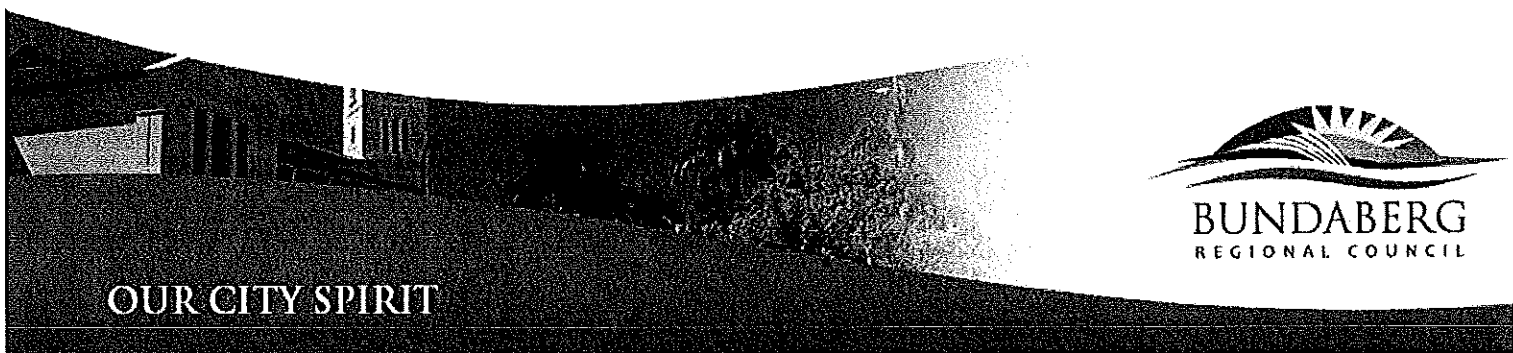


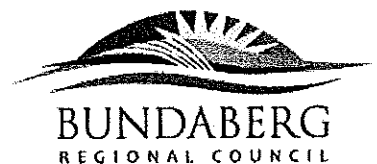
Queensland Floods Commission of Enquiry

*Requirement to Provide Information to the
Commission – Bundaberg Regional Council*
Reference: 1675979 and 1675968

Statement by:
Mr Andrew William FULTON
Director Infrastructure & Planning Services
Bundaberg Regional Council



OUR CITY SPIRIT



BUNDABERG
REGIONAL COUNCIL

QUEENSLAND FLOODS COMMISSION OF INQUIRY

**Requirement to Provide Written Information to Commission of Inquiry
Andrew William FULTON, Director Infrastructure & Planning Services
Bundaberg Regional Council**

In accordance with *Section 5 of the Commissions of Inquiry Act 1950 (Qld)*,
I, Andrew William FULTON, Director Infrastructure & Planning Services,
Bundaberg Regional Council, provide the following statement of
information as directed by letters dated 10 August 2011 (References
1675979 & 1675968).

Statement Prepared By:-

Mr Andrew William FULTON
Director Infrastructure & Planning Services
Bundaberg Regional Council

[Redacted Signature]

Signature

1 September 2011

.....
Dated

INDEX

PART A – Reference 1675979

- | | | |
|-----|--|--------------------|
| 1. | A summary of the assessment criteria contained in council's planning scheme(s) and how such criteria are used to assess applications for development in the natural hazard management area. | <u>Question 1</u> |
| 2. | A description of how the natural hazard management area, as it relates to flood affected land, is reflected in the planning scheme. | <u>Question 2</u> |
| 3. | Details of Council's defined flood event including a description of:
a) how the defined flood event was chosen;
b) the way in which the council's defined flood event was calculated or determined. | <u>Question 3</u> |
| 4. | A description of any planning requirements to have evacuation routes and/or early warning systems for areas identified to be at high risk of flooding, including information about how the existence of such evacuation routes and/or early warning systems are communicated to occupiers of areas at high risk of flooding. | <u>Question 4</u> |
| 5. | A description of any controls or standards used to assess the storage of chemicals or other Environmentally Relevant Applications for development below the Q100 flood line or the Council's defined flood event. | <u>Question 5</u> |
| 6. | A description of any conditions imposed by Council on the approval of development applications to ensure that hazardous materials affected by flood water do not affect public safety and/or the environment. | <u>Question 6</u> |
| 7. | A description of how levee banks are regulated in the council area using specific examples. | <u>Question 7</u> |
| 8. | Details of council infrastructure (sewers, roads, stormwater etc) that was affected by flooding during the period 1 December 2010 to 31 January 2011. | <u>Question 8</u> |
| 9. | A description of the measures used by Council to protect Council infrastructure (sewers, roads, storm water etc) and to ensure such infrastructure functions during a defined flood event. | <u>Question 9</u> |
| 10. | A description of Mr Fulton's role in administering the four planning schemes within the Bundaberg Regional Council's jurisdiction. | <u>Question 10</u> |
| 11. | Details of the development constraints that apply to flood prone land under each of the four planning schemes. | <u>Question 11</u> |
| 12. | A description of any challenges Mr Fulton has experienced in the performance of his role that arise because of the need to administer four planning schemes with varying development constraints for flood prone land, citing specific examples where possible. | <u>Question 12</u> |
| 13. | A description of any challenges or difficulties experienced at an institutional level by Council that arise because of the need to administer four planning schemes with varying development constraints for flood prone land, citing specific examples where possible. | <u>Question 13</u> |

INDEX

PART B – Reference 1675968

1. Details of any council infrastructure that was affected by flooding between the period 1 December 2010 to 31 January 2011. Question 1
2. Details of any flood mitigation infrastructure (for example flood detention basins, storm water culverts, back flow devices) in the council's area including a description of the maintenance programs for such infrastructure. Question 2
3. Details of the storm water design capacity and urban run-off capacity, sewerage design capacity and the most recent review of these capacities including details of any plans to upgrade. Question 3

ATTACHMENTS

Name

Attachment A	<u>Bundaberg City Plan - Flood Management Code</u>
Attachment B	<u>Bundaberg City Drainage Analysis and Catchment Management Plan 1996</u>
Attachment C	<u>Bundaberg Regional Council Saltwater Creek Flood Study February 2010</u>
Attachment D	<u>Burnett Shire Natural Features or Resources Overlays Code</u>
Attachment E	<u>Burnett Shire Flood Line, River, Storm Tide and Local Flooding Assessment</u>
Attachment F	<u>Isis Shire Schedule 6 – Recommended Flood Levels for Community Infrastructure</u>
Attachment G	<u>Isis Shire Council Apple Tree Creek Flood Study</u>
Attachment H	<u>Isis Shire Natural Hazards Overlay Code</u>
Attachment I	<u>Isis Shire Extract from the Natural Features or Resources Overlays Code</u>
Attachment J	<u>Bundaberg City Burnett River Flood Study September 2004</u>
Attachment K	<u>Bundaberg City Burnett River Flood Study February 2002</u>
Attachment L	<u>Bundaberg City Burnett River Sensitivity Analysis March 2003</u>
Attachment M	<u>Bundaberg City Burnett River Flood Study Additional Hydrological Investigations</u>
Attachment N	<u>Typical Road Reports</u>
Attachment O	<u>Bundaberg Floor Heights</u>
Attachment P	<u>Burnett River 2% Exceedance Probability Flood Map</u>
Attachment Q	<u>Queensland Reconstruction Authority – Initial reconstruction identification template</u>
Attachment R	<u>Bundaberg City Planning Scheme</u>
Attachment S	<u>Isis Shire Planning Scheme</u>
Attachment T	<u>Kolan Shire Planning Scheme</u>

ATTACHMENTS

Name

Attachment U Burnett Shire Planning Scheme
Attachment V Roads Priority Areas and Road Assessments
Attachment W Bundaberg Sewerage Planning Report 2008
Attachment X Bundaberg City Planning Strategy for
Bundaberg's Wastewater Plants 2009
Attachment Y Coastal Sewerage Reticulation Planning 2010
Attachment Z Treatment Plant Locations
() Attachment AA Wastewater Treatment and Effluent
Management Master Plan 2009
Attachment AB Burnett Coastal Sewerage Strategy 2005
Attachment AC Gin Gin Stormwater Treatment Plant Report 2009
Attachment AD Sewerage – 10 Year Forward Capital Works Program

PART A

(Reference 1675979)

1. ***A summary of the assessment criteria contained in council's planning scheme(s) and how such criteria are used to assess applications for development in the natural hazard management area.***

Bundaberg Regional Council currently administers four (4) Planning Schemes:-

- Bundaberg City Council
- Burnett Shire Council
- Kolan Shire Council
- Isis Shire Council

1.1 **Bundaberg**

1.1.1 The Planning Scheme for Bundaberg City is identified as to address *State Planning Policy (SPP) 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*. The Planning Scheme has a *Flood Management Overlay* which triggers assessment for particular development located within the identified Defined Flood Event (DFE). The DFE is either a 2% AEP (Annual Exceedence Probability) Burnett River flood event or a 1% AEP local flood event. When a particular property is affected by both types of flood event the highest flood height is the DFE.

1.1.2 The assessment table attached to the overlay operates by making development identified within a DFE area 'code assessable' unless listed within the exemptions within the table. For the most part, these exemptions are limited to minor building works, agriculture, animal husbandry, parks and recreation outdoor uses.

- 1.1.3 Development triggered by the overlay is assessable against the *Flood Management Code*. (See Attachment A: Bundaberg City Plan – Flood Management Code)
- 1.1.4 In addition to the overlay triggering assessment against the *Flood Management Code*, the Local Area Development Assessment Tables trigger the *Flood Management Code* for uses defined Community Infrastructure ie. electrical supply, telecommunications and water supply etc.
- 1.1.5 The flood height data used in assessing development comes from two different sources, depending on the type of flood ie. the Burnett River Flood or Local Flood. The adopted 2% AEP River Flood data is from the Burnett River Flood Study prepared by GHD and adopted by Council on 23 May 2005. The local flood data (as mapped within the Planning Scheme Overlay) is based on modelling prepared by GHD (December 1996). (See Attachment B: Bundaberg City Council – Drainage Analysis and Catchment Management Plan 1996)
- 1.1.6 Due to the nature and scale of local flooding, the characteristics of the local flooding can be altered by works undertaken within a particular catchment. Council maintains the model and uses data from the most recent model to assess development. Early 2010 Council commenced a review of the local flooding catchments within the Bundaberg City Area. This review which incorporates updating the model type is an ongoing process. To date a new model for Saltwater Creek has been developed (See Attachment C: Bundaberg Regional Council – Saltwater Creek Flood Study – February 2010) and a review of Bundaberg Creek is underway.

- 1.1.7 In addition to the flood management overlay provisions within the Planning Scheme, lots deemed unsuitable for urban land because of flooding or drainage constraints have been zoned Non Urban. This is reinforced by the local area planning intent of a number of the local areas, which states when referring to lots located within the Non Urban precinct: -

'This precinct includes areas of land unsuitable for urban development because of physical constraints such as flooding and local drainage issues.'

- 1.1.8 The Planning Scheme does not have any specific assessment criteria for bushfire and landslide hazards. The flat topography of the land and minimal identified remnant vegetation within the locality, determined that these hazard types were considered to be insignificant.

1.2 Burnett

- 1.2.1 The Planning Scheme for Burnett Shire is identified as to address SPP 1/03. The Planning Scheme contains a Natural Hazards Areas Overlay which triggers assessment for particular development located with the identified hazard areas. A number of types of hazard are identified and mapped: Bushfire Prone Areas, Flood Line, Storm Surge, Local Flooding, Coastal Storm Tide Risk Area, Potential Salinity, Landslide Hazard and Acid Sulfate Areas.

- 1.2.2 Development identified within one or more of the identified hazard areas are triggered for assessment (code) against the provisions of the Natural Features or Resources Overlays Code via Assessment Table (5.1). Uses identified by the overlay mapping are code assessable unless specifically meeting prescribed exemption criteria. (See Attachment D: Burnett Shire – Natural Features or Resources Overlays Code). Exemptions include detached dwellings, domestic storage, home based business, general agriculture and parks.
- 1.2.3 In addition to the assessable flood management provisions within the *Natural Features or Resources Overlays Code*, the *Detached Dwelling and Domestic Storage Code* prescribes additional outcomes for development in regard to flooding outcomes for dwellings and associated buildings and structures. Below is an extract of the applicable criteria from the *Detached Dwelling and Domestic Storage Code*:-

Column 1: Specific outcomes		Column 2: Acceptable solutions (if self-assessable) or Probable solutions (if code assessable)
SO.255	Detached Dwellings are provided with an acceptable level of immunity from flood and storm tide.	PS.255.1 The floor levels of all habitable rooms are 300mm above— <ul style="list-style-type: none"> i. the inundation levels shown on the flood and stormtide risk area maps if located in the study area;³⁰ ii. the 1971 flood level for the Kolan River and the maximum flood levels for the upper Burnett River in Schedule 3, if located within 1km of the centreline of the upper Burnett River (outside the study area for (i) above) or the Kolan River; iii. for Rocky Point and Baffle Creek — 2.7m AHD; or iv. 3.3m AHD in all other locations³¹

- 1.2.4 The specified flood heights and mapping within the Natural Features or Resources Overlay and planning scheme codes is sourced from Burnett Shire Flood Line, River, Storm Tide, and Local Flooding Assessment Report prepared by GHD in 2004. (See Attachment E: Burnett Shire – Flood Line, River, Storm Tide and Local Flooding Assessment). It is understood this report was never formally adopted by Council.
- 1.2.5 Council is currently undertaking studies of Coastal stream flooding and also Storm tide modelling.

1.3 **Isis**

- 1.3.1 The Planning Scheme for Isis Shire is identified as to address SPP 1/03. The Planning Scheme has a Natural Hazard Overlay which triggers assessment for particular development located within the identified hazard areas. Three types of hazard are identified and mapped: Potential Acid Sulphate Soils, Bushfire Hazard Management and Flood Management.
- 1.3.2 The Flood Management overlay identifies land that is subject to inundation during a 1% AEP flood in and around Apple Tree Creek. Development is triggered for assessment (code) against the provisions of The Natural Hazards Overlay Code (Attachment H) via an assessment table (5.1). Generally uses identified by the overlay mapping are code assessable unless specifically meeting exemption criteria. Exemptions are restricted to building works within existing buildings, agriculture, animal husbandry, aquaculture (minor impact), local utilities, open space and recreation.

- 1.3.3 In addition to the assessable flood management provisions within The Natural Hazards Overlay Code, each zone code prescribes outcomes for development in regard to flooding solutions. Below is an extract from the Rural Zone Code, as an example:-

Performance Criteria		Acceptable Solution	
Flood Management			
PC6	Natural hydrological systems, landforms and drainage lines and the flood conveyance capacity of floodplains and waterways are maintained.	AS6.1	No acceptable solution prescribed.
PC7	Natural hydrological systems, landforms and drainage lines and the flood conveyance capacity of floodplains and waterways are maintained.	AS7.1	No acceptable solution prescribed.
PC8	Development and community infrastructure has an acceptable level of flood immunity, providing for the protection of development at an acceptable level of risk ¹⁶ .	AS8.1*	Floor levels for habitable rooms are – (a) for areas where minimum floor levels are specified, not less than the specified level; or (b) for areas where flood modelling is available, not less than 300mm above the modelled 1% AEP (Q100) flood level; or (c) for areas where flood modelling is not available, not less than 300mm above the highest known flood level or 300mm above ground level where no flood level is known.

- 1.3.4 In regard to Solution AS8.1(b) above, and other like solutions within other zone codes, Council currently has historical adopted flood levels for Woodgate and Buxton. Furthermore, schedule 6 prescribes flood immunity for each community infrastructure type. (See Attachment F: Isis Shire – Schedule 6: Recommended Flood Levels for Community Infrastructure)

1.3.5 The specified flood mapping within the overlay is sourced from the Apple Tree Creek Flood Study, dated 15 November, 2004, prepared by Cardno MBK. (See Attachment G: Isis Shire Council – Apple Tree Creek Flood Study)

1.3.6 The Bushfire Management overlay identifies land that is at low, medium or high bushfire risk. The accompanying assessment table (5.1) triggers assessment (code) against the provisions of the *Natural Hazards Overlay Code* for proposed development located within the High and Medium risk areas, unless specifically meeting exemption criteria. Areas identified as Low risk are not triggered for assessment against the Planning Scheme. (See Attachment H: Isis Shire - The Natural Hazards Overlay Code)

1.3.7 No provision exists within the Scheme with regards to land slip.

1.4 Kolan

1.4.1 The Planning Scheme for Kolan Shire is identified by the Minister to appropriately address bushfire only in regard to *SPP 1/03*, ie. it does not appropriately address flooding or landslide.

- 1.4.2 However, the Planning Scheme does identify a 'Flood and Drainage Liability' area within the Infrastructure Overlay map. Twelve (12) properties in the town of Gin Gin are impacted by this overlay provision. Development assessment table (4.15) requires development on land identified by the Flood and Drainage Liability area to be assessed (code assessment) against the *Infrastructure Areas and Items Overlay Code*, unless the particular development is identified as exempt by the assessment table. Exemptions include community services, community space, farming and roads. The assessment criteria are set out in the below table:-

Column 1: Specific outcomes		Column 2: Probable solutions	
If located in the Flood and Drainage Liability Area			
SO 82.	An acceptable level of flood immunity is provided.	PS 82.1	Habitable rooms are to have a floor level not less than 300mm above the 1% AEP flood level.
SO 83.	Development minimises risks to personal safety and the risk of damage to property.	No Probable Solution Identified	
SO 84.	Works do not create or increase flooding or drainage problems.	No Probable Solution Identified	

- 1.4.3 In addition to the provisions of the Infrastructure Areas and Items Overlay Code, the zone codes: Filling and Excavation Code, Reconfiguring a Lot Code within the Planning Scheme, require floor levels of particular uses to be above a 1% AEP flood.

- 1.4.4 There is no particular flood study within Council's records to detail the areas that are subject to the Flood and Drainage Liability area. It is understood these sites have been identified within the planning scheme from local knowledge of historical flooding within the town of Gin Gin.

1.4.5 In regard to Bushfire, the Planning Scheme contains Bushfire Prone Areas mapping within the Natural Features or Resources Overlay. The development assessment table (4.11) requires development on land identified to be within the High or Moderate bushfire risk area to be assessed (code assessment) against the Natural Features or Resources Overlays code, unless the particular development is identified as exempt by the assessment table. The assessment criteria are set out in Attachment I: Kolan Shire – Extract from the Natural Features or Resources Overlays Code.

2. A description of how the natural hazard management area, as it relates to flood affected land, is reflected in the planning scheme.

2.1 This question has been answered as part of Question 1.

3. Details of Council's defined flood event including a description of:

- a) how the defined flood event was chosen;**
- b) the way in which the council's defined flood event was calculated or determined.**

3.1 Bundaberg

3.1.1 A 2% AEP event for Burnett River flooding was chosen in consideration of the following:-

3.1.1.1 The 2% AEP Burnett River flood chosen was based on flood studies undertaken by GHD between 2001 and 2004 and finalised in the GHD Report Burnett River Flood Study September 2004 (See Attachment J). Three preceding documents, Burnett River Flood Study Feb 2002 (Attachment K), Burnett River Sensitivity Analysis March 2003 (Attachment L), Burnett River Flood Study Additional Hydrologic Investigations June 2003 (Attachment M) were the basis for the final document. A flow of 15,000 cumecs in the Town Reach of the river was selected as representative of a 2% AEP Burnett River flood. There was a degree of conservatism in selecting this flow. The Sensitivity Analysis indicated flows for a 2%AEP flood could range from a lower limit of 13,770 cumecs to an upper limit of 15,400 cumecs.

3.1.1.2 Historically the community considered the 1942 flood levels were reasonable for flood plain management. Much of the North Bundaberg community and areas immediately adjacent are on low-lying areas that are flood affected. The Superseded Transitional Planning Scheme for the City of Bundaberg which comprised the Planning Schemes of The former Bundaberg City (1988), Woongarra Shire (1976) and Gooburrum Shire(1981), and to be superseded by the 2004 Scheme, provided the following flood development management requirements for the area under the former Bundaberg Scheme:-

Premises for Residential use

- Land surface and access thereto not lower than 1.25 m below highest recorded flood level;
- Ingress and egress from the street and the street to be not lower than 1.25 m below highest recorded flood level;
- Floor level to be higher than the highest recorded flood level.

Premises for business, commercial or industrial purposes

- Land surface and access thereto not lower than 2.5 m below highest recorded flood level;
- Ingress and egress from the street and the street to be not lower than 2.5 m below highest recorded flood level;
- Floor level not lower than 1.25 m below the highest recorded flood level.

3.1.1.2.1 The highest recorded flood level for the purposes of the above was determined by reference to historical records of the 1942 flood.

3.1.1.2.2 The Flood Management Code in the 2004 Planning Scheme now required new residential development (streets and land) to be above the DFE rather than allowing access 1.25 m below the 1942 flood.

3.1.1.2.3 The Flood Management Code in the Planning scheme now required new business commercial and industrial development (streets and land) to be above the DFE rather than allowing access 2.5 m below the 1942 flood.

3.1.1.3 The 2% AEP Burnett River Flood adopted was some 200mm to 400mm higher than the 1942 previously adopted flood levels (in the urban areas of the City).

3.1.1.4 It was considered, due to the City's location at the downstream end of the Burnett River Catchment, that there was adequate warning time (approximately 24 hours) to allow evacuation of persons from the flood areas.

3.1.1.5 It should be noted that the December 2010 event recorded RL 7.92m AHD on the Targo Street gauge (Bundaberg CBD), this being approximately 700mm below a 2%AEP level adopted of 8.7m AHD at the guage.

3.1.1.6 Bundaberg Regional Council utilises a 1%AEP flood as the DFE for flooding other than Burnett River Flooding ie. localised rainfall event flooding. This reflects the provisions of the Queensland Urban Drainage Manual.

3.1.2 Council's defied flood event was determined in the following manner:-

3.1.2.1 As part of drafting a new Planning Scheme for the City of Bundaberg, the former Bundaberg City Council engaged GHD in November 2000 to undertake a flood study of the Burnett River. GHD completed the study in February 2002 (Burnett River Flood Study February 2002) and a 2% AEP flood map proposed and incorporated in the draft planning scheme which was placed for public notification between August 2002 and November 2002.

3.1.2.2 Due to a significant negative public response GHD were commissioned to undertake two further reports:-

- Burnett River Flood Study – Report on Sensitivity Analysis – March 2003
- Burnett River Flood Study – Additional Hydrologic Investigations – June 2003

3.1.2.3 As Council wished that further studies be undertaken, the flood map (which indicated flood levels) was removed from the draft Planning Scheme to allow its adoption by Council on the 5th Feb 2004. The scheme contained a flood overlay map only.

3.1.2.4 The above reports were requested to further inform Council on numerous issues raised as part of the public consultation.

3.1.2.5 These reports resulted in:-

3.1.6.1 Greater confidence in the river flow estimates upon which the flood levels were based;

3.1.6.2 Mapping to finer detail (100mm flood contours rather than 250mm flood contours).

3.1.2.6 Following consideration of these reports Council commissioned GW Surveys to survey all residential habitable floor levels that may have been affected by the proposed 2% AEP Burnett River flood. This work was completed in January 2004. (Attachment O: Bundaberg Floor Heights)

3.1.2.7 The Burnett River Flood Study Final Report was completed in September 2004. This document was a compilation of the previous three documents. Council adopted the Burnett River 2% AEP flood map on the 23rd May 2005 (Attachment P: Burnett River 2% Exceedance Probability Flood Map).

3.1.2.8 Whilst my field of expertise is not river flood modelling, my understanding of the process used by GHD to determine the flood mapping was:-

3.1.2.8.1 Determine the catchment runoff and resultant flows utilising the Bureau of Meteorology URBS CM model for the Burnett River. This was refined, calibrated and analysed for its sensitivity.

3.1.2.8.2 Model the resultant flows utilising a 2D hydrologic model – Delft FLS which determined a flood water surface in conjunction with a terrain model and river cross sections.

3.1.2.9 The specific work done is detailed in the report *Burnett River Flood Study Final Report Sept 2004*.

3.1.2.10 The 1%AEP localised flood levels are determined by the use of hydrologic/ hydraulic models for creek systems traversing the Urban City area. These were originally established by a study undertaken by GHD completed in December 2006. The models are being progressively reviewed with a new model developed for Saltwater Creek completed in 2010 and a new model for Bundaberg Creek expected to be completed in 2011. The new models are based on the software package known as SWMM.

3.2 Burnett

3.2.1 The Former Burnett Shire Council Planning Scheme (2006) utilises a 1%AEP flood line for areas downstream and just upstream of Bundaberg City. Burnett Shire commissioned GHD to undertake a desktop study based on the work GHD had done for Bundaberg City. This is contained in the report Burnett Shire Flood Line, River, Storm Tide and Local Flooding Assessment. (See Appendix E: Burnett Shire Flood Line, River, Storm Tide and Local Flooding Assessment)

3.2.2 No studies have been undertaken for the Kolan or Elliot Rivers. Historic flood levels where known are the basis for any development flood controls adjacent these rivers. No studies at the time of Burnett Shire Planning Scheme drafting were undertaken on other local coastal streams. Modelling of the coastal streams has since been undertaken but not finalised.

3.2.3 The Burnett Shire utilised a 1%AEP flood for other local areas (Localised flood scenario).

3.3 Isis

3.3.1 The Flood Management overlay identifies land that is subject to inundation during a 1% AEP flood in and around Apple Tree Creek. The basis of these flood levels is a Report by Cardno MBK – Flood Study – Final Report – Apple Tree Creek (See Appendix G: Apple Tree Creek Flood Study) This modelling utilises RAFTS and HEC- RAS to determine localised flood levels in the Apple Tree Creek area.

3.3.2 In the areas of Woodgate and Buxton levels utilised by the Isis Shire appear to be based historically but are not tabulated in the planning scheme or other planning documents.

3.4 Kolan

3.4.1 The Planning Scheme for the Shire of Kolan was not supported by any flood modelling either for Burnett River flooding or localised flooding. It identifies a 1% AEP as the required level of flood immunity.

4. A description of any planning requirements to have evacuation routes and/or early warning systems for areas identified to be at high risk of flooding, including information about how the existence of such evacuation routes and/or early warning systems are communicated to occupiers of areas at high risk of flooding.

4.1 The Bundaberg City Flood Management Code performance criteria requires the following with respect access routes:-

P3	Bridges and culverts for flood immunity minimise traffic disruption, provide for public safety and bike ways, allow for fauna habitat and movements and maintain necessary hydraulic performance.
P4	Land surface and road access thereto of land used for residential purposes must provide safe egress during the DFE.
P6	Land surface and road access thereto of land used for commercial, business or industrial purposes shall provide for safe egress during the DFE.

4.2 The Planning Scheme does not specifically identify evacuation routes nor does it address early warning systems. The Planning Scheme does not have a primary role in identifying such to occupiers of flood prone land apart from actually identifying that the land is flood prone.

4.3 The Burnett Scheme does not require development to have any evacuation routes or early warning systems in areas identified to be at high risk of flooding. Despite not specifically detailing such solutions Probable Solution 209.1 and its accompanying Specific Outcome 209 do not foresee development on land that is subject to inundation during the DFE.

Column 1: Specific outcomes	Column 2: Acceptable solutions and Probable solutions
SO.209 Development maintains the safety of people on the premises from all floods up to the Defined Flood Event (DFE) and storm tide events.	PS.209.1 Development is sited on land that would not be subject to flooding during the DFE.

The Isis Scheme does not require development to have any evacuation routes or early warning systems in areas identified to be at high risk of flooding.

The Kolan Scheme does not require development to have any evacuation routes or early warning systems in areas identified to be at high risk of flooding.

5. A description of any controls or standards used to assess the storage of chemicals or other Environmentally Relevant Applications for development below the Q100 flood line or the Council's defined flood event.

- 5.1 The Bundaberg Planning scheme within the Flood management code provides the following Performance Criteria and Acceptable solutions:-

<p>P8 Public safety and the environment are not adversely affected by the detrimental impacts of floodwater on hazardous, toxic or noxious materials manufactured or stored in bulk.</p>	<p>A8.1 The manufacture or storage in bulk of hazardous, toxic or noxious materials takes place above the DFE level; or</p> <p>A8.2 Structures used in the manufacture or storage in bulk of hazardous, toxic or noxious materials are designed to prevent intrusion from floodwaters.</p>
--	--

- 5.2 It should be noted that the Bundaberg Scheme defines a 2%AEP (Q₅₀) as the DFE for the Burnett River flood, as such a development may achieve compliance with the relevant solution of the planning scheme but still be under the 1%AEP flood level.

- 5.3 The Burnett Scheme through the Natural Features or Resources Overlay Code requires the storage of hazardous materials above the DFE.

Column 1: Specific outcomes	Column 2: Acceptable solutions (if self-assessable) or Probable solutions (If code assessable)
<p>SO.215 Public safety and the environment are not adversely affected by the detrimental impacts of floodwater or storm tide on hazardous materials manufactured or stored in bulk.</p>	<p>PS.215.1 The manufacture or storage of bulk or hazardous materials takes place above the DFE flood level.</p> <p>PS.215.2 Structures used for the manufacture or storage of hazardous materials in bulk are designed to prevent the intrusion of floodwaters.</p>

- 5.4 The Isis Scheme provides no direct solutions in regard to storage of hazardous materials above the DFE. Despite the scheme not specifically referring the storage of hazardous materials above a DFE, the Industry Zone Code does provide assessable criteria in regard to ensuring such materials are safely contained on-site.

Performance Criteria		Acceptable Solution	
<i>Environmental Protection and Amenity</i>			
PC6	Chemicals and materials used in industrial operations and related activities should be stored and handled on site in a manner which adequately guards against hazard from spills and exposure to the elements and unsightly view.	AS6.1	Chemicals and materials are stored in covered, bunded areas or in sealed containers within bunded areas.
		AS6.2	Bunded areas are not in the path of stormwater flows.
PC7	Development is sited, constructed and managed such that: (a) the generation of any noise does not cause unreasonable nuisance to adjoining properties or other noise sensitive areas; (b) any emissions of pollutants do not cause a nuisance beyond the site boundaries; (c) there is no significant adverse impact on the quality of any surface water or ground water resource; (d) the ecological and hydraulic processes of any waterway or wetland are not adversely affected; and (e) areas of nature conservation significance are not adversely affected.	AS7.1	No acceptable solution prescribed.

- 5.5 Additionally the planning scheme is structured as such that industrial development within areas impacted by a DFE is not foreseeable.
- 5.6 The Kolan Scheme through the Industrial Zone requires the storage of hazardous materials above a 1 in 100 year flood event.

Column 1: Specific outcomes	Column 2: Probable solutions
<i>Wastewater, surface water and refuse disposal</i>	
SO 33. Wastewater does not enter watercourses or groundwater	PS 82.1 Habitable rooms are to have a floor level not less than 300mm

Column 1: Specific outcomes	Column 2: Probable solutions
because the following measures have been implemented— i. ... v. locating storage tanks containing hazardous, toxic or noxious wastes only in locations that area flood free for a 1 in 100 year flood event.	above the 1% AEP flood level.

5.7 Like the Isis Scheme the Kolan Scheme does not foresee industrial development outside of the Industry zone.

6. A description of any conditions imposed by Council on the approval of development applications to ensure that hazardous materials affected by flood water do not affect public safety and/or the environment.

6.1 None

7. A description of how levee banks are regulated in the council area using specific examples.

7.1 There are no flood control levee banks under the control of Bundaberg Regional Council. A levee bank known as The Bywash protects Kendalls Flats adjacent the CBD from tidal inundation. Levee banks exist on the northern Burnett River bank downstream of the city and protect the Bundaberg Sugar Fairymead sugar plantation. These are under the control of Bundaberg Sugar.

8. Details of council infrastructure (sewers, roads, stormwater etc) that was affected by flooding during the period 1 December 2010 to 31 January 2011.

8.1 A preliminary list of identified reconstruction works is attached at Appendix Q - Queensland Reconstruction Authority - Initial reconstruction identification template. This question is also answered at Reference 1675968, Question 1.

9. A description of the measures used by Council to protect Council infrastructure (sewers, roads, storm water etc) and to ensure such infrastructure functions during a defined flood event.

9.1 Each planning scheme within the local government area has provisions to ensure new infrastructure is constructed to an acceptable level of flood immunity.

9.1.1 Bundaberg City

9.1.1.1 In regard to the provision of flood immunity of new infrastructure the Flood Management Code states: -

Performance Criteria		Acceptable Solution	
P4	Land surface and road access thereto of land used for residential purposes must provide safe egress during the DFE.	A4.1	On all allotments in the Residential A and Residential B Precinct existing at the date the planning scheme commences, no solution is prescribed; or
		A4.2	On all other allotments, the land surface and road access thereto of all land used for residential purposes is above the DFE level for the site.

Performance Criteria		Acceptable Solution	
P9	Essential services infrastructure (e.g. electricity, gas, water supply, sewerage and telecommunications) maintains its function during a DFE,	A9.1	Essential services infrastructure is located above the DFE level; or
		A9.2	Essential services infrastructure located below the DFE are designed and constructed to exclude floodwater intrusion/infiltration; and
			Essential services infrastructure is designed and constructed to resist hydrostatic and hydrodynamic forces as a result of inundation by the DFE.

9.1.1.2 Burnett Shire

In regard to the provision of flood immunity of new infrastructure the Natural Features or Resources Overlays Code states: -

Column 1: Specific outcomes	Column 2: Acceptable solutions and Probable solutions
<i>If within a Flooding or storm tide risk area identified on Maps NHA 2.1 to NHA 2.4 and maps NHA 3.1 to NHA 3.7</i>	
SO.216 Essential service infrastructure (e.g. on-site electricity, gas, water, sewerage and telecommunications) maintain its function during the DFE or storm tide events.	<p>PS.216.1 Any components of the infrastructure that are likely to fail to function or may result in contamination when inundated by floodwater (e.g. electrical switchgear and motors, water supply pipeline air valves) are—</p> <ol style="list-style-type: none"> located above the DFE; or designed and constructed to exclude floodwater intrusion or infiltration. <p>PS.216.2 Infrastructure is designed and constructed to resist</p>

Column 1: Specific outcomes	Column 2: Acceptable solutions and Probable solutions
	hydrostatic and hydrodynamic forces as a result of inundation by the DFE.

9.1.2 Isis Shire

In regard to the provision of flood immunity of new infrastructure, each zone code prescribes the outcomes for community infrastructure. Below is an extract from the Residential Zone Code: -

Performance Criteria	Acceptable Solution
<i>Flood Management</i>	
PC13 Development and community infrastructure has an acceptable level of flood immunity, providing for the protection of development at an acceptable level of risk ²³ .	AS13.1 ... AS13.2 Community infrastructure is located at or above the recommended flood levels identified in Schedule 6.

Community infrastructure uses are defined within Schedule 6. As an example a Power Station is required to have a 0.2% AEP flood immunity.

9.1.3 Kolan Shire

In regard to the provision of flood immunity of new infrastructure, each zone code prescribes the outcomes for community infrastructure. Below is an extract from the Residential Zone Code: -

Column 1: Specific outcomes	Column 2: Probable solutions
<i>Site suitability</i>	
SO 41. Community infrastructure ¹³ is able to function effectively during and immediately after flood, bushfire or landslide	PS41.1 ... PS41.2 ... PS41.3 The floor level of community infrastructure is located

Column 1: Specific outcomes	Column 2: Probable solutions
events.	300mm above the 1% AEP flood level.

Note: As SPP 1/03 is identified as not being addressed within the Kolan Planning Scheme (for flooding) assessment against the provisions of the SPP is still required.

- 9.2 A brief description pertaining to specific infrastructure as it operates during a flood event is provided below:-

9.2.1 Roads and Drainage

9.2.1.1 The Local Government road network is the infrastructure asset most significantly affected by flooding. The network comprises both rural and urban roads. During the December 2010-January 2011 flood event, major roads were cut and a number of areas of Bundaberg City were inaccessible as flood waters backed up into local creeks. Major creek systems in the hinterland including the Perry River system were affected by the flooded river with most hinterland bridges inundated and impassable. Major routes in and out of Bundaberg were all inundated at times during the event.

9.2.1.2 It is estimated that 10% of the sealed road network has major damage requiring restoration.

9.2.1.3 Stormwater detention basins throughout the City area maintain localised flooding (resulting from localised rainfall events) to acceptable levels.

9.2.2 Water Supply

9.2.2.1 The city's water supply system sources water from the Branyan Water Treatment Plant together with 18 bores spaced across the City.

9.2.2.2 This distributed supply and reticulation system provides the City's water supply with significant flexibility and redundancy. The Branyan Water Treatment Plant, apart from its water intake, is above Council's DFE, the majority of the bores are also above Council's DFE.

9.2.2.3 Long term major power outages across the City may affect reticulation and treatment capacity. It is considered the City's water supply system demonstrated its resilience to flooding in the December 2010-January 2011 event. A Business Continuity Plan for the water supply system is to be prepared.

9.2.3 Sewerage

9.2.3.1 The City's two (2) largest wastewater treatment plants, Millbank and East, are subject to inundation during a DFE flood event. The Millbank plant was substantially inundated whilst the East plant was partially inundated. The control room of both the Millbank and East plants were above the 2010/2011 flood event. Where practicable, switchboards and other electrical infrastructure are and will continue to be constructed above the 2010/2011 flood event. Other sewerage infrastructure such as submersible pumps, are generally not impacted by flood.

10. A description of Mr Fulton's role in administering the four planning schemes within the Bundaberg Regional Council's jurisdiction.

10.1 Andrew Fulton was Director Planning and Development Bundaberg Regional Council from March 2008 until March 2011 and then Director Infrastructure and Planning April 2011 to present.

10.2 As Director of a multidisciplinary group, I was supported by Manager Strategic Planning, Manager Planning - City and Hinterland (Bundaberg and Kolan Planning Schemes), Manager Planning - Coastal (Burnett and Isis Planning Schemes), Manager Sustainability plus other managers not related to planning. I provided high level management and leadership to the directorate.

11. Details of the development constraints that apply to flood prone land under each of the four planning schemes.

11.1 Each planning scheme addresses development within flood prone land differently and triggers assessment differently. Additionally, each planning scheme is informed by differing levels of information to support the assessment of development within flood prone land.

- 11.2 The Planning Scheme for Bundaberg City (Attachment R) utilises an overlay to identify land that is flood prone and an accompanying overlay code to provide assessment criteria for proposed development within such areas. Furthermore, land identified as being too heavily constrained by flood or drainage problems are within 'Non Urban' precinct. The Non Urban designation is reinforced by Item 3 of the Preferred Settlement Pattern and Development Characteristics within the Non Urban Strategy which states that Non Urban land identified unsuitable for urban purposes because of constraints such as flooding are to be used by uses that are unlikely to be affected by or affect flooding.
- 11.3 The Flood Management Overlay mapping is based on two differing flood events, a 2% AEP Burnett River flood and 1% AEP local flooding for the local streams. The data for these flood events are sourced from the GHD Burnett River Flood Study 2004 and the Drainage Analysis and Catchment Management Plan 1996 prepared by GHD.
- 11.4 The Flood Management Code which is triggered by the Flood Management Overlay, unless specifically identified as exempt by the development assessment table, provides prescribed outcomes for development identified as flood prone. The Flood Management Code is performance based, thus provides opportunity for development that does not strictly comply with a particular probable solution to satisfy a performance criteria via an alternative solution.
- 11.5 Uses identified as exempt are limited to specific minor building works, agriculture, animal husbandry, park and recreation outdoor.

- 11.6 The Planning Scheme for Burnett Shire (Attachment U) uses an overlay to identify land that is flood prone and an accompanying overlay code to provide assessment criteria for proposed development within such areas. Unlike the Bundaberg planning scheme more uses are exempted from these provisions, e.g. dwellings. Dwellings whilst exempt from the overlay and accompanying code have self assessment criteria contained within the Detached Dwelling and Domestic Storage Code. This self assessment criterion provides for habitable floor levels for dwelling within an identified flood prone area.
- 11.7 The minimum floor levels stated vary in regard to the source of the data. Some floor levels are prescribed as a result of information from the Burnett Shire Flood Line, River, Storm Tide, and Local Flooding Assessment prepared by GHD in approximately 2004, other heights are specified by above the 1971 flood level for the Kolan River and default heights are provided for the remainder of the former local government area. These default heights are provided in lieu of more accurate data being available.
- 11.8 Like the Flood Management Code within Bundaberg scheme the Natural Features or Resources Overlays Code within the Burnett scheme provides prescribed outcomes however ultimately assessment is performance based.
- 11.9 The Planning Scheme for Isis Shire (Attachment S) uses an overlay to identify land that is flood prone and an accompanying overlay code to provide assessment criteria for proposed development within and around the township of Apple Tree Creek. Within other areas of the shire the Zone Codes provides assessable criteria. Primarily the zone codes provide self assessable provisions for dwellings and performance based outcomes for all other uses that are generally identified for higher level of assessment.

- 11.10 An anomaly within the Isis scheme is that a dwelling proposed within the Rural Zone is exempt development i.e. not assessable against the provisions of the planning scheme, but yet floor heights for habitable rooms are nominated as outcomes of the Rural Zone Code. As a consequence proposed dwellings within the Rural Zone are not assessable against any flood provisions (when outside of the area identified by the Natural Hazards Overlay) whether there is historical flood information for the site or not.
- 11.11 The specified flood mapping within the overlay is sourced from the Apple Tree Creek Flood Study, dated 15 November, 2004, prepared by Cardno MBK.
- 11.12 Like the Bundaberg and Burnett schemes the assessable criteria within the codes are performance based.
- 11.13 The Planning Scheme for Kolan Shire (Attachment T), like the Isis Shire scheme, uses an overlay trigger (Flood and Drainage Liability area) for a portion of the former local government area and uses Zone Code provisions for the remainder.
- 11.14 There are no flood studies within the former local government area to inform the planning scheme or development assessment decision making. The twelve properties identified in the town of Gin Gin impacted by the Flood and Drainage Liability area are known historically to have such issues.
- 11.15 Like the three other planning schemes the assessable criteria within the codes are performance based.

11.16 It should be noted that the Kolan Scheme is nominated as to not address the SPP 1/03 in regard to flooding so an assessment against the State Planning Policy for applications is still required.

11.17 Although structured differently and informed by differing levels of supporting documents a number of consistent assessable elements can be found throughout all four planning schemes. For example each scheme nominates that the habitable floor level for dwellings are to be 300mm above the applicable flood level, manufacturing and storage of hazardous material is to occur above any nominated flood, and flood flows paths are protected from operational works.

11.18 It is considered that these consistencies are a result of the State Planning Policy 1/03 and have been achieved because these elements are a minimum standard required by the SPP.

12. A description of any challenges Mr Fulton has experienced in the performance of his role that arise because of the need to administer four planning schemes with varying development constraints for flood prone land, citing specific examples where possible.

12.1 The Kolan planning scheme nominates land within a Flood and Drainage Liability Area but does not have any reports, data or policies to support this land designation. This has created frustration for Council Officers assessing triggered application and the community. Application example: 322.2007.20901.1 – a Material Change of Use for 2 residences within the Flood and Drainage Liability Area. In this instance, the habitable floor level for each dwelling was to be set no less than 600mm above the ground level of the site based on the neighbouring dwelling.

- 12.2 The Zone Codes, Infrastructure Areas and Items Overlay Code, Filling and Excavation Code, Reconfiguring a Lot Code within the Planning Scheme for Kolan Shire refer to a 1% AEP flood. Council has no records or supporting studies of any flooding.
- 12.3 Within the Planning Scheme for Kolan Shire proposed dwellings, unless located on 1 of the 12 lots identified within the Flood and Drainage Liability area, dwellings are not assessed potential flooding when located nearby a waterway.
- 12.4 Within most rural areas of the local government area dwellings are not assessed against flood provisions as limited information exists.
- 12.5 Different triggers due to the different structures of the planning schemes does not allow for consistency in assessment processes and outcomes. For example within the Bundaberg city dwellings are triggered for assessment by the Flood management Overlay and assessed against the Flood Management Code where in the Burnett Shire dwellings are exempt from the Natural Features or Resources Overlay and the Detached Dwelling and Domestic Storage Code has self assessable provisions relating to flooding.

13. A description of any challenges or difficulties experienced at an institutional level by Council that arise because of the need to administer four planning schemes with varying development constraints for flood prone land, citing specific examples where possible.

13.1 The following institutional matters are raised:-

13.1.1 The difficulty Council has in attracting and retaining engineers with experience and skills in stormwater modelling – this issue not only affects Council but also the Engineering Consultancy industry. There is a responsibility, both of Council and the Consultants servicing the development industry, to ensure that professional engineers undertake stormwater design with due care and attention to ensure that design standards are reflected in stormwater infrastructure provided.

13.1.2 Recognising the issues of administering four (4) planning schemes, the Bundaberg Regional Council engaged Humphries Reynolds Perkins in November 2010 at a tended cost of \$654,112 to commence drafting of a new Planning Scheme. In addition to this monetary requirements, Council in the 2011/2012 Budget has provided \$200,000 to review and extend the Flood Study previously undertaken for the Burnett River as well as develop a flood model for the Kolan River (\$40,000). This work will provide the background for Flood Management provisions in the new Planning Scheme.

13.1.3 In recognising the importance of stormwater drainage planning, Council is in the process of reallocating a current technical position to focus on stormwater drainage planning.

Statement Prepared By:-

Mr Andrew William FULTON
Director Infrastructure & Planning Services
Bundaberg Regional Council

..

Signature

1 September 2011

.....
Dated

PART B

(Reference 1675968)

1. Details of any council infrastructure that was affected by flooding between the period 1 December 2010 to 31 January 2011. (See Attachment Z – Treatment Plant Locations)

1.1 Roads and Drainage

- 1.1.1 Bundaberg Regional Council experienced heavy rains in early December 2010 which resulted in flash flooding which cut a number of local roads.
- 1.1.2 On 5 December 2010, heavy rain in the McCoys Creek catchment washed away a large culvert on Arcadia Drive at Branyan isolating approximately 300 residents. A temporary replacement culvert was installed to provide access to these residents the following day.
- 1.1.3 Access on a number of local roads was further disrupted as rain continued to fall in December and extremely heavy rain washed away four major culvert structures in the Bungadoo and Delan areas. Two of these structures were on the Wallaville-Goondoon Road.
- 1.1.4 The Burnett River began to rise rapidly on 28 December 2010 and rose to a peak height of 7.92 metres on 30 December 2010. All low lying areas of the city were inundated.

- 1.1.5 Major roads were cut and a number of areas of Bundaberg City were inaccessible as flood waters backed up into local creeks. Major creek systems including the Perry River were affected by the flooded river with most bridges inundated and impassable. A number of communities were isolated and the Bruce Highway was cut at Currajong Creek and all south-bound highway traffic was halted at Gin Gin for several days.
- 1.1.6 The flooded Burnett River inundated riverside park facilities and washed away Council jetties and pontoons in the town reach. Scouring of the river bank and car parking areas and stripping of vegetation occurred as the river peaked a further two times.
- 1.1.7 Two Council buildings, Rowers on the River in Quay Street and the Walla Street Hall, were inundated in the flood and suffered significant damage. The Walla Street Hall has since been demolished and the Rowers building is restricted to use on the second story only (storage on the ground floor only).
- 1.1.8 The combination of inundation and continuing rain causing rising water table levels resulted in saturated road pavements across the Regional Council area. Roads suffered rutting, heaving, and potholing. It is estimated that 10% of the sealed road network has major damage requiring reconstruction. Stormwater pipes suffered from erosion or siltation.

1.1.9 Many roads were cut or inaccessible and updates on closures were provided daily during December and January. These reports were provided weekly during the emergent repair period and then monthly to date. The reports were provided to the Disaster District Co-Ordinator and uploaded to the Council's Intranet. Typical reports are provided (See Appendix N: Typical Road Reports)

1.1.10 A preliminary list of claimable restoration works is provided at Attachment Q (Queensland Reconstruction Authority - Initial reconstruction identification template). A map indicating locations of road damage prepared subsequently to the above list, is provided in Attachment V (Roads Priority Areas and Road Assessments).

1.2 Water

1.2.1 Generally, the water supply for Bundaberg City was not impacted by the December 2010-January 2011 floods. Quantity and quality service levels were maintained primarily because of the flexibility in this water supply system. Low water consumption during this period enabled total water usage to be supported by the groundwater system.

1.2.2 Branyan Water Treatment Plant was not operated during the flood period due to its river inlet being submerged however, the plant did remain in a operable condition. There is sufficient redundancy in the water supply system to accommodate Branyan water treatment plant being offline.

- 1.2.3 Infiltration occurred in the Thornton Street bore well, this bore was inundated and hence was isolated and brought back online after the floodwater receded.
- 1.2.4 Floodwater ingress occurred in one water reservoir at the east depot, this reservoir was taken offline. The ingress occurred because of the condition and age of the inground reservoir and the damage to the floor not considered a result of the flood. Rectification works have been budgeted in the 2011/2012 budget to repair this reservoir.
- 1.2.5 The inlet works at Wallaville were submerged and as a result this plant did not operate during the flood period. There was sufficient water available in the elevated storage tank to ensure that service levels were not compromised.
- 1.2.6 As floodwaters receded visual inspections were performed to identify any damage or apparent leakage that occurred within the reticulation system.
- 1.2.7 Power outages did not affect the majority of bores or groundwater treatment plants.
- 1.2.8 The total claimable cost of flood damage to Water Supply infrastructure is \$16,330 (August 2011).

1.3 Sewerage

- 1.3.1 Council's second largest wastewater treatment plant (Millbank) was isolated and the majority of the plant submerged during the December 2010 event. Prior to its inundation, some critical components eg. motors, were removed from the plant and power disconnected. A number of switchboards and pump motors that remained on the site were submerged but the main oxidation ditch was not inundated. This enabled the bio mass to be retained and made it easier to restore the treatment process following the flood event.
- 1.3.2 The plant was operable several days after the waters receded with effluent quality improving shortly after this time. Besides damage to electrical components, a section of the perimeter fence was also damaged.
- 1.3.3 Council's largest wastewater treatment plant (East) was flooded in the lower areas containing sludge beds and sludge storage areas. The treatment plant was not affected however flows to the plant increased significantly during the flood period, in order of 7-8 times ADWF.
- 1.3.4 Eight (8) sewerage pump stations were affected (4 small pump station) as flood waters rose, power was disconnected to these stations; all stations apart from Tallon Bridge, had wet well submersible pumps and hence sustained little damage. Pump stations were progressively brought back online as the flood waters receded. Surcharging in the sewerage reticulation system was managed on a case by case basis. During the flood period, two crews were assigned to investigate and provide advice to property owners/tenants.

1.3.5 An odour control station which provides oxygen injection at Waterview Road was damaged and at this time, has not been repaired. This site is currently being assessed to see whether it is appropriate for the future.

1.3.6 The total claimable cost of damage to sewerage infrastructure is \$185,812 (August 2011).

2. Details of any flood mitigation infrastructure (for example flood detention basins, storm water culverts, back flow devices) in the council's area including a description of the maintenance programs for such infrastructure.

2.1 The following major stormwater detention basins are within the Bundaberg Regional Council Local Government area:-

- Airport Detention Basin
- Pressler Basin
- Industrial Park Basin
- McCarthy Street Basin
- Belle Eden Basin
- Ring Road Basins – Goodwood Road, Bells Road, Walker Street, Clayton Road
- Beach Mileu

2.2 All of these basins are designed to attenuate local run-offs. Numerous other minor detention storages are incorporated in developments across the City, predominately in car park areas.

2.3 Maintenance of these basins consists of mowing and vegetation management on frequencies of up to six (6) times per year.

2.4 Backflow devices are limited to tidal gates in tidal areas. There are inspected annually for operation.

3. Details of the storm water design capacity and urban run-off capacity, sewerage design capacity and the most recent review of these capacities including details of any plans to upgrade.

3.1 The following studies provide stormwater design capacity information:-

3.1.1 Stormwater

3.1.1.1 Bundaberg City Drainage Analysis and Catchment Management Plan 1996 (Attachment B)

3.1.1.1.1 This Study provides capacity details of all major drainage paths in the City. It has been used predominantly for development assessment purposes. Upgrades identified are within the document but have been constructed or undertaken include:-

- Saltwater Creek – Airport Detention Basin (Constructed)
- Crofton Street Drain – flood affected land purchased
- Edward Street Drain – upgrades of culverts downstream of the Railway Line crossing
- Avenell Street Drain – widening of drain and upgrade of culverts

3.1.1.1.2 As identified in my statement, the catchment models within this document are progressively being upgraded. The attachment below for Saltwater Creek is the upgraded Saltwater Creek model. A new model for Bundaberg Creek is about to be completed.

3.1.1.2 Bundaberg Regional Council Saltwater Creek Flood Study February 2010 (Attachment C)

3.1.1.2.1 This Report is the most recent report on Saltwater Creek and reflects all development works in the upper catchment of that Creek.

3.1.1.3 Isis Shire Council Apple Tree Creek Flood Study (Attachment G)

3.1.1.3.1 This Report is used for development assessment within its area of Study.

3.2 The following studies provide sewerage capacity information:-

3.2.1 Sewerage

3.2.1.1 Wastewater Treatment and Effluent Management Master Plan 2009 (Attachment AA)

3.2.1.1.1 This Report recommends a new Wastewater Treatment Plant to service both the coastal areas of the Local Government Area and eastern parts of Bundaberg.

Subsequent to the commissioning of the proposed Rubyanna Wastewater Treatment Plant, the East Wastewater Treatment Plant will be decommissioned.

3.2.1.1.1 Council is currently purchasing land for the proposed Rubyanna Wastewater Treatment Plant.

3.2.1.2 Bundaberg Sewerage Planning Report – 2008
(Attachment W)

3.2.1.2.1 This Report provides analysis of sewerage catchments within the City. The attachment below provides Council's 10 year Wastewater Capital Works Program that identifies those capital works Council is committed to.

3.2.1.3 Bundaberg City Planning Strategy for Bundaberg's Wastewater Plants – 2009 (Attachment X)

3.2.1.3.1 Study provides future strategies for Thabeban Wastewater Treatment Plant, Millbank Wastewater Treatment Plant and East Wastewater Treatment Plant. Council is currently engaging consultants for proposed upgrades to Thabeban and Millbank Wastewater Treatment Plants. Following its commitment to the proposed Rubyanna Wastewater Treatment Plant, East Wastewater Treatment Plant will be decommissioned.

3.2.1.4 Burnett Coastal Sewerage Strategy 2005 (Attachment AB)

3.2.1.4.1 This Report is obsolete and superseded by the Coastal Sewerage Reticulation Planning 2010 Report.

3.2.1.5 Gin Gin Stormwater Treatment Plant Report 2009 (Attachment AC)

3.2.1.5.1 Council is engaging a Consultant to design upgrades for this Treatment Plant.

3.2.1.6 Coastal Sewerage Reticulation Planning 2010 (Attachment Y)

3.2.1.6.1 This Report provides a strategic direction to provide sewerage between Burnett Heads and Elliott Heads along the coastal strip. Council has committed to the construction of the Rubyanna Wastewater Treatment Plant. This commitment will facilitate sewerage reticulation to the coast. Much of the proposed trunk infrastructure identified in this Report is expected to be provided in conjunction with major developers.

3.2.1.7 Sewerage – 10 Year Forward Capital Works Program (Attachment AD)

3.2.1.7.1 The 10 year Capital Works Program for sewerage identifies Councils commitment to upgrade capital sewerage works identified in the above reports.

Statement Prepared By:-

Mr Andrew William FULTON

Director Infrastructure & Planning Services
Bundaberg Regional Council

.....

Signature

1 September 2011

.....

Dated