of this area was devoid of vegetation with evidence of regular inundation (including a tendency to look saline). The flood plain on the left bank was wide before the ground level rises to form a secondary river bank. It is uncertain how wide the alluvial plain on the right bank extends before reaching a higher elevation or harder ground. A photo of ground conditions on the left bank is highlighted in Figure 9.

Anecdotal information indicates that in the reach upstream of this possible weir site are a number of deep pools.

Figure 9 – View of Left Bank Alluvial Plain at the 11 Mile Site

A schematic detailing how the "11 Mile" weir site would integrate into the system is shown in Figure 10.

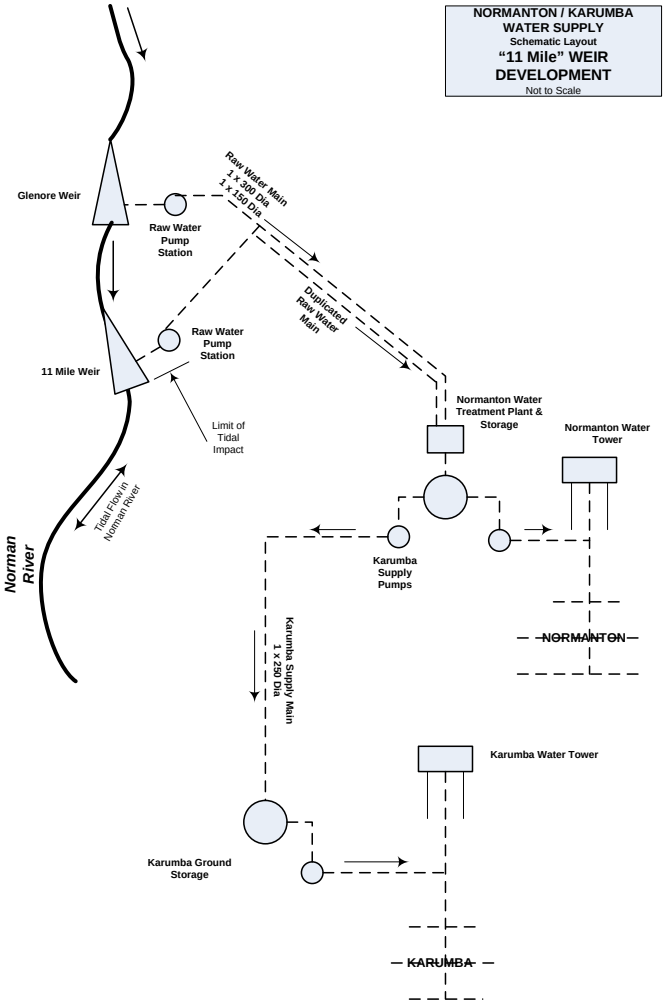


Figure 10 – Schematic Arrangement for Integration of a Weir at "11 Mile"

The proposed site at "11 Mile" is located in an area where daily tidal movement is taking place. A weir at this location would not only act as a "dam" to contain fresh water on its upstream side but to also act as a barrier to separate the downstream saline tidal flow from the upstream fresh water. The weir design would need to take into account the likely variation of water levels on both sides of the weir. Possible weir loading scenarios include:-

- Low tide and a full or overflowing weir (including flood flow). This situation is the maximum loading on the upstream face of the weir; and
- Major storm event occurring which creates a storm surge (and waves) with a low weir pool level. This situation is the maximum loading on the downstream face of the weir.

The above situations are shown diagrammatically in Figure 11.

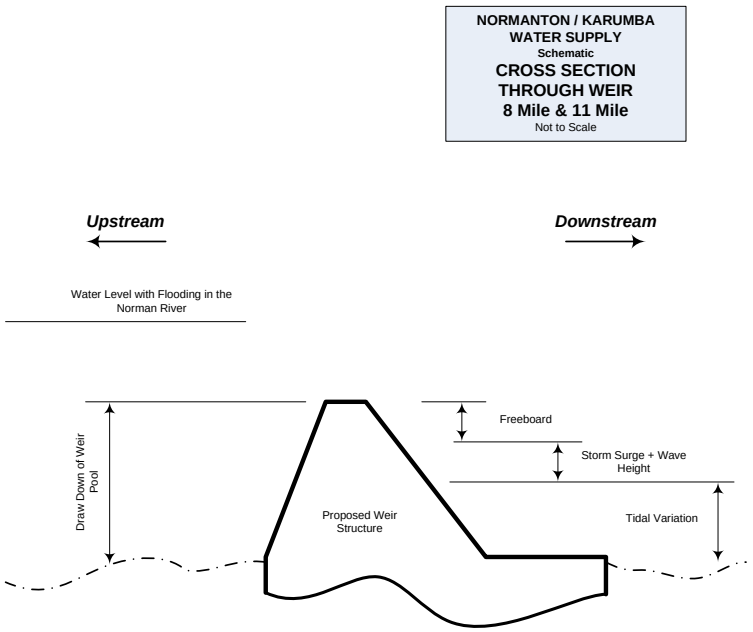


Figure 11 – Variation in Water Levels on Proposed Weir

In order to access the deeper pool areas contained behind a weir at this site, a pump offtake structure would need to be constructed. The location of the pump offtake will need to be the subject of further investigation to identify a site that enables good access to a deep pool but also minimises distances for electric and control cables. It has been assumed that submersible type pumps would most likely be used.

As identified for the raising Glenore Weir option, consideration will also need to be given to providing an offtake that permits water to be selectively withdrawn from different water levels in the weir pool.

The wide flood plain in this area will make locating the electrical controls and motor starters close to the pumps difficult whilst elevating the controls above flood level. Constructing an elevated platform adjacent to the river for an electrical control building is feasible but not ideal as the building (and its support platform) will be exposed to flood damage and difficult to access during a flood.

The location of the pumps, their controls and power supply (including transformers and backup generators) will need to be investigated further and is considered as an issue for this option.

6.2 11 Mile Weir Inundation

Creation of a new weir at the 11 Mile location will create an extensive weir pool that extends upstream from the weir for a considerable distance. The weir pool occupies the main profile of the river and is fully contained within the existing main river banks as shown in Figure 12.

Figure 12 – Inundation Area with the 11 Mile Weir Option

From the above figure the light blue area indicates the extent of the weir with the water at the weirs crest level (top water level).

As expected the weir pool extends upstream to include the existing Glenore Weir. The impact on the existing Glenore Weir and whether to retain the existing weir under this option are discussed in Section 6.5 below.

6.3 11 Mile Weir Water Quality

The water quality expected in a weir constructed at "11 Mile" is expected to be similar to that stored in the existing Glenore Weir. A weir at this location will be filled by flows in the Norman River.

The main issue or concern with the 11 Mile site is that at this location the river is tidal and the water at this location is saline except during periods of flood flows down the river. Salinity will have penetrated into the sediments and alluvium of the river bank and adjoining flood plain. It is expected that on creating a weir at this location there will be some leaching of salinity into the weir pool.

The levels of salinity that can be expected are difficult to estimate but likely to be at a level that has potential to impact on both taste and odour in the water reticulation system. Whilst not considered a health hazard, it is likely that consumers will voice their complaints, particularly as there will be an expectation that the upgrade works will either maintain water quality or improve it.

The existing chemical addition, flocculation, sedimentation and filtration treatment process used at Normanton will not reduce salinity to any degree. It is likely that additional treatment will be required to address this issue. Further investigation and testing would be required to quantify any additional treatment required as a consequence of drawing water from this location.

Once a weir has been created, the only water entering the weir pool will be flows down the Norman River. Over time it is expected that salinity levels in the weir pool will drop to be close to that from the fresh water flows. The number of events required to achieve a more acceptable level of salinity in the weir pool is unknown as it depends on the leaching of salts from the alluvium and the river sediments.

To minimise the impact of salinity, it may be necessary to withdraw raw water for treatment from both the existing Glenore Weir as well as the new weir site to dilute the salinity of the water entering the treatment plant. In the initial years of operation at least, sole use of the water from a weir at "11 Mile" may not be possible due to water quality issues.

This issue also highlights the need to ensure that the top of the weir crest (overflow section) is above any potential tidal level including provision for storm surge and wave action so that saline water cannot enter the weir pool.

6.4 11 Mile Weir Engineering & Constructability

The reason for selecting the "11 Mile" site is the presence of the rock bar across the river on which a weir structure could be founded. At the current time there is minimal information on the rock at this location.

Observations made during the site inspection indicated that the rock bar was mostly submerged with the tide at the time estimated to be at around the mid-point of its range. The exposed sections of rock indicated that it ran at a sharp angle of approximately 45 degrees across the river.

The construction of a weir at this location will present a number of challenges including:-

- The tidal movement will impact on both detail investigation and construction. Inundation of the rock bar will limit when access can be gained;
- It will most likely be necessary to install a coffer dam upstream and downstream of the weir site in order to provide an area to work within that can be maintained in a relatively dry condition;
- The tidal movement will make access across the river more difficult;

The rock condition and suitability for construction of a weir at this location is unknown and a further extensive geotechnical investigation will be required to examine the rock type, weathering, fracture zones, permeability (particularly the presence of clay or silt seams that may wash out under

pressure) and the orientation of the rock strata. In order to have confidence that this location is suitable, exploratory coring will be required along the proposed weir alignment including at regular intervals across the river as well as in the river banks.

It is evident that an uneven profile exists at this location with indications that the rock strata is angled sharply across the river. The weir structure (and particularly the overflow section) will have to be constructed perpendicular to the main river channel and flow direction (ie straight across the river). The location and depth of the rock strata straight across the river will need to be surveyed and the presence of rock confirmed;

The only rock observed during the site visit was a small area on the river bank upstream of the weir site. The rock at this location appears to be a cemented alluvial material. The suitability of rock of this nature to support a weir structure needs to be investigated. Irrespective, if a weir was to be constructed it is likely that up to 1 metre or more depth of rock will need to be excavated from the foundation area to ensure the weir is founded on sound material. This additional depth of excavation is significant given that the area is under water for long periods of time each day.

The alluvial river plains have a considerable width at this location. The weir structure will need to extend across the alluvial plains to ensure that a bypass channel around the weir does not develop. The length of the sections in the alluvial plains is considerable. Whilst the works in these areas would only need to provide a cut off for seepage and could consist of a thin cut off wall with appropriate erosion protection provided on each side;

The site will require the establishment of a considerable length of access road and associated works, including importing a large volume of material in order to provide an access across the alluvial river banks to the weir site;

Given the site constraints, the costs associated with the construction of a weir at "11 Mile" will be high due to the risks and issues associated with working in a difficult marine site that is impacted on by tidal flows. The costs for construction will be considerably higher compared to construction of a similar weir where there is no tidal movement.

Construction will be limited to the "dry" season with a total construction period of around 6 months only each year. It is likely that construction would need to be spread over a period of 18 months which would incur additional costs for the Contractor associated an additional demobilisation and mobilisation task.

There is a very high probability that construction of a weir at this site and removal of the vegetation along the river bank upstream of the weir (required to prevent the decay of the vegetation impacting on water quality) will expose and require the removal of acid sulphate soil (ASS). The presence and extent of ASS will need to be confirmed by further investigation. The presence of ASS and its treatment will add considerable cost to any construction work and the need for an increased level of environmental controls and monitoring for the project.

Construction at this site will require a Contractor who has some experience and good organisation and management practices. The nature of work is such that it may be necessary to attract a "second tier" contractor for the works rather than a smaller resourced local contractor. The smaller contractors may also see a level of unacceptable risk in a project of this nature.

Overall, it is possible to design and build a weir at this location (provided that a geotechnical investigation identifies that sound foundations are shown to exist), but it will incur a high cost due to the complexities and issues with the site.

To date there is minimal information available on this site (and the 8 Mile site). A full investigation program including a large drilling program is required to confirm the suitability of this site for development as a weir site. Investigations for dam and weir sites are normally carried out in 2 stages with the first stage providing sufficient detail and information to confirm whether the site is suitable.

The second stage to provide additional information for detail design of a weir is only undertaken if the first stage confirmed the suitability of the site. A first stage geotechnical and investigation will cost in the order of $400,000 to plan and undertake.

Due to the extensive impact that a weir at this site will have on the estuarine environment, it is anticipated that a large environmental study will also be required.

Taking into account, the most likely time line for development of a weir at 11 Mile would be:-

Calendar Year	Tasks / Activities
2014	• Geotechnical investigation • Environmental Studies • Preliminary inquiries on the possible conditions to be placed on any permits or approvals
2015	• Detail Design and Documentation • Finalisation of permits and approvals • Tendering of works • Award of tender • Start of site works
2016	• Completion of construction

The earliest possible capture of water in a new weir would be the 2016/2017 wet season, provided that approvals are received in a timely manner and that no engineering or environmental issues are identified that result in any hold ups or delays.

6.5 Existing Glenore Weir Inundation

As noted in the above sections the proposed crest level (to be confirmed) for a weir at 11 Mile Weir option (and the 8 Mile Weir Option) will result in top water for the weir pool equal to that of the existing Glenore Weir. At full supply the crest of the existing Glenore Weir will be just submerged. This raises the query of whether to demolish (breach the existing Glenore Weir) or to retain the existing weir.

Breaching the existing weir would remove a barrier within the new weir for movement of aquatic fauna and eliminate having to maintain both the weir structure and a pumping facility at the existing location.

However, removal of the existing Glenore Weir is considered to have the following disadvantages:-

- Places total reliance on the structural integrity of a new weir. In the event of the new weir failing then the pumping pool and the water supply is lost and saline tide flows will once again flow into the area;
- does not remove the issues associated with the reliance on a single source of supply.

Retention of the weir and pumping infrastructure provides the following benefits:-

- Provides a level of redundancy in the event of issues with the proposed downstream weir or its offtake;
- provides separation to enable selective or dual pumping in the event of water quality issues. These issues could include:-
    - leaching of salinity from the alluvial areas around the new weir pool; or
    - spillage of chemicals as a result of a road accident on the Gulf Development Road or road bridge.

For the purposes of this report, it is proposed that the existing Glenore Weir and its associated pumping system will remain operational under these options (11 Mile Weir or 8 Mile Weir development).

7 "8 MILE" WEIR

7.1 Outline of 8 Mile Weir Option

Council has identified a potential weir location on the Norman River (downstream of Glenore Weir) at a location known as "8 Mile". The site is downstream of Glenore Weir and the Gulf Development Road Bridge and the site known as "11 Mile".

A rock bar exists in the river at this location. At the time of the site inspection (18th June 2013) short sections only of this rock bar were visible above the water level. The exposed rock sections appeared to run at an angle starting on the left bank angling in an upstream direction towards the right bank. Whilst a rock bar exists at this location, the orientation of the rock bar needs to be confirmed by further investigation. The condition of the rock, rock type and underlying strata is to be confirmed by detailed investigation.

On the left bank an alluvial flood plain stretches for a distance away from the river of approximately 200 metres before striking rockier and elevated ground. It is uncertain how wide the alluvial plain on the right bank extends before reaching a higher elevation or harder ground.

Anecdotal information indicates that in the reach upstream of this possible weir site are a number of deep pools.

The proposed system is similar to that shown schematically in Figure 10 except that the weir is closer to Normanton.

The proposed site at "8 Mile" is located in an area where daily tidal movement is taking place. A weir at this location would not only act as a "dam" to contain fresh water on its upstream side but to also act as a barrier to separate the downstream saline tidal flow and the upstream fresh water as outlined in Section 6 and Figure 11.

In order to access the deeper pool areas contained behind a weir at this site, a pump offtake structure would need to be constructed. The location of the pump offtake will need to be the subject of further investigation to identify a site that enables good access to a deep pool but also minimises distances for electric and control cables. It has been assumed that submersible type pumps would most likely be used.

As identified for the raising Glenore Weir option, consideration will also need to be given to providing an offtake that permits water to be selectively withdrawn from different water levels in the weir pool will need to be considered for this option.

The wide flood plain in this area will make locating the electrical controls and motor starters close to the pumps difficult whilst elevating the controls above flood level. Constructing an elevated platform adjacent to the river for an electrical control building is feasible but not ideal as the building (and its support platform) will be exposed to flood damage and difficult to access during a flood.

The location of the pumps, their controls and power supply (including transformers and backup generators) will need to be investigated further and is considered as an issue for this option.

7.2 8 Mile Weir Water Quality

The water quality in a weir located at "8 Mile" will be similar to that at the proposed "11 Mile" site located further upstream (refer to Section 6.3).

The comments made in the above section on a weir at "11 Mile" are also applicable to this site, except for salinity. This location is closer to the sea and has a larger range of tidal movement and therefore an increased level of salinity can be expected.

As outlined in the section on the "11 Mile" weir site, there could be initial taste and odour problems in the treated water supply as a result of the salinity.

7.3 8 Mile Weir Engineering & Constructability

The construction of a weir at "8 Mile" also presents similar investigation, design and construction issues as those identified for the "11 Mile" location (refer to Section 6.4). This needs to be confirmed by further site investigation and testing. A view of the proposed "8 Mile" weir locality is provided below in Figure 13.

Figure 13 – View of "8 Mile" Weir Site

As noted in the section on the "11 Mile" site, one of the major constraints and impacts is the tidal movement that occurs in this area. As this site is further downstream than "11 Mile", the tidal flow and impact is expected to be marginally larger and therefore is just as much or more of an issue.

On the left bank a series of deep scour holes were noted between the river bank and the point where the land level rises. These scour holes are a good indication that during floods there is a substantial flow of water across these areas at a velocity sufficient to create and maintain the scour holes. The side abutments for a weir would need to be robust to resist this flood loading.

On the left bank a rock shelf is evident in the tidal zone (refer to Figure 13). The orientation of the rock bar at this location is uncertain but it appeared to angle across the river at a steep angle in an upstream direction from the left bank (similar to that at the "11 Mile" location).

Compared to the site at "11 Mile" this site is expected to have the similar engineering and construction issues (limited construction periods, working in a tidal zone, presence of acid sulphate soils (ASS), access issues etc) but an increased level of risk due to a marginally higher tidal range.

The possible project delivery timeline is also expected to be similar to that outlined for the 11 Mile Weir in that capture of water in a new weir pool is unlikely to take place before the 2016/2017 wet season, provided that approvals are received in a timely manner and that no engineering or environmental issues are identified that result in any hold ups or delays.

8 OFFSTREAM STORAGE

8.1 Outline of Offstream Storage Option

Development of an offstream storage for Normanton would ideally take place at a location situated between the existing Glenore Weir and the Normanton WTP to minimise pipeline connections. Identifying potential sites for an offstream storage has not been undertaken at this stage.

Under this option the existing Glenore Weir is retained as the pumping pool from which to fill the offstream storage. Under normal operation, the existing Glenore Weir remains as the primary source of water with the offstream storage supplementing supply during droughts or for operational reasons (poor quality water in Glenore Weir, failure or maintenance of the Glenore Weir Pumps etc). As further development and growth in demand takes place, increasing draw down of the offstream storage occurs.

This option relies on having large pumps in the existing Glenore Weir that would extract water from the weir pool at high flow rate during the 1 to 2 month period each year when high flows take place in the Norman River. Careful pump selection and the use of variable speed motor controllers would permit water to be transferred from Glenore Weir into an offstream storage down to the point where Glenore Weir stops spilling to maximise the potential pumping period.

The construction of an offstream storage can take several forms including placing an embankment across the head of a valley or the construction of raised embankments to form a “turkey nest” type dam.

The location of the storage needs to be such that its embankment crest is located well above major flood levels so that any water in the storage remains isolated as the flood water is likely to have a higher turbidity.

A significant advantage of an offstream storage is that it can be developed in stages to keep pace with development. The initial stage could consist of a storage that is designed to cater for the current demand allowing for failure of a wet season plus a percentage of growth (say 20%). Further stages could be constructed to meet development and the availability of funding.

It is noted that this option will however result in additional operational costs in that the water held in the offstream storage is being pumped twice in order to be delivered to the Water Treatment Plant.

8.2 Offstream Storage Water Quality

The provision of an offstream storage is likely to have some benefits in respect to water quality. High flow rates in the Norman River often result in high levels of turbidity which impact adversely on the water treatment plant.

An offstream storage provides the opportunity to supply the water treatment plant with lower turbidity water during these periods.

Any high turbidity water transferred into the offstream storage can be stored for a period of time to allow suspended material to settle to the base of the storage before the water is used.

In the event of contamination taking place in the Norman River and into the Glenore Weir pool, an offstream storage provides an alternative source of supply whilst the contamination is cleared or treated.

8.3 Offstream Storage Engineering & Constructability

Construction of large offstream storages are regularly undertaken in Australia with a number of recent examples in Queensland including:-

- Bromelton Offstream Storage (Beaudesert) – 8,500 ML
- Coal Seam Gas Water Storages – HDPE lined storages, 100 ML up to +1,000 ML

An example of a large storage utilizing a HDPE liner is highlighted in Figure 14.

Figure 14 – Example of Large HDPE lined Storages

The construction of an offstream storage is considered to have a number of benefits compared to construction or upgrading of a weir, including:-

- Not needing to work in a water course and make provision for flow past the site or the potential for the site to become inundated;
- Not having to make provision for tidal movements and exposing foundations below water level;
- The majority of the construction work is earthworks and suitable for undertaking by local resources;
- Ability to stage construction to meet growth and availability of funding;
- Have minimal environmental impact. There is no impact on the estuarine environment;
- No need to undertake the construction of a fish passage if the existing Glenore Weir only is used; and
- No changes to the regional flooding.

Ideally an offstream storage would be constructed using a clay liner to provide the impervious barrier required. Obtaining the required quantity of suitable clay in this area may be an issue (to be confirmed by site investigation). The alternative is to use a synthetic liner such as High Density Polyethylene (HDPE). The cost of a synthetic liner will be similar that incurred in placing a 300 mm to 400 mm thick clay liner.

To minimise pipeline and pumping costs, a storage location that is in close proximity to the existing supply main between Glenore Weir and Normanton would need to be developed. A preferred site would need to be the subject of further investigation.

The possible timeline for delivery of a small offstream storage is as follows:-

Calendar Year	Tasks / Activities
2014	• Locate site • Site Survey

Calendar Year	Tasks / Activities
	• Geotechnical investigation • Site Acquisition • Environmental Studies • Finalisation of permits and approvals • Detail Design and Documentation • Tendering of works • Award of tender
2015	• Construction • Commissioning

The earliest possible capture of water in a upgrading / repairing the existing Glenore Weir and construction of an offstream storage would be the 2015/2016 wet season, provided that approvals are received in a timely manner and that no engineering, environmental or land acquisition issues are identified that result in any hold ups or delays.

It is noted that if this option is selected for implementation, then Council would have to acquire the site. This may include having to use compulsory acquisition provisions under their statutory powers under law. Costs of acquisition may also include compensation payable to the landowner for loss of income from the acquired area.

9 WATER YIELD ANALYSIS

To assess the performance and benefits of each of the proposed weir options, a yield analysis was undertaken through the development of a water balance model. The model uses daily inflow, usage and evaporation data to estimate changes in the daily volume of water held in the storage. A nominated growth rate is applied to the historical date in an attempt to predict what could be the yield and performance of the different options in the future. This is an indication only as variation to seasonal conditions (climate change), growth rates or demand patterns all impact on the modelling.

9.1 Data & Yield Model Development

In order to develop a yield model, a variety of data is required. For modelling the weirs on the Norman River the following data was compiled.

Topographical

Topographical data is required to provide a digital representation of the river and particularly the proposed weir sites and their corresponding storage volumes. The main source of topographical data was provided in the form of detailed survey. This data contained a combination of:

- Aerial photogrammetry captured at a 10m grid;
- Detailed ground survey at Glenore Weir, and the proposed 11 Mile and 8 Mile weir sites;
- Bathymetry survey upstream of Glenore weir; and
- Cross sectional survey of the Norman River from Glenore to Normanton with sections spaced approximately 100m apart.

Stream Flow Data

Critical to any yield assessment is the data for stream flows. Information and data for the Norman River and Glenore Weir was sourced from the DRNM Water Monitoring Portal. This data included:

- Discharge rating curve;
- Historical stream flow from 1974 to 2013;
- Historical water level from 1974 to 2013. Note that data prior to 1996 does not contain details on the water level below the Glenore Weir crest level (2.25 m AHD).

The inflow data set is converted from water level readings taken at the weir pool. As such, the data set does not include the inflow volumes that occur while the weir is not spilling. This does not pose a problem on the majority of the data as there are large inflows during the wet season. During the period of 1984 to 1989 when consecutive years of no weir overflow taking place, the model may be sensitive to theses missing flows. A graphical plot of the annual volume spilling from Glenore Weir is shown in Figure 15.

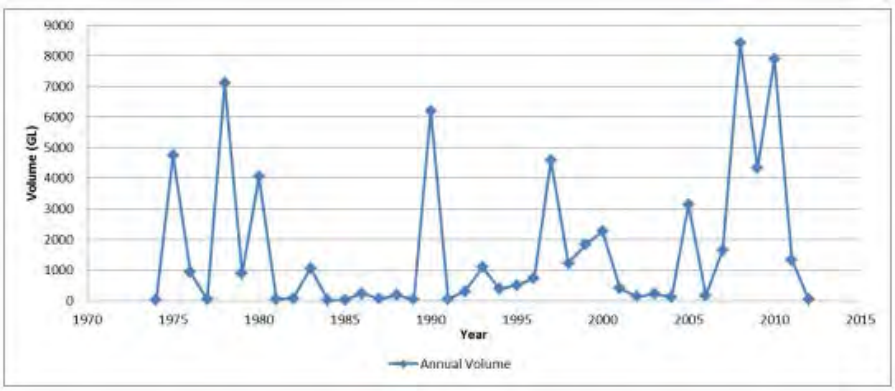


Figure 15 – Annual Spill Volume – Glenore Weir

From the above it is evident that there is considerable flow variation being experienced at Glenore Weir. In the majority of years, the weir fills and water passes over the weir. However in the observed period dating from 1974 there have been at least 2 periods where the weir has either failed to fill or only a low volume has passed over the weir. As noted above, these include a period 1984 to 1989 and again in 2002 to 2004.

Evaporation Data

When modelling the yield from systems that include storages with a large surface area, evaporation is a significant loss that has to be included in the model. All of the weir options on the Norman River will have large surface areas and therefore significant loss of water from the surface of the weir pool, irrespective of the draw off of water for consumption.

Monthly average daily evaporation rates were sourced from the Bureau of Meteorology for the Normanton Post Office Gauge (029041). The evaporation rate values that have been adopted for this study are shown graphically in Figure 16. Evaporation co-efficient to correct the pan evaporation rate to actual evaporation was utilised to calibrate the water balance model.

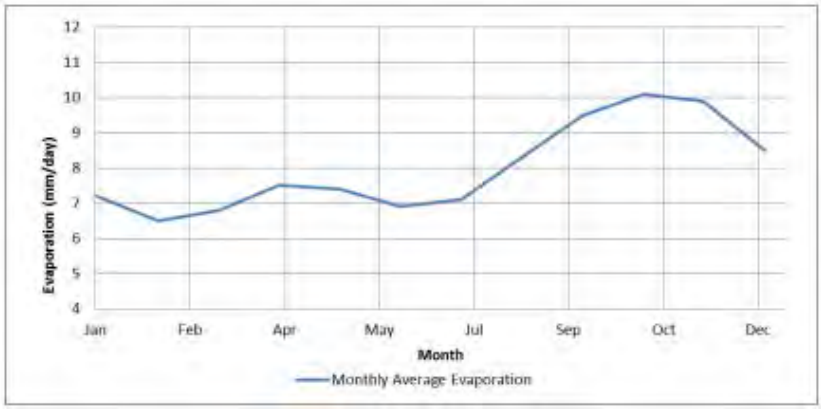


Figure 16 – Monthly Average Evaporation - Normanton Post Office (029041)

As expected for this region, evaporation peaks towards the end of the "dry" season when cloud cover and climatic conditions are ideal for evaporation.

Water Usage Data

Carpentaria Shire Council provided metered usage data for use in this study. The data spanned only a short period from 1996 to 2011 and provided monthly usage rates. The data provided is shown graphically in Figure 17.

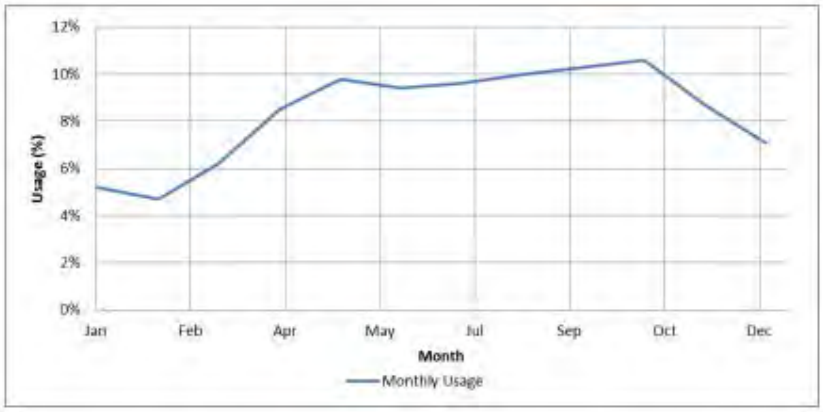


Figure 17 – Monthly Water Consumption

As expected, water consumption in the system rises to a peak in April / May each year and stays relatively constant until nearly October when it declines to nearly 50% of the peak consumption rate. This pattern is largely attributed to the influx of a large number of visitors to the area during the "dry" season.

Estimates of the future usage rates based on projected population increase were also provided for use in this report. The data has been extrapolated in order to try and predict future growth and demand for water. The project water demands are represented in Figure 18. Whether the increase in equivalent population in future years is achieved will depend on a number of factors. Other factors that can impact on water demand include the development of industries such as meat processing and mining which have a high water demand. The development of industry may require bringing forward future stages of water supply development if the demand cannot be catered for within the adopted growth rate.

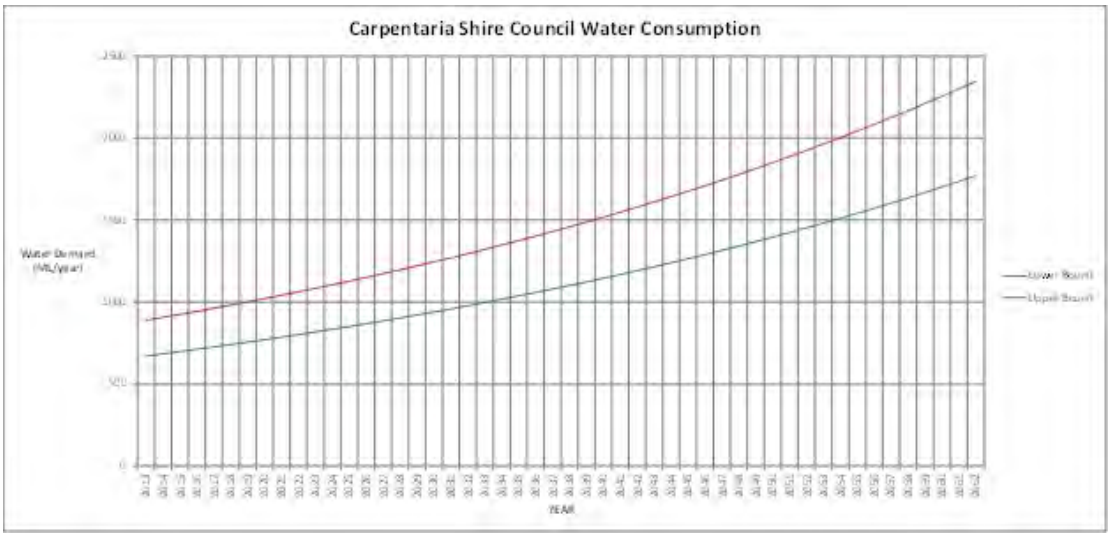


Figure 18 – Proposed Growth in Population and Water Demand

Using the above figure average water consumption for the system is currently in the order of 1,200 to 1,300 Litres per person per day. This consumption rate is considered high but is based on the total system consumption divided by the population and therefore includes all uses and not just domestic consumption.

The above consumption rate equates to approximately 800 ML per annum at the current time (existing population of approximately 1,750 persons).

Storage Option Configurations

- **Usable Storage:** The volume of storage below weir crest level with a minimum pump level of -2.9m AHD. Storage volume was computed ensuring that pools are interconnected to not overestimate the usable storage. 11 Mile and 8 Mile usable storage volume includes the volume stored behind Glenore Weir.
- **Inundated Area:** The surface area of inundation when the weir(s) are at full storage level. This provides an indication of land that may be permanently inundated due to each option. A more robust assessment of the inundation impact will be included in the flood hazard assessment.
- **Peak Evaporation:** Estimated maximum daily evaporation from full storage level. This provides an indication of loses for each water storage option. Note that additional loses due to leakage or seepage have not been included.

Table 2 – Water Storage Configurations

Option	Usable Storage (ML)	Inundated Area (ha)	Peak Evaporation (ML/day)
Existing Glenore Weir	960	57	4
Raise Glenore Weir by 1.2 m	2,200	155	11
11 Mile Weir	3,300	180	13
8 Mile Weir	7,800	360	25

Water Balance Model

A high level daily water balance model was developed in excel to model the inflows, yield and performance of the Norman River water supply options. The model utilises the 38 years of gauged data to compare the relative yield between the options. It should be noted that using the existing data set will assess the risks of water supply failure in response to the 38 year record, but does not capture risks from differing climate patterns (i.e. extended droughts or long term climate trends).

The following assumptions have been made in development of the design models:

- Usage based on the provided usage rates and monthly trend.
- Inflow rates are based on the historical gauged data set from Glenore Weir.
- Weir levels for 8 Mile and 11 Mile are set to a level of +2.25 mAHD due to the tidal nature of the Norman River at these locations.
- A Minimum pumping level of -2.9 mAHD has been adopted for all options.
- Extraction will be from the new weir location (11 Mile or 8 Mile). Transfer from Glenore Weir to the downstream storages is undertaken when the lower reservoir reaches a level of 0.0 mAHD.

Stage-storage relationships were developed for the storage areas based on the provided topographic data. The data was checked to ensure inter-connectedness of pools to the main pump pool so as not to overestimate the available storage. Stage-storage curves and tables used in the study area are included in the Appendices.

Stage-discharge relationships were developed for each of the weir scenarios to compute daily spill from the water storage. Discharge for each weir configuration was assessed and converted into a daily spill volume using a simplified hydraulic model. Stage-discharge curves and tables used in the study are included in the Appendices.

Stage-area relationships were also developed from the provided survey data for use in calculating evaporation from the water surface. Stage-area curves and tables used in the study are included in Appendix A.

A diagrammatic representation of the water balance model over a daily time step for the Glenore Weir water storage is shown in Figure 19. This diagram is also applicable to the option of Raising Glenore Weir. An indication of the data used in each step is provided in parenthesis.

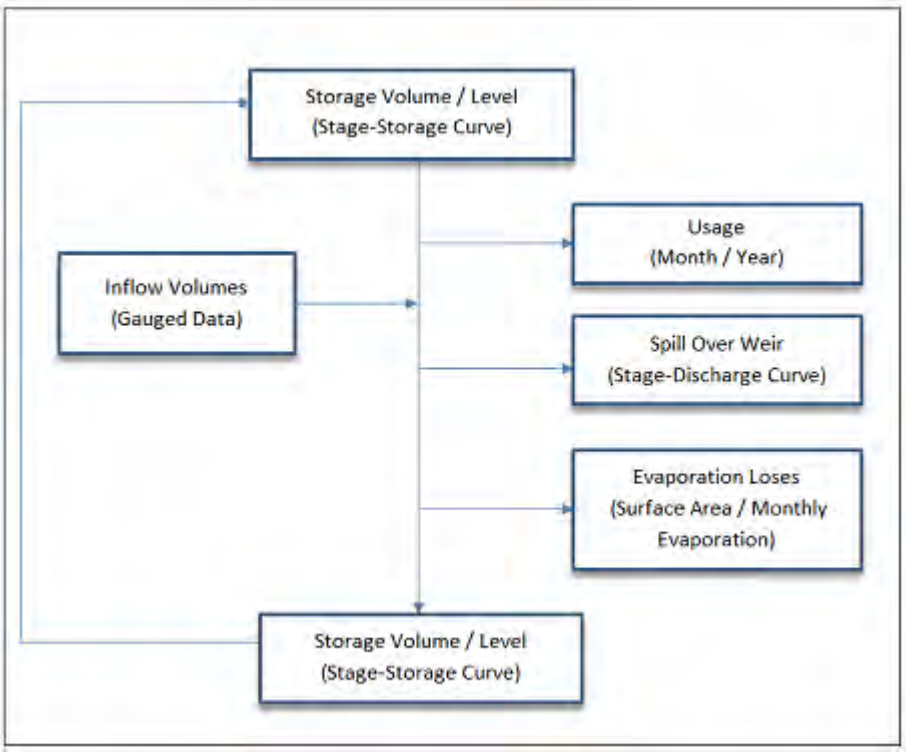


Figure 19 – Water Balance Model Flow Chart – Single Weir

For the options of 8 Mile and 11 Mile Weirs, the model is based on Glenore Weir still being part of the system and its current storage capacity and yield is added to the above weirs. The system will therefore consist of 2 weirs in series. The downstream weir is filled by either a spill over the weir crest at Glenore or by transfer of water from Glenore Weir downstream. A diagrammatic representation of the water balance model over a daily time step for the Glenore Weir water storage plus a downstream weir is shown in Figure 20.

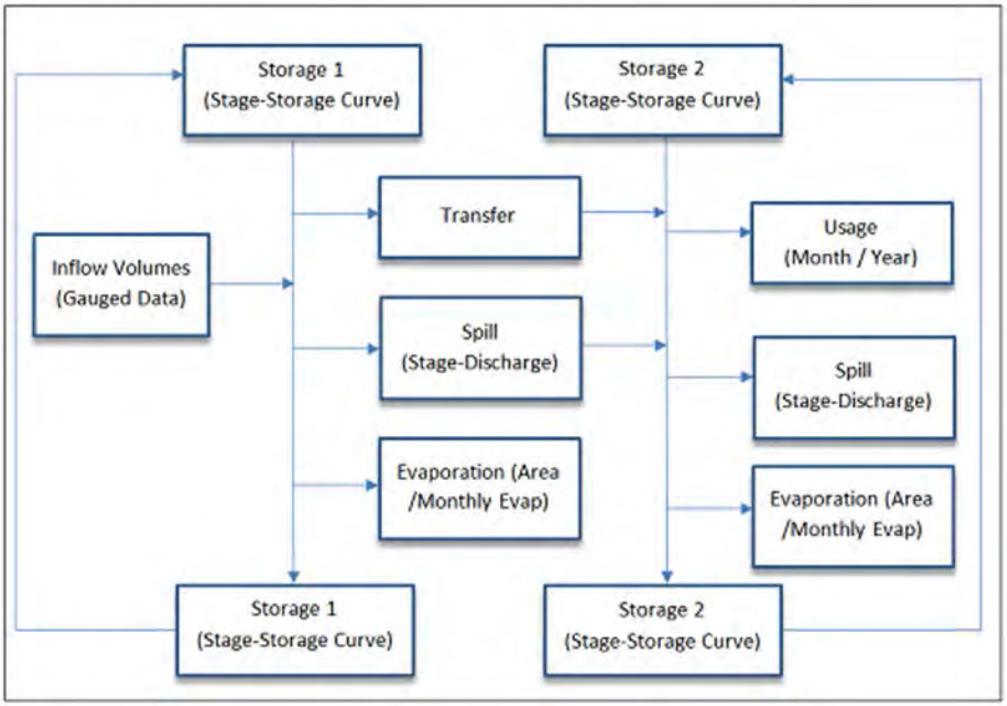


Figure 20 – Water Balance Model Flow Chart – 2 Weirs in Series

Model Calibration

In order to provide a level of confidence that the model is representative of how the Norman River system operates and performs it is necessary to calibrate the model against the past performance of the system. The gauged data at Glenore Weir was used to calibrate the water balance model. The model was calibrated over a 17 year period due to lack of below weir water level data prior to 1996.

Calibration of the model was achieved through the adjustment of the evaporation coefficient. This coefficient was altered until the modelled draw down response accurately mimicked the gauged data. An evaporation coefficient of eventually 0.7 was adopted for this study from this calibration. The calibration outcome is shown graphically in Figure 21.

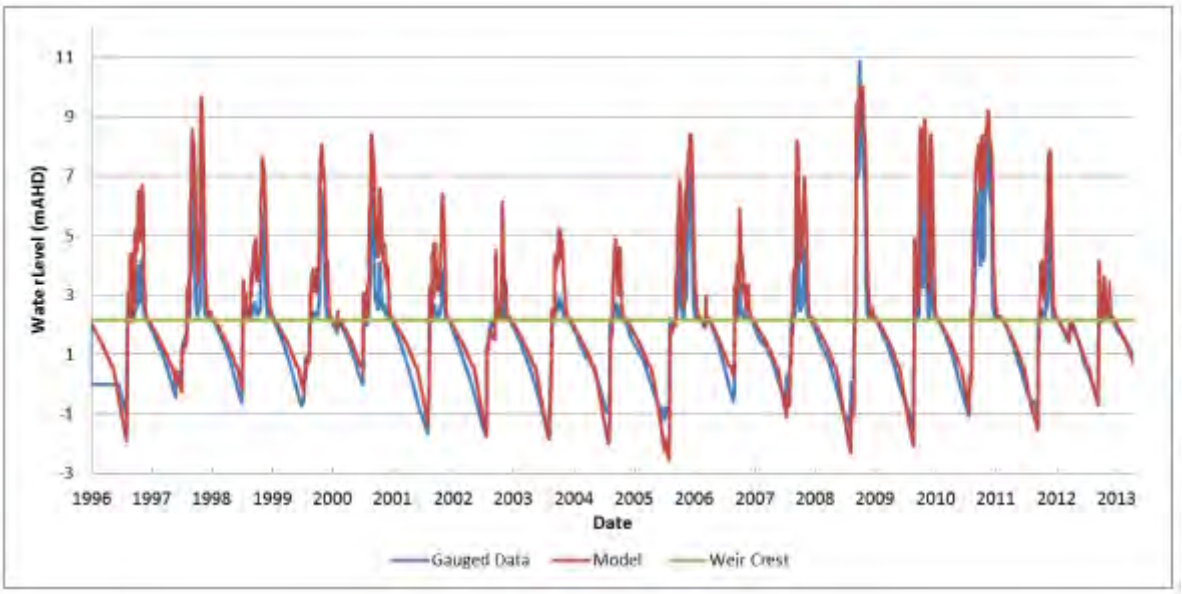


Figure 21 – Glenore Weir Model Calibration

The short distance between the lines for the gauged data and the model are an indication that the model is as good representation of the existing Glenore Weir System. In particular the draw-down of the weir pool has excellent correlation between the model and the actual gauged data.

9.2 Yield Model Outputs

The following section provides the key outputs from the model including Maximum "Safe" Annual Yield and the long term system performance allowing for growth.

Maximum "Safe" Yield

The maximum safe yield is the volume of water that can be extracted from the nominated source with a high degree of certainty, taking into account the previous recorded flow data for the Norman River. This is the yield that can be provided during the previous worst drought conditions and is an indication of the "worst case scenario".

This assessment of maximum "safe" yield has been determined by applying a constant annual usage (i.e. not following the projected demand increase) for the whole simulation. The maximum annual Yield is taken just before a failure is experienced (storage level below -2.9mAHD) during the simulation over the existing 38 year stream flow data set.

Table 3 – Estimated Maximum Annual "Safe" Yield

Option	Max. Annual "Safe" Yield (ML/year)
Existing Glenore	310
Raise Glenore by 1.2m	1,250
11 Mile Weir	1,650
8 Mile Weir	3,200

It should be noted that the estimates of maximum safe yield are based on the existing recorded stream flow data which may not capture the full variability of the local climate. A more severe dry period than that experienced between 1984 and 1989 would reduce the maximum annual safe yield estimates.

It is evident that from the above table a repeat of the conditions experienced between 1984 and 1989 would have serious consequences for Normanton (and Karumba) and would require a severe level of water restrictions to be implemented and maintained and or alternative water supply arrangements implemented.

Long Term System Performance

To provide guidance on the capability of the options to meet ongoing growth the long term performance of each option was examined.

The design models were simulated for the 38 year data set representing demand increase up to the year 2052. The following measures were used to assess the performance of each storage option that includes modelled droughts up to the year 2052.

- **Minimum Volume**: The minimum volume reached in the water storage during the 38 year simulation period. This provides an indication of security of supply.
- **Days Failed:** The number of days the water supply is below the minimum -2.9 mAHD pumping level

Table 4 – Long Term Performance of Options

Option	Storage at FSL (ML)	Min Storage (ML)	Max Draw Down %	Days Failed
Existing Glenore Weir	960	0	100%	1,790
Raise Glenore Weir by 1.2 m	2,200	130	94%	0
11 Mile Weir	3,300	690	79%	0
8 Mile Weir	7,800	4190	46%	0

From the above table, the existing Glenore Weir is expected to be unable to maintain supply for a large number of days over the next 38 years, with water levels in the weir pool falling below the nominated minimum for nearly 1,790 days out of 13,870 days (38 years) or approximately 13% of time. This assumes the adopted growth rate taking place.

The above table also indicates that all of the proposed weir upgrade options will be capable of meeting adopted growth demands and maintaining supply for the next 38 years before further augmentation is required including the option of raising Glenore Weir. From the above table it is apparent that raising Glenore Weir by 1.2 metres will provide the security of supply required for the foreseeable future. Construction of new weirs at either 11 Mile or 8 Mile provide a higher degree of security but requires funding the construction of new works at a higher capital cost that for many years to come will be substantially underutilised.

The annual variation of water level in the weir pools for each option is shown graphically in Figure 22.

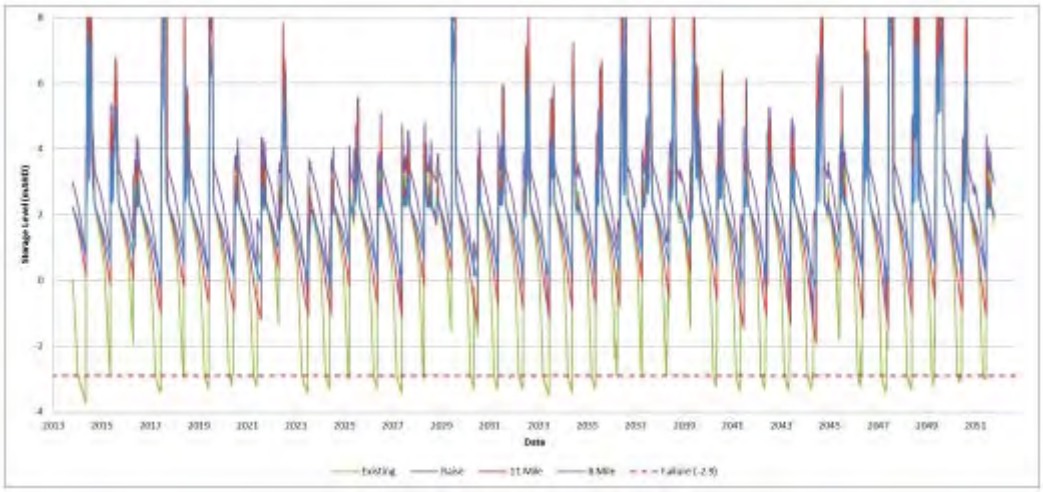


Figure 22 – Model Simulation of Storage Levels

10 FLOOD IMPACTS

A 2D hydrodynamic model using the TUFLOW software model was developed for the assessment of flooding and potential impacts along the Norman River associated with the upgrade of the Glenore Weir and the installation of downstream weirs. Outlined below are scenarios that were investigated as part of this project:

TUFLOW is a suite of numerical engines primarily used in hydraulic studies involving waterways, floodplains, estuaries and coastlines. It is suited to the investigation of flood behaviour in complex flow scenarios where there is interaction between flow paths that occur in flat floodplain areas.

The 2D model extents were chosen based on contributing hydrological catchments and topography and was extended far enough to enable a smooth transition from the model edges and capture road crossings potentially impacted by flooding. They have been taken as far upstream and downstream as practical to ensure any flood impacts are shown.

The modelling undertaken for this report is preliminary only and is based on proposed weir crest levels. Further detailed modelling will be required if a weir raising option is adopted that takes into account any revised weir crest levels and fishway operating requirements.

10.1 Flood Inundation Maps

The flood impacts associated with the existing Glenore Weir and the Norman River and other streams in the area are well understood through local knowledge and experience. Normanton and Karumba are often isolated during the wet season as the roads become impassable and flooding of river crossings and other low lying areas occur.

This study has included undertaking preliminary flood modelling to determine the impact on the area around the proposed weirs from flooding as a result of construction of either a Raised Glenore Weir, 11 Mile Weir or an 8 Mile Weir.

Due to the relatively flat topography around the Norman River and Normanton, there is a concern that further development of weirs on the Norman River may exacerbate flood levels. Flood return periods for 2 years, 5 years, 10 years, 20 years and 100 years have been modelled and compared with the current situation (existing Glenore Weir).

Flood inundation maps for the above flood return periods are included in Appendix B.

The scenarios adopted in the modelling include:-

- Scenario 1 The existing Glenore Weir - Crest Level RL 2.26m
- Scenario 2 Raised Glenore Weir – Crest Level RL 3.46m
- Scenario 3 11 Mile Weir – Crest Level RL 2.26m
- Scenario 4 8 Mile Weir – Crest Level RL 2.26m

Each flood inundation map contains a table detailing the modelled flood level at a number of locations along the Norman River for that particular flood return period (ie 2 year Return Period).

An example of a flood inundation map is shown below (refer to Figure 23).

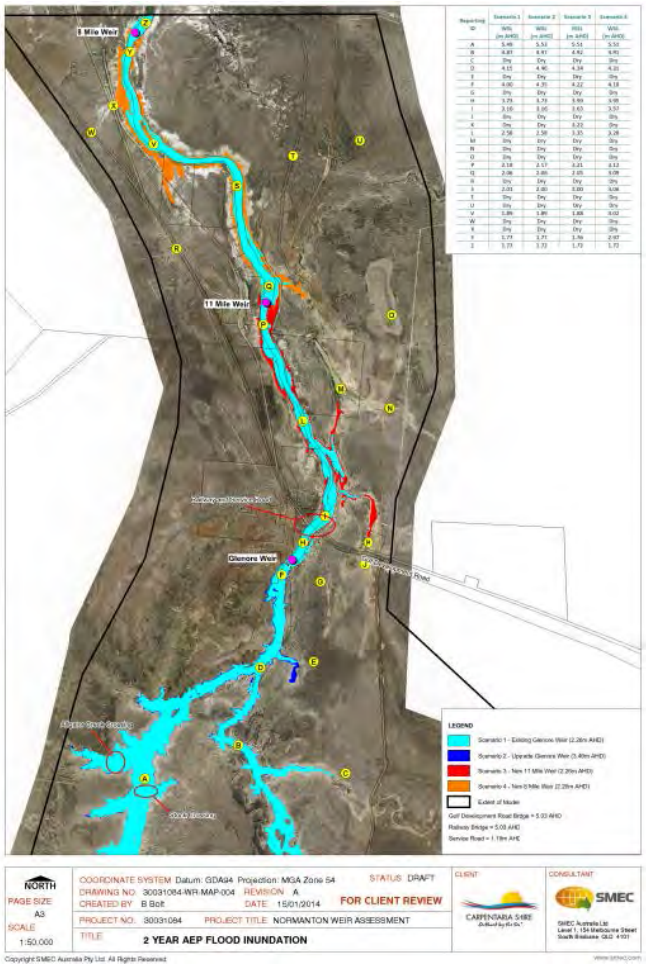


Figure 23 – Example of a Flood Inundation Map For the Norman River

The **light blue** colour represents the flooding that can be expected in and around the Norman River with only the existing Glenore Weir in place. The **dark blue**, **red** and **orange** colours indicate the additional flood inundation areas that can be expected if the proposed weir options of a raised Glenore Weir, 11 Mile and 8 Mile respectively are developed.

The area modelled was limited to that within the black lines shown on the flood inundation maps. This area contains the majority of the area inundated in all but the less frequent floods.

The flood maps include the approximate location of several “crossings” upstream of Glenore Weir. The modelling indicates that these crossings will be inundated frequently, even without raising the existing Glenore Weir.

The flood modelling indicates that for a flood approaching a 5 year return event that inundation of the Gulf Development Road and Rail bridges across the Norman River will not occur. A higher level flood approaching a 10 year return event results in inundation of the Gulf Development Road between Normanton and the Norman River.

As expected for the more extreme (less frequent) floods the flood modelling is indicating widespread flooding.

10.2 Flood Afflux Maps

In addition to the flood inundation maps, the modelling has also produced Flood Afflux Maps for each of the flood return periods.

The Afflux Maps provide an indication of the difference in flood level that will result as a consequence of development of one of the weir options when compared to the levels expected with the existing Glenore Weir.

The afflux mapping indicates that for the majority of the floods and weir options, a marginal increase in flood levels for the same flood return period in the order of up to 0.2m (200 mm) can be expected in the areas upstream of the weir sites. This increased flood level (when compared to the existing) was expected as each of the new weir options creates a barrier that has created a raised pool of water.

The increase in the level of flooding expected diminishes as the flood flow increases. For example at the 11 Mile site (Scenario 3) for a 5 year return period flood, the afflux is expected to be greater than 200 mm (ie the flood level is more than 200 mm higher than likely to be incurred for a flood with only just the existing Glenore Weir in place). For the same location under a 100 year return period flood, the afflux expected is closer to 100 mm only.

For the more frequent flood events (2 year and 5 year return periods), the modelling is indicating a small drop in flood levels immediately downstream of the proposed weir options.

10.3 Flood Modelling Summary

The flood modelling undertaken as part of this investigation has identified that either raising the existing Glenore Weir or construction of new weirs at either 11 Mile or 8 Mile will increase the level of flooding experienced in this area. Flood levels can be expected to increase by up to 200 mm depending on the scenario adopted and the magnitude of the flood being experienced.

Whilst the increase in flood levels is not significant it can still have a large impact on the area as the topography is relatively flat. Small increases in flood levels can inundate large additional areas.

In respect to the access to the water supply assets, all of the proposed weir sites will continue to experience issues as the order of magnitude of the flood increases. This includes loss of access along the Gulf Development Road from Normanton.

At the 11 Mile and 8 Mile sites, frequent flooding and inundation of the flood plain on the left abutment can be expected. The left abutment is the one that is easily accessed off the Gulf Development Road and is the abutment / river bank on which development of the offtake pumps and associated controls will most likely take place. In order to ensure that the pump controls and motor starters are located well above flood level it is likely that they will need to be located some distance from the river and the pumps.

The flood modelling also highlights that for floods with an increased level of inundation (less frequent floods) the inundation of old flow channels on the flood plains either side of the river. This has implications for the proposed raised Glenore Weir or new weirs at either 11 Mile or 8 Mile locations. These areas are all potential locations for the development of a bypass channel around the proposed weirs. It is likely that they will require an engineering treatment if any of the raised weir options are adopted.

The afflux modelling provides an indication that flood inundation levels will be marginally higher and therefore some areas may incur some increase in the frequency of inundation, particularly those areas already inundated on a frequent basis.

11 FISH MOVEMENT

The following section examines the issue of fish passage on the Norman River and is applicable to either the raising of the existing Glenore Weir or the construction of new weirs at "11 Mile" and "8 Mile".

11.1 Fish Species

The Australian Centre for Tropical Freshwater Research at James Cook University (Burrow and Perna 2006) surveyed the Norman River for fish in October 2006 and reviewed existing records. They concluded there were 56 freshwater fish species in the catchment and recorded 26 in the one-off survey in the Norman River (Table 5).

Three species are of particular interest: freshwater sawfish, freshwater whipray (a stingray), and a new species of eel-tailed catfish.

Freshwater sawfish (Pristis microdon) is federally and globally (IUCN) threatened and is listed as 'Vulnerable to Extinction' under the Australian Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). It is well known in the nearby Leichhardt and Gilbert rivers, and is reported in the Norman River (Last & Stevens 1994, Burrows & Perna 2006). There have been records of catches of freshwater sawfish in the freshwater reaches of the Norman River upstream (Peverell 2005, Peverell 2009 and Thorburn et al 2003). There are also museum specimens from the nearby Flinders and Bynoe rivers (Philips et al. 2009), although no recent reports from these systems.

Freshwater sawfish spawn near the mouths of estuaries and juveniles swim upstream into the estuarine and freshwater reaches. Juvenile sawfish may occur up to 500km upstream from the river mouth (Allen et al. (2002).

The freshwater whipray is uncommon but is not presently a threatened species. However, the closely related freshwater whipray in the Mekong River is endangered.

The new species of eel-tailed catfish has not been described taxonomically and is very uncommon; hence, the relatively recent finding by scientists. The conservation status of this species is unknown but it is found upstream of Glenore Weir and at this stage appears to be a wholly freshwater species.

Table 5 – Species list and catch data from 12 sites in the Norman River in October 20064

No.	Family	Species	Common Name	2006 survey	2006 landholder reports	Other references, museum records
1	Ambassidae	*Ambassis macleayi*	Macleay's glassfish	*		*
2		*Ambassis elongatus*	Elongate perch			*
3		*Ambassis nalua*	Scalloped glassfish			*
4		*Ambassis* sp. (Northwest glassfish)	Northwest glassfish			*
5		*Ambassis* sp.	Glassfish			*
6		*Parambassis gulliveri*	Giant glassfish	*		*

[4] From Burrow and Perna (2006). Threatened species are shaded orange and uncommon species are shaded green.

No.	Family	Species	Common Name	2006 survey	2006 landholder reports	Other references, museum records
7	Apogonidae	*Glossamia aprion*	Mouth almighty	*		*
8	Ariidae	*Ariopsis berneyi*	Berney's catfish	*		
9		*Ariopsis graeffei*	Lesser salmon catfish	*		*
10		*Ariopsis paucus*	Carpentaria catfish	*		
11		*Ariopsis leptaspis*	Triangular shield catfish		*	*
12		*Ariopsis* sp.	Fork-tailed catfish			*
13	Atherinidae	*Craterocephalus stercusmuscarum*	Fly-specked hardyhead	*		*
14		*Craterocephalus* sp.	unidentified hardyhead			*
15	Belonidae	*Strongylura krefftii*	Longtom	*		*
16	Carcharhinidae	*Carcharhinus leucas*	Bull shark		*	
17	Centropomidae	*Lates calcarifer*	Barramundi	*		*
18	Chanidae	*Chanos chanos*	Milkfish			*
19	Clupeidae	*Clupeoides cf papuensis*	Papuan sprat	*		
20		*Nematalosa erebi*	Bony bream	*		*
21		*Nematalosa come*	Bony bream			*
22	Dasyatidae	*Himantura chaophrya*	Freshwater stingray		*	
23	Eleotridae	*Hypseleotris compressa*	Empire gudgeon			*
24		*Oxyeleotris lineolatus*	Sleepy cod	*		*
25		*Oxyeleotris selheimi*	Giant gudgeon	*		*
26	Engraulidae	*Thryssa scratchleyi*	Freshwater anchovy	*		
27	Gobiidae	*Chlamydogobius ranunculus*	Tadpole goby			*
28		*Glossogobius aureus*	Golden goby			*
29		*Glossogobius giuris*	Flathead goby	*		
30		*Glossogobius* sp. 2 *(munroi)*	Munro's goby	*		
31		*Glossogobius sp.*	unidentified goby			*
32	Kurtidae	*Kurtus gulliveri*	Nursery fish		*	
33	Megalopidae	*Megalops cyprinoides*	Tarpon	*		*
34	Melanotaeniidae	*Melanotaenia splendida inornata*	Chequered rainbowfish	*		*

No.	Family	Species	Common Name	2006 survey	2006 landholder reports	Other references, museum records
35		*Melanotaenia* sp.	unidentified rainbowfish			*
36	Mugilidae	*Liza alata*	Diamond mullet			*
37		*Liza* sp.	Mullet			*
38		*Liza subviridis*	Greenback mullet			*
39	Plotosidae	*Anodontoglanis dahli*	Toothless catfish	*		*
40		*Neosilurus hyrtlii*	Hyrtl's tandan	*		*
41		*Neosilurus* sp. nov.	undescribed catfish	*		
42		*Neosilurus* sp.	unidentified catfish			*
43		*Porochilus rendahli*	Rendahl's tandan	*		*
44	Pristidae	*Pristis microdon*	Freshwater sawfish		*	
45	Scatophagidae	*Scatophagus argus*	Spotted scat		*	
46		*Selenotoca multifasciata*	Banded scat		*	
47	Scorpaenidae	*Notesthes robusta*	Bullrout			*
48	Soleidae	*Brachirus salinarum*	Saltpan sole		*	
49		*Brachirus selheimi*	Freshwater sole		*	*
50	Synbranchidae	*Ophisternon gutturale*	One-gilled eel			*
51	Terapontidae	*Amniataba percoides*	Barred grunter	*		*
52		*Hephaestus fuliginosus*	Sooty grunter		*	*
53		*Leiopotherapon unicolor*	Spangled perch	*		*
54		*Pingalla gilberti***	Gilbert's grunter			
55		*Scortum ogilbyi*	Gulf grunter	*		*
56	Toxotidae	*Toxotes chatareus****	Seven-spot archer fish	*		*

11.2 Fish Ecology and Weirs

Migration between marine/estuarine and freshwater habitats is a characteristic feature of freshwater fish in tropical lowland rivers. These species are migrating to spawn, feed and seek refuge habitat.

In the wet season of the tropics, most low-level weirs in the lowlands spend significant periods underwater and fish pass freely over them. As the high flows recede between flood events and at the end of the wet season, the dominant migration is upstream into freshwater and refuge habitats

for the dry season. It is mainly during this recession that low-level weirs can impact on fish migration.

The extent that low-level weirs are an impact on migrating fish depends on the "drown-out" characteristics of the weir, namely duration, timing and frequency of occurrence. If the weir drowns out at a low flow it will have less impact on migrating fish.

Fish species and life stages (adult, sub-adults, and juveniles) move upstream at different times. Fish that migrate early in the recession of flow, in the later part of the wet season, can pass over a low-level weir and those species or life stages that migrate late in the recession, as the dry season approaches, are blocked by a low-level weir.

Fish that migrate late in the wet season are often small-bodied fish species and juveniles of larger species. Juveniles of freshwater sawfish are in the latter group, moving into freshwater as late as May and June (Whitty *et al*. 2008), which suggests that this species is likely to be impacted by low-level weirs.

Juvenile barramundi migrate upstream towards the end of the wet season and have been reported passing over Glenore Weir at high flows (Cr Fred Pascoe, Mayor, Carpentaria Shire Council, pers. comm.). Juvenile barramundi are also known to move upstream in low flows (Stuart and Mallen-Cooper 1999) and the proportion of fish that pass Glenore Weir partly depends on the duration and intensity of wet season flows. The regular stocking of barramundi into Glenore Weir (Burrow and Perna 2006) suggests that the abundance of this species upstream of the weir is sometimes poor and it is possible that, despite regular drownout of the weir, the successful migration and recruitment of juvenile barramundi into freshwater has been affected by the weir.

11.3 Queensland Legislation Relating to Fish Passage and Habitats

At water infrastructure such as weirs and dams, providing for upstream and downstream migration minimises the impact on fish populations and their abundance. In the case of existing weirs, the provision of fish passage can rehabilitate depleted populations and provide robustness against future climate change.

In recent years there have been seven projects to re-establish fish passage at existing waterway barriers in the Southern Gulf region by Natural Resource Management (NRM) groups (Figure 24). These fishways include rock-ramp fishways, cone fishways (Figure 25) and culvert fishway with side baffles (Figure 27). Other options with potential at low-level weirs include trapezoidal weir fishways (Figure 26) and vertical-slot fishways (Figure 28). Each of these designs applies to specific hydrology, fish species and site conditions.

To maintain fish populations in rivers, providing for fish passage at waterway barriers is part of Queensland legislation as well as an accepted part of the water industry in Australia and developed countries with freshwater fish. Most water authorities now view their corporate responsibility as including the biota within any managed water. The State Assessment and Referral Agency (SARA) commenced on 1 July 2013. SARA provides a coordinated, whole of government approach to state development assessment for applications lodged under the *Sustainable Planning Act 2009* (SPA).

Figure 24 – Map of recent fishways built in the southern gulf region.

Figure 25 – Example of a cone Fishway on Flinders River

Figure 27 – Example of a Culvert Fishway with side baffles.

Figure 26 – Example of a Trapezoidal Weir Fishway.

Figure 28 – Example of a Vertical-Slot Fishway

There are two key areas of the Queensland legislation to consider:

- The requirement for fish passage at new or modified instream structures.

The SPA requires structures that may constitute a waterway barrier are to be evaluated under a development assessment process. The following link from the Qld. Dept. of State Development, Infrastructure and Planning provides a checklist of requirements to for consideration in regards to a Waterway Barrier Works proposal: www.dlg.qld.gov.au/resources/template/sdap/module-5-2.doc There is a high likelihood that any instream works relating to a new or raised weir on the Norman River will trigger requirements for the provision of fish passage.

- The impacts on habitats and connectivity and the consideration of offsets for lost habitats.

The Qld. Dept. of Environment and Heritage Protection has developed the Queensland Biodiversity Offset Policy to increase the long-term viability of the state's biodiversity where residual impacts from development on an area possessing state-significant biodiversity values cannot be avoided or minimised. Under the Biodiversity Offset Policy, there will be certain development activities that might trigger the requirement for a biodiversity offset. These include:

- developments managed under the Sustainable Planning Act 2009,
- development in the coastal zone under the Coastal Protection and Management Act 1995,
- environmentally relevant activities with an aggregate environmental score assessed under the Environmental Protection Act 1994,

- development under section 4 of the State Planning Policy 2/11 (SPP 2/11) Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments, involving operational work that is high-impact earthworks in a wetland protection area.

There is a possibility that any instream works relating to a new or raised weir on the Norman River will trigger requirements for biodiversity offsets.

11.4 Federal Legislation

The main Federal Legislation to consider for the Normanton project is the EPBC Act with regard to freshwater sawfish (Pristis microdon). Referral may be needed under the EPBC Act, to the Environment Minister, on the basis that the proposal has potential significant impacts on the threatened species, including in terms of the availability of habitat. Should the project then be deemed a 'Controlled Action', this would also potentially trigger offset requirements.

The EPBC Act provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether a proposed action will need formal assessment and approval under the EPBC Act. A referral of proposed action form is available from http://www.environment.gov.au/epbc/assessments/referral-form.html

11.5 Environmental Considerations in Option Selection

The different water supply options have different impacts on fish and aquatic habitats. Two key areas to consider are the effect of changing drown-out of the weir and the effect on estuarine habitat.

Drown-out

At present fish migrate over the weir when it is underwater or "drowned out" at high flows. Raising the existing Glenore Weir would increase the flow required for drownout and increase the weir as a barrier to migrating fish.

Estuarine Habitat

The habitat downstream of the weir is estuarine with a gradient of freshwater and saltwater, which is valuable for many fish species. There are two components to this habitat: the estuarine/freshwater gradient and the structural complexity of the habitat. An example of structural habitat complexity in the Norman River between Glenore Weir and the '8 mile' weir site that is valuable fish habitat is shown in Figure 29.

Figure 29 – Example of Structural Habitat Complexity

The estuarine/freshwater gradient changes with the seasons. At the end of the wet season the Norman River would be fresh to the coast. As the dry season progresses, with less freshwater flow, the estuarine/freshwater interface would move upriver and oscillate with the tides.

All the water supply options that extract more freshwater will impact and reduce the extent of the estuarine interface at the end of the dry season. The extent that this occurs can probably be modelled. The weir options that are downstream of Glenore Weir would have the two impacts of removing structural complexity from the estuarine habitat and of reducing the extent of the estuarine interface at the end of the dry season. These impacts can be addressed through the habitat offset provision where other works, programs or research are funded as an offset to lost habitat.

Other Barriers

Downstream of Glenore Weir there is a low-level road crossing between the Gulf Development Road and the railway bridge. This may also be a barrier to fish passage at low flows and needs further investigation.

11.6 Fish Passage Considerations

From the on-site and office meetings in Normanton and discussions since, a few themes have arisen on fish passage:

- Off-stream storage and desalinisation, without weir raising, would have the least impact on fish.
- The estuarine habitat will need to be considered in evaluating the water supply options.

- A lower drown-out flow of a structure is preferred to a higher fishway, as drown-out can provide excellent fish passage.
- Any fishway design would need to be simple. It would need to be self–operating and require minimal maintenance. Having a gate on the fishway is to be avoided; one option to achieve this is to increase the height of the weir by a small amount (e.g. 0.4 m) and have that weir pool volume dedicated to continuation of fishway operation following the flow peak.
- Fish passage at near drown-out flows can be improved by simple abutment design, which reduces the operational range, complexity and cost of the fishway.
- During the dry season the fishway should operate when there are inflows, especially toward the end of the dry. This criterion has a direct influence on the headwater range of the fishway, which in turn influences the type and application of the fishway design. Modelling of headwater fluctuations during the dry season, when the water level is below the crest, will be required before a full assessment of the impact of the weir and fishway options can be made.

These are not comprehensive but are suggested here to guide initial thoughts on the options.

11.7 Opportunities

The freshwater sawfish is listed as Critically Endangered (IUCN) worldwide, which is one category below "Extinct in the Wild" (http://www.iucnredlist.org/details/18174/0) and listed as 'Vulnerable to Extinction" in Australia. Since juveniles migrate into freshwater it is likely the present weir has impacted this species; the nearby rivers that are noted for sawfish populations do not have weirs in the tidal or lowland reaches. This presents an opportunity to rehabilitate this species, as well as other species impacted by the weir, in the Norman River by restoring fish passage.

Independent of the water supply project, the site should be a high priority for Federal support, as restoring migratory pathways is an acknowledged recovery action for this species.

Further investigation of cultural values of sawfish and other species upstream of the weir should be investigated. Providing fish passage would restore the abundance of a range of fish species and hence, has the potential to restore cultural values.

11.8 Fish Passage Conclusions

Fish passage would be required under the Queensland Fisheries legislation for any of the weir construction or weir raising options. We consider that there is likely to be a relatively simple fishway design that is applicable but further modelling of the headwater fluctuations is required.

The major opportunity of the project is the likely presence of freshwater sawfish, which could attract federal support for the project.

12 FINANCIAL ESTIMATES

The estimates have included provision of known and expected works only. It is likely that detailed investigation and design will identify additional items not included or itemised in these estimates. The estimates should be considered as having an accuracy of no greater than +40%.

In order to enable direct comparison of options, the estimates include all works required to harvest, store and deliver water to the existing Normanton Water Treatment Plant. Therefore they include the provision of new or upgraded pipelines as well as the construction of weirs or storages.

The cost estimates are provided only to give council an indication of the magnitude of the funding required for each option and should not be used for financial purposes other than the development of long term capital planning.

It is noted that Council has previously been supplied with indicative cost estimates. This report has reviewed these estimates and minor amendments have been made accordingly.

Details of the concept cost estimates are included in Appendix D.

For comparison purposes, the following options have been costed.

Table 6 – Summary of Option Costs

Normanton Water Supply Upgrade Options						
Concept Cost Summary						
Scenario	**Option Description**	**Total System Storage - ML**	**Concept Cost Estimate**		**Total Development Cost (2014)**	**NPV (50 Year Costs)**
			Stage 1	**Stage 2**		
ESTIMATED COSTS TO MEET PLANNED DEVELOPMENT						
1	Upgrade (Repair) Existing Glenore Weir	960	Upgrade Existing Weir, Replace pump offtake	Construct New Pipeline to Normanton to meet future demand		
			$3,700,000	**$16,400,000**	**$20,100,000**	**$17,700,000**
2	Raise Glenore Weir	2,200	Raise Glenore Weir by 1.2m	Construct New Pipeline to Normanton to meet future demand		
			$10,500,000	**$16,400,000**	**$26,900,000**	**$24,500,000**
3	11 Mile Weir	3,300	Construct New Weir at 11 Mile	Construct New Pipeline to connect to Normanton		
			$33,200,000	**$12,400,000**	**$45,600,000**	**$44,800,000**
4	8 Mile Weir	7,800	Construct New Weir at 8 Mile	Construct New Pipeline to connect to Normanton		
			$39,300,000	**$9,900,000**	**$49,200,000**	**$49,700,000**
	Large Offstream Storage - 5500 ML	Glenore Weir + OS Storage = 6,460	Construct Storage	Construct New Pipeline to Normanton		
			$57,500,000	**$14,000,000**	**$71,500,000**	**$70,100,000**
	Desalination Plant / Upgrade Glenore Weir	Glenore Weir = 960	Desalination and Upgrade Weir	Construct New Pipeline to Normanton to meet future demand		
			$11,100,000	**$16,400,000**	**$27,500,000**	**$117,100,000**
STAGED DEVELOPMENT - STAGE 1						
	Small Offstream Storage - 800 ML	Glenore Weir + OS Storage = 1,760	Construct Storage	Construct New Pipeline to Normanton		
			$18,000,000	**$14,000,000**	**$32,000,000**	**$30,600,000**

Where possible the works of the options have been divided into 2 stages to reduce the impact of capital expenditure. The second stage work examples include the construction of a new supply pipeline between the upgraded works and the Normanton WTP. The existing delivery main from

Glenore Weir is experiencing increasing frequency of main breaks and repairs and has a limited capacity to meet increasing demand. This main may be kept in service for some time but it will reach a point where it either can no longer meet demand or the cost of repair becomes excessive, at which time construction of a replacement will be required.

Except for the option of Raising Glenore Weir, all other options include the cost of upgrading (repairing) the existing Glenore Weir ($3.7M).

From the above table the lowest capital cost option that is acceptable (provides an increased storage and yield compared to the existing Glenore Weir) is the raising of the existing weir by 1.2 metres. The total project cost (concept) including provision of a new delivery pipeline connecting to Normanton is in the order of $26.9M. The next lowest capital cost option is the development of a small offstream storage (800 ML) at a cost in the order of $32M.

The capital cost of new weirs at either 11 Mile or 8 Mile are considerably higher than either of the above options.

13 SUMMARY AND ANALYSIS

This investigation has examined a number of options to address the shortage of water in Normanton and Karumba and to provide a more secure water supply that includes provision for further growth and development.

This report has confirmed that the "safe" yield from the existing Glenore Weir is unable to meet demands during drought or dry conditions, particularly if the annual wet season fails and the weir fails to fill annually. The other infrastructure associated with the existing Glenore Weir including the pump offtake structure and the delivery mains to Normanton are known to be in poor condition and in need of upgrading or replacement.

Raising the existing Glenore Weir will provide sufficient yield to meet increasing demands for nearly the next 30 years (subject to upper and lower bound demands), but will require providing a fish passage on the raised weir. Sunwater have previously examined this option and concluded that the site is suitable for raising the height of the weir crest by approximately 1.2 metres.

Potential new weir development sites have been identified at locations known as 11 Mile and 8 Mile, located downstream from the existing Glenore Weir. These options provided significant increases in storage volume, the largest yield and the ability to meet demands well beyond the examined planning horizon.

Both of the proposed weir sites are located in tidal zones in the Norman River. Whilst there is an indication of rock being present at these sites on which to construct a weir, the suitability and extent of this rock has yet to be proven. A geotechnical investigation program is required before either of the proposed sites can be considered as being viable.

Both of the proposed weir sites also present issues in respect to construction (working in a tidal zone), potential water quality issues due to salinity leaching from the soil and their environmental impact including the need to provide a fish passage at the weir.

The development of offstream storages will also meet the modelled increase in demand and provide a similar level of total storage to that created by the possible weirs. The offstream storage options use the existing weir (noting that it needs to be upgraded / repaired) as part of the storage volume as well as a pool from which water is extracted to fill the offstream storage. These offstream storage options have the lowest environmental impact and will not trigger the need to provide fish passage on Glenore Weir. This option can be developed in stages with the initial construction of a smaller storage and later stages being developed in response to growth or development taking place.

Provision of a desalination plant at Karumba has also been costed for this report in order to ensure all options are canvased. Desalination has some advantages in terms of being able to operate when required to meet peak demands or a shortage of water from Glenore Weir, its speed of delivery and access to an unlimited volume of water. However desalination is costly to operate and maintain and relies on a high level of technology.

Desalination can also be developed in stages if a modular approach is adopted. Future modules are added to increase the capacity of the desalination in response to increased demand or growth. The base infrastructure including pipework, controls, tanks, chemical dosing etc is provided in the initial stage with future upgrades requiring additional pumps and filter modules only. This option also provides an increased security of supply in that it does not rely on annual seasonal weather conditions to replenish weir pools or provide sufficient flow to fill an offstream storage.

Whilst a number of options have been examined ranging from raising the existing Glenore Weir through to new weirs and offstream storages and desalination, it is apparent that there is no one single option that provides a clear benefit. The options providing the highest storage volume and

yield are also the highest in capital cost and present a number of issues in respect to environmental impact and construction.

This report has also identified that all of the upgrade options have significant capital costs. Project funding and the impact on the ratepayers and future development costs and headworks have not been considered at this stage.

Options including development of an offstream storage and desalination can be staged whereby storage or capacity is provided to secure the water supply for the current demand only plus an allowance for say 10 years of growth. These options can be expanded when and if growth occurs with the funding of future stages being contributed to by the developers. In this way Council does not have to provide funding for provision of an asset with a large ability to absorb future growth that may or may not occur.

The options of new weirs at 11 Mile and 8 Mile cannot be staged apart from the pipeline upgrade component. The high capital cost of these weirs comes with the penalty of providing funding for works that are capable of providing for growth beyond the current planning horizon, with the risk of not being able to recover costs if future growth or development does not occur.

In order to identify a preferred option and a ranking of the options, a matrix scoring approach has been adopted. The following matrix provides an indication of the ranking of each option for a range of criteria. The ranking and scoring has been undertaken on a subjective basis and has been provided to enable comparison of the options.

For the numbered score matrices, the first one has given weighting to the cost component (35%). To incorporate both capital and annual costs, NPV (Net Present Value) costs have been used in the matrices.

The second matrix has given weighting to the non-financial aspects of yield, reliability and water quality (total of 50%) in order to provide a measure of sensitivity for this method of comparison.

Table 7 – Criteria Rating Matrix

COMPARITIVE RANKING OF CRITERIA

		Cost	Water Quantity/Quality				Social Impact			Environmental Impact		Risk
Option No	Description	NPV	Available Yield (ML/year)	Reliability	Water Quality	Future Expansion Capability	Flood Impacts	Impact on Private Property	Economic Development	Loss of habitat	Effect on threatened Species	Risk from Approvals/ Construction
1	Raise Glenore Weir	Excellent	Average	Excellent	Good	Horrible	Average	Average	Average	Good	Good	Average
2	11 Mile Weir	Average	Average	Excellent	Average*	Average	Average	Average	Good	Average	Poor	Poor
3	8 Mile Weir	Average	Good	Excellent	Poor*	Average	Poor	Average	Excellent	Poor	Poor	Poor
4	Off Stream Storage 30+	Good	Average	Good	Good	Good	Excellent	Good*	Good	Good	Excellent	Good
5	Off Stream Storage 50+	Horrible	Good	Good	Good	Average	Excellent	Good*	Excellent	Good	Excellent	Good
6	Desalination/Gelnore Weir	Poor	Good	Average	Good	Good	Excellent	Good	Excellent	Excellent	Excellent	Good
7	Desalination	Poor	Good	Poor	Good	Good	Excellent	Good	Excellent	Excellent	Excellent	Good

CRITERIA WEIGHED TOWARDS COSTS

	Weighting	Cost 35%	Water Quantity/Quality 10%	10%	10%	5%	Social Impact 5%	5%	5%	Environmental Impact 5%	5%	Risk 5%	100%
Option No	Description	NPV	Available Yield (ML/year)	Reliability	Water Quality	Future Expansion Capability	Flood Impacts	Impact on Private Property	Economic Development	Loss of habitat	Effect on threatened Species	Risk from Approvals/ Construction	Rank
1	Raise Glenore Weir	10	4	9	8	0	4	5	5	8	8	6	7.40
2	11 Mile Weir	5	5	10	4	5	4	5	5	5	2	2	5.05
3	8 Mile Weir	5	10	10	3	8	3	5	10	2	2	2	5.65
4	Off Stream Storage 30+	7	5	8	8	8	10	8	5	8	10	8	7.40
5	Off Stream Storage 50+	1	8	8	8	5	10	8	10	8	10	8	5.70
6	Desalination/Gelnore Weir	2	8	5	8	8	10	8	10	10	10	8	6.00
7	Desalination	2	8	2	8	8	10	8	10	10	10	8	5.70

Ranking	Horrible	Poor	Average	Good	Excellent
Number	0	2	5	8	10

CRITERIA WEIGHED TOWARDS YIELD, RELIABILITY AND WATER QUALITY

	Weighting	Cost 20%	Water Quantity/Quality 20%	12.5%	12.5%	5%	Social Impact 5%	5%	5%	Environmental Impact 5%	5%	Risk 5%	100%
Option No	Description	NPV	Available Yield (ML/year)	Reliability	Water Quality	Future Expansion Capability	Flood Impacts	Impact on Private Property	Economic Development	Loss of habitat	Effect on threatened Species	Risk from Approvals/ Construction	Rank
1	Raise Glenore Weir	10	4	9	8	0	4	5	5	8	8	6	6.73
2	11 Mile Weir	5	5	10	4	5	4	5	5	5	2	2	5.15
3	8 Mile Weir	5	10	10	3	5	3	5	10	2	2	2	6.08
4	Off Stream Storage 30+	7	5	8	8	8	10	8	5	8	10	8	7.25
5	Off Stream Storage 50+	1	8	8	8	5	10	8	10	8	10	8	6.75
6	Desalination/Gelnore Weir	2	8	5	8	8	10	8	10	10	10	8	6.83
7	Desalination	2	8	2	8	8	10	8	10	10	10	8	6.45

Scenario 1 which is for upgrading and repairing the existing Glenore Weir is not an acceptable option alone as it does not provide any increase in yield or improvement in security of supply. This option has not been included in the above comparisons.

The above is considered a simplified ranking only. Other criteria that could also be considered include:-

Financial impact on ratepayers;

Acceptance by ratepayers of the financial and non-financial implications;

Likelihood of the option attracting funding such as Government Grants;

Operational aspects including ease of operation and maintenance and access to key components during flood periods;

Improvement or creation of recreational facilities or amenity.

From the above matrices it is apparent that the option of upgrading (repairing) the existing Glenore Weir and providing a small offstream storage (800 ML or less) is the highest ranking option whether the scoring is weighted towards cost or non-financial criteria. This option has a clear preference based on the above scoring and weightings. However the capital cost for this option may still be beyond the current financial capacity of the Council.

Other options that have ranked highly from the above include Raising Glenore Weir and Desalination in combination with upgrading Glenore Weir. In any event the most cost effective solution based on costs alone would be the Raising of Glenore Weir option.

Further investigation is required in terms of geotechnical investigations, concept design and improved estimates and confirmation of any environmental issues or conditions that are applicable before any firm recommendation can be made.

Whilst the above provides a good indication of the ranking of the options, the final selected option may be influenced by other factors outside of the scope of this report including direction from State or Federal Government in respect to use of any Grant Money or other funding.

14 RECOMENDATIONS

The following recommendations have been made in response to the outcomes of this investigation and the need to implement works that addresses the current lack of security of water supply for Normanton and Karumba.

Council consider the information provided in this report;

Assess their financial capacity to fund the project based on preliminary information to date;

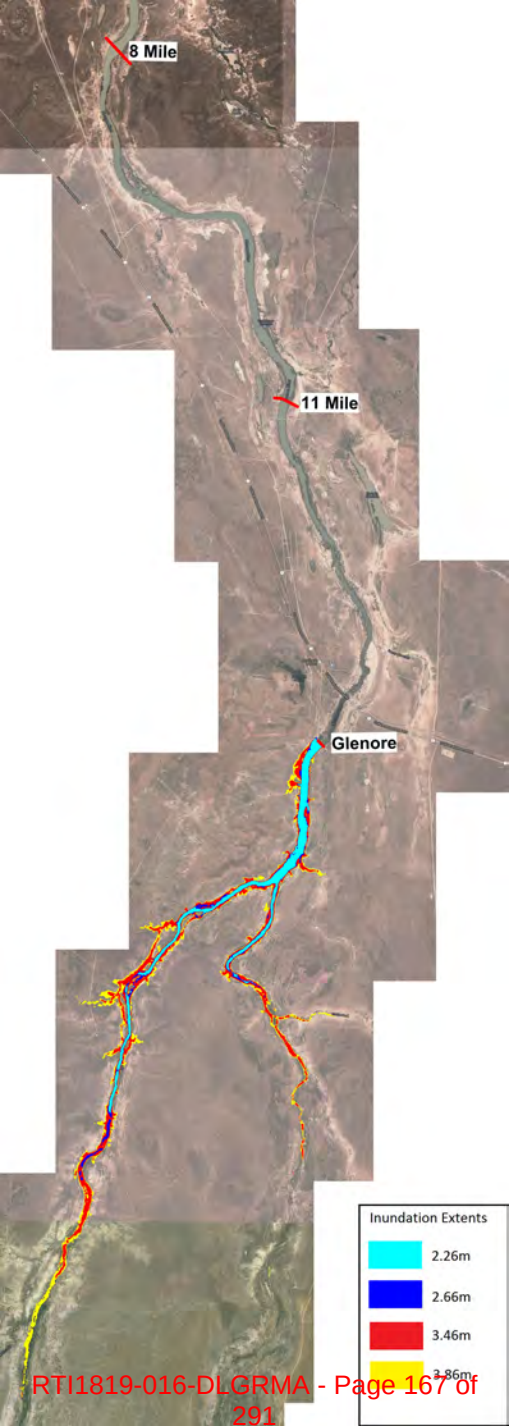
Preferably select one preferred option to be investigated further. Alternatively Council could select a number of preferred options to be investigated further but needs to consider the costs;

If Council have limited financial capacity, then it is recommended that the Raising of Glenore Weir option be adopted as Council's preferred option;

Undertake Community consultation on the preferred option;

Investigate opportunities for funding a water supply upgrade project including the sources and potential level of funding including identification of any conditions associated with the funding.

APPENDIX A1 – GLENORE WEIR POOL INUNDATION MAP


8 Mile
11 Mile
Glenore
Inundation Extents
2.26m
2.66m
3.46m
3.86m

APPENDIX A2 – 11 MILE WEIR POOL INUNDATION MAP

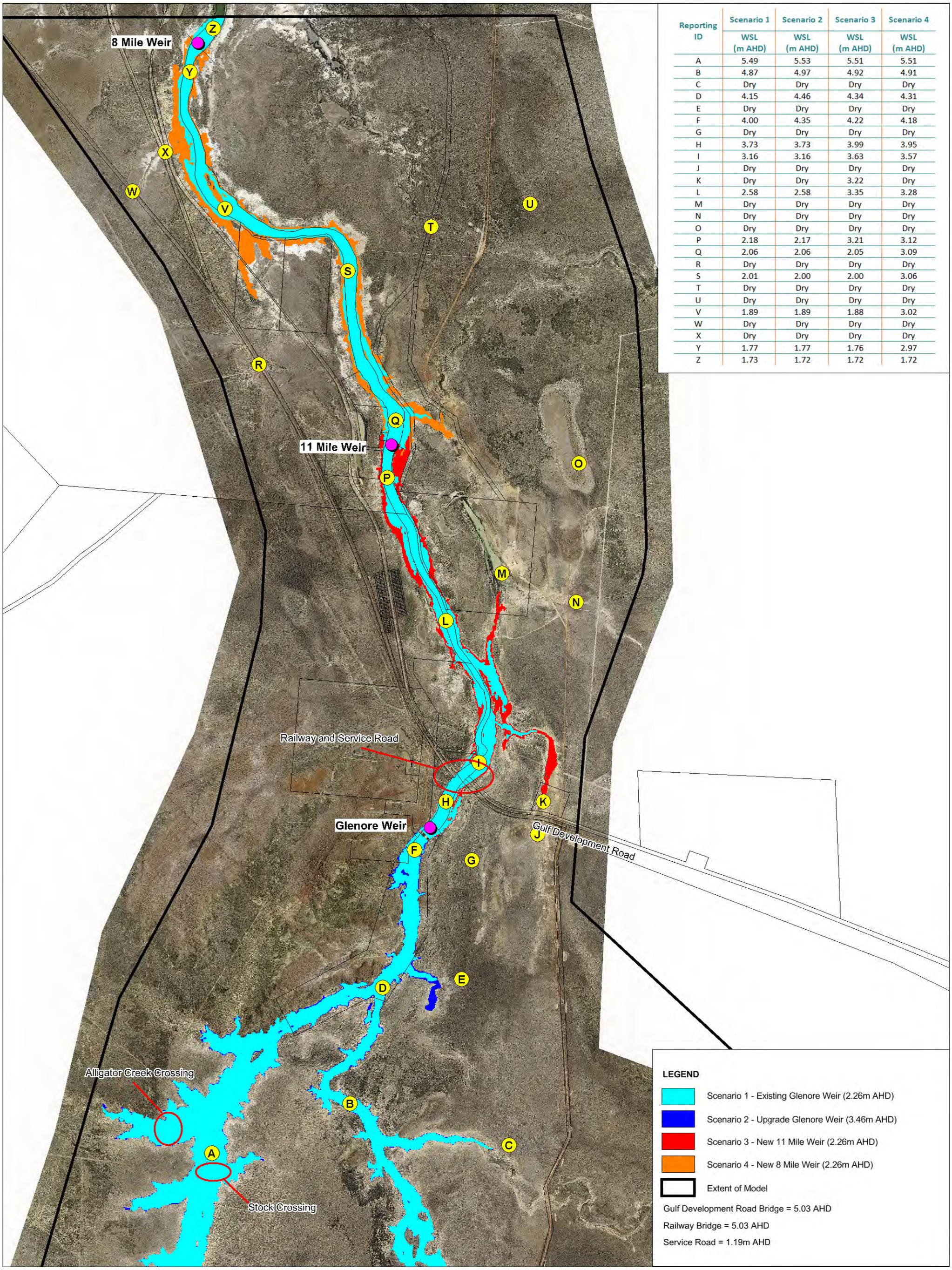

8 Mile
11 Mile
Glenore
Inundation Extents
2.26m
2.06m

APPENDIX A3 – 8 MILE WEIR POOL INUNDATION MAP


8 Mile
11 Mile
Glenore
Inundation Extents
2.26m
2.66m

APPENDIX B1 – 2 YEAR RETURN PERIOD FLOOD INUNDATION MAP

Reporting ID	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	WSL (m AHD)	WSL (m AHD)	WSL (m AHD)	WSL (m AHD)
A	5.49	5.53	5.51	5.51
B	4.87	4.97	4.92	4.91
C	Dry	Dry	Dry	Dry
D	4.15	4.46	4.34	4.31
E	Dry	Dry	Dry	Dry
F	4.00	4.35	4.22	4.18
G	Dry	Dry	Dry	Dry
H	3.73	3.73	3.99	3.95
I	3.16	3.16	3.63	3.57
J	Dry	Dry	Dry	Dry
K	Dry	Dry	3.22	Dry
L	2.58	2.58	3.35	3.28
M	Dry	Dry	Dry	Dry
N	Dry	Dry	Dry	Dry
O	Dry	Dry	Dry	Dry
P	2.18	2.17	3.21	3.12
Q	2.06	2.06	2.05	3.09
R	Dry	Dry	Dry	Dry
S	2.01	2.00	2.00	3.06
T	Dry	Dry	Dry	Dry
U	Dry	Dry	Dry	Dry
V	1.89	1.89	1.88	3.02
W	Dry	Dry	Dry	Dry
X	Dry	Dry	Dry	Dry
Y	1.77	1.77	1.76	2.97
Z	1.73	1.72	1.72	1.72



NORTH

PAGE SIZE A3

SCALE 1:50,000

COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

DRAWING NO. 30031084-WR-MAP-004 REVISION A

CREATED BY B Bolt DATE 15/01/2014

STATUS DRAFT

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **2 YEAR AEP FLOOD INUNDATION**

CLIENT

CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT

SMEC

SMEC Australia Ltd
Level 1, 154 Melbourne Street
South Brisbane QLD 4101

APPENDIX B2 – 5 YEAR RETURN PERIOD FLOOD INUNDATION MAP

Reporting ID	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	WSL (m AHD)	WSL (m AHD)	WSL (m AHD)	WSL (m AHD)
A	7.03	7.07	7.04	7.04
B	6.93	6.97	6.94	6.94
C	7.04	7.06	7.05	7.05
D	6.44	6.54	6.46	6.47
E	6.36	6.46	6.38	6.40
F	6.14	6.28	6.16	6.19
G	5.92	6.01	5.93	5.95
H	5.76	5.74	5.79	5.83
I	5.13	5.12	5.20	5.28
J	5.14	5.21	5.21	5.30
K	5.11	5.12	5.18	5.27
L	4.45	4.44	4.60	4.76
M	4.66	4.65	4.75	4.86
N	4.66	4.65	4.75	4.86
O	Dry	Dry	Dry	Dry
P	3.84	3.83	4.09	4.35
Q	3.69	3.68	3.70	4.27
R	Dry	Dry	Dry	3.99
S	3.47	3.46	3.49	4.12
T	Dry	Dry	Dry	Dry
U	Dry	Dry	Dry	Dry
V	3.18	3.16	3.19	3.94
W	Dry	Dry	Dry	Dry
X	Dry	Dry	Dry	3.81
Y	2.69	2.68	2.70	3.67
Z	2.51	2.50	2.52	2.50

8 Mile Weir
11 Mile Weir
Glenore Weir
Railway and Service Road
Gulf Development Road
Alligator Creek Crossing
Stock Crossing

LEGEND

- Scenario 1 - Existing Glenore Weir (2.26m AHD)
- Scenario 2 - Upgrade Glenore Weir (3.46m AHD)
- Scenario 3 - New 11 Mile Weir (2.26m AHD)
- Scenario 4 - New 8 Mile Weir (2.26m AHD)
- Extent of Model

Gulf Development Road Bridge = 5.03 AHD
Railway Bridge = 5.03 AHD
Service Road = 1.19m AHD

NORTH
PAGE SIZE A3
SCALE 1:50,000

COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54
DRAWING NO. 30031084-WR-MAP-005 REVISION A
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TITLE **5 YEAR AEP FLOOD INUNDATION**

CLIENT
CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT
SMEC
SMEC Australia Ltd
Level 1, 154 Melbourne Street
South Brisbane QLD 4101

APPENDIX B3 – 10 YEAR RETURN PERIOD FLOOD INUNDATION MAP

Reporting ID	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	WSL (m AHD)	WSL (m AHD)	WSL (m AHD)	WSL (m AHD)
A	7.90	7.91	7.90	7.90
B	7.75	7.77	7.76	7.76
C	7.66	7.68	7.67	7.67
D	7.46	7.49	7.48	7.48
E	7.38	7.41	7.40	7.40
F	7.20	7.26	7.23	7.23
G	7.09	7.12	7.12	7.12
H	6.92	6.92	6.96	6.96
I	6.69	6.70	6.75	6.74
J	6.89	6.91	6.93	6.93
K	6.77	6.78	6.82	6.80
L	6.11	6.11	6.21	6.18
M	6.04	6.05	6.13	6.11
N	6.08	6.08	6.16	6.14
O	5.45	5.47	5.73	5.75
P	5.63	5.64	5.82	5.75
Q	5.52	5.52	5.51	5.65
R	4.89	4.89	4.87	5.09
S	5.18	5.18	5.15	5.34
T	4.67	4.68	4.66	4.84
U	Dry	Dry	Dry	Dry
V	4.78	4.79	4.76	5.01
W	Dry	Dry	Dry	Dry
X	4.46	4.47	4.44	4.76
Y	4.01	4.01	3.99	4.41
Z	3.75	3.75	3.73	3.65

8 Mile Weir
11 Mile Weir
Glenore Weir
Railway and Service Road
Gulf Development Road
Alligator Creek Crossing
Stock Crossing

LEGEND

- Scenario 1 - Existing Glenore Weir (2.26m AHD)
- Scenario 2 - Upgrade Glenore Weir (3.46m AHD)
- Scenario 3 - New 11 Mile Weir (2.26m AHD)
- Scenario 4 - New 8 Mile Weir (2.26m AHD)
- Extent of Model

Gulf Development Road Bridge = 5.03 AHD
Railway Bridge = 5.03 AHD
Service Road = 1.19m AHD

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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54
DRAWING NO. 30031084-WR-MAP-006 REVISION A
CREATED BY B Bolt DATE 15/01/2014
STATUS DRAFT
FOR CLIENT REVIEW

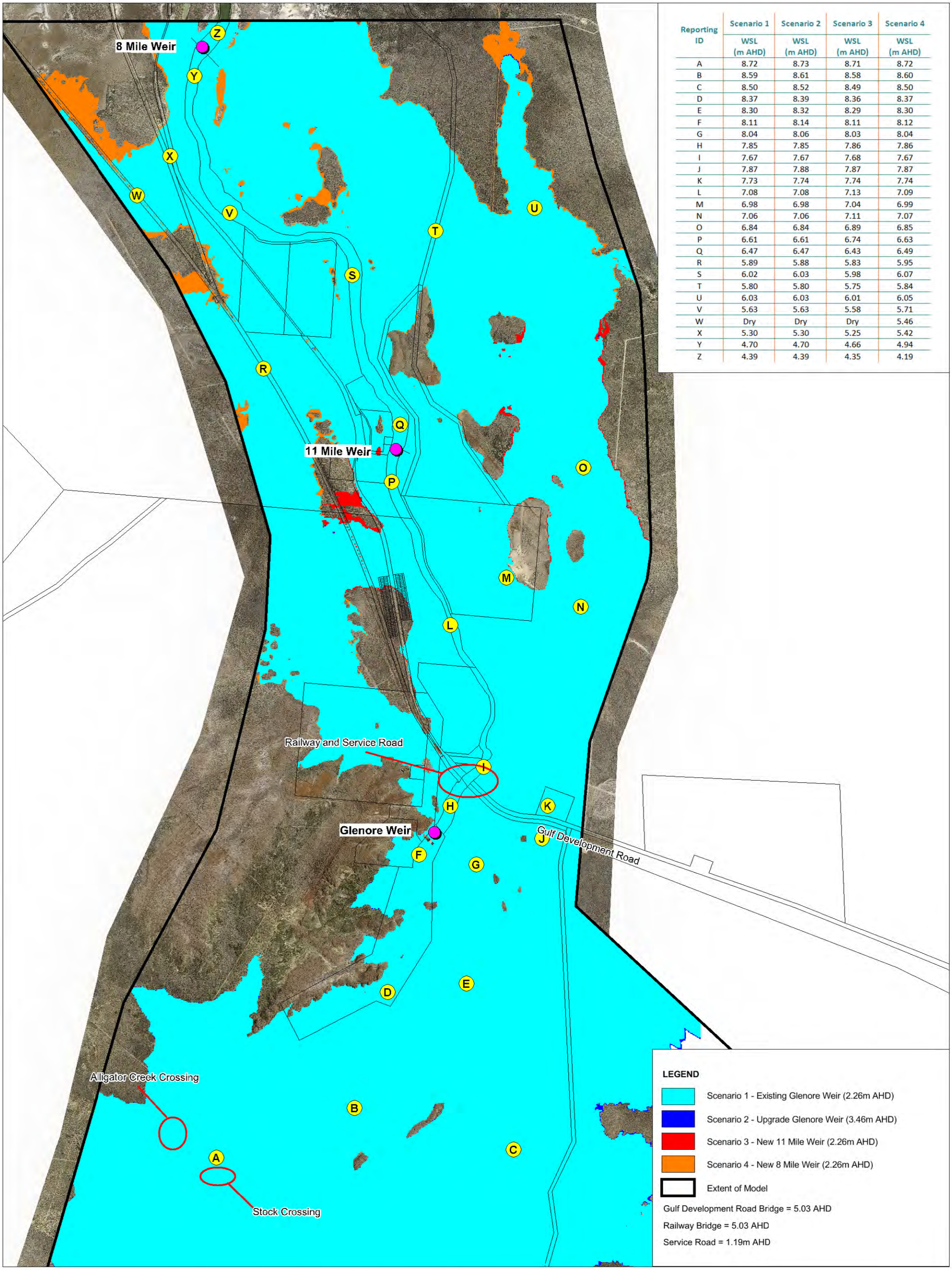
PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **10 YEAR AEP FLOOD INUNDATION**

CLIENT
CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT
SMEC
SMEC Australia Ltd
Level 1, 154 Melbourne Street
South Brisbane QLD 4101

APPENDIX B4 – 20 YEAR RETURN PERIOD FLOOD INUNDATION MAP



Reporting ID	Scenario 1 WSL (m AHD)	Scenario 2 WSL (m AHD)	Scenario 3 WSL (m AHD)	Scenario 4 WSL (m AHD)
A	8.72	8.73	8.71	8.72
B	8.59	8.61	8.58	8.60
C	8.50	8.52	8.49	8.50
D	8.37	8.39	8.36	8.37
E	8.30	8.32	8.29	8.30
F	8.11	8.14	8.11	8.12
G	8.04	8.06	8.03	8.04
H	7.85	7.85	7.86	7.86
I	7.67	7.67	7.68	7.67
J	7.87	7.88	7.87	7.87
K	7.73	7.74	7.74	7.74
L	7.08	7.08	7.13	7.09
M	6.98	6.98	7.04	6.99
N	7.06	7.06	7.11	7.07
O	6.84	6.84	6.89	6.85
P	6.61	6.61	6.74	6.63
Q	6.47	6.47	6.43	6.49
R	5.89	5.88	5.83	5.95
S	6.02	6.03	5.98	6.07
T	5.80	5.80	5.75	5.84
U	6.03	6.03	6.01	6.05
V	5.63	5.63	5.58	5.71
W	Dry	Dry	Dry	5.46
X	5.30	5.30	5.25	5.42
Y	4.70	4.70	4.66	4.94
Z	4.39	4.39	4.35	4.19

NORTH

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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

DRAWING NO. 30031084-WR-MAP-015 REVISION A

CREATED BY B Bolt DATE 15/01/2014

STATUS DRAFT

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **20 YEAR AEP FLOOD INUNDATION**

CLIENT

CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT

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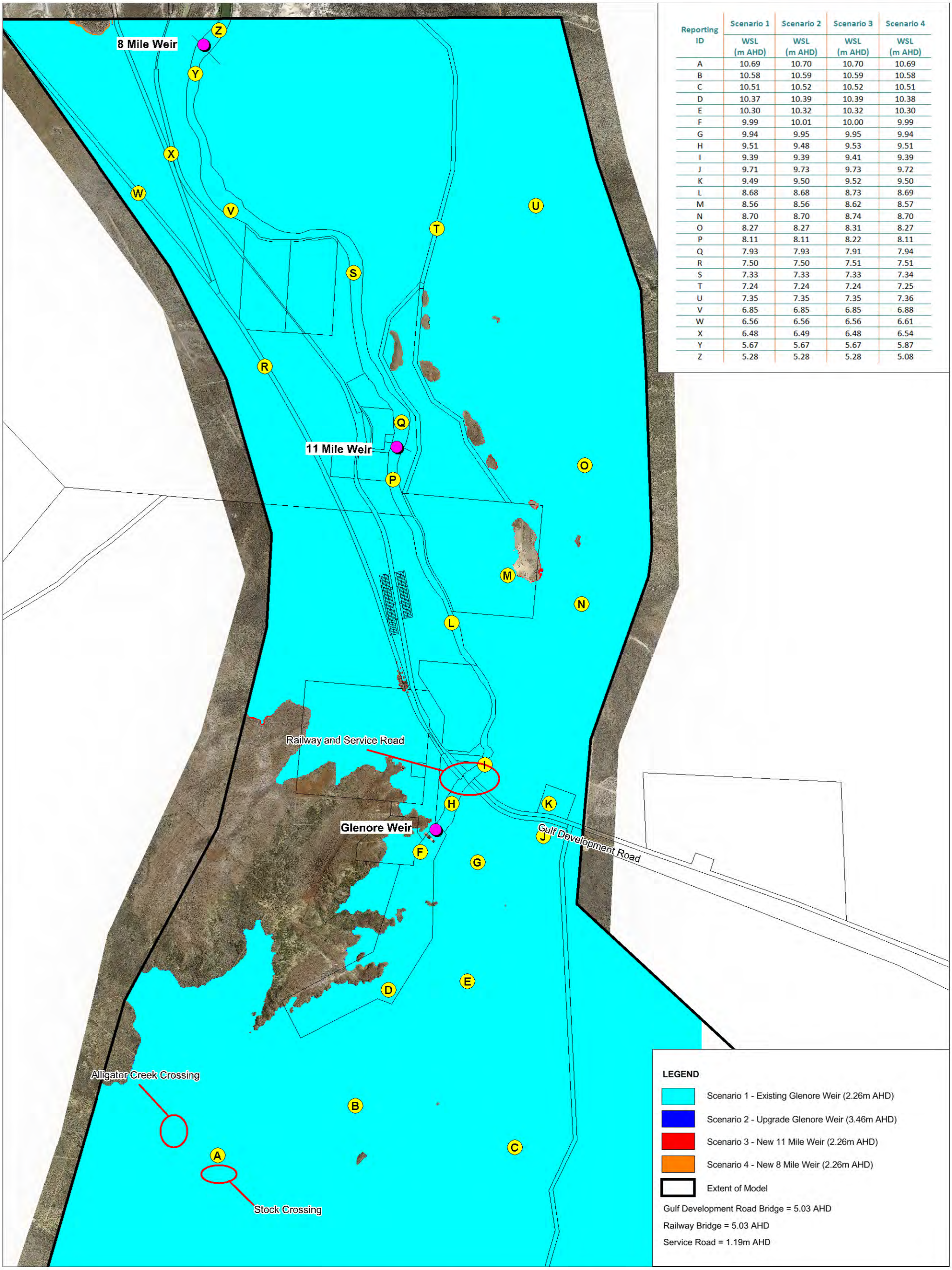
South Brisbane QLD 4101

APPENDIX B5 – 100 YEAR RETURN PERIOD FLOOD INUNDATION MAP

Reporting ID	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	WSL (m AHD)	WSL (m AHD)	WSL (m AHD)	WSL (m AHD)
A	10.69	10.70	10.70	10.69
B	10.58	10.59	10.59	10.58
C	10.51	10.52	10.52	10.51
D	10.37	10.39	10.39	10.38
E	10.30	10.32	10.32	10.30
F	9.99	10.01	10.00	9.99
G	9.94	9.95	9.95	9.94
H	9.51	9.48	9.53	9.51
I	9.39	9.39	9.41	9.39
J	9.71	9.73	9.73	9.72
K	9.49	9.50	9.52	9.50
L	8.68	8.68	8.73	8.69
M	8.56	8.56	8.62	8.57
N	8.70	8.70	8.74	8.70
O	8.27	8.27	8.31	8.27
P	8.11	8.11	8.22	8.11
Q	7.93	7.93	7.91	7.94
R	7.50	7.50	7.51	7.51
S	7.33	7.33	7.33	7.34
T	7.24	7.24	7.24	7.25
U	7.35	7.35	7.35	7.36
V	6.85	6.85	6.85	6.88
W	6.56	6.56	6.56	6.61
X	6.48	6.49	6.48	6.54
Y	5.67	5.67	5.67	5.87
Z	5.28	5.28	5.28	5.08



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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-016 REVISION A

CREATED BY B Bolt DATE 15/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **100 YEAR AEP FLOOD INUNDATION**

CLIENT

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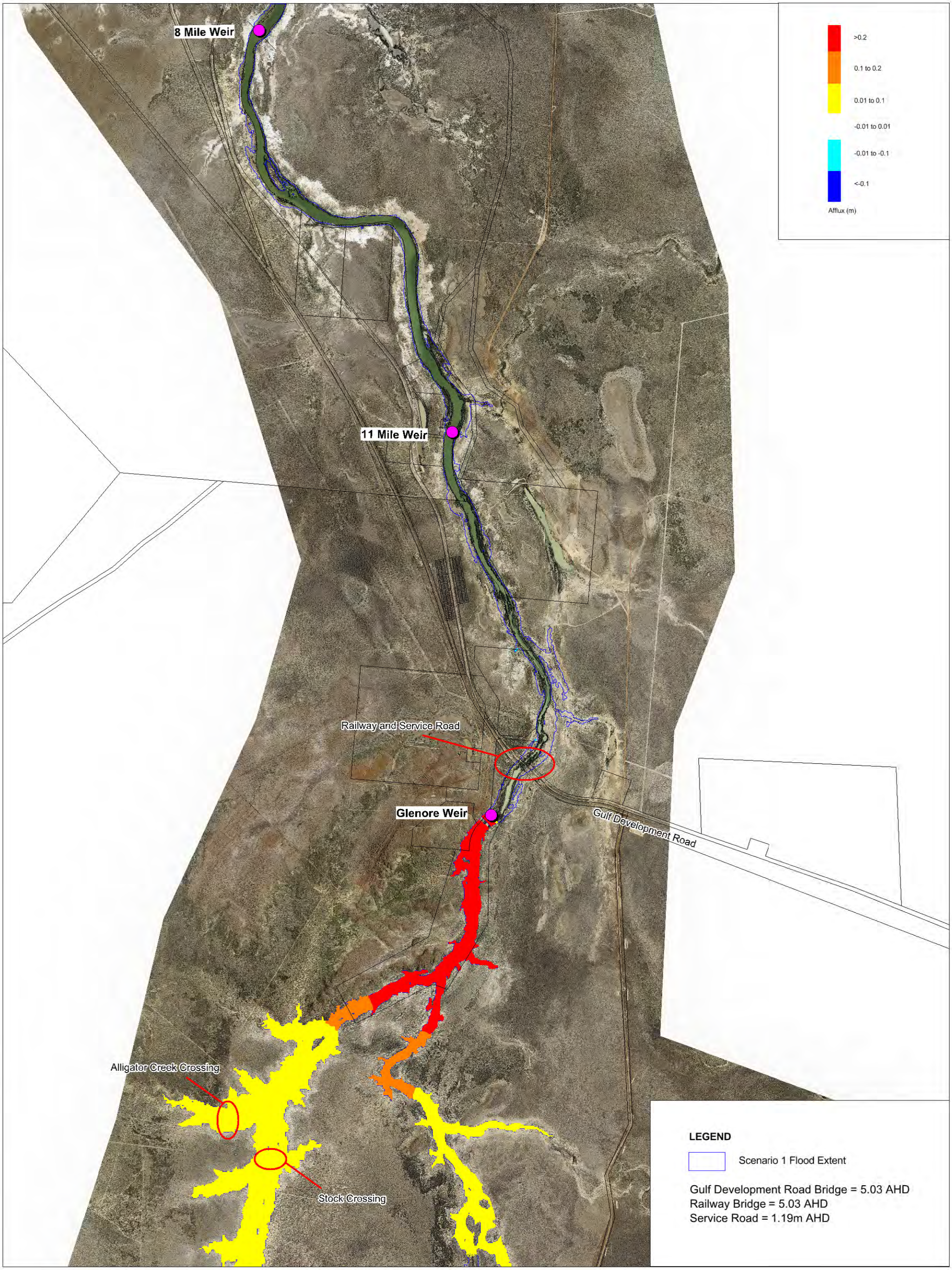
APPENDIX C1 – 2 YEAR RETURN PERIOD FLOOD AFFLUX MAP



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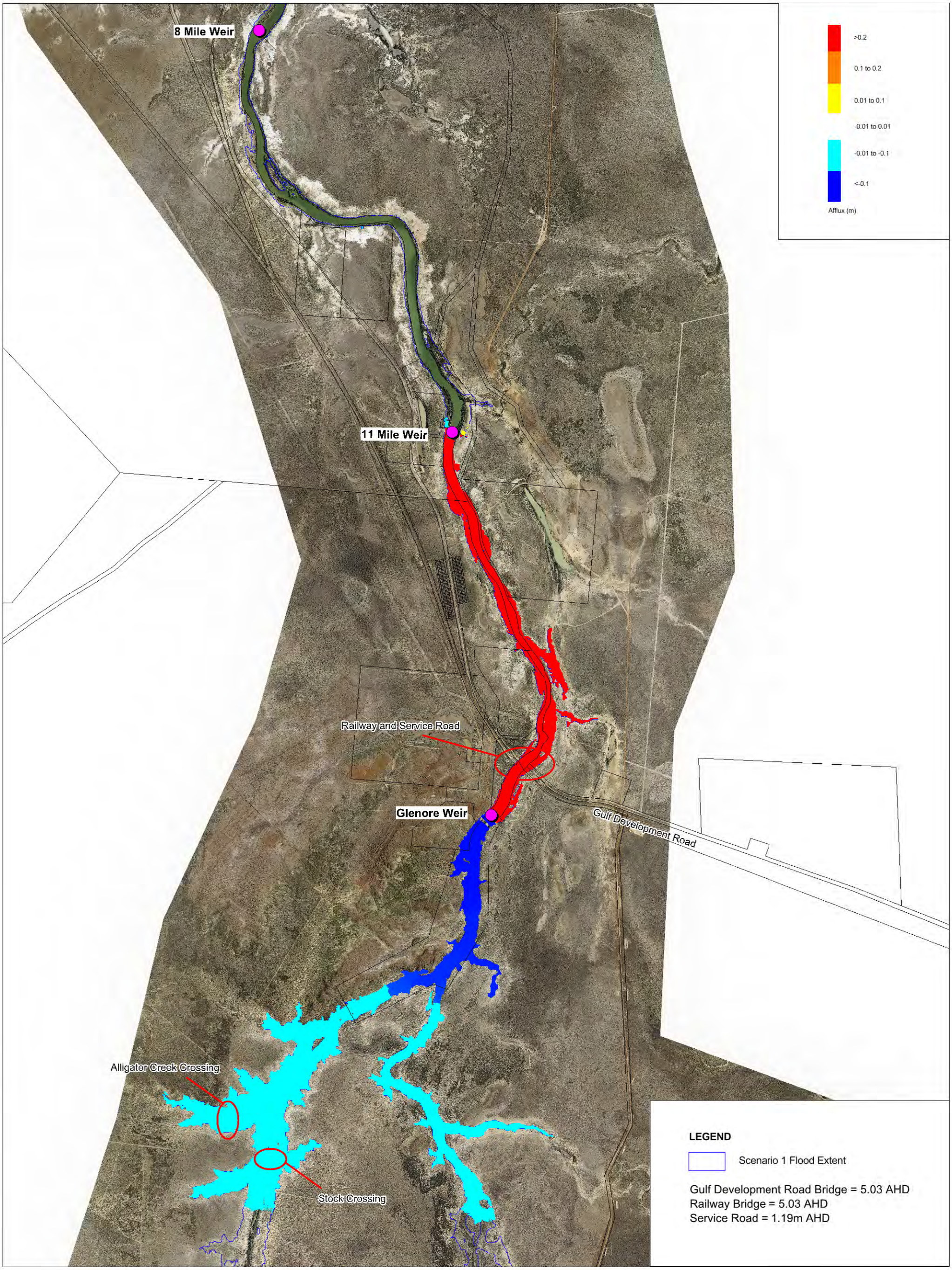

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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-008 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **2 YEAR AEP FLOOD AFFLUX - SCENARIO 3**

CLIENT

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Outback by the Sea

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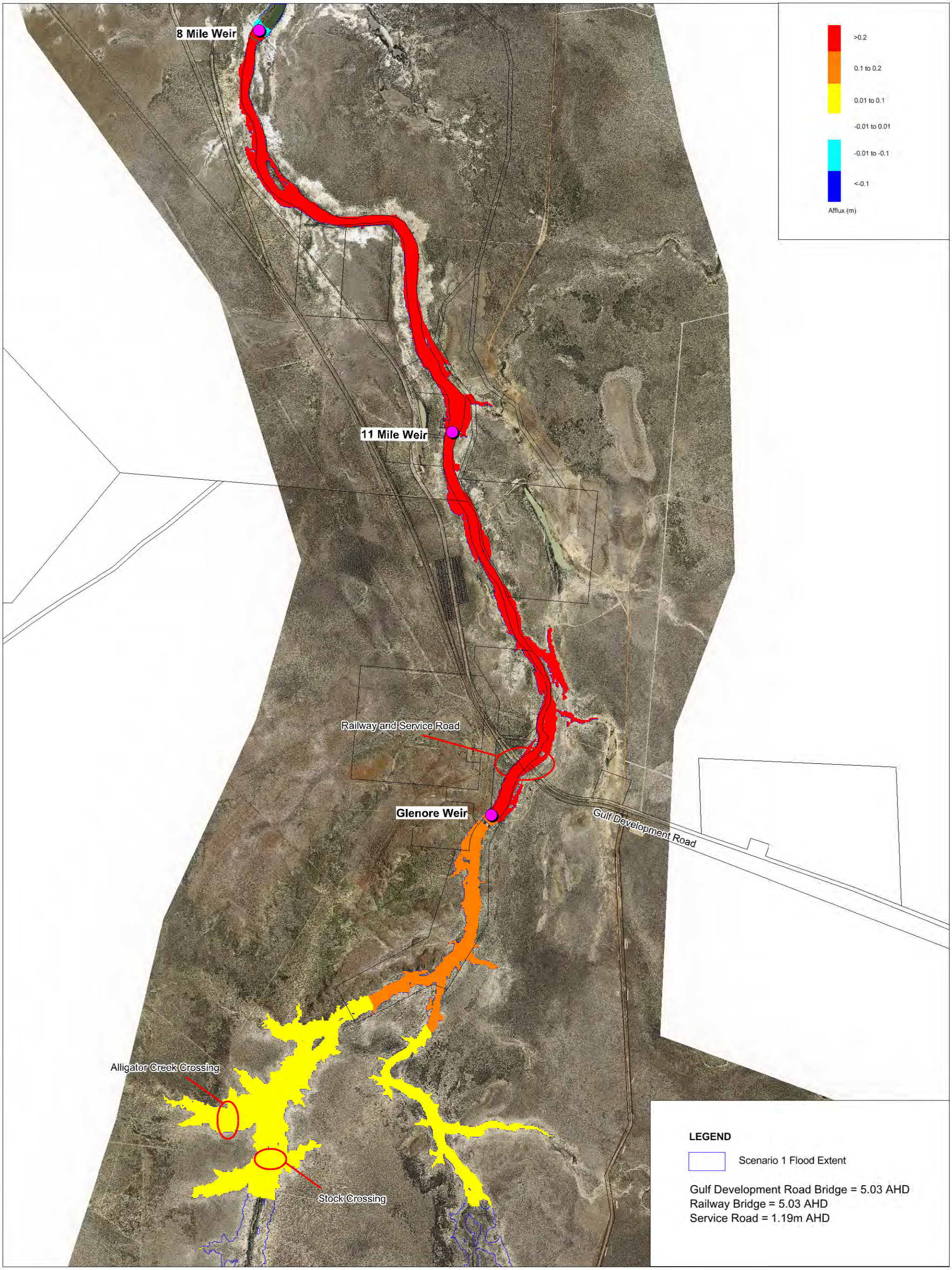

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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-017 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **2 YEAR AEP FLOOD AFFLUX - SCENARIO 4**

CLIENT

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Outback by the Sea

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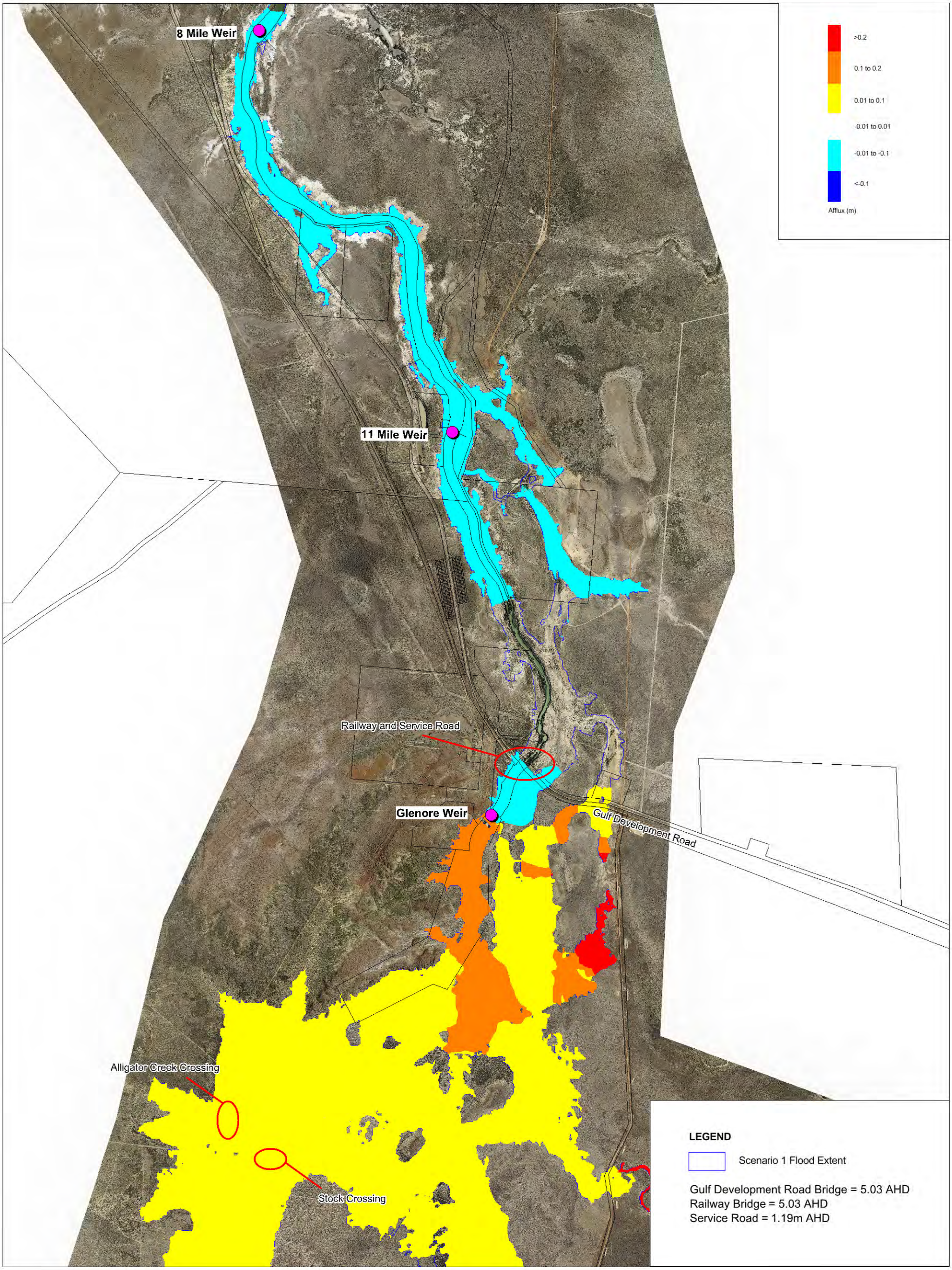
South Brisbane QLD 4101

APPENDIX C2 – 5 YEAR RETURN PERIOD FLOOD AFFLUX MAP



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STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-009 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **5 YEAR AEP FLOOD AFFLUX - SCENARIO 2**

CLIENT

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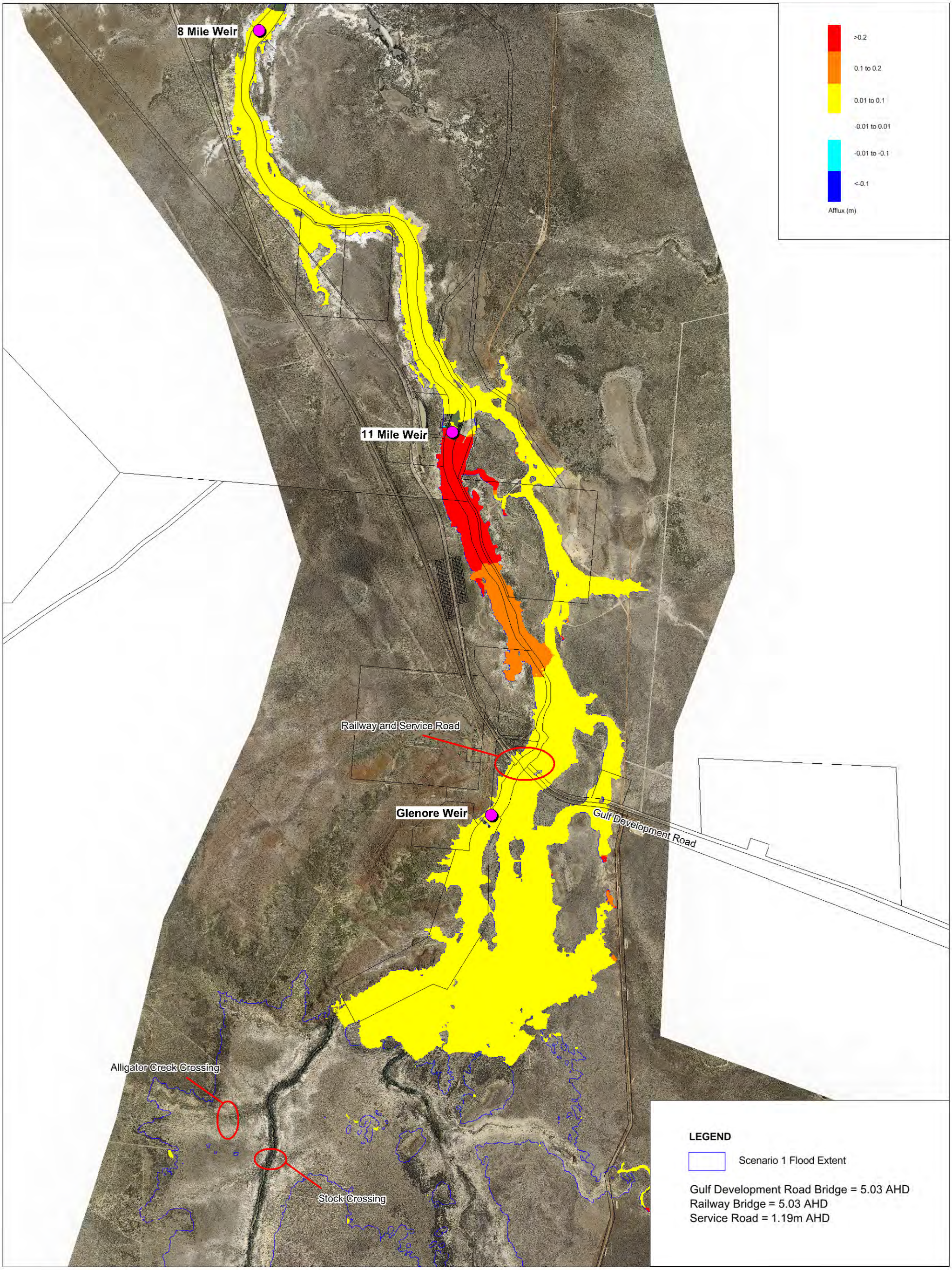

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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

STATUS DRAFT

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CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **5 YEAR AEP FLOOD AFFLUX - SCENARIO 3**

CLIENT

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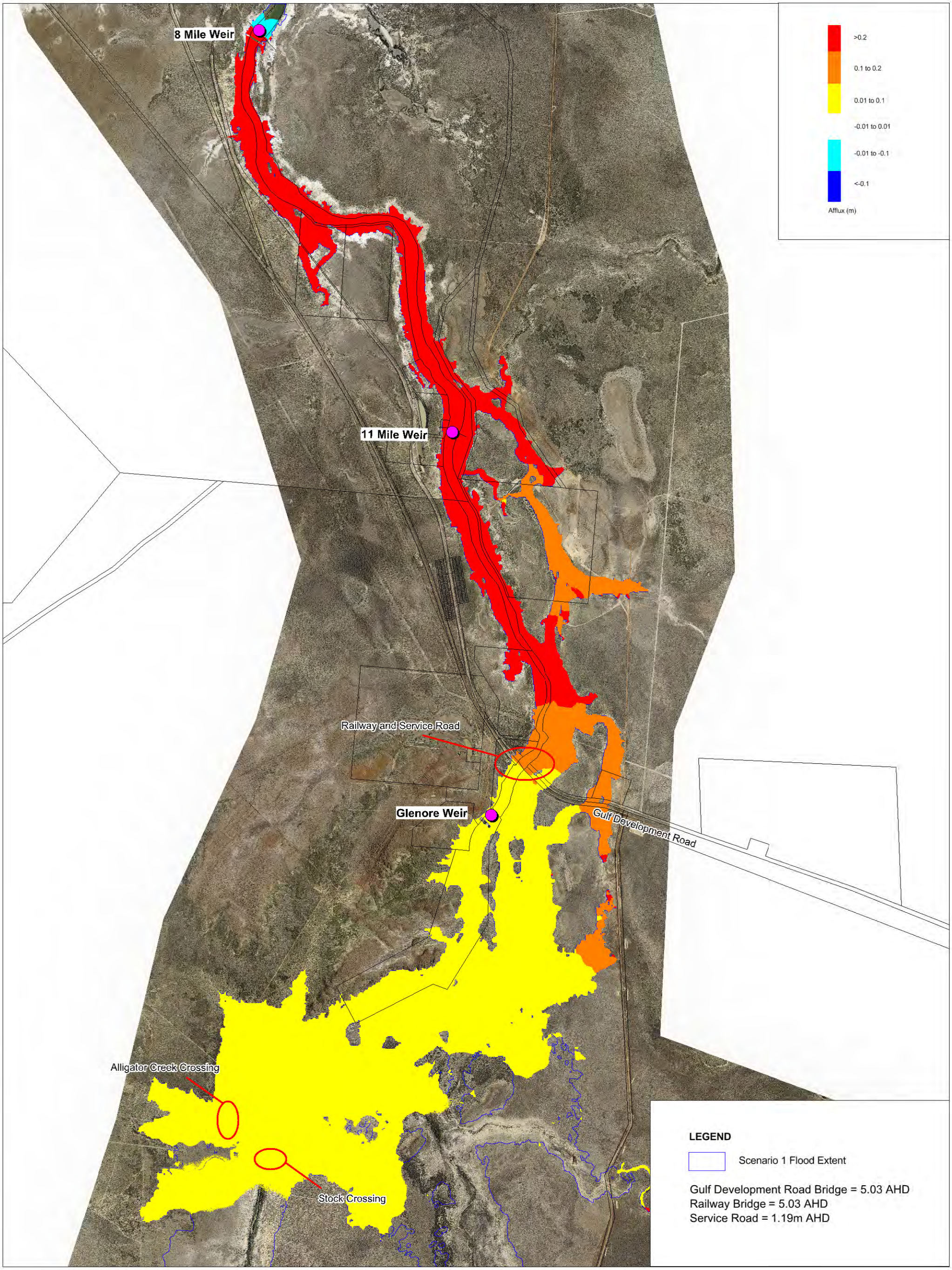

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STATUS DRAFT

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CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **5 YEAR AEP FLOOD AFFLUX - SCENARIO 4**

CLIENT

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Outback by the Sea

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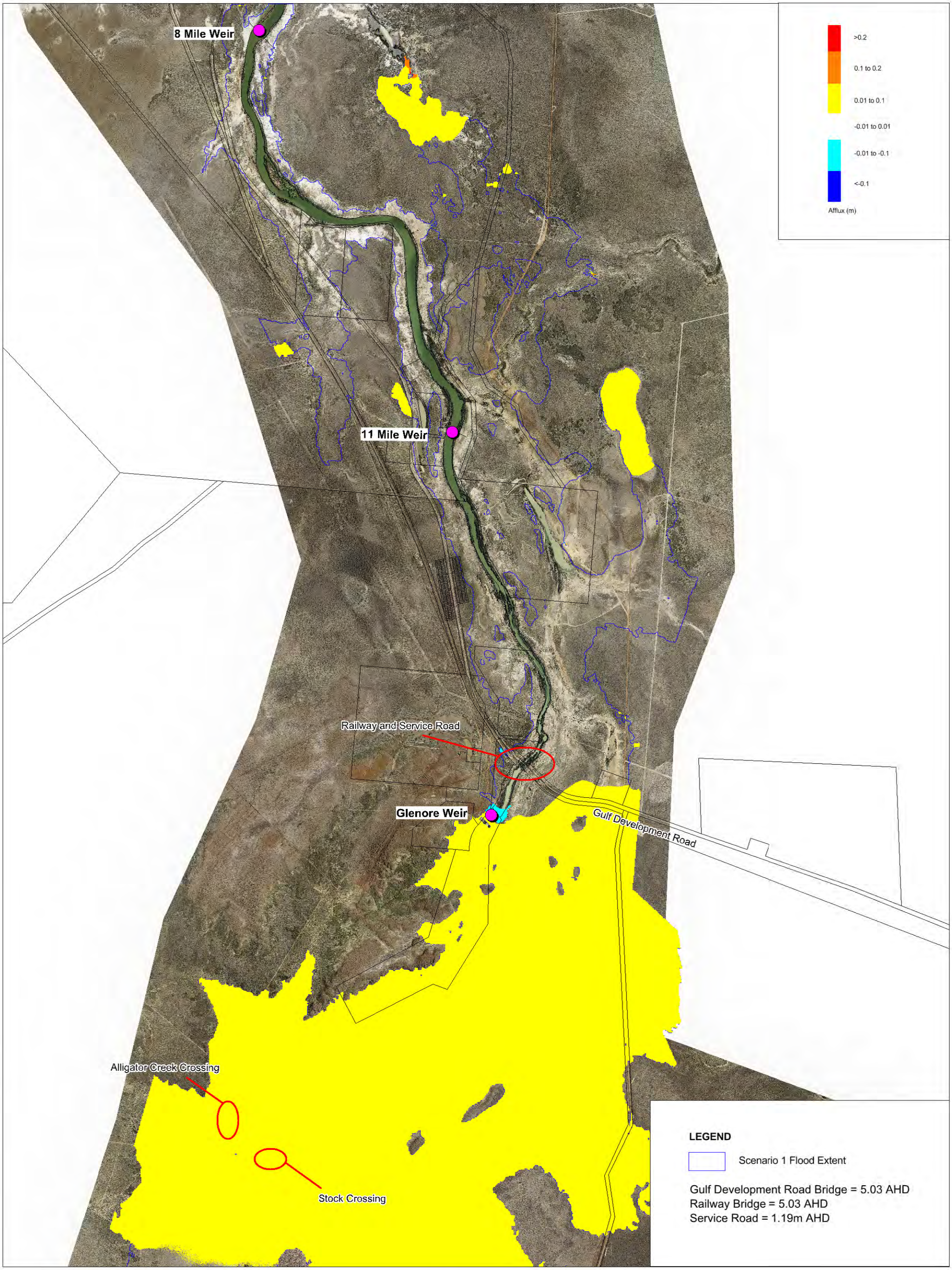
South Brisbane QLD 4101

APPENDIX C3 – 10 YEAR RETURN PERIOD FLOOD AFFLUX MAP



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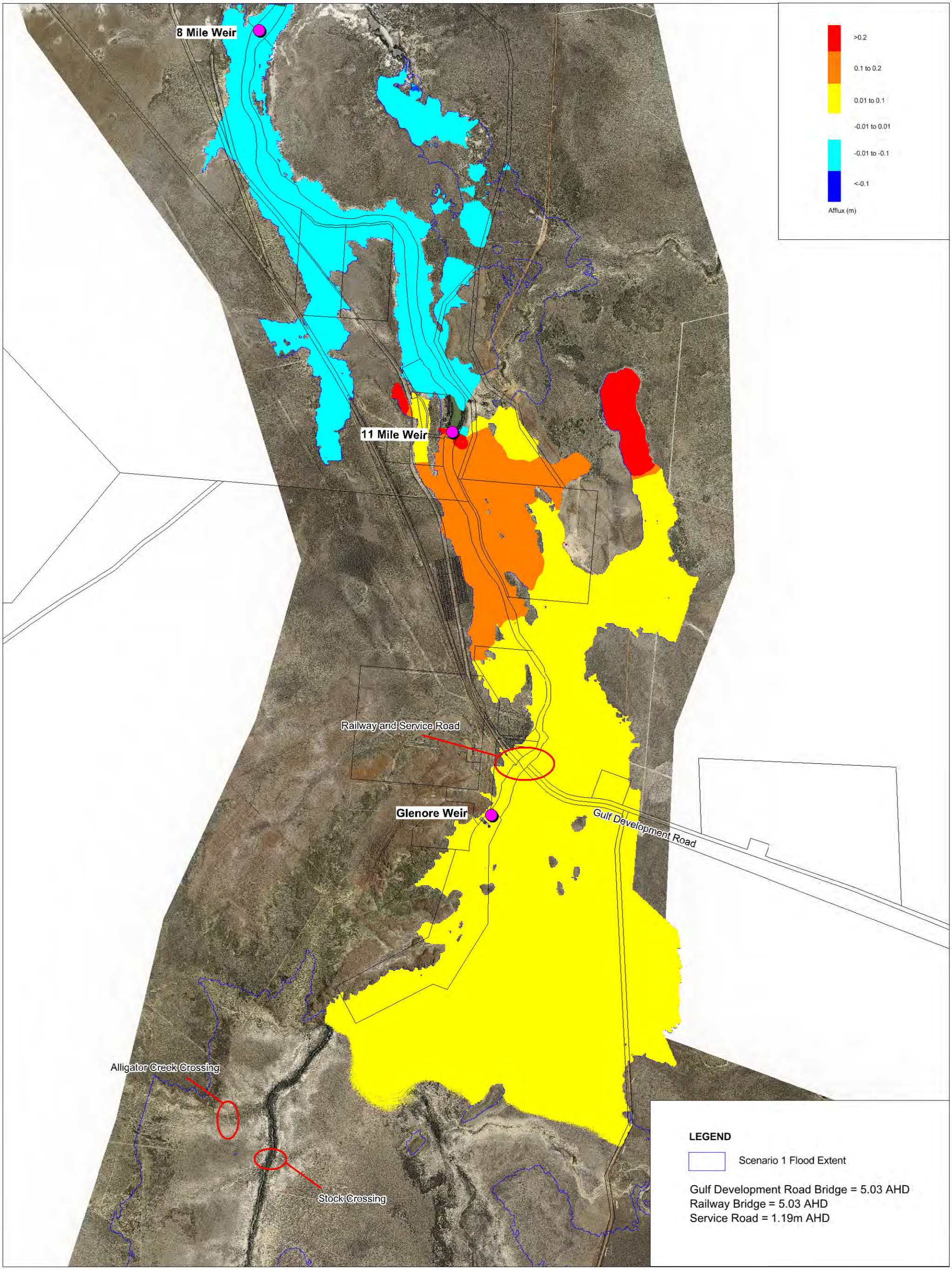

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STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-012 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **10 YEAR AEP FLOOD AFFLUX - SCENARIO 3**

CLIENT

CARPENTARIA SHIRE
Outback by the Sea

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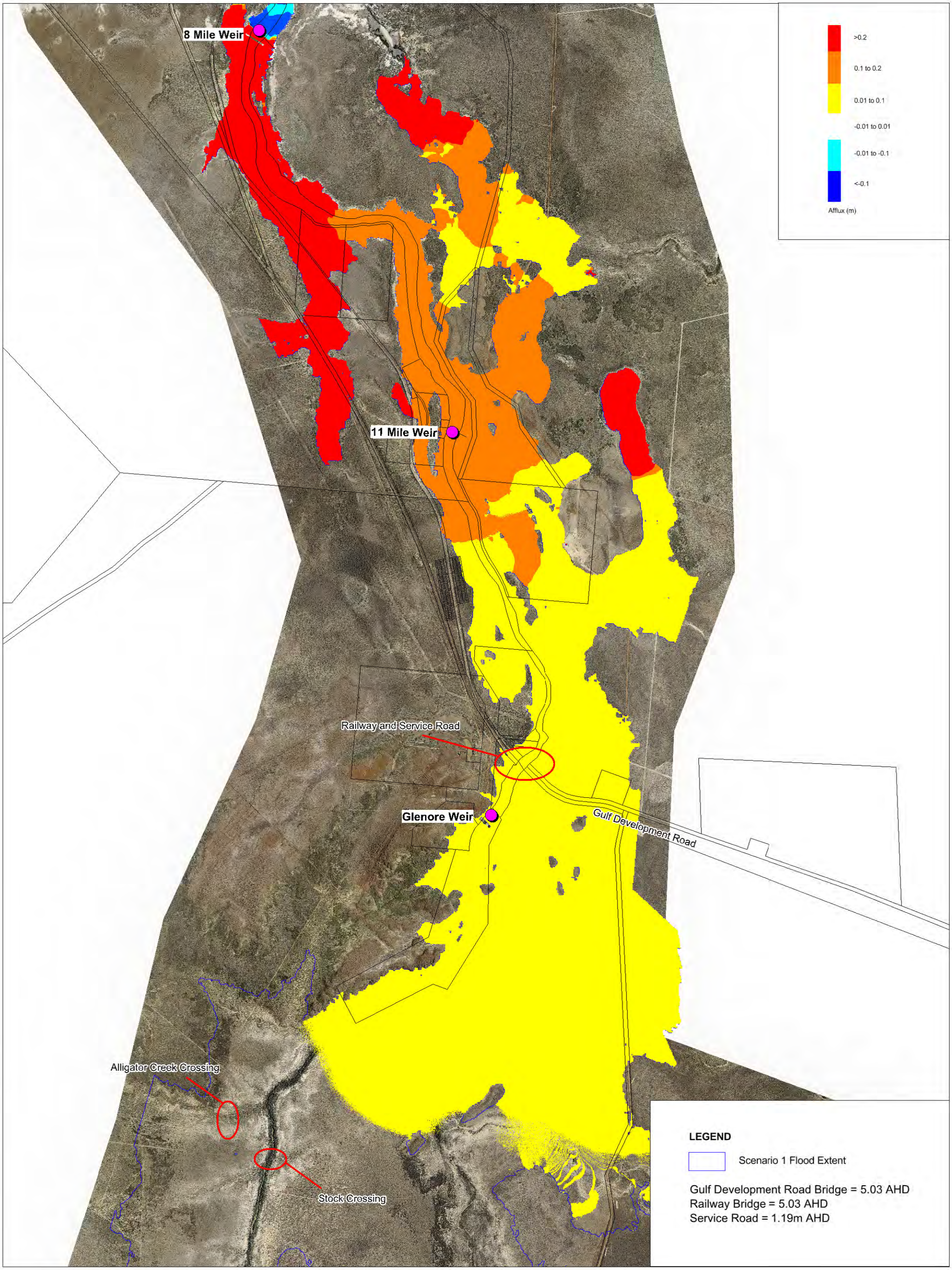
Level 1, 154 Melbourne Street
South Brisbane QLD 4101



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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-019 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **10 YEAR AEP FLOOD AFFLUX - SCENARIO 4**

CLIENT

CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT

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SMEC Australia Ltd
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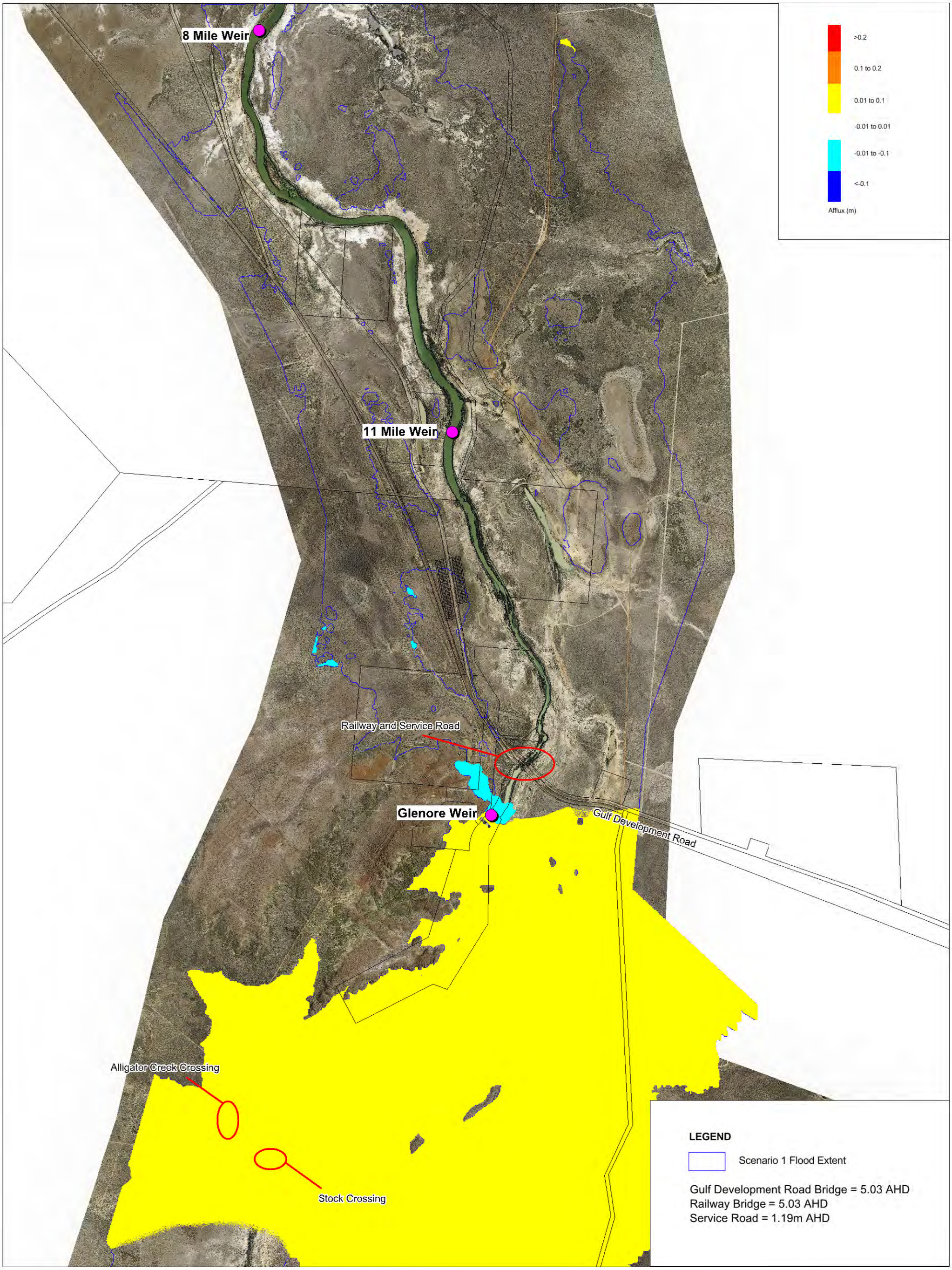
South Brisbane QLD 4101

APPENDIX C4 – 20 YEAR RETURN PERIOD FLOOD AFFLUX MAP



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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-020 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **20 YEAR AEP FLOOD AFFLUX - SCENARIO 2**

CLIENT

CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT

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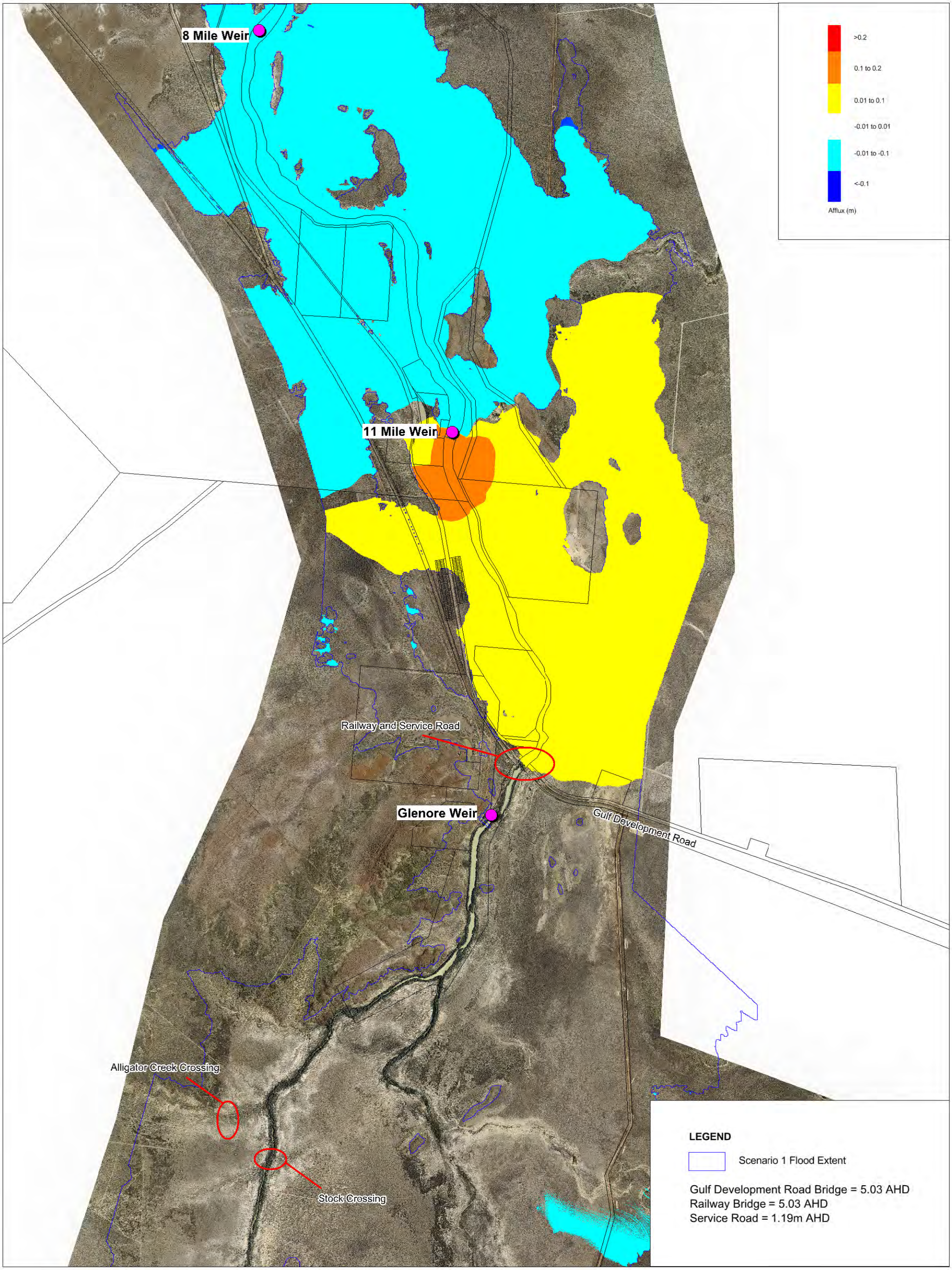
South Brisbane QLD 4101



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STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-021 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **20 YEAR AEP FLOOD AFFLUX - SCENARIO 3**

CLIENT

CARPENTARIA SHIRE
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CONSULTANT

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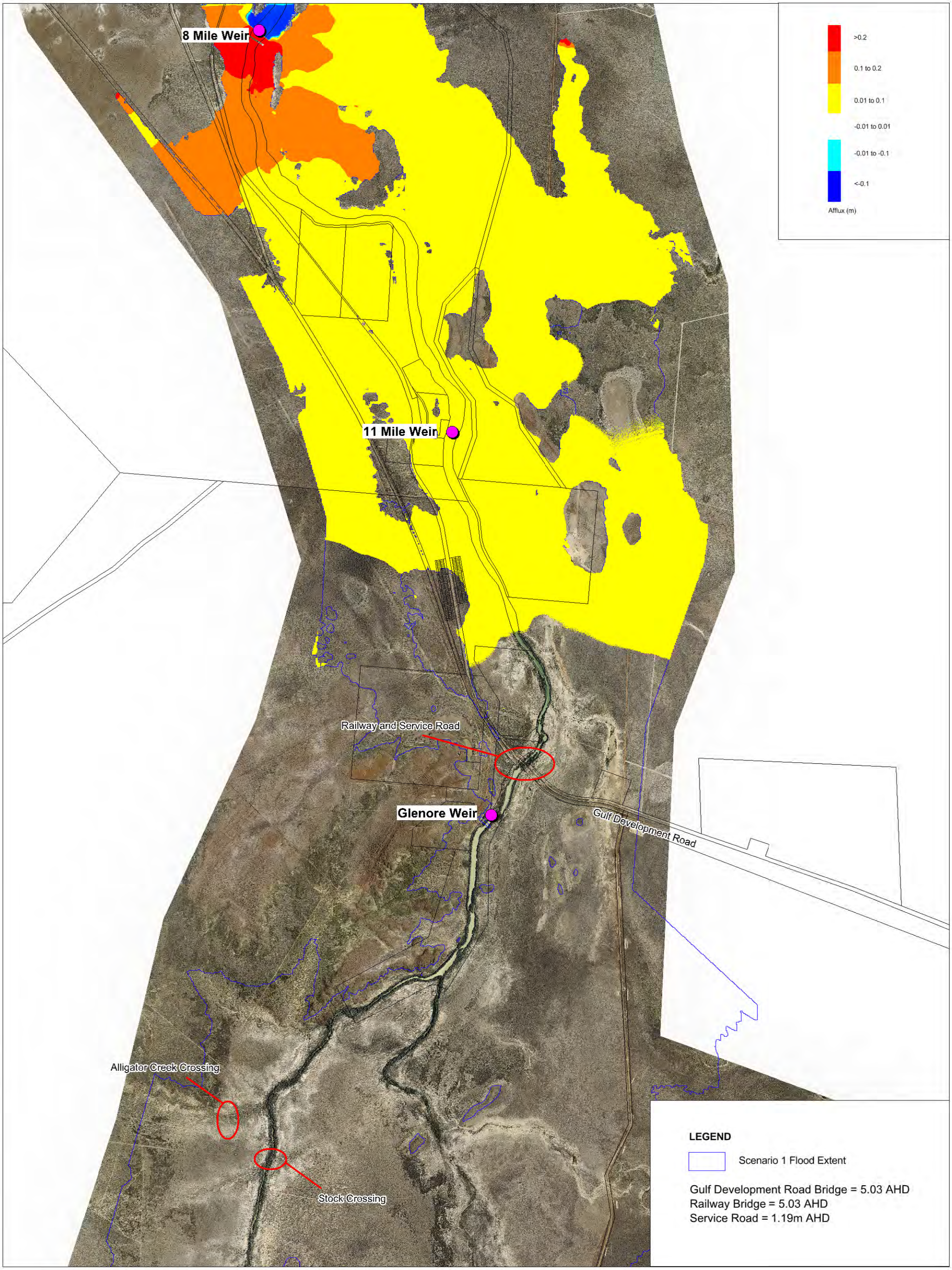
South Brisbane QLD 4101



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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-022 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **20 YEAR AEP FLOOD AFFLUX - SCENARIO 4**

CLIENT

CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT

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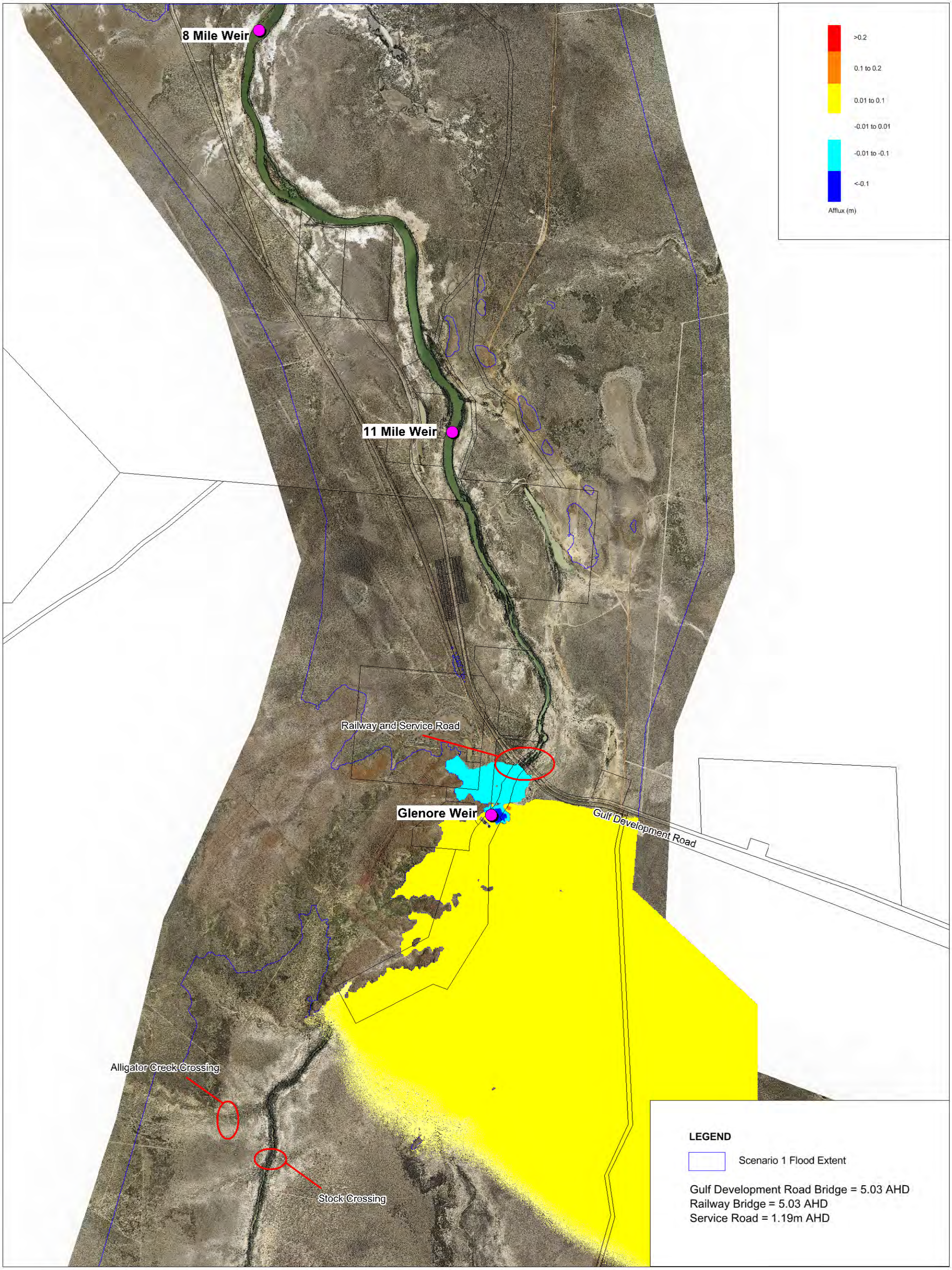
SMEC Australia Ltd
Level 1, 154 Melbourne Street
South Brisbane QLD 4101

APPENDIX C5 – 100 YEAR RETURN PERIOD FLOOD AFFLUX MAP



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COORDINATE SYSTEM Datum: GDA94 Projection: MGA Zone 54

STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-023 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **100 YEAR AEP FLOOD AFFLUX - SCENARIO 2**

CLIENT

CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT

SMEC

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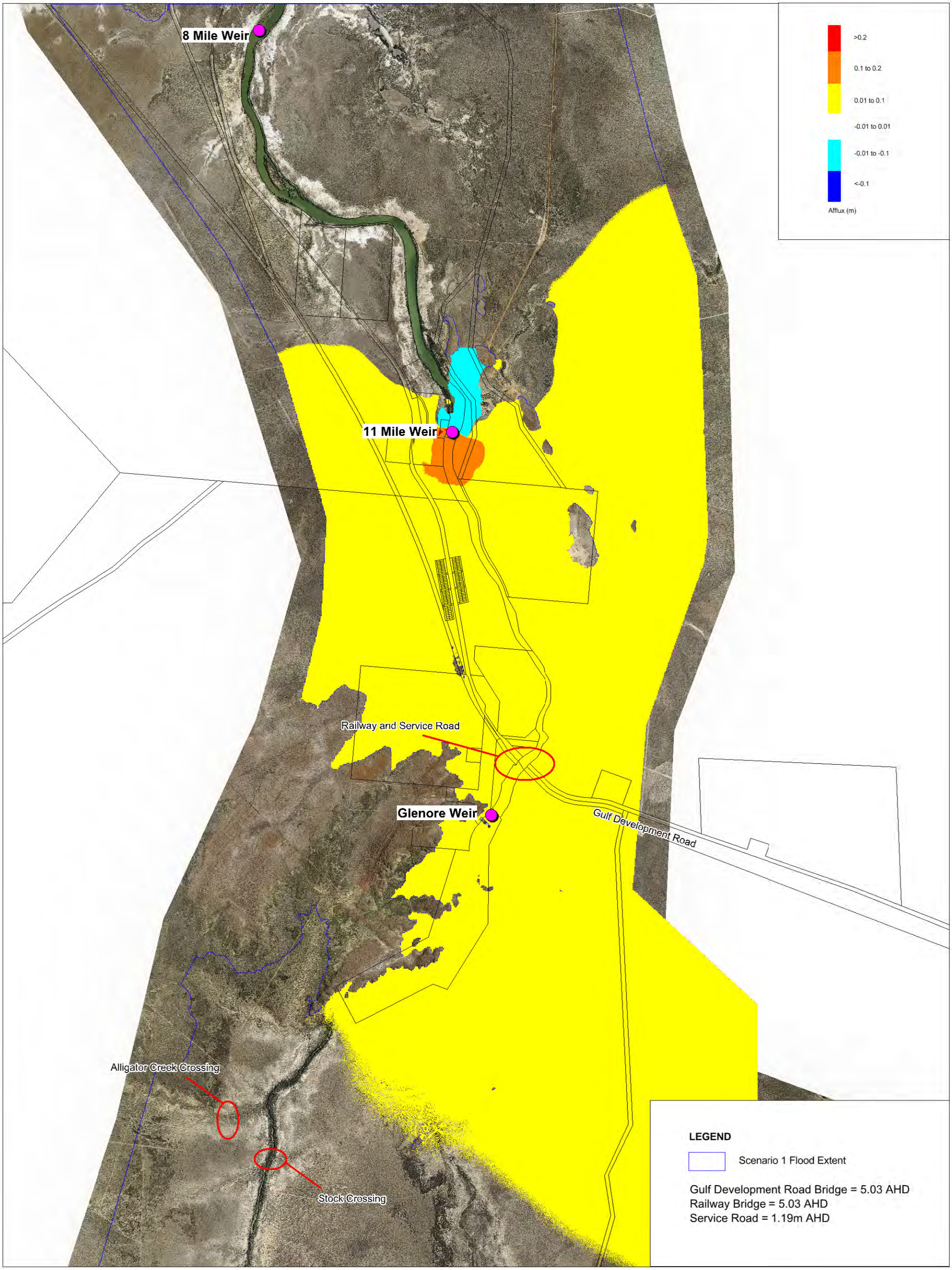
Level 1, 154 Melbourne Street
South Brisbane QLD 4101



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STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-024 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **100 YEAR AEP FLOOD AFFLUX - SCENARIO 3**

CLIENT

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Outback by the Sea

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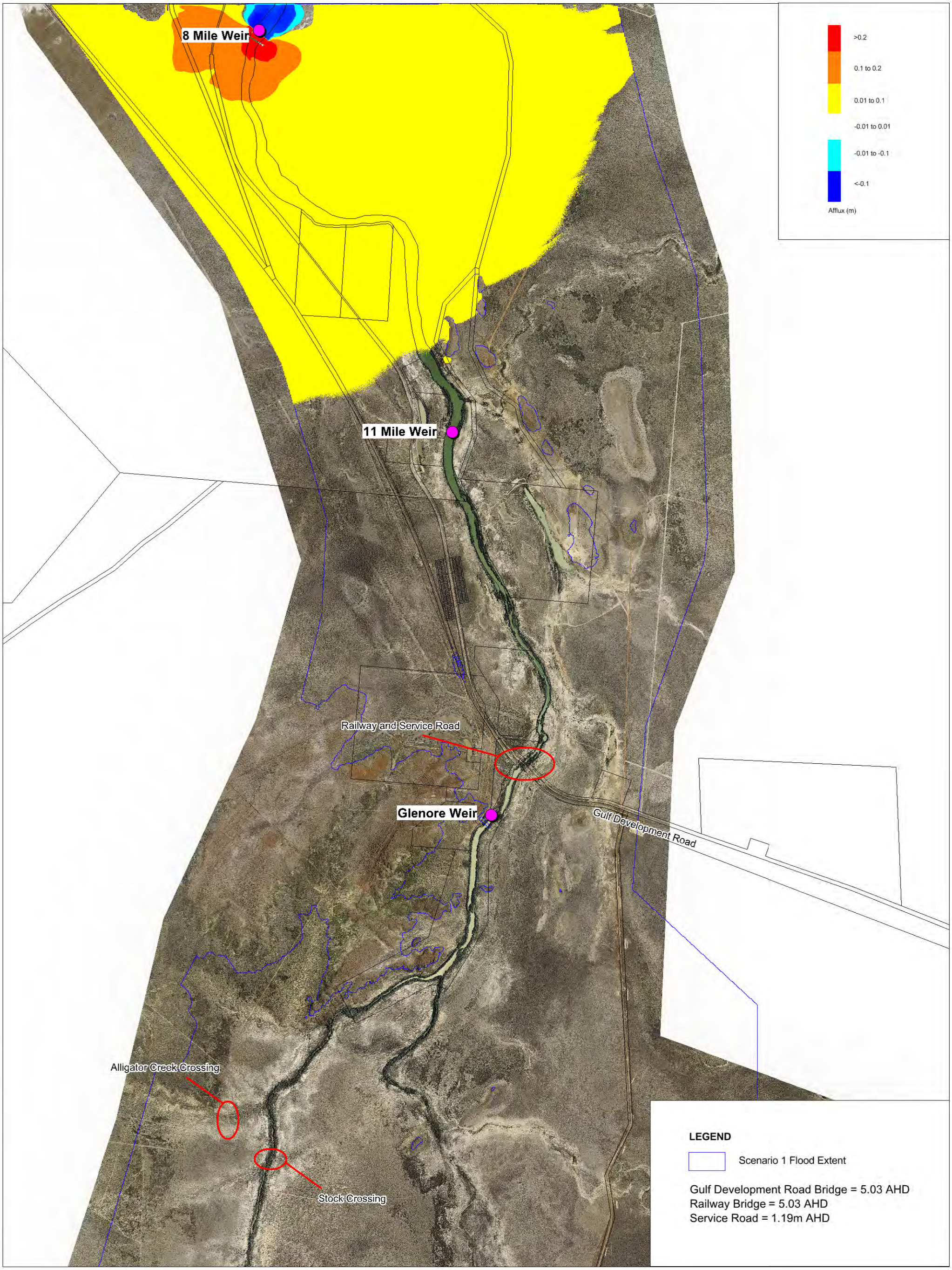
South Brisbane QLD 4101



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STATUS DRAFT

DRAWING NO. 30031084-WR-MAP-025 REVISION A

CREATED BY B Bolt DATE 16/01/2014

FOR CLIENT REVIEW

PROJECT NO. 30031084 PROJECT TITLE NORMANTON WEIR ASSESSMENT

TITLE **100 YEAR AEP FLOOD AFFLUX - SCENARIO 4**

CLIENT

CARPENTARIA SHIRE
Outback by the Sea

CONSULTANT

SMEC

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Level 1, 154 Melbourne Street
South Brisbane QLD 4101

APPENDIX D1 – REPAIR EXISTING GLENORE WEIR CONCEPT COST ESTIMATE

Carpentaria Shire Council

WATER SUPPLY UPGRADE OPTIONS

Concept Cost Estimates

REPAIR GLENORE WEIR
Scenario 1

Item	Description	Quantity	Unit	Rate	Amount

Sub Total $2,562,000

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				$2,946,300
8	Contingency	25%			$736,575
	TOTAL				$3,682,875
	ADOPTED CONCEPT COST				**$3,700,000**

APPENDIX D2 – RAISE GLENORE WEIR CONCEPT COST ESTIMATE

Carpentaria Shire Council

WATER SUPPLY UPGRADE OPTIONS

Concept Cost Estimates

RAISE GLENORE WEIR by 1.2M
Scenario 2

Item	Description	Quantity	Unit	Rate	Amount

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				$8,365,100
9	Contingency	25%			$2,091,275
	TOTAL				$10,456,375
	ADOPTED CONCEPT COST				**$10,500,000**

APPENDIX D3 – 11 MILE WEIR CONCEPT COST ESTIMATE

Carpentaria Shire Council

WATER SUPPLY UPGRADE OPTIONS

Concept Cost Estimates

11 MILE WEIR
Scenario 3

Item	Description	Quantity	Unit	Rate	Amount

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				$23,552,000
11	Contingency		25%		$5,888,000
	TOTAL				$29,440,000
	ADOPTED CONCEPT COST 11 Mile Weir				**$29,500,000**
	Cost of Repair to Existing Glenore Weir				$3,700,000
	TOTAL PROJECT COST 11 Mile				**$33,200,000**

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				$9,915,750
	Contingency	25%			$2,478,938
	TOTAL				$12,394,688
	ADOPT PIPELINE UPGRADE COST				**$12,400,000**

APPENDIX D4 – 8 MILE WEIR CONCEPT COST ESTIMATE

Carpentaria Shire Council

WATER SUPPLY UPGRADE OPTIONS

Concept Cost Estimates

8 MILE WEIR
Scenario 4

Item	Description	Quantity	Unit	Rate	Amount

Item	Description	Quantity	Unit	Rate	Amount

TOTAL	$35,535,000
ADOPTED CONCEPT COST 8 Mile Weir	**$35,600,000**
Cost of Repair to Existing Glenore Weir	$3,700,000
TOTAL PROJECT COST 8 Mile	**$39,300,000**

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				$7,881,750
	Contingency	25%			$1,970,438
	TOTAL				$9,852,188
	ADOPT PIPELINE UPGRADE COST				**$9,900,000**

APPENDIX D5 – LARGE OFFSTREAM STORAGE CONCEPT COST ESTIMATE

Carpentaria Shire Council

WATER SUPPLY UPGRADE OPTIONS

Concept Cost Estimates

OFFSTREAM STORAGE
Equivalent to Storage in 8 Mile Weir - 5500 ML

Item	Description	Quantity	Unit	Rate	Amount

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				$43,012,300
8	Contingency	25%			$10,753,075
	TOTAL				$53,765,375
	ADOPTED CONCEPT OFFSTREAM STORAGE COST				**$53,800,000**
	Cost of Repair to Existing Glenore Weir				$3,700,000
	TOTAL PROJECT COST				**$57,500,000**
	Sub Total				$11,187,000
	Contingency	25%			$2,796,750
	TOTAL				$13,983,750
	ADOPT PIPELINE UPGRADE COST				**$14,000,000**

APPENDIX D6 – SMALL OFFSTREAM STORAGE CONCEPT COST ESTIMATE

Carpentaria Shire Council

WATER SUPPLY UPGRADE OPTIONS

Concept Cost Estimates

OFFSTREAM STORAGE
Staged Storage - 800 ML

Item	Description	Quantity	Unit	Rate	Amount

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				$11,416,625
8	Contingency	25%			$2,854,156
	TOTAL				$14,270,781
	ADOPTED CONCEPT OFFSTREAM STORAGE COST				**$14,300,000**
	Cost of Repair to Existing Glenore Weir				$3,700,000
	TOTAL PROJECT COST				**$18,000,000**
	Upgrade of Pipeline to Normanton				
	Remaining distance of 22,000 m	22000	lin m	$450	$9,900,000
	Engineering (Design & Supervision	13%			$1,287,000
	Sub Total				$11,187,000
	Contingency	25%			$2,796,750
	TOTAL				$13,983,750
	ADOPT PIPELINE UPGRADE COST				**$14,000,000**

APPENDIX D7 – UPGRADE GLENORE PIPELINE

Carpentaria Shire Council

WATER SUPPLY UPGRADE OPTIONS

Concept Cost Estimates

UPGRADE GLENORE PIPELINE
Glenore Weir to Normanton WTP

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				$13,060,260
7	Contingency	25%			$3,265,065
	TOTAL				$16,325,325

ADOPTED CONCEPT COST **$16,400,000**

Average Cost per metre (excluding Eng & Conting.) ***$450.00***

APPENDIX D8 – DESALINATION PLANT AT NORMANTON

Carpentaria Shire Council

WATER SUPPLY UPGRADE OPTIONS

Concept Cost Estimates

DESALINATION PLANT AT NORMANTON
3.5 ML/day Package Treatment Plant

Item	Description	Quantity	Unit	Rate	Amount

Item	Description	Quantity	Unit	Rate	Amount
	Sub Total				**$6,128,750**
16	Contingency	20%			$1,225,750
	TOTAL				**$7,354,500**
	ADOPTED CONCEPT COST - 3.5 ML/D DESAL				**$7,400,000**

DOCUMENT / REPORT CONTROL FORM

File Location Name:	I:\Projects\30031084\006_Rptg\Draft\Normanton Report Issue
Project Name:	NORMANTON & KARUMBA WATER SUPPLY UPGRAGE OPTIONS STUDY
Project Number:	30031084
Revision Number:	01

Revision History

Revision #	Date	Prepared by	Reviewed by	Approved for Issue by
01	13/02/2014			

Issue Register

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Krystal Kirkman

From: Lynn Sawtell <Lynn.Sawtell@dilgp.qld.gov.au>
Sent: Thursday, 1 October 2015 9:46 AM
To: Natalie Karger
Cc: Michael Norris
Subject: FW: CRF - Requests for information
Attachments: ATT00001.htm; Glenore Weir Volumes_2.xlsx; ATT00002.htm; CRF - Carpentaria SC - Glenore Weir Raising Project - Request for information (QRA Ref CRF 21 15).xlsx; ATT00003.htm

Hi Natalie
Another one back.

Lynn

Lynn Sawtell
Manager, Grants Management
Finance and Funding
Department of Infrastructure, Local Government and Planning
p [redacted] **m.** Refused under sectio **e.** lynn.sawtell@dilgp.qld.gov.au

Customers first | **Ideas into action** | **Unleash potential** | **Be courageous** | **Empower people**

Please consider the environment before printing this email

Date	916001B 100 Level (Metres) Mean
Jan-97	6.661
Feb-97	7.289
Mar-97	7.65
Apr-97	6.436
May-97	6.103
Jun-97	5.719
Jul-97	5.3
Aug-97	4.802
Sep-97	4.239
Oct-97	4.329
Nov-97	5.238
Dec-97	6.44
Jan-98	9.814
Feb-98	6.916
Mar-98	10.206
Apr-98	6.526
May-98	6.441
Jun-98	6.159
Jul-98	5.772
Aug-98	5.299
Sep-98	4.757
Oct-98	4.127
Nov-98	5.424
Dec-98	6.495
Jan-99	6.79
Feb-99	6.751
Mar-99	8.715
Apr-99	6.756
May-99	6.458
Jun-99	6.142
Jul-99	5.699
Aug-99	5.175
Sep-99	4.594
Oct-99	3.964
Nov-99	3.986
Dec-99	5.462
Jan-00	6.644
Feb-00	7.49
Mar-00	9.021
Apr-00	6.603
May-00	6.329
Jun-00	6.323
Jul-00	6.138
Aug-00	5.732
Sep-00	5.233

Oct-00	4.677
Nov-00	5.679
Dec-00	7.54
Jan-01	9.019
Feb-01	7.408
Mar-01	6.877
Apr-01	6.603
May-01	6.28
Jun-01	5.85
Jul-01	5.353
Aug-01	4.788
Sep-01	4.178
Oct-01	3.55
Nov-01	3.057
Dec-01	4.735
Jan-02	6.779
Feb-02	6.77
Mar-02	7.252
Apr-02	6.412
May-02	6.015
Jun-02	5.557
Jul-02	5.073
Aug-02	4.545
Sep-02	3.997
Oct-02	3.361
Nov-02	2.887
Dec-02	6.036
Jan-03	6.41
Feb-03	6.514
Mar-03	6.852
Apr-03	6.451
May-03	6.153
Jun-03	5.784
Jul-03	5.347
Aug-03	4.857
Sep-03	4.332
Oct-03	3.75
Nov-03	3.099
Dec-03	3.949
Jan-04	6.651
Feb-04	7.024
Mar-04	6.627
Apr-04	6.394
May-04	6.087
Jun-04	5.684
Jul-04	5.31
Aug-04	5.06
Sep-04	4.701
Oct-04	4.138
Nov-04	3.579

Dec-04	5.198
Jan-05	6.795
Feb-05	6.668
Mar-05	6.407
Apr-05	5.983
May-05	5.63
Jun-05	5.323
Jul-05	4.916
Aug-05	4.405
Sep-05	3.885
Oct-05	3.541
Nov-05	3.355
Dec-05	5.529
Jan-06	6.631
Feb-06	7.536
Mar-06	7.751
Apr-06	10.276
May-06	6.728
Jun-06	6.45
Jul-06	6.383
Aug-06	6.343
Sep-06	5.91
Oct-06	5.332
Nov-06	4.697
Dec-06	4.051
Jan-07	6.058
Feb-07	6.924
Mar-07	6.588
Apr-07	6.474
May-07	6.122
Jun-07	5.772
Jul-07	5.569
Aug-07	5.188
Sep-07	4.665
Oct-07	4.171
Nov-07	4.15
Dec-07	5.728
Jan-08	8.543
Feb-08	7.183
Mar-08	7.397
Apr-08	6.423
May-08	6.032
Jun-08	5.624
Jul-08	5.296
Aug-08	4.795
Sep-08	4.198
Oct-08	3.581
Nov-08	3.174
Dec-08	3.99
Jan-09	10.251

Feb-09	12.876
Mar-09	8.319
Apr-09	6.504
May-09	6.417
Jun-09	6.07
Jul-09	5.673
Aug-09	5.185
Sep-09	4.614
Oct-09	4.03
Nov-09	3.589
Dec-09	3.551
Jan-10	6.927
Feb-10	9.58
Mar-10	8.846
Apr-10	8.608
May-10	6.472
Jun-10	6.208
Jul-10	5.809
Aug-10	5.284
Sep-10	4.659
Oct-10	4.029
Nov-10	3.563
Dec-10	6.087
Jan-11	9.54
Feb-11	9.749
Mar-11	11.525
Apr-11	8.671
May-11	6.506
Jun-11	6.456
Jul-11	6.174
Aug-11	5.711
Sep-11	5.171
Oct-11	4.581
Nov-11	4.037
Dec-11	3.717
Jan-12	4.844
Feb-12	6.706
Mar-12	8.389
Apr-12	7.23
May-12	6.434
Jun-12	6.145
Jul-12	5.92
Aug-12	6.317
Sep-12	5.817
Oct-12	5.209
Nov-12	4.749
Dec-12	4.28
Jan-13	5.223
Feb-13	6.508
Mar-13	6.515

Apr-13	6.43
May-13	6.136
Jun-13	5.913
Jul-13	5.627
Aug-13	5.331
Sep-13	4.962
Oct-13	4.534
Nov-13	4.746
Dec-13	6.371
Jan-14	6.392
Feb-14	8.08
Mar-14	6.965
Apr-14	6.325
May-14	5.991
Jun-14	5.636
Jul-14	5.33
Aug-14	5.069
Sep-14	4.565
Oct-14	3.917
Nov-14	3.311
Dec-14	3.911
Jan-15	6.865
Feb-15	6.592
Mar-15	6.437
Apr-15	6.044
May-15	5.706
Jun-15	5.44
Jul-15	5.006

Gauge 916001B - Norman River @Glenore Weir

(Gauge Zero of the gauge is -4.315 metres Australian Height Datum (please note the negative))

Date	Level (Metres) Mean	Est Storage ML
Jan-97	6.661	1,840
Feb-97	7.289	1,840
Mar-97	7.65	1,840
Apr-97	6.436	1,832
May-97	6.103	1,647
Jun-97	5.719	1,447
Jul-97	5.3	1,242
Aug-97	4.802	1,020
Sep-97	4.239	795
Oct-97	4.329	829
Nov-97	5.238	1,213
Dec-97	6.44	1,834
Jan-98	9.814	1,840
Feb-98	6.916	1,840
Mar-98	10.206	1,840
Apr-98	6.526	1,840
May-98	6.441	1,835
Jun-98	6.159	1,678
Jul-98	5.772	1,474
Aug-98	5.299	1,242
Sep-98	4.757	1,001
Oct-98	4.127	753
Nov-98	5.424	1,301
Dec-98	6.495	1,840
Jan-99	6.79	1,840
Feb-99	6.751	1,840
Mar-99	8.715	1,840
Apr-99	6.756	1,840
May-99	6.458	1,840
Jun-99	6.142	1,668
Jul-99	5.699	1,436
Aug-99	5.175	1,184
Sep-99	4.594	933
Oct-99	3.964	695
Nov-99	3.986	703
Dec-99	5.462	1,319
Jan-00	6.644	1,840
Feb-00	7.49	1,840
Mar-00	9.021	1,840
Apr-00	6.603	1,840
May-00	6.329	1,772
Jun-00	6.323	1,768
Jul-00	6.138	1,666
Aug-00	5.732	1,453
Sep-00	5.233	1,211
Oct-00	4.677	967
Nov-00	5.679	1,426
Dec-00	7.54	1,840
Jan-01	9.019	1,840
Feb-01	7.408	1,840

Average Monthly Rainfalls

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2001				0.0	0.0	0.8	0.0	0.2	0.0	3.8	14.2	120.2	139.2
2002	190.0	113.2	64.2	0.0	0.2	0.0	0.0	2.0	0.2	0.0	143.0	102.2	615.0
2003	170.6	169.6	80.6	0.0	0.0	4.8	0.2	0.2	0.0	1.2	1.6	192.0	620.8
2004	222.4	309.6	51.4	8.6	0.0	0.0	0.0	0.0	0.0	2.8	44.2	121.6	760.6
2005	236.4	71.2	43.8	0.0	0.0	0.0	0.2	6.8	39.8	3.4	38.8	94.8	535.2
2006	128.2	32.4	271.6	208.2	5.0	0.0	15.8	0.2	1.0	0.0	28.4	35.0	725.8
2007	154.6	231.2	92.6	0.0	6.0	59.8	0.0	1.2	5.8	2.6	31.8	75.8	661.4
2008	147.8	327.4	29.6	0.0	0.0	0.0	4.4	0.2	0.0	17.0	36.6	52.4	615.4
2009	787.8	267.2	28.0	6.0	0.4	0.2	0.4	0.2	0.0	0.0	20.0	227.4	1,337.6
2010	223.6	246.2	113.8	97.0	1.8	0.0	0.4	0.0	49.8	3.8	86.6	359.8	1,182.8
2011	375.0	188.2	468.0	35.8	0.0	0.2	0.0	0.0	0.0	58.2	22.2	144.2	1,291.8
2012	165.6	119.2	478.0	2.6	3.4	0.0	1.4	0.4	3.0	0.2	0.6	92.6	867.0
2013	229.8	77.0	67.8	57.8	37.8	0.0	0.0	0.0	0.0	0.0	143.0	104.8	718.0
2014	128.0	360.4	52.8	75.4	0.0	2.6	0.2	0.4	0.4	0.0	2.2	66.6	689.0
2015	297.4	137.2	16.2	35.2	0.8	0.0	0.0	0.4					487.2

Mar-01	6.877	1,840
Apr-01	6.603	1,840
May-01	6.28	1,744
Jun-01	5.85	1,514
Jul-01	5.353	1,267
Aug-01	4.788	1,014
Sep-01	4.178	772
Oct-01	3.55	557
Nov-01	3.057	413
Dec-01	4.735	992
Jan-02	6.779	1,840
Feb-02	6.77	1,840
Mar-02	7.252	1,840
Apr-02	6.412	1,818
May-02	6.015	1,600
Jun-02	5.557	1,366
Jul-02	5.073	1,138
Aug-02	4.545	914
Sep-02	3.997	707
Oct-02	3.361	500
Nov-02	2.887	369
Dec-02	6.036	1,611
Jan-03	6.41	1,817
Feb-03	6.514	1,840
Mar-03	6.852	1,840
Apr-03	6.451	1,840
May-03	6.153	1,674
Jun-03	5.784	1,480
Jul-03	5.347	1,264
Aug-03	4.857	1,043
Sep-03	4.332	830
Oct-03	3.75	622
Nov-03	3.099	425
Dec-03	3.949	690
Jan-04	6.651	1,840
Feb-04	7.024	1,840
Mar-04	6.627	1,840
Apr-04	6.394	1,808
May-04	6.087	1,639
Jun-04	5.684	1,429
Jul-04	5.31	1,247
Aug-04	5.06	1,132
Sep-04	4.701	977
Oct-04	4.138	757
Nov-04	3.579	567
Dec-04	5.198	1,195
Jan-05	6.795	1,840
Feb-05	6.668	1,840
Mar-05	6.407	1,816
Apr-05	5.983	1,583
May-05	5.63	1,402
Jun-05	5.323	1,253
Jul-05	4.916	1,069
Aug-05	4.405	858
Sep-05	3.885	668
Oct-05	3.541	555

Nov-05	3.355	498
Dec-05	5.529	1,352
Jan-06	6.631	1,840
Feb-06	7.536	1,840
Mar-06	7.751	1,840
Apr-06	10.276	1,840
May-06	6.728	1,840
Jun-06	6.45	1,840
Jul-06	6.383	1,802
Aug-06	6.343	1,779
Sep-06	5.91	1,545
Oct-06	5.332	1,257
Nov-06	4.697	976
Dec-06	4.051	726
Jan-07	6.058	1,623
Feb-07	6.924	1,840
Mar-07	6.588	1,840
Apr-07	6.474	1,840
May-07	6.122	1,658
Jun-07	5.772	1,474
Jul-07	5.569	1,372
Aug-07	5.188	1,190
Sep-07	4.665	963
Oct-07	4.171	769
Nov-07	4.15	762
Dec-07	5.728	1,451
Jan-08	8.543	1,840
Feb-08	7.183	1,840
Mar-08	7.397	1,840
Apr-08	6.423	1,825
May-08	6.032	1,609
Jun-08	5.624	1,399
Jul-08	5.296	1,240
Aug-08	4.795	1,017
Sep-08	4.198	779
Oct-08	3.581	567
Nov-08	3.174	446
Dec-08	3.99	704
Jan-09	10.251	1,840
Feb-09	12.876	1,840
Mar-09	8.319	1,840
Apr-09	6.504	1,840
May-09	6.417	1,821
Jun-09	6.07	1,630
Jul-09	5.673	1,423
Aug-09	5.185	1,189
Sep-09	4.614	942
Oct-09	4.03	718
Nov-09	3.589	570
Dec-09	3.551	558
Jan-10	6.927	1,840
Feb-10	9.58	1,840
Mar-10	8.846	1,840
Apr-10	8.608	1,840
May-10	6.472	1,840
Jun-10	6.208	1,705

Jul-10	5.809	1,492
Aug-10	5.284	1,235
Sep-10	4.659	960
Oct-10	4.029	718
Nov-10	3.563	561
Dec-10	6.087	1,639
Jan-11	9.54	1,840
Feb-11	9.749	1,840
Mar-11	11.525	1,840
Apr-11	8.671	1,840
May-11	6.506	1,840
Jun-11	6.456	1,840
Jul-11	6.174	1,686
Aug-11	5.711	1,443
Sep-11	5.171	1,183
Oct-11	4.581	928
Nov-11	4.037	721
Dec-11	3.717	611
Jan-12	4.844	1,038
Feb-12	6.706	1,840
Mar-12	8.389	1,840
Apr-12	7.23	1,840
May-12	6.434	1,831
Jun-12	6.145	1,670
Jul-12	5.92	1,550
Aug-12	6.317	1,765
Sep-12	5.817	1,497
Oct-12	5.209	1,200
Nov-12	4.749	997
Dec-12	4.28	810
Jan-13	5.223	1,207
Feb-13	6.508	1,840
Mar-13	6.515	1,840
Apr-13	6.43	1,829
May-13	6.136	1,665
Jun-13	5.913	1,546
Jul-13	5.627	1,400
Aug-13	5.331	1,257
Sep-13	4.962	1,089
Oct-13	4.534	909
Nov-13	4.746	996
Dec-13	6.371	1,795
Jan-14	6.392	1,807
Feb-14	8.08	1,840
Mar-14	6.965	1,840
Apr-14	6.325	1,769
May-14	5.991	1,587
Jun-14	5.636	1,405
Jul-14	5.33	1,256
Aug-14	5.069	1,136
Sep-14	4.565	922
Oct-14	3.917	679
Nov-14	3.311	485
Dec-14	3.911	677
Jan-15	6.865	1,840
Feb-15	6.592	1,840

Mar-15	6.437	1,833
Apr-15	6.044	1,616
May-15	5.706	1,440
Jun-15	5.44	1,309
Jul-15	5.006	1,108

Community Resilience Fund

Agency / Local Government Area	Carpentaria Shire Council
Assessment	Joint Compliance/VfM Assessment
Application Details	Glenore Weir Raising Project (CRF.21.15)

Assessment Criteria / Project Details	Compliance queries	VFM queries	Council response	Final comments
Basic project details.				
Details of how the project supports the 2015-26 CRF objectives.				
How council determined the project is a priority need and why this project is the preferred option.				
Summary of nature and history of natural disaster events and the identified needbeing addressed by this project.	Council has noted restricted water supply due to a low-rain wet season in 2012/2013. Can council provide an indication of what % the town's water supply reached in this period. Please provide any similar historical data for previous years.		Have provided the last 10 years (monthly) level of the Norman River at Glenore Weir as well as the average monthly rainfall for the last 10 years. Straight correlation in that weir levels are high during the rains and period after and drops during the dry months.	
Outline of how the project will build resilience, help reduce the impact of future natural disasters and benefit the community.				
Details of catchment-wide considerations incorporated into the proposed project.				
Details of any existing works, measures or related activities that address natural disasters.				
Details of any community, economic environmental or other benefits that will be delivered as a result of this project.	Please outline how many jobs (if any) will be created as a result of this project. Please advise whether any jobs are likely to go to locals.		During construction it was estimated that there would be around 30-35 jobs created out of the project for a period of 9 months. After construction of the weir, Council anticipates that the increase in water storage and supply would initially open the opportunities to further expand land developments and progress its Lilyvale subdivision. Having the water capacity, Council is keen to promote and attract further business at the Karumba Port - which in turn would attract further follow-on activity such as housing and small business to serve the increase in demand.	
Details of community and/or regional support for the project.				
Criteria that council will use to measure the success of the project.				
Proposed project delivery timeframes.		It is noted that comments in the SMEC Options Study indicate further investigation is required to support the preferred option, that various permits and approvals are required and that work will need to be undertaken during the dry season. However, it is also noted ithat council's application identifies works as ready to commence, with a noted commencement date of August/September 2015. Please clarify this discrepency and provide further data supporting that the project is ready to commence (i.e has progressed through design, tender and contract stages).	Council undertook further cost estimates of the options provided and engaged further consultants (as well as further community consultation workshops) to identify the most appropriate and "best bang-for-buck" option. The raising the Glenore Weir option was identified as the most appropriate and Council then committed further funding to progress further investigations, design and quantatitive estimates. Part of these further works included obtaining all relevant approvals, as well as factoring required conditions into the plans (including the fish way component) We are currently in the "dry season" as normal wet season begins November through till April. Council undertook the tender process and awarded the successful tenderer Koppen Construction, the contract in July 2015. They mobilised onto site just recently. Attached copy of July meeting agenda item - awarding tender construction	
The project's link to to council's corporate and forward planning processes or regional plans.				
Commitment to the ongoing operation and maintenance of the proposed infrastructure project, post completion.				
Details of land tenure where the project will be located.				
Native title and/or cultural heritage consideration.				
Proposed budget for project.		Please clarify what the ineligible costs of $1,000,000 represents.	Council has already expended funds in regards to initial investigations, surveys, design, consultation and tender process. As these costs/works have already been incurred, under Section 2.3 of the CRF 2015/16 Guidelines we deemed them to be ineligible.	
Previous Qld Government funding for any component of this project.				
Breakdown of project costs.		It is noted the SMEC report has a cost estimate totalling $10,456,375 however council's application identifies a project total of $11M. Please reconcile the Breakdown of Project costs included in section 4 of Council's Application with the concept cost estimate ibncluded as appendix D2 of the SMEC report.	SMEC's figure were initial estimates, once Council committed to investigating the raising the weir option (and subsequently undertaking the tender process) Revised costings were projected. Have provided copies of Tender analysis notes for the construction component as well as the overall project component.	
Supporting documents.				

2015-16 COMMUNITY RESILIENCE FUND
ASSESSMENT FORM

	DILGP - Local Government region	NORTHERN	**GRaNT project ref. number**	
	Assessing officer/s	Peter Whiting	**Source ref. number** (Compliance & Assessment Form)	**WR15/18046**
PART 1 - APPLICANT AND PROJECT DETAILS				
Application ref.				
Section 1 Q1.1	**Council/Applicant name**	Carpentaria Shire Council		
Section 1 Q1.3	**Project title**	Glenore Weir Raising Project		

PART 2 - APPLICATION ASSESSMENT

Measure 1 - Assessment of program priorities

Application ref.	Assessment criteria	20%
Section 2 Q2.1	**How the project supports the 2015-16 CRF objectives**	3
	SCORE %	**12**

Measure 1 - Assessment of program priorities comments

Project is primarily a drought resilience project, however, project clearly fits under CRF objectives .. to support “at risk” local governments that are faced with significant funding challenges and have restricted capacity to fund critical infrastructure.

Measure 2 - Assessment of need / Community benefits / Value for money

Application ref.	Assessment criteria	40%
Section 2 Q2.2, Q 2.3, Q2.6, Q2.8, Q2.11	**The project addresses an identified priority need**	5
Section 2 Q2.4, Q2.11	**The project will Make Queensland communities more resilient in relation to natural disasters**	5
Section 2 Q2.5, 2.8	**The project builds partnerships between sectors and encourages a regional and catchment area approach to mitigation and resilience**	3
Section 2 2.11	**Criteria that will be used to measure the success of project**	5
Section 2 Q2.2; Q2.11, Q2.12, Q2.13, Q2.15, Q2.16, Q2.17	**Project is financially sound and demonstrates value for money**	3
	SCORE %	**34**

Measure 1 - Assessment of need / Community benefits and support / Value for money comments

Measure 3 - Assessment of ability to deliver		
Application ref.	**Assessment criteria**	**40%**
Section 2 Q2.13 & Supporting Docs	**Project links to corporate and forward planning processes**	5
Section 2 Q2.12, Q2.13 Project Plan	**Project will be delivered within the required timeframes**	5
Project Plan	**Project plan**	5
Section 1 Q1.6	**Project site details**	3
Section 3 Q.2.1 Section 4	**Proposed project budget**	5
	SCORE %	**37**

Measure 3 - Assessment of ability to deliver comments

PART 3 - RESULTS OF REGION'S ASSESSMENT AND MODERATION	100%

TOTAL WEIGHTED SCORE	82	%

Is this LGGSP application being recommended?	**YES**
Region priority ranking	**HIGH**

Assessor/s comments

The project is primarily a drought resilience project. Specifically, the objectives of the CRF include funding essential disaster mitigation infrastructure that will support communities to build resilience to future natural disaster events and supporting "at risk" local governments that are faced with significant funding challenges and have restricted capacity to fund critical infrastructure. In addition, eligible projects include projects aimed at addressing climate change impacts. The Department has been involved in discussions with Council concerning the security and reliability of Council's water supply for a number of years. Council has funded numerous studies to identify those projects most likely to provide a secure and reliable water supply to Normanton and Karumba. These studies were conducted on the basis that Council's water supply is heavily dependent on a significant wet-season occurring each year, a risky proposition given recent poor wet seasons. The 'Normanton & Karumba Water Supply Upgrade Options Study' (2014) identified that the most cost effective solution based on costs alone would be the raising of Glenore Weir, with this option providing the best value for money for the provision of a long term secure water supply. Extensive community consultation was undertaken as part of the above water study. Support for Council's CRF submission would complement existing State funding provided to Council to secure its water supply. For example, in the 2012-13 round of LGGSP, the State approved funding of $1,324,214 to construct an additional 2.5ML water storage tank in Normanton. This infrastructure provided Normanton with extra water storage in case of a breakage in Council's water supply system and the project was completed on time and on budget.

Regional Director comments

In completing this assessment (through sign-off in the Source) I/we declare that, I/we have assessed the application against the assessment criteria and not aware of any real or perceived conflict of interest I/we may have in relation to the assessment of this application from Council.

Completed by (Assessment officer/s name/s)	**Peter Whiting**	**Date**	**15/09/2015**
Recommendation endorsed by (Regional Director name)	**Jo Stephenson**	**Date**	**30/09/2015**

NORTHERN		0	0
SOUTHERN		1	5
	Drought resilience	3	
	Water infrastructure	5	
HIGH	Sewerage infrastructure		YES 0
MEDIUM	Community infrastructure		NO 1
LOW	Crime prevention and community safety infrastructure		N/A 3
	Economic development		5

Tourism infrastructure	
Other	
New infrastructure	
Upgrade of existing infrastructure	
Replacement of existing infrastructure	
Other	

RECOMMENDED	0
NOT RECOMMENDEI	1
	5
Aurukun Shire Council	0
Balonne Shire Council	3
Banana Shire Council	5
Barcaldine Regional Council	
Barcoo Shire Council	
Blackall-Tambo Regional Council	
Boulia Shire Council	
Brisbane City Council	
Bulloo Shire Council	
Bundaberg Regional Council	
Burdekin Shire Council	
Burke Shire Council	
Cairns Regional Council	
Carpentaria Shire Council	
Cassowary Coast Regional Council	
Central Highlands Regional Council	
Charters Towers Regional Council	
Cherbourg Aboriginal Shire Council	
Cloncurry Shire Council	
Cook Shire Council	
Croydon Shire Council	
Diamantina Shire Council	
Doomadgee Aboriginal Shire Council	
Douglas Shire Council	
Etheridge Shire Council	
Flinders Shire Council	
Fraser Coast Regional Council	
Gladstone Regional Council	
Gold Coast City Council	
Goondiwindi Regional Council	
Gympie Regional Council	
Hinchinbrook Shire Council	
Hope Vale Aboriginal Shire Council	
Ipswich City Council	
Isaac Regional Council	
Kowanyama Aboriginal Shire Council	
Livingstone Shire Council	
Lockhart River Aboriginal Shire Council	
Lockyer Valley Regional Council	
Logan City Council	
Longreach Regional Council	
Mackay Regional Council	
Mapoon Aboriginal Shire Council	
Maranoa Regional Council	
Mareeba Shire Council	

McKinlay Shire Council
Moreton Bay Regional Council
Mornington Shire Council
Mount Isa City Council
Murweh Shire Council
Napranum Aboriginal Shire Council
Noosa Shire Council
North Burnett Regional Council
Northern Peninsula Area Regional Council
Palm Island Aboriginal Shire Council
Paroo Shire Council
Pormpuraaw Aboriginal Shire Council
Quilpie Shire Council
Redland City Council
Richmond Shire Council
Rockhampton Regional Council
Scenic Rim Council
Somerset Regional Council
South Burnett Regional Council
Southern Downs Regional Council
Sunshine Coast Regional Council
Tablelands Regional Council
Toowoomba Regional Council
Torres Shire Council
Torres Strait Island Regional Council
Townsville City Council
Western Downs Regional Council
Whitsunday Regional Council
Winton Shire Council
Woorabinda Aboriginal Shire Council
Wujal Wujal Aboriginal Shire Council
Yarrabah Aboriginal Shire Council

Queensland Reconstruction Authority

Community Resilience Fund (CRF)

2015-16 Project Review

Council:	**Carpentaria Shire Council**
Project Title:	**CRF.21.15 – Glenmore Weir Raising Project**
QRA Assessors:	**Phillip Green / Steven Vickery**
	Neville Newbold

Project Overview

Brief description of project
Council's project proposes to raise the Glenmore Weir on the Normanton River, addressing the critical and dangerous water shortages faced annually within Carpentaria Shire. The project also includes updating of associated pumping equipment which is known to be in poor condition. Council has identified the existing capacity of the Glenmore Weir as insufficient to provide the townships of Normanton and Karumba with an ongoing, safe and reliable source of water. Council has cited recent experience, whereby the water supply has neared full depletion, as highlighting the need for immediate action to increase the weir's capacity. Carpentaria Shire Council is a category 3 council; with a population base of around 2,500, with 900 rateable properties. This results in significant funding challenges with regard to critical infrastructure. Council notes this project is approximately three times the annual revenue attributed to general rates. Notes on eligibility: • The core aim of council's project is to safeguard the water supply of Normanton and Karumba; ensuring the community has adequate water during severe drought conditions. Whilst this project offers benefits in terms of community resilience, the aims and objectives of the CRF place a clear emphasis on flood and cyclone mitigation. It appears this project may not be consistent with aims and objectives of the CRF, other than to safeguard a clearly at risk community. • QRA notes this project may be better suited to an alternative funding source, particularly the LGGSP, which provides specific assistance for drought affected communities. • Council's has confirmed the tender process for this project is complete, with the contract awarded to Koppen Construction (KC) in July 2015. KC has mobilised and council has noted works began in August/September 2015, with scheduled completion in April 2016. It is noted section 2.3 of the CRF Guidelines identifies works that have already begun as ineligible. • Council has noted ineligible costs relating to works completed to date ($1,012,000) and contingency above 15% ($1,113,000). These costs relate to design and planning, rather than actual construction. • A Value for Money (VFM) assessment has been completed. The project appears to provide VFM.

Review Findings

1. The project provides infrastructure that builds resilience for the community and achieves improved mitigation outcomes.
The project appears partially consistent with the CRF aims and objectives, in that it will address an issue that is placing a community at risk and safeguard the water supply for the townships of Normanton and Karumba. However, the project does not appear consistent with the primary aims and objectives of the CRF, which involve the building of resilience to flood and cyclone events. • The project will require a decision from the Department over its consistency with CRF aims and objectives and in relation to specific eligibility concerns. As evidence of the need for these works, Council has detailed the reliance of the Normanton and Karumba townships on the annual monsoon season for their water supply. The current weir has only enough capacity to last from one wet season to the next. The reliance on this weather event was highlighted during the 2012/13 wet season, which failed to fully replenish the flows in the Normanton River and resulted in the town water supply nearing depletion. There is no alternative water supply available, with the only option to bring in potable water. Given the townships use approximately 1,000,000 litres each per day, transporting water is not a viable solution. In the event of water running out, the towns of Normanton and Karumba would need to be evacuated, creating irreparable damage to the economic and social fabric of the Shire. • Council has noted the situation will continue to worsen as the population increases and the influx of tourists rises – the population of Karumba is 600, but this can rise to 4500 during the tourist season, and the population of Normanton is 1600, rising to 2200 during the tourist season. Council also plans to attract industry to the area, which will place added pressure of the water supply. Raising the existing weir will provide sufficient yield to meet increasing demands for nearly 30 years (subject to upper and lower bound demands), but will require providing a fish passage on the raised weir. Sunwater has previously examined this option and concluded that the site is suitable for raising the height of the weir crest by approximately 1.2m.

By raising the weir, council's project aims to:

- Increase the height of the weir by 1.2m;
- Increase capacity from 960ML to 2200ML;
- Increase the Maximum Annual Safe Yield from 310 ml/year to 1250 ml/year.

Council has noted clear community benefits associated with the project, including:

- Ongoing, safe and reliable drinking water;
- Sustainable economic development opportunities;
- Realisation of key economic opportunities (e.g. Karumba Port, & agricultural lands);
- Improved amenity, quality of life, growth, and prosperity; and
- Creation of 30-35 jobs over the project period.

Council has advised it has explored alternative solutions to increasing weir height, such as using portable pumps to transfer water from downstream pools however these too involve unrealistic demands for transporting water.

Historical expenditure		
Year	**Expenditure**	**Comments**
2015	$	
2014	$	
2013	$	
2012	$	
2011	$	
Total	**$**	**Not provided by Council**

2. Demonstrated commitment by the applicant to co-fund the project

The project line to council's corporate and forward planning process and is part of Council's Long Term Financial Forecasting and is included in the 2014/15 Carpentaria Shire Annual Budget.

3. The project is financially sound and is ready to be delivered

The project is assessed as financially sound and is ready to be delivered.

Council has tendered the works and awarded a contract for the full scope of works. The accepted tender price was approximately 12% below the project budget. On this basis the project can be assessed as providing value for money.

The ongoing management of the project will be undertaken by independent consultants on behalf of Council.

Council has confirmed the Contractor, KC has recently mobilised to site.

4. The project has demonstrated community support
Various public consultation meetings and workshops were held in both Normanton and Karumba to outline the findings of the study and to go through in-depth the various options available. Participants voted for the most appropriate option for Council to pursue. Without expanding the current water supply, there is no opportunity to: • Cater for expanding tourism market; • Supply water to any more mining projects; • Expand the Port of Karumba – identified as critical to the development of agriculture in Northern Australia; • Encourage development of any type; residential or industrial. The importance of water infrastructure is identified as being essential for the long term development of regional Queensland. The water supply project satisfies the priority action areas of the framework of: • Growing regions: capitalising on economic drivers; • Infrastructure services for regional growth; & • Attracting and retaining people in regional Queensland.

5. The project is collaborative and based upon a regional catchment approach (where relevant)
Council has recently upgraded its reservoirs in Normanton to allow for extra storage capacity in stored potable water. Currently reservoirs in Normanton and Karumba allow for continued supply for 3 days and 7 days respectively, should water supply at the source by interrupted. Council also implements stringent water restrictions when water supplies are reaching critical levels. This enables supply to continue in the hope that seasonal rains will replenish supplies.

Options Review Findings

Council's Preferred Option	
Describe the engineering treatment associated with this option:	Raising the existing weir to increase water storage volumes and replacement of water supply infrastructure at the site.
What risks are associated with this option?	Design is complete, the works tendered and a contract awarded. The remaining risks relate to normal construction risk for a project of this type.
What is the total estimated project cost for this option?	$11,000,000.00
Cost build-up:	Council has provided details of the tenders received for the works
Why is this Council's preferred option?	This was the most cost effective of the options detailed in the SMEC report included with the submission. This option also provides maximum utilisation of the existing water distribution infrastructure.

Alternative Option Considered	
Describe the engineering treatment associated with this option:	The SMEC report detailed options of constructing new weirs downstream from the existing weir and increasing storage in offsite tanks. These options were all discounted based on construction and operational costs.
What risks are associated with this option?	N/a
What is the total estimated project cost for this option?	N/a

Financial Elements

Project costs	Requested	Recommended
A - Total Project Cost	$11,000,000.00	
B - Other contributions	$ Nil	
C - Ineligible costs	$1,000,000.00	
D - Claimable Project Cost (A-(B+C))	$10,000,000.00	$TBC
E - CRF subsidy (% of D)	$4,000,000.00 40%)	$TBC (TBC%)

Comments

- Project provides resilience benefit, however may not align with CRF guidelines. DILGP to advise on eligibility.
- Council's response to QRA requests for information indicate that $2.125 million of work was undertaken on this project, and Council advise it will not seek reimbursement of that amount.

Krystal Kirkman

From: Lynn Sawtell <Lynn.Sawtell@dilgp.qld.gov.au>
Sent: Thursday, 1 October 2015 10:19 AM
To: Natalie Karger
Cc: Michael Norris
Subject: FW: CRF - Requests for information
Attachments: ATT00001.htm; doc00712020151001100717.pdf; ATT00002.htm

Hi Natalie
Further information just came in on the Carpentaria application.

Lynn

Lynn Sawtell
Manager, Grants Management
Finance and Funding
Department of Infrastructure, Local Government and Planning
p. [redacted] **m.** Refused under sectio | **e.** lynn.sawtell@dilgp.qld.gov.au

Customers first | **Ideas into action** | **Unleash potential** | **Be courageous** | **Empower people**

Please consider the environment before printing this email

4. Conclusion

The twenty (20) tender submissions received at close of tender had the tendered pricing varying for the project from the lowest price of $7,778,703 (excl. GST) to highest price of $18,901,369 (excl. GST).

[redacted]

On this basis, the table below would reflect the project budget breakdown. The revised budget allows for approximately 20% contingency which provides an adequate safety net, however it is unlikely to be fully utilized.

Project Component	Adjusted Budget (June 2015)	Revised Budget
Engineering and Project Management	$ 1.55M	$ 1.55M
Construction	$ 9.20M	$ 8.07M
Contingency	$ 1.25M	$ 2.38M
Total	**$ 12.0M**	**$ 12.0M**

3 PROJECT FINANCES

Expenditure to date on the project totals approximately $1,012,515. Refer to Appendix B for copy of current Project Financial Status.

The table below is a summary of the project forecast costs, including the expenditure to date:

Table 4: Project Expenditure – Design and Tender Phase

Task	Forecast Cost Estimate to Complete	Expenditure to Date
Geotechnical Investigation	$ 300,000	$ 216,643
Council Costs (#)	-	$ 127,377
Survey	$ 50,000	$ 20,676
Approvals and Legals	$ 100,000	$ 34,974
Concept Design	$ 120,000	$ 112,200
Detailed Design	$ 450,000	$ 442,596
Tender Phase	$ 70,000	$ 58,050
Total (excl. GST)	**$1,090,000**	**$ 1,012,515**

Note:

(#) Council internal costs.

Council should ensure sufficient funds are available to cover the above expenditure and cash flow requirements.

Glenore Weir Upgrade Project - Tender Price Matrix

		TEN15/0404
TEN15/0405	Civil Team Engineering	
	Koppen Development	
	LDI Constructions	
	Leed Engineering and Construction	
	RMS Engineering & Construction	
	Wren Construction *	
	CCUS	
	JPMI	
	NQ Civil Contractors	
	Geotech Group	
	Civil Teknix	
	Abergeldie Complex Infrastructure	

							PROJECT FINANCIAL RECORDS						
							PROJECT BUDGET						ESTIMATED TOTAL FORECAST & TOTAL EXPENDITURE TO DATE
PDR PROJECT NUMBER	COUNCIL PROJECT NUMBER	Glenore Weir Upgrade Component Tasks	Consultant	Project Contractor	Project Phase	Project Comments	ORIGINAL	ADJUSTED	CONTRACTED AMOUNTS TO DATE		ESTIMATE FORECAST COST TO COMPLETE	EXPENDITURE TO DATE	
									PROJECT MANAGER	CONSTRUCTION			
						TOTAL	$ 12,000,000	$ 12,000,000	$ -	$ -	$ 10,987,485	$ 1,012,515	$ 12,000,000
13272		Geotechnical Investigation Drilling, Coring and geological model	PDR/SMEC		Investigation	100% complete							
	4820-2915-0002	Carpentaria Shire Council - Clearing/Geotech/Internal Costs etc	-		Investigation	Ongoing							
13274		Site survey and control	Ausnorth		Investigation	100% complete							
13273		Approvals and legal fees	Liz Taylor/PDR/Preston		Approvals	In progress							
13274		Concept Design	PDR/SMEC		Planning	100% complete							
13274.1		Detailed Design	PDR/SMEC		Design	In progress							
13274.2		Procurement	PDR/SMEC		Tender	In progress							
13274.3		Engineering Supervision and Management of Construction Phase	PDR/SMEC		Construction								
13274.4		Handover and Defects Liability	PDR/SMEC		Defects Liability								
		Construction Contract		TBA	Construction								
		Contingency Allowance											

NOTE:
All figures are excluding GST
Costs in this table do not include any previous planning such as Water Supply Options Study and Public Consultation
Council internal costs are included in this table
Construction Contract Budget has been adjusted to reflect tender assessment recommendation

Krystal Kirkman

From: STILES Toni <Toni.Stiles@dews.qld.gov.au>
Sent: Thursday, 12 November 2015 1:36 PM
To: Pauline Butler
Cc: DOBE Linda
Subject: RE: 2015-16 Community Resilience Fund - Request for External Agency Feedback - Carpentaria Shire Council - Glenore Weir Raising Project
Attachments: Glenore Weir - Community Resilience Fund 2015-16.pdf

Hi Pauline
Please find attached our feedback signed by our DDG.
Thanks
Toni

Toni Stiles
Director – Water Supply Regulation
Water Supply Planning and Regulation
Telephone

From: Pauline Butler [mailto:Pauline.Butler@dilgp.qld.gov.au]
Sent: Wednesday, 11 November 2015 1:43 PM
To: DOBE Linda; STILES Toni
Cc: Lynn Sawtell
Subject: 2015-16 Community Resilience Fund - Request for External Agency Feedback - Carpentaria Shire Council - Glenore Weir Raising Project

Good Afternoon Linda and Toni

I hope this email finds you well.

The abovementioned project was received under the 2015-16 Community Resilience Fund and as part of our assessment process we are seeking external agency feedback from DEWS.

I will have a USB stick delivered to you this afternoon which will contain the following information:

- 2015-16 Community Resilience Fund Guidelines
- Carpentaria Shire Council's CRF Application and supporting documentation
- 2015-16 CRF External Agency Assessment Form
- 2015-16 CRF Input from DEWs Template

We are currently working towards a very tight timeframe and it would be greatly appreciated if I could have your feedback by 3 pm Thursday 12 November 2015.

Thanks and kind regards

Pauline Butler
Senior Project Officer
Finance and Funding
Department of Infrastructure, Local Government and Planning
Level 11, 100 George St Brisbane QLD 4000
p **e.** pauline.butler@dilgp.qld.gov.au

Community Resilience Fund 2015-16

External Agency Feedback Form

GUIDELINES FOR AGENCIES	
1. The Department of Infrastructure, Local Government and Planning (DILGP) seeks your agency's feedback on the proposed project/s detailed in the application documentation. 2. The Community Resilience Fund 2015-16 (CRF) program guidelines are available for your reference at: http://dilgp.qld.gov.au/local-government/grants-ilgp/community-resilience-fund.html 3. If you have any queries or require assistance please contact the CRF program team on (07) 3452 6723. 4. Please complete the form and return to Department of Infrastructure, Local Government and Planning at 2015-16CRF@dilgp.qld.gov.au	
Government agency:	**Department of Energy and Water Supply**
Application summary	
Council:	**Carpentaria Shire Council**
Project title:	**Glenore Weir Raising Project**
Project Description:	**This project seeks to address the critical and dangerous annual water shortages in Carpentaria Shire. The project proposes to raise the Glenore Weir, (upon where the townships of Normanton and Karumba derive their water supply from) to ensure a safe and reliable water supply for the regions in order to provide sustainable economic development opportunities, as well as improved amenity, quality of life, growth and prosperity.**
Project Funding:	**Total Project Cost: $11 000 000 and CRF Funding Sought: $4 000 000**
Application assessment	
Q2	**Please provide details and identify any involvement your agency has had with the proposed project.**
	Comments: DEWS and its previous agencies have had dealings with regards to the performance of Glenore Weir as a water supply for Normanton and Karumba previously. The weir's performance is subject to annual filling and months overtopping to be able to provide a suitable level of water supply security, as such supply continuity is at risk as a result of failed, low yielding or late commencing wet seasons. DEWS have provided demand management information to council to assist with reducing water demand in response to period of low water availability. *Carpenteria Shire Council's approved Drinking Water Quality Management Plan (August 2013) has mentioned that supply from Glenore Weir can be unreliable, highly dependent upon good early wet season rains and is prone to both flooding and drought. The current demands in Normanton and Karumba are noted as 1.92 and 2.54 ML/day respectively. The approved plan indicates very slight increase in future water demands.*
Q3	**Based on your agency's experience and expertise, is the proposed project fit for purpose, viable and achievable?**

	Viable: ☒ Yes ☐ No **Achievable:** ☒ Yes ☐ No **Fit for Purpose:** ☒ Yes ☐ No *Comments: Water supply source options in the area are limited, proponent has considered other potentially suitable options and this proposal appears favourable with regards to cost to yield comparison.*
Q4	**Does your agency support the proposed time lines for the delivery of the project?**
	Support: ☒ Yes ☐ No *Comments: The timeframe for the project appear achievable in duration however the timing is within the wet season and as such delays would be likely however, the opportunity to gain benefit of augmenting the existing weir require works to be complete prior to the wet season.*
Q5	**Does the project address any of your agency's recognised priorities?**
	Priority: ☐ High ☒ Medium ☐ Low
Q7	**Does your agency consider the proposed project represents good value for money?**
	Value for Money: ☒ Yes ☐ No *Comments: It would be desirable to see revised figures about the existing storage capacity and capacity of proposed augmentation. The information provided indicates that the existing weir has a storage capacity ~ 960 ML providing a safe yield of ~310 ML/annum yet the annual demand is listed to be in excess of 730ML/annum plus an industry demand of 36.5 GL (this figure cannot be correct). Information held by DEWS indicates that the existing weir has a storage capacity ~1850 ML and has been supporting an average annual demand of 849 ML/annum over the past 4 years. The need for changes to the existing intake works being costed at ~ $1.2m may be generous but there is no information that allows validation of the type of works proposed, suitability to compare costing.*
Q8	**Does your agency support this project? If not supported, please specify.**
	Support: ☒ Yes ☐ No *Comments: The project would provide for increased water supply security and address risk around water supply continuity.*
Q9	**Please provide any other comments your agency feels may be relevant to the project.**
	Comments: The need for improved water supply security exists for the area and communities of Normanton and Karumba. There appears to be a number of errors in the application and supporting document with regards to existing storage and water demand however, the performance of the existing infrastructure in meeting current and foreseeable water demands is questionable and at risk of water supply failure during extended periods of drought or repeated failed wet seasons. *Confirmation of existing infrastructure size and storage characteristics and resulting improvements from proposed augmentation would be advantages however the fact remains that raising the weir will provide more storage to a system that currently has a water supply performance risk.*
Q10	**Please compare all of the applications received by your agency from DILGP for this funding program and rank THIS project 'Low', 'Medium' or 'High'.**
	Low ☐ Medium ☒ High ☐

Government agency officer:	Name: Ken Sedgwick Position: Deputy Director-General	Signature:	Date: 12-11-15
	Phone number:	Email: ken.sedgwick@dews.qld.gov.au	

Community Resilience Fund (CRF)

2015-16 Guidelines

July 2015

The Department of Infrastructure, Local Government and Planning leads a coordinated Queensland Government approach to delivering short and long-term solutions for strong local government.

An electronic copy of this report is available on the Department of Infrastructure, Local Government and Planning's website at www.dilgp.qld.gov.au

Contents

General

Introduction and aims

The Queensland Government has committed $40 million in 2015-16 to support local governments to deliver critical infrastructure that will develop and improve resilience in the built environment and support communities in adapting to climate change.

The Community Resilience Fund (CRF) is administered by the Department of Infrastructure, Local Government and Planning (the Department).

The CRF aims to support local governments to:

- fund essential disaster mitigation infrastructure that will support communities to build resilience to future natural disaster events
- fund projects that protect existing essential public infrastructure
- fund projects that safeguard residents in “at risk” communities.

Outcomes from this program will be to protect existing essential public infrastructure, make Queensland communities more resilient in relation to natural disasters, and reduce future expenditure on asset restoration.

CRF objectives

The objectives of the CRF are:

- to help local governments to deliver key natural disaster infrastructure that is informed by the Department of Natural Resources and Mines Queensland Flood Plan Mapping Study and/or a completed flood management study that incorporates consideration of the potential impact of the project on communities downstream (e.g. levees and detention basins to protect lives, property and essential infrastructure) and the needs of the catchment
- to develop significant flood and cyclone mitigation infrastructure highlighted as a priority following the impact of recent disaster events on Queensland communities and infrastructure, as well as unaddressed needs
- to plan for and support local governments in reducing the risk to property from bushfires
- to support “at risk” local governments that are faced with significant funding challenges and have restricted capacity to fund critical infrastructure.

Funding

A total of $40 million in CRF funding is allocated in the 2015-16 financial year.

Eligible applicants

Eligible applicants under the CRF are local government bodies constituted under the *Local Government Act 2009* and the *City of Brisbane Act 2010.*

Other entities may be deemed by the Minister as an eligible applicant for the purposes of the CRF.

How to apply

Download the 2015-16 CRF Guidelines and application form at: www.dilgp.qld.gov.au.

- Scanned PDFs of the application form will not be accepted
- The application form is designed for information to be entered directly into the relevant sections
- Complete and submit one application for each individual project
- Submit each completed application and all supporting project documents electronically via email to 2015-16CRF@dilgp.qld.gov.au
- Complete all sections relevant to the project
- Ensure the certification form is completed.

Key dates in 2015-16

Applications open	**xx July 2015**
Applications close	**XX August 2015**
Announcement of successful projects	**From October 2015**

Applications must be received by the application closing date to be considered for funding.

Resources

Department of Infrastructure, Local Government and Planning
http://www.dilgp.qld.gov.au/grants-and-subsidies-programs/

Department of Natural Resources and Mines
https://www.dnrm.qld.gov.au/mapping-data/maps/flood-mapping-program

Queensland Reconstruction Authority - Floodplain maps
http://www.qldreconstruction.org.au/maps/floodplain-areas

Queensland Reconstruction Authority: http://www.qldreconstruction.org.au/

Queensland Floods Commission of Inquiry: http://www.floodcommission.qld.gov.au/

More information

For more information on the CRF, contact the Department of Infrastructure, Local Government and Planning.

Brisbane Office	Phone: 07 3452 6725
	Email: **2015-16CRF@dilgp.qld.gov.au**
Northern Region	Phone: 07 4758 3421
Southern Region	Phone: 07 3452 6762

Section 1 – Project Overview

1.1 Eligible projects

Eligible projects are those that deliver critical infrastructure that improves resilience in the built environment and supports communities adapt to the impacts of climate change, thereby reducing the costs of recovery from flood, cyclone and other natural disaster events.

Eligible projects include:

- levees
- detention basins
- cyclone shelters
- bridges
- bridge and road raising
- replacement/upgrading of existing road networks to improve resilience and functionality, minimising road closure times and traffic interruptions during and after major rainfall and flooding
- floodgates
- diversion channels
- embankment stabilisation
- drainage management pump stations
- measures to improve creek/river water flow such as stormwater systems, floodway and culvert upgrades and major drain widening
- backflow prevention devices
- projects that enhance the resilience of essential public infrastructure (e.g. assets that are key to the functioning of the community such as economic and public safety assets)
- projects aimed at addressing climate change impacts such as storm surge and tidal inundation
- projects aimed at identifying and addressing bushfire mitigation risk priorities across the state. For example:
  - construction and maintenance of fire trails and associated accessibility measures that contribute to safer, sustainable communities better able to prepare, respond to and withstand the effects of bushfires
  - fire towers.

1.2 Assessment criteria

All applications will be assessed against how the proposed project meets the 2015-16 State's funding priorities, how it aligns with the relevant guiding principles of the *Queensland Strategy for Disaster Resilience*, and the CRF aims and objectives. Applications will be assessed against the following criteria:

1. **The project provides infrastructure that builds resilience for the community and achieves improved mitigation outcomes**
   - evidence of need for the project demonstrated through the historical impact of natural disaster events
   - supported by a recent study, such as a flood management study or DNRM's Flood Mapping Study Project, that clearly demonstrates why it is a preferred option
   - clearly demonstrates how the project will reduce the impact of disaster events to the built environment and, in particular, will protect lives and property and/or essential infrastructure
   - bushfire prevention measures that provide early warning and/or infrastructure that mitigates against imminent threat to private and public property.

2. **Demonstrated commitment by the Applicant to co-fund the project**

3. **The project is financially sound and is ready to be delivered**
   - Provision of a project decision making framework – Queensland Treasury Corporation
   - Provision of a project budget, which gives a breakdown of costs
   - Demonstrated value for money and a plan for the viability of the project (such as applicant's ability to manage, operate and maintain the infrastructure following construction)
   - The applicant has the capability to deliver the project, such as appropriate staff expertise and capacity to manage the implementation of the project (capability may be sourced externally)
   - All factors in relation to the site details for infrastructure projects have been considered.
   - The project can be delivered within approved timeframes
   - The project will comply with applicable legislative, industry or regulatory requirements
   - The project effectiveness will be evaluated by the applicant post completion
   - The applicant's proven ability to deliver Queensland Government funded projects, where applicable.

4. **The project has demonstrated community support**
   - The application includes evidence of community consultation regarding the project
   - The application includes evidence of a priority need and clear benefits to the community.

5. **The project is collaborative and based upon a regional catchment approach (where relevant)**
   - The project demonstrates a regional or catchment approach to mitigation
   - Evidence that consultation has occurred with relevant affected and neighbouring councils.

Section 2 – General funding requirements

2.1 Ineligible projects

Under the CRF, ineligible projects include:

- early flood warning systems
- flood monitoring instruments/systems (e.g. flood, river and rain gauges)
- work that has already been completed
- purchase of an asset or works to an asset that will not be owned and/or controlled by the applicant
- purchase of land (e.g. land buy-back schemes)
- planning studies
- flood studies and flood mapping/management/modelling
- purchase or leasing of plant, vehicles and equipment.

2.2 Eligible costs

Funding is intended only to assist with the direct eligible costs to applicants of an approved project as detailed in the application for funding.

Eligible project costs are the total project costs from the application, less any other funding contributions to the approved project, less any ineligible costs.

2.3 Ineligible costs/project components

CRF applications must exclude costs not directly associated with the project. Ineligible costs include:

- legal costs
- house raising
- in-kind contributions
- official opening expenses
- ongoing operational and management costs
- works that have already commenced
- duplication of existing initiatives
- core business for an organisation
- purchase of core business capital equipment, such as motor vehicles and office equipment
- temporary works, except where required as part of the construction of the eligible works

- remuneration of senior executive officers and technical or professional work up to 100 hours on the planning, designing or construction of approved works.

  Note: Work time additional to 100 hours may be included as part of the project budget. These hours and costs must be detailed in the project application.
- general overhead charges relating to the administration of project costs
- official opening expenses (excluding project signage)
- legal expenses.

These lists should not be interpreted as either prescriptive or comprehensive. Contact the Department if you require clarification on the eligibility of the proposed project and costs.

2.4 Subsidy rate

For projects approved for funding under the CRF, funding will be allocated based on a subsidy rate of up to 40 per cent of the eligible project costs.

Under the CRF, eligible project costs are **the total project cost minus ineligible components and any other funding contributions to the project.** Other funding contributions include: funding from partners, government grant funding received or applied for, and in-kind contributions.

Note: Approval of any increased subsidy rate for a project will be at the Minister's discretion.

Section 3 – General funding conditions

3.1 Minister retains rights and powers

The Minister retains all rights and powers to make all decisions and actions that the Minister sees fit in order to achieve the priorities and objectives of the relevant Queensland Government funding program.

The Minister may require funding recipients to provide all such documents or to remedy irregularities, as deemed necessary, to demonstrate the appropriate management and use of State and/or Federal funds.

The Minister may delegate, either generally or in specific cases, the powers and duties of the Minister under this program, where appropriate.

3.2 Successful applications

Successful applicants are required to enter into a funding agreement with the Department before commencing the project and making claims for payments.

More information on funding agreements can be found at the Department's website at: www.dilgp.qld.gov.au

3.3 Funding period

The funding period for an approved project will be a maximum of 12 months from the date of execution of the sub-agreement. Where the applicant considers the complexity of a project may call for a longer funding period, the applicant must satisfactorily demonstrate to the Department that an extended funded period is required. This will be considered on a case-by-case basis.

Each project must have a sub-agreement in place within two (2) months of the date of funding approval.

Successful applicants must ensure that:

- all project work is completed within the approved funding period
- all final reporting and claims for payment are submitted to the Department within one (1) month of the approved project completion date.

Funding approvals will lapse upon the expiration of the approved funding period, at which point the Department's commitment to the relevant payments will be discharged and unclaimed funding will be forfeited.

3.4 Claims for payment

The funding agreement provides details of the payment schedule for each project. Under the CRF, funding will be administered on a 30:60:10 model.

A first payment equal to 30 per cent of the approved funding will be made following the execution of the funding agreement for the project by both parties. In particular circumstances, the Department may approve a different payment schedule.

Once the first payment has been expended and acquitted, the funding recipient can then submit claims for progress payments at the approved subsidy rate against works completed (up to 60 per cent of approved funding), in accordance with the funding recipient's payment forecasts and project plan.

A final payment of 10 per cent will be made on completion and acquittal of the project.

Each claim for payment must be made on the prescribed form, with certification by the funding recipient that the works have been completed satisfactorily, and that expenditure of the amount stated has been properly incurred on the work for which funding was approved in accordance with these guidelines and the funding agreement. Certification must be made by an appropriately delegated officer of the funding recipient, or other persons as agreed by the Department.

The prescribed form for claiming payments is available on the Department's website: www.dilgp.qld.gov.au

3.5 Regulatory requirements

Community Resilience Fund funding approvals and payments are conditional on the funding recipient observing all relevant laws and state or federal policies. The Queensland Government provides funding assistance only and does not relieve a funding recipient from:

- performing or observing all conditions and duties that may apply to the works under any Act, Law or Regulation
- having due regard to any relevant state or federal policies.

Approval of funding under the Community Resilience Fund does not imply that any necessary licences or approvals will be granted, or that agencies will make favourable policy decisions. Funding recipients must independently obtain all necessary permits, licences, consents, or a clear statement of requirements, from relevant parties prior to commencement of projects.

Following the completed construction of an approved project, the funding recipient must independently obtain all relevant approvals and certifications as required by any Acts, Laws or Regulations.

Where licences cannot be obtained prior to completion, the final 10 per cent of the approved assistance may be withheld by the Queensland Government until licences are obtained.

3.6 Third party contributions

Applicants may seek funding contributions for the proposed project from other sources.

3.7 Approval prior to commencement of works

Prior to commencing works on an approved project where funding has been granted, funding recipients must:

- obtain confirmation of Queensland Government funding approval for the project
- enter into a funding agreement with the Department.

Works are considered to have commenced once:

- actions incurring physical changes to a proposed project site have been instigated

- the funding recipient enters into a contract or tender for the project.

3.8 Forecasts of cash flows

Funding recipients are required to provide forecasts of cash flows and milestones at the time of executing the funding agreement for a project. This will align with the project plan and indicate dates when payment claims are expected to be lodged with the Department.

Should project expenditures or timeframes vary following commencement, the funding recipient must provide updated cash flow forecasts and revised project timeframes to the Department within 10 working days of these variances being identified.

3.9 Project costs

State subsidies and financial assistance are intended only to assist with the direct costs of approved projects, as detailed in the application for funding.

3.10 Roles and responsibilities

The funding agreement clearly specifies the roles and responsibilities of the parties in relation to the funding allocated.

3.11 Extensions of time

In exceptional circumstances, the Minister or delegate may approve a request for an extension of time to complete a project. Any request for an extension of time should be submitted as soon as practical and at least two months prior to the approved project completion date.

3.12 Suspension of works

Where project works have been delayed for any reason, the funding recipient must immediately notify the relevant contact officer, as specified in the funding agreement, indicating reasons for the delay and the anticipated date of recommencement of works.

3.13 Incomplete projects

Where a funding recipient determines that work on a project will cease and will not be completed, the funding recipient may be required to repay all or part of the financial assistance received as outlined in the funding agreement executed for the project.

3.14 Retention money

Retention money held by the funding recipient may be included as part of the final project costs when submitting a certified claim for final payment.

3.15 Rights to site inspections

The Minister, or any person/s authorised by the Minister, may inspect the site of any project prior to, during, and/or after completion of works.

All reasonable requests by the Minister or by authorised person/s for access to the site of an approved project must be complied with by the funding recipient.

3.16 Acknowledgment of the funding

Funding recipients must acknowledge the contributions of the Queensland Government funding. For capital works projects, this may include:

- erection of signage at construction sites
- placement of a plaque or sign once construction is finished
- acknowledgement in publicly made statements, or appropriate documentation.

Further information on acknowledgement requirements, including the use of the Queensland Government logo, can be found within the funding agreements for each funding program.

3.17 Reporting and evaluation

The funding agreement provides details of reporting and evaluation requirements for the approved project. Funding recipients must submit project progress reports and post completion reports and the results of the project evaluation to the Department.

If a funding recipient does not comply with these requirements for an approved project, the final 10 per cent of the approved funding may be withheld until all relevant reporting is submitted to the Department.

3.18 Privacy and confidentiality

The use and disclosure of information provided by applicants for the program is regulated by the relevant provisions and penalties of the *Right to Information Act 2009*, the *Information Privacy Act 2009* and the general laws of the State of Queensland.

The information contained in applications will be regarded as private and confidential, and will be treated as such by the Department. This is subject to the operational need to provide applications to assessors, and any statutory or legal requirements to provide information to the Parliament and other organisations, for audit, law enforcement, investigative, or other purposes.

As part of the assessment of an application, the Department may need to consult with, and provide material from the application to, other government agencies or bodies, other organisations and/or relevant individuals, in order to substantiate any claims or statements made in the application form, or to otherwise assist in the assessment of the application. If this occurs, the Department will endeavour to ensure that the parties who are consulted observe appropriate confidentiality provisions.

Following approval of an application, the broad details of an application (e.g. the identity of the successful applicant, the funding amount awarded, and a brief description of the project) may be disclosed by the Department for purposes such as promoting the program and reporting on the program's operation and policy development.

Glossary

assistance	a monetary allocation under the Queensland Government disaster mitigation and resilience funding program approved by the Ministers provided to assist to conduct approved projects
approved or approval	the approval by the Ministers or Executive Council
approval date	the date which a proposed project receives approval by the Ministers or Executive Council
approved applicant	a council or other entity for whom funding is approved by the Ministers under a specified program
authorised person	an officer or employee of a government department or other person authorised by the Ministers to perform a specific function or duty
capital works	works of a lasting nature to be used by or to provide services to people. The term, where necessary, includes land, buildings, major items of plant, machinery or other equipment, but does not include component replacement or periodic maintenance
chief executive officer	the head of an organisation
council or councils	a local government body
eligible project costs	eligible project costs equals the total project costs as per application/approval: • less any other contributions to the approved project and/or • less any ineligible costs
extension of time	the approval by the Minister of additional time in which the funding recipient can complete the approved project
funding agreement	a head of agreement and sub-agreement forms the formal funding arrangement between the recipient and the department for the project
funding period	the period from the approval date to the project completion date as stipulated in the funding agreement
funding recipient or recipient	an eligible organisation in receipt of a subsidy for an approved project
lapsing	the discharging of a commitment to provide funding assistance to an approved project
mayor	the mayor of a council or in the case of Brisbane City Council, the Lord Mayor
Minister	the Minister responsible for the respective Queensland Government disaster mitigation and resilience funding programs for the CRF - the Minister for Infrastructure, Local Government and Planning
prescribed form	a form issued by the department
project	a discrete set of activities, producing a defined range of infrastructure or other defined outputs, within a specified timeframe
project completion date	the date by which approved project works must be completed, as stipulated in the funding agreement
retention money	money held by the funding recipient to ensure that a contractor makes good any defects identified following completion of the project, as per the agreed contract
round	the period of time when requests for funding applications are open to councils
sub-agreement	a sub-agreement that forms part of the formal funding agreement executed by the recipient and the department providing details of the funding approved, approved project and conditions related to the specific funding program
tender	an offer specifying prices, costs and other details under which a person will enter into a contract with an approved applicant
third party contributions	funding contributions to the project received from other sources (e.g. other state agencies, Australian Government or the private sector)

total project costs	those costs directly attributable to the proposed project as at the time of application or approval
work or works	means identifiable part/s of a project

Department of Infrastructure, Local Government and Planning
100 George Street, Brisbane
PO Box 15009 City East
Queensland 4002 Australia
tel 13 QGOV (13 74 68)
2015-16CRF@dilgp.qld.gov.au
www.dilgp.qld.gov.au

Community Resilience Fund 2015-16

External Agency Feedback Form

GUIDELINES FOR AGENCIES 1. The Department of Infrastructure, Local Government and Planning (DILGP) seeks your agency's feedback on the proposed project/s detailed in the application documentation. 2. The Community Resilience Fund 2015-16 (CRF) program guidelines are available for your reference at: http://dilgp.qld.gov.au/local-government/grants-ilgp/community-resilience-fund.html 3. If you have any queries or require assistance please contact the CRF program team on (07) 3452 6723. 4. Please complete the form and return to Department of Infrastructure, Local Government and Planning at 2015-16CRF@dilgp.qld.gov.au	
Government agency:	
Application summary	
Council:	
Project title:	
Project Description:	
Project Funding:	**Total Project Cost:** **CRF Funding Sought:**
Application assessment	
Q2	**Please provide details and identify any involvement your agency has had with the proposed project.**
	Comments:
Q3	**Based on your agency's experience and expertise, is the proposed project fit for purpose, viable and achievable?**
	Viable: ☐ Yes ☐ No **Achievable:** ☐ Yes ☐ No **Fit for Purpose:** ☐ Yes ☐ No *Comments:*

Q4	**Does your agency support the proposed time lines for the delivery of the project?**
	Support: ☐ Yes ☐ No *Comments:*
Q5	**Does the project address any of your agency's recognised priorities?**
	Priority: ☐ High ☐ Medium ☐ Low *Comments:*
Q7	**Does your agency consider the proposed project represents good value for money?**
	Value for Money: ☐ Yes ☐ No *Comments:*
Q8	**Does your agency support this project? If not supported, please specify.**
	Support: ☐ Yes ☐ No *Comments:*
Q9	**Please provide any other comments your agency feels may be relevant to the project.**
	Comments:
Q10	**Please compare all of the applications received by your agency from DILGP for this funding program and rank THIS project 'Low', 'Medium' or 'High'.**
	Low ☐ Medium ☐ High ☐ *Comments:*

Government agency officer:	Name: Position:	Signature:	Date:
	Phone number:	Email:	

RTI1819-016-DLGRMA - Dot points 4 and 5

Council	Project Title	Payment Dates	Payment Amounts
Irrelevant information deleted under section 73 of the RTI Act		25/07/2016	36,000.00
		14/02/2018	57,738.52
		4/06/2018	26,261.48
			120,000.00
		4/04/2016	173,094.00
		3/05/2017	94,772.90
		2/02/2018	309,113.10
			576,980.00
		9/03/2016	558,000.00
		28/10/2016	1,116,000.00
		3/05/2017	186,000.00
			1,860,000.00
		4/04/2016	26,280.00
		17/11/2016	5,624.40
		20/12/2016	20,922.88
		23/03/2017	34,772.72
			87,600.00
		13/05/2016	240,900.00
		10/07/2017	481,800.00
		8/08/2017	80,300.00
			803,000.00
		6/06/2016	490,324.50
		27/02/2017	190,640.25
		9/10/2017	698,053.74
		14/02/2018	255,396.51
			1,634,415.00
		9/03/2016	168,000.00
		28/03/2017	62,782.80
		8/08/2017	329,217.20
			560,000.00
Carpentaria Shire Council	Glenore Weir Raising Project	4/05/2016	1,200,000.00
		24/05/2016	1,749,780.01
		27/06/2016	140,208.80
		26/08/2016	407,265.13
		29/11/2016	102,746.06
		6/06/2017	400,000.00
	Glenore Weir Raising Project Total		**4,000,000.00**
Irrelevant information deleted under section 73 of the RTI Act		30/05/2016	105,858.00
		10/05/2017	86,412.76
		31/10/2017	160,589.24
		tal	**352,860.00**
		13/05/2016	170,050.80
		14/07/2017	396,785.20
			566,836.00
		4/03/2016	62,700.00
		25/07/2016	41,134.80
		29/09/2016	44,325.20
		14/03/2017	60,840.00
			209,000.00
		9/03/2016	568,623.00
		24/06/2016	131,377.00
		26/08/2016	344,504.00
		21/10/2016	226,696.00
		15/02/2017	624,210.00
			1,895,410.00
		9/03/2016	270,120.00
		24/06/2016	491,880.00
		14/03/2017	42,148.00
			804,148.00
		16/02/2016	7,200.00
		28/03/2017	16,800.00
			24,000.00
		16/02/2016	56,040.00
		24/06/2016	97,653.10
			153,693.10
		16/02/2016	54,000.00
		29/06/2016	72,676.11
			126,676.11
		16/02/2016	26,400.00
		13/06/2016	43,340.59
		17/02/2017	57,450.91
		15/03/2018	14,132.39
		al	**141,323.89**
		13/05/2016	143,022.30
		29/06/2016	114,417.16
		29/11/2016	219,301.54
			476,741.00
		30/05/2016	1,249,152.60
		12/01/2017	339,230.68
		2/02/2017	1,077,180.26
		5/04/2017	290,529.59
		6/09/2017	755,130.74
		3/03/2018	452,618.13

Irrelevant information deleted under section 73 of the RTI Act

	4,163,842.00
14/04/2016	84,000.00
14/03/2017	30,423.20
	114,423.20
29/06/2016	187,680.00
28/11/2017	116,014.15
18/05/2018	405,780.26
	709,474.41
30/06/2016	4,800.00
24/04/2017	11,200.00
	16,000.00
24/05/2016	13,200.00
27/07/2016	22,376.53
6/03/2017	2,704.79
	38,281.32
3/03/2016	19,200.00
23/02/2017	28,913.51
	48,113.51
6/06/2016	115,200.00
7/12/2017	268,800.00
	384,000.00
4/03/2016	21,238.20
14/03/2017	40,689.20
	61,927.40
31/03/2016	54,000.00
6/03/2017	111,123.48
	165,123.48
18/02/2016	287,808.00
26/10/2016	458,006.88
	745,814.88
18/02/2016	69,240.00
14/03/2017	150,918.51
	220,158.51
31/03/2016	425,076.60
23/03/2017	458,291.40
14/07/2017	168,263.01
	1,051,631.01
11/04/2016	494,100.00
12/01/2017	590,992.80
23/03/2017	397,207.20
6/06/2017	164,700.00
	1,647,000.00
4/05/2016	5,550.00
24/04/2017	12,950.00
	18,500.00
22/04/2016	598,268.70
12/10/2016	382,731.30
21/11/2016	215,537.40
6/12/2016	199,452.60
31/01/2017	299,105.00
29/08/2017	299,134.00
	1,994,229.00
18/02/2016	33,600.00
29/06/2017	78,400.00
	112,000.00
18/02/2016	65,460.90
4/11/2016	152,742.10
	218,203.00
16/02/2016	290,310.00
15/12/2016	366,982.40
23/03/2017	213,637.60
17/05/2017	96,770.00
	967,700.00
16/02/2016	127,691.40
6/12/2016	255,382.80
14/03/2017	42,563.80
	425,638.00
4/04/2016	102,000.00
23/03/2017	210,692.50
	312,692.50
4/04/2016	9,720.00
18/01/2017	22,680.00
	32,400.00
3/03/2016	9,504.00
12/01/2017	2,913.14
2/02/2017	938.57
23/03/2017	12,462.25
	25,817.96
31/03/2016	19,440.00
6/09/2017	34,657.20
	54,097.20
31/03/2016	82,800.00
14/07/2017	193,200.00
	276,000.00
31/03/2016	43,762.50
20/09/2017	16,853.06
	60,615.56

Irrelevant information deleted under section 73 of the RTI Act		4/03/2016	6,000.00
		6/12/2016	3,639.20
		20/12/2016	10,360.80
			20,000.00
		22/04/2016	53,760.00
		24/06/2016	63,407.40
		15/07/2016	41,011.40
		17/11/2016	21,021.20
			179,200.00
		22/04/2016	130,080.00
		30/05/2017	43,680.00
		10/07/2017	159,736.00
		7/11/2017	100,104.00
			433,600.00
		22/04/2016	9,360.00
		30/05/2017	21,840.00
			31,200.00
	Total		**28,920,366.04**

The 2015–16 Community Resilience Fund (CRF), totalling $40 million, aims to support local governments to:

- help local governments deliver key natural disaster infrastructure that is informed by the Department of Natural Resources and Mines Queensland Flood Mapping Study or a completed flood management study
- fund essential disaster mitigation infrastructure that will support communities to build resilience to future natural disaster events
- fund projects that protect existing essential public infrastructure
- fund projects that safeguard residents in 'at risk' communities.

Outcomes of this program will be to protect existing essential public infrastructure, make Queensland communities more resilient in relation to natural disasters and reduce future expenditure on asset restoration.

Download the 2015–16 CRF Guidelines (267 KB) for further information.

Key dates

- Applications closed - 10 September 2015

Grants

To date, 30 councils have been granted project funding under the CRF. They are:

Council name	Project title	Project description
Balonne Shire Council	Bollon flood mitigation levee - Balonne highway - stage 2	Completion of design and construction of the western side section of the Bollon flood mitigation levee bank
Brisbane City Council	Coorparoo Creek Park flood mitigation	Redevelopment of the Coorparoo precinct to include the creation of a detention basin, upgrading local stormwater and culverts and the installation of a series of backflow devices
Brisbane City Council	Backflow prevention devices - Jamieson Street, Bulimba	Construction of two backflow prevention devices to protect 191 residential properties and one commercial property from river backflow flooding in the vicinity of Jamieson Street, Bulimba
Burdekin Shire Council	Burdekin cyclone shelter fit-out	Provision of equipment and infrastructure to ensure service capability, correct operation and functionality of Burdekin cyclone shelter
Cairns Regional Council	Shaft Street pump station application	Installation of a pump station at Shaft Street, Edmonton to prevent inundation of 100 residential properties

Council name	Project title	Project description
Carpentaria Shire Council	Glenore Weir raising project	Raise the Glenore Weir to ensure a safe and reliable water supply for communities within the region
Cloncurry Shire Council	Cloncurry eastern township stormwater mitigation project	Construction of bund walls, inlets pits, channel improvements and stormwater management infrastructure in and around Musgrave and McIlwraith Streets
Cook Shire Council	Cooktown Community Events Centre cyclone shelter upgrades	Project will include upgrades to an existing community hall/evacuation centre to bring it up to cyclone shelter standard
Diamantina Shire Council	Overtaking opportunity Ch. 20.20 - 22.20 on Birdsville - Simpson Desert National Park Road	Widen existing traffic lanes to 8m and seal approx. 2km of unsealed road to provide an overtaking opportunity on the Birdsville - Simpson Desert National Park Road
Fraser Coast Regional Council	Hervey Bay Shoreline (Halcro St to Dayman Pk) management plan	Construction of new revetment structures (e.g. rock walls) to enhance the resilience of essential public infrastructure from the impacts of tidal inundation and storm surge
Gladstone Regional Council	Cedarvale Road, Boyne Valley reconstruction of floodway	Reconstruction of concrete floodway bridging Degalgil Creek, Boyne Valley, the stabilization of unmade road approaches to floodway and the formalisation of table drain drainage to approaches ensuring drain off into Creek
Gladstone Regional Council	Callide Crescent Storm water culvert replacement	Excavation and removal of failed culvert concrete components, the construction of a new culvert system and the reconstruction of the road pavement, kerb and channel and drainage channel headwall at the system outlet
Gladstone Regional Council	Installation of flap valves (flood gates) to Young Street culvert, Barney Point, Gladstone	Installation and supply of five flap valves (flood gates) to the Young Street culvert, Barney Point
Gladstone Regional Council	Mangrove Place - stormwater infrastructure	Formalise an overland channel flow and installation of one-way non-return valves on existing twin 900 diameter stormwater outlets
Gold Coast City Council	City wide priority fire trail network upgrade project	Maintenance of the cityâ€™s existing fire trail network (358km) and the construction of up to 6km of new fire trail in strategically targeted locations on city managed lands
Gold Coast City Council	Surf Street Mermaid Beach flood mitigation - final stage (Surf Street project)	Installation of large pipes from Ruddar Canal, along Sovereign Drive, Heron Avenue (including under the Gold Coast Highway), Petrel Avenue, finishing in Seashell Avenue,

Council name	Project title	Project description
		Mermaid Beach to relieve over floor flooding for 23 properties within the Surf Street catchment
Gold Coast City Council	Dowling Drive to Smith Street project flood mitigation - final stage	Upgrade of existing drainage infrastructure in the Dowling Drive to Smith Street, Southport to provide flood immunity in stormwater events to 100% of the properties in Dowling Drive during Q100 wet weather events
Gympie Regional Council	East Deep Creek Road flood resilience project	Widening of East Deep Creek Road
Lockhart River Aboriginal Shire Council	Portland Road Upgrade: pavement, seal and culverts/causeways	Project will include upgrade works to stormwater crossings and re-sheeting selected areas of Portland Road
Lockyer Valley Regional Council	Laidley Flood mitigation works - drainage channel works and associated levee	Construction of a drainage channel and associated levee bank works to assist in the protection of residential and commercial areas within Laidley
Longreach Regional Council	Crossmoor Road Aramac Creek floodway upgrade	Realignment of road and construction of a new crossing (approx. 600mm higher than the existing crossing) increasing the Floodway length by 40m and sealing of an adjacent minor channel
Maranoa Regional Council	Roma flood mitigation project - clearing of Bungil Creek	Undertake clearing works along 4.7km of Bungil Creek within the Roma town to minimize flood event impacts whilst maintaining the integrity of the creek bank and habitat
Maranoa Regional Council	Maranoa small communities fire mitigation project	Install fire containment lines around nine small towns and selected infrastructure in rural areas
Mareeba Shire Council	Euluma Creek Road floodway project	The construction of a new 100m long concrete floodway on Euluma Creek Road, Julatten
Mareeba Shire Council	Tate River beef causeway upgrade	To raise the height of the Tate causeway by 1.6m above the existing concrete base slab and widen to 4.5m width for the 252m length of the causeway
Mareeba Shire Council	Upgrade of Koah Community Hall	Upgrade the existing Koah Community Hall to allow for emergency accommodation during disaster scenarios
Mareeba Shire Council	Mareeba Shire western beef causeways construction project	Construction of nine small causeways on Mount Mulgrave Road, Mount Mulligan Road, Ootann Road and Torwood Road to improve connectivity and safety for cattle hauling road trains and protect gravel road pavement during

Council name	Project title	Project description
		and after heavy rainfall and cyclone disaster events
McKinlay Shire Council	Building resilience and connectivity in McKinlay: Punchbowl Bridge replacement	Construction of a new bridge over the Flinders River at Julia Creek
Moreton Bay Regional Council	Beachmere Biggs Avenue seawall replacement	Reconstruction of a degenerating seawall to increase the height and extent of the seawall
Moreton Bay Regional Council	Coulthards Creek drainage channel upgrade	Upgrade the capacity of the creek channel for a length of approximately 300m, widen the existing waterway area and the inclusion of a low flow concrete invert
Mornington Shire Council	Mornington Shire Council - Gununa Jetty and barge landing re-development project - stage 1	Re-development of the Gununa Jetty and barge landing to include replacement of the existing timber jetty with a more robust (and possibly extended) concrete structure and the installation of a larger barge frame (causeway style ground-slab)
North Burnett Regional Council	Biggenden Memorial Hall upgrade for disaster accommodation	Upgrade the existing Biggenden Memorial Hall to allow for emergency accommodation during disaster scenarios
Palm Island Aboriginal Shire Council	Clump Point Road rock revetment wall	Construction of 600m of rock revetment wall to protect vital infrastructure including power, sewer and water supply links between their point of origin and the main township of Palm Island
Redland City Council	Billiau Road Mount Cotton fire trail replacement	Replacement and resealing of Billiau Road to enable reliable and ongoing fire trail access for residents living in and around the Billiau Road area, Mt Cotton
Redland City Council	Minjerribah fire mitigation project stage 1	Undertake bush fire mitigation through the establishment of new fire trails and environmental management in the indigenous Native Title areas of Existent Residential Occupancies (ERO) in the area of â€˜One Mileâ€™ and areas boarded by the townships of Dunwich and Amity. The project will collaborate on native title and significant sites to establish increased protection of life and property
Rockhampton Regional Council	McLeod Park Drainage Scheme stage 2	Installation of approximately 1070m of drainage pipe in Simpson, Berserker and

Council name	Project title	Project description
		Leamington Streets to divert overland flow to the Moores Creek system
Rockhampton Regional Council	Park Street Drainage Scheme stages 2B and 3	Installation of approximately 735m of drainage pipe in Glenmore Road and Park Street, Park Avenue to capture and convey stormwater to the Fitzroy River
Rockhampton Regional Council	Thozets Creek and Frenchmans Creek road crossings debris deflectors	Installation of collapsible handrails and reinforced concrete debris deflectors on two existing culvert structures to allow large floating debris to pass up and over the culvert structures during flooding
Scenic Rim Regional Council	Upper Coomera Road culvert upgrade	Replacement of an existing pipe culvert and floodway at Upper Coomera Road, Ferny Glen, at the Lahey Creek crossing
Scenic Rim Regional Council	Bridge approaches improvement project	Reconstruction of road approaches to five bridges on Council's unsealed gravel road network i.e. Wilbraham Bridge, Undullah; Addis Bridge, Rathdowney; Prout Bridge, Knapp Creek; Kingsley Bridge, Josephville and Mollenhagen Bridge, Illibah
South Burnett Regional Council	Alford Street culvert replacement	Upgrade of existing culverts to accommodate improved flood immunity to Alford St, Kingaroy swimming pool and other open space infrastructure in Memorial Park
Southern Downs Regional Council	Fire trail construction and maintenance	Construction and maintenance of new and existing Fire Trails in the Stanthorpe Region
Sunshine Coast Regional Council	Sunshine Coast fire trail construction and upgrade project	Construction and upgrade of key fire trails in Mountain Creek Conservation Area (Mountain Creek) and Bobbie Sattler Nature Refuge (Meridan Plains)
Tablelands Regional Council	Millstream Estate flood mitigation project	Extension of drainage infrastructure capacity in the Western View Crescent area of Millstream Estate
Toowoomba Regional Council	Cattle Creek Cecil Plains - Moonie Road crossing upgrade	Installation of reinforced concrete box culverts (RCBC) causeway to enhance flood resilience and reliability of this critical connection for industry and the community
Toowoomba Regional Council	Bushfire alert siren to enable timely evacuation of residents	Installation of a mass bushfire notification device (siren) to alert Millmerran residents (highly timbered area) of an early bushfire evacuation warning
Toowoomba Regional Council	Lorrimer Street Oakey Creek crossing upgrade	Upgrade the existing floodway with a multi-cell RCBC concrete causeway

Council name	Project title	Project description
Townsville City Council	Identifying and addressing bushfire mitigation risk priorities in Townsville LGA	Installation of firebreaks on priority council land around Townsville

Forms and resources

- Subsidy claim form (117 KB)

For more information

Email: 2015-16CRF@dilgp.qld.gov.au

Northern Region - Phone: 07 4758 3420
Southern Region - Phone: 07 3452 6762

Media release

Treasurer, Minister for Employment and Industrial Relations and Minister for Aboriginal and Torres Strait Islander Partnerships
The Honourable Curtis Pitt

Regional and rural Queensland benefit from additional Budget funding

The Palaszczuk Government's first Budget features additional funding and new programs to benefit regional and rural areas of Queensland.

Treasurer Curtis Pitt said rural and regional Queensland would see a significant proportion of infrastructure funding allocated in the Budget, with around $4.8 billion of the overall $10.1 billion for 2015-16 spent in these communities.

Mr Pitt said the Palaszczuk Government recognised the paramount importance of Queensland's regions and its rural areas.

"Regional and rural Queensland are part of Queensland's core – they fundamentally shape who and what we are as a State.

"Queensland is our nation's most decentralised State, and as a government we are focussed on supporting families, creating jobs and fostering economic development in regional and rural areas."

The Budget initiatives include $200 million for a new Building our Regions program, more than $50 million for drought relief measures, $180 million for a new hospitals refurbishment program and a $40 million western roads funding package.

"We have decided to bring forward an initial $100 million in funding for the Building our Regions program to this financial year," Mr Pitt said.

"This means that projects can begin six months earlier than originally anticipated, with regional communities seeing important infrastructure projects get underway.

"A further $100 million will be available in 2016-2017."

Mr Pitt said the Budget provided an additional $180 million to address the state's most urgent health infrastructure through a new Enhancing Regional Hospitals program.

The investment would fund upgrades and repairs at the Roma, Hervey Bay, Gladstone and Caloundra hospitals.

For the State's north, the Budget allocates $90 million over four years for a new primary school and towards a new high school in Townsville, and $25 million over two years for a new special education school in Cairns to open in 2017.

The Budget also sets aside $438.2 million as a Community Service Obligation payment to help households and small businesses in regional Queensland meet the cost of their electricity bills.

"The Palaszczuk Government remains committed to providing subsidies to families and households in regional Queensland," Mr Pitt said.

“Without this subsidy, households in places such as Townsville, Cairns and Mount Isa would pay between 30 and 140 per cent more for their electricity than people in the south east.”

Mr Pitt said the Budget included funding of $52.1 million over four years for much-needed drought relief for primary producers in regional and rural areas.

The Budget also provides $5 million to fund a three-year program to address the problems caused by wild dogs and feral cats in Queensland.

Mr Pitt said 14 priority road projects would be undertaken across western Queensland over the next two years as part of a $40 million road funding package.

“We recognise the importance of a safe and reliable road network for people who live and work in western Queensland. In many ways, roads are the lifeblood of many rural and regional communities.”

“This $40 million investment will deliver a safer and more reliable road network for communities in western parts of the state. It will also provide jobs at a time when jobs and job security are more important than ever.

“It will keep road crews on the job in the north west and the south west of our State, regions which are doing it tough as a result of the drought.

“Central Queensland has also been doing it tough in the aftermath of Tropical Cyclone.
“In recognition of this, the Budget provides $25 million to revitalise the Yeppoon foreshore and $15 million to revitalise the Rockhampton riverbank.”

Likewise, regional and rural Queensland would benefit from a statewide $763.4 million investment in state school maintenance over four years – including an uplift of $300 million – of which $178 million was to be spent in 2015-16.

In addition, councils in regional and rural areas would be able to access a new $40 million Community Resilience Fund to help mitigate against natural disasters, and $23 million in funding through the Local Government Grants and Subsidies program for shovel-ready projects to build vital community infrastructure.

Other Budget initiatives to support regional and rural Queensland include:

• $9.8 million in 2015-16 to continue to respond to the potentially devastating Panama disease tropical race 4 threatening the state’s banana industry
• $5.8 million over two years for phase 4 of the Great Artesian Basin Sustainability Initiative, assisting landholders to rehabilitate uncontrolled flowing bores and to replace open bore drains with piped water reticulation systems
• $24.1 million over two years to boost regional transport services
• $10 million for a Mobile Black Spot Program that will expand and improve mobile phone coverage and promote digital connectivity.

Media contact: Treasurer’s office 3719 7200

Queensland Government

Deputy Premier
Minister for Infrastructure, Local Government and Planning and Minister for Trade and Investment

Our ref: MBN15/1560

- 5 FEB 2016

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The Honourable Annastacia Palaszczuk MP
Premier and Minister for the Arts
PO Box 15185
CITY EAST QLD 4002

Dear Premier Annastacia,

As you would be aware, the $40 million Community Resilience Fund (CRF) was established in 2015–16 to support local governments to deliver critical infrastructure that improves resilience in the built environment and supports communities in adapting to climate change. The CRF is one of our election commitments (Number 433).

Applications from councils closed for this program on 10 September 2015 and have been assessed. I propose to announce successful projects early in 2016. Almost $30 million of the available funds is being committed to these projects.

In addition to this, I am proposing to quarantine the balance of the available CRF budget to provide the Government with capacity to address future emerging projects.

The Bundaberg Flood Protection Scoping Study, which you launched in Bundaberg as part of Community Cabinet in October 2015, is also an election commitment (Number 565). Specifically the commitment is to *"Undertake a Bundaberg flood protection scoping study and develop a 10 year action plan for major flood mitigation works in Bundaberg."*

I expect the 10 year action plan will be developed before June 2016 and that it is likely to identify significant expenditures will be needed to undertake the flood mitigation works. In anticipation of this, I have quarantined $4.0 million from the CRF to provide some initial seed funding to support implementation of the 10 year action plan should it be required.

You would also be aware of the current water supply issues facing the Palm Island community. Discussions with the Palm Island Aboriginal Shire Council about an appropriate response are ongoing. One option under active consideration involves establishing a desalination plant and associated supporting infrastructure. I have quarantined $3.5 million for this work should it be required.

Refused under section 47(3)(a) of the RTI Act - Cabinet information

Yours sincerely

JACKIE TRAD MP
DEPUTY PREMIER
Minister for Infrastructure, Local Government and Planning and Minister for Trade and Investment

Queensland Government

Deputy Premier
Minister for Infrastructure, Local Government and Planning and Minister for Trade and Investment

Our ref: MBN15/1560

-5 FEB 2016

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The Honourable Curtis Pitt MP
Treasurer, Minister for Aboriginal and Torres
Strait Islander Partnerships and Minister for Sport
PO Box 611
BRISBANE QLD 4001

Dear Treasurer Curtis,

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[redacted]
Refused under section 47(3)(a) of the RTI Act - Cabinet information

Yours sincerely

JACKIE TRAD MP
DEPUTY PREMIER
Minister for Infrastructure, Local Government and Planning
and Minister for Trade and Investment