

BURNETT RIVER FLOODPLAIN ACTION PLAN

COMMUNITY REFERENCE GROUP MEETING

TUESDAY 31 OCTOBER 2013 – 4PM

FUNCTION ROOM, BUNDABERG MAIN ADMINISTRATION OFFICE, 190 BOURBONG STREET, BUNDABERG

AGENDA

RSVP Robyn Laing

Thursday 31 October 2013 - 9am

Robyn.laing@bundaberg.qld.gov.au

- A) Apologies:**
- B) Confirmation of Minutes from 8 October 2013**
- C) Ratification of amended criteria and weightings (as tabled) in respect of the MCA**
- D) Ratification of Flood Resilience Submissions submitted to GHD for consideration with the MCA (including additional submissions by Jon Carman and Barry Ehrke)**
- E) Memo from GHD listing large-scale floodplain risk management options for MCA (compiled from feedback from community, CRG and Council Officers).**
- F) GHD's response to flood modelling questions tabled by John Olsen at last CRG Meeting**
- G) Adoption of GHD's Consultation Findings Summary – Final Version (to be circulated separately, upon receipt).**
- H) Other Matters:**
 - a. John Olsen – removal of debri in river (by email dated**
 - b. Update from Rob Calligaris on proposed flood levies at Tech Park and Batchlers Road, Bundaberg North.**
- I) Next Meeting Date:**

BURNETT RIVER FLOODPLAIN ACTION PLAN

COMMUNITY REFERENCE GROUP MEETING

TUESDAY 8 OCTOBER 2013 – 4PM

COMMITTEE ROOM, BUNDABERG MAIN ADMINISTRATION OFFICE, 190 BOURBONG STREET,

BUNDABERG

MINUTES

ATTENDANCE:

Rowan Bond (Chairperson), Kay Amsler, Helen Dayman, Rob Marshman, John Olsen, Barry Ehrke, Mark Pressler, John Lee, Jon Carman, John Bailey, Steve Cooper, Rob Calligaris (Council's Design Team Leader), Dan Copelin (GHD Flood Consultant), Robyn Laing (Administration Support).

CONFIRMATION OF MINUTES:

CRG Member, Kay Amsler requested that page 1, 2nd last paragraph be amended to show, "Pine Creek / Givelda / Electra residents" and, "the CRG's attention was drawn to the presence of two large, naturally occurring holes in the river bed;".

CRG MEMBERS, JOHN OLSEN AND BARRY ERHKE MOVED that the minutes of the first CRG Meeting held on 23 September 2013 be confirmed subject to inclusion of the above amendments and that the amended minutes be made available on Council's website.

The motion was put CARRIED.

At this stage, CRG Chairman, Rowan Bond advised the Meeting that a resignation had been received from CRG Member, Christine Hardy and that with the agreement of the Meeting; it was proposed to leave the position open in case Ms Hardy requests to re-join the CRG. The Meeting unanimously agreed to leave the position unfilled and retain Christine Hardy in CRG email listings so Ms Hardy receives all information and was able to rejoin the CRG later in the process, if desired.

CRG MEMBERS, JOHN CARMAN AND HELEN DAYMAN MOVED that Christine Hardy's position on the CRG be left open.

THE MOTION WAS PUT AND CARRIED.

REPORT ON COMMUNITY CONSULTATION PROCESS:

CRG Chairman, Rowan Bond stated that he felt there had been a positive outcome to the recently held community information sessions.

Rob Calligaris presented a report from GHD outlining preliminary results from the community consultation process held to identify and assess preferred floodplain risk management options that builds flood resilience and fosters community preparedness. Comprehensive communication, public consultation and stakeholder engagement was undertaken as follows to

educate the community on the flood model and Floodplain Action Plan and seek their input to assist Council identify the top five floodplain resilience options:

- CRG expressions of interest sought and confirmed
- Media interviews on ABC Wide Bay, 4BU and Seven
- BRC website content updates – prominent location
- Dedicated email floods@bundaberg.qld.gov.au
- Stakeholder briefings and presentations
- Advertisements in 3 local papers to promote CRG and Info Sessions
- Email update to over 10,000+ individuals and organisations to encourage participation
- Speaking role at TAFE on 22 August
- Info Session Posters across community touch-points
- Facebook posts and Tweets reaching 4,000+ people
- Factsheets x 3
- YouTube videos and animations

During the above consultation process, the community was invited to submit their ideas to improve flood resilience to dedicated email addresses: floods@bundaberg.qld.gov.au or floodplaincrg@gmail.com; talk to a CRG member (who were present at community information sessions); and complete a Community Questionnaire. It was noted that 280 or more residents attended 10 community information sessions held at 6 different locations across the region. These sessions outlined the outcomes of the 2013 flood study, gave an overview of the floodplain action plan process, issued invitation to make submissions, provided mapping and information stations and also gave the opportunity for community members to have one on one discussion with Councillors, Council staff and GHD representative (flood consultant).

Steve Cooper advised there were individual businesses with ideas but had been reluctant to submit their submissions as it would look like they were furthering their own business. **The Meeting agreed that CRG Member, Steve Cooper and CRG Chairman, Rowan Bond would consult with the Bundaberg Chamber of Commerce regarding the possibility of Steve Cooper representing them and taking a submission for flood resilience ideas.**

The preliminary report presented at the Meeting showed early analysis of the feedback received from the community indicating that the majority favoured flood response/warning mechanisms/evacuation plans (49%) and response modifications including structural modifications/infrastructure (48%). It was noted that this result would alter when GHD updated their findings with the latest submissions.

It was further noted that the wording of Sharon/South Kolan is to be amended to read, “Pine Creek / Givelda / Electra / South Kolan / Sharon” where it appears in the GHD report.

CRG Member, Mark Pressler attended the Meeting at 4.20pm

Andrew Fulton (General Manager Infrastructure & Planning) and Dwayne Honor (Manager Design Services and Project Manager), Ben Regan (GHD Flood Consultant) joined the meeting via telephone conference facility at 4.45pm to discuss the Multi Criteria Analysis spreadsheet which had been emailed to the CRG for their perusal. Andrew Fulton stated that the weightings for the criteria were to be determined by the CRG. The CRG were requested to give consideration to the likely funding available when determining rankings for some of the options.

CRG Member, Helen Dayman referred to the recently released Review of Dam Safety Management Actions for Paradise Dam (Flood Event of January-March 2013). The Meeting agreed to forward a copy of this report to Council for Andrew Fulton to read.

This concluded the teleconference with Messrs Fulton, Honor and Regan and the Meeting returned to the order of business, continuing with GHD's presentation on the preliminary findings of the community consultation process.

CRG member, John Olsen tabled a list of questions (attached to minutes) for flood consultant GHD to answer and thus authenticate the outcome. CRG Members, Barry Ehrke and Rob Marshman also had questions regarding the flood model; some of which were answered at the Meeting and others were referred to GHD consultant, Dane Copelin to answer outside of this Meeting via email: *floodplaincrg@gmail.com*.

John Olsen stated that the Burnett River had been modified beyond the level of responsible management and that he was concerned that information on the natural level of the Burnett River was not included. There was discussion regarding the lack of tidal flow in the river and stagnant sections upstream. CRG Member, Jon Carman stated that there is a much lower tidal prism since installation of the Ben Anderson Barrage. He referred to compacted sediment in the vicinity of the Burnett River Bridge and Millaquin and stated that the problem was fine siltation rather than sand and that the Burnett River was slowly moving south. He further stated that Harriet Island was growing in size and that it hardly existed prior to 1942 flood. There was discussion regarding removal of Ben Anderson Barrage to improve tidal flow and reduce sedimentation and John Lee stated that he had observed more sedimentation now than in previous years. CRG Member, Mark Pressler pointed out that the Ben Anderson Barrage had been installed to provide irrigated water to farms in the Woongarra system and stated that the recent drop at Ben Anderson Barrage to 2.2m (to carry out repair work) had put approximately 35 irrigators out of action. Without this barrage, there will be no farms on the south side. CRG Member, Rob Marshman referred to LiDAR imagery taken at the peak of the 2013 flood and stated that the floodplain area at Fairymead was the natural diversion for high flood levels and that the levee construction was dictating the water levels in the city.

Dan Copelin (GHD Flood Consultant) drew the Meeting's attention to the large size of the Burnett River system and stated the 2013 flood of the Burnett River was something like 4-5 times the volume of the 2011 Brisbane flood.

Multi Criteria Analysis (MCA) Weightings:

GHD Consultant, Dan Copelin advised the Meeting that this tool was a method of assessment often used to evaluate different criteria and that it gave the CRG an opportunity to give meaning to what criteria they felt was more important.

There was some discussion and amendment to the criteria proposed by GHD. The attached draft criteria and weighting was resolved at the Meeting; noting that the MCA (as amended at the Meeting) would be forwarded by email to the CRG for further review. CRG members were asked to advise the Chair no later than 10 October 2013 of their agreement or propose additional amendment.

The CRG requested that all flood submissions be collated in one database and emailed to CRG members for review for the purpose of eliminating unrealistic submissions. It was noted that this amended list was also required by 10 October 2013.

Next Meeting Date:

It was resolved to hold the next CRG Meeting in the Bundaberg Office on Thursday 31 October 2013 at 4pm.

This concluded the business of the Meeting at 8.05pm.

Overall Categories - Calculation of Weightings

	ADOPTED WEIGHT
Economic	25%
Social	40%
Environmental	35%

Economic Criteria

A	Overall cost-benefit
B	Cost of implementation
C	Cost of maintainance / upkeep
D	Inundation of agriculture land
E	Impact on local business / commercial land
F	Impact on residential properties
G	Impact on municipal infrastructure / utilities
H	Impact on fisheries
I	Impact on tourism

Calculation of Weightings

	A	B	C	D	E	F	G	H	I		SCORE	CALCULATED WEIGHT
A											3	8%
B	A										1	3%
C	A	C									2	6%
D	D	D	D								6	17%
E	E	E	E	E							7	19%
F	F	F	F	F	F						8	22%
G	G	G	G	D	E	F					5	14%
H	H	H	H	D	E	F	G				4	11%
I	A	B	C	D	E	F	G	H			0	0%

Social Criteria

A	Communication / notification during a flood event
B	Flood warning time
C	Frequency & duration of flooding or isolation / effects of isolation
D	Impact on direct exposure to flood hazard / safety
E	Visual amenity
F	Cultural heritage
G	Impact on community infrastructure
H	Impact on evacuation routes
I	Impact on recovery / accommodating displaced victims of a flood

Weighting Calculation

	A	B	C	D	E	F	G	H	I		SCORE	CALCULATED WEIGHT
A											7	19%
B	A										6	17%
C	C	C									6	17%
D	A	B	D								5	14%
E	A	B	C	D							0	0%
F	A	B	C	D	F						1	3%
G	A	B	C	D	G	G					2	6%
H	A	B	C	D	H	H	H				4	11%
I	A	B	I	I	I	I	I	H			5	14%

Calculation of Weightings

	A	B	C	D	E		SCORE	CALCULATED WEIGHT
A							2	20%
B	A						3	30%
C	A	B					0	0%
D	D	B	D				3	30%
E	E	B	E	D			2	20%

Environmental Criteria

A	Impact on terrestrial environment (flora / fauna)
B	Impact on aquatic / riparian environment (flora / fauna)
C	Difficulty of environmental approvals
D	Impact on river stability / sedimentation
E	Erosion / scour to floodplain

Modelling questions

FROM JOHN OLSEN...

I personally have questions to ask before being convinced that the scope of the modelling is sufficiently rigorous to cover all bases.

- . Does the modelling date from a period where natural conditions occurred, and before impoundments changed the river?
- . If the modelling does not do that, then the results could well be skewed in relation to rainfall volume v river height reached during flood events past and present.

Why?

- . Because the river heights of a natural system are the base line factor. They have become elevated due to the influences of the human activity. We need to know, (as best we can), to what extent human activity has elevated river heights during floods, and to what extent the duration of flooding has changed.

Other modelling concerns and questions.

- . Has the modelling accounted for cm capacity of river narrowing caused by the installation of training walls? How much water capacity has been displaced by training walls?
- . The model needs to consider the changed tidal influences at play since the training walls were put in place across the mouth of Skyringville Passage. Skyringville pass was the natural northern entrance of the river. The training walls have changed the exhaust direction of the river.
- . It seems implausible that were the northern entrance re-opened, that the silt level deposits in the Port Bundaberg sea leads area would not be significantly reduced.
- . This is because the sedimentary drift of silt etc is carried in the direction the water is flowing.
- . Therefore, whilst a simplistic example, it follows that were the north wall breached to permit say, 30% of the tidal flow to escape in its natural water course, then approx. 30% less silt should build up in the Port sea leads. At the very least, dredging should be reduced by a comparative margin, and shipping access could be achieved at an earlier date, and at a lesser cost.

. Some learned locals are saying that Moore park beach is eroding away because the water carrying the sand which used to be carried by tide from the river through Skyringville Passage no longer replenishes the beach front because the tidal flow has been modified. The sand now finds it's way east into the sea leads and settles there, instead of being transported northward to replenish the Moore Park beaches.

. Does the modelling take into account the creeks and streams which were filled in and subjected to development over time?

These streams were nature's drainage system, the system which helped drainage occur at the earliest possible period after rainfall.

. In terms of flood relief, the CRG could identify specific problem areas. Some of these will be mentioned in public submissions, whilst others may not.

It would be helpful to identify solutions as well. Again I stress that necessary items such as early warning systems are a must. However they in no way relate to flood level relief.

Amended MCA Criteria & Weightings

Burnett River Floodplain Risk Management Study

Draft Multi Criteria Assessment Framework

INSTRUCTIONS:

- 1 First assign weightings to the overall categories of economic, social and environmental aspects.
- 2 Then assign weightings to the individual criteria within each option.



HOW TO USE THE PAIRED COMPARISON MATRICES:

- i The paired comparison matrices below are provided as a tool to help assign relative weightings to each criteria.
 - ii The matrices work by comparing each criteria against all others one at a time, and determining which of the pair of criteria is more important. An overall score is then determined for each criteria based on how it fared against all other criteria in the pair-wise comparisons.
 - iii Note that the weightings provided below are simply intended to demonstrate the function of this spreadsheet. The CRG is advised to start afresh and determine independent weightings for each item.
- 1 Start by listing all criteria to be considered, and assigning each a letter.
 - 2 Label the rows and columns of the matrix with the letter labels.
 - 3 In each blank cell in the matrix, compare the criteria in the corresponding row and column, and write down the letter corresponding to the most important criteria of the two.
 - 4 After completing the matrix, review the calculated weights to the right.
 - 5 Using your own judgement, adjust the weights manually if necessary.



Overall Categories - Calculation of Weightings

	Eco	Soc	Env	SCORE	RANK	CALCULATED WEIGHT	ADOPTED WEIGHT
Eco				0	#NAME?	#DIV/0!	25%
Soc				0	#NAME?	#DIV/0!	40%
Env				0	#NAME?	#DIV/0!	35%
TOTAL						#DIV/0!	100%

Economic Criteria

A	Overall cost-benefit
B	Cost of implementation
C	Cost of maintainance / upkeep
D	Inundation of agriculture land
E	Impact on local business / commercial land
F	Impact on residential properties
G	Impact on municipal infrastructure / utilities
H	Impact on fisheries
I	Impact on tourism
J	Impact on Developable Land

Economic Criteria - Calculation of Weightings

	A	B	C	D	E	F	G	H	I		SCORE	RANK	CALCULATED WEIGHT	ADOPTED WEIGHT
A											3	#NAME?	8%	
B	A										1	#NAME?	3%	
C	A	C									2	#NAME?	6%	
D	D	D	D								6	#NAME?	15%	
E	E	E	E	E							7	#NAME?	17%	
F	F	F	F	F	F						8	#NAME?	22%	
G	G	G	G	D	E	F					5	#NAME?	14%	
H	H	H	H	D	E	F	G				4	#NAME?	11%	
I	A	B	C	D	E	F	G	H			0	#NAME?	1%	
												3%		
												100%		

Social Criteria

A	Communication / notification during a flood event
B	Flood warning time
C	Frequency and duration of flooding or isolation / effects of isolation
D	Impact on direct exposure to flood hazard / safety
E	Visual amenity
F	Cultural heritage
G	Impact on community infrastructure
H	Impact on evacuation routes
I	Impact on recovery / accomodating the displaced victims of a flood
J	

Social Criteria - Calculation of Weightings

	A	B	C	D	E	F	G	H	I		SCORE	RANK	CALCULATED WEIGHT	ADOPTED WEIGHT
A											7	#NAME?	19%	
B	A										6	#NAME?	17%	
C	C	C									6	#NAME?	17%	
D	A	B	D								5	#NAME?	14%	
E	A	B	C	D							0	#NAME?	0%	
F	A	B	C	D	F						1	#NAME?	3%	
G	A	B	C	D	G	G					2	#NAME?	6%	
H	A	B	C	D	H	H	H				4	#NAME?	11%	
I	A	B	I	I	I	I	I	H			5	#NAME?	14%	
												100.00%		

Environmental Criteria

A	Impact on terrestrial environment (flora / fauna)
B	Impact on aquatic / riparian environment (flora / fauna)
C	Difficulty of environmental approvals
D	Impact on river stability / sedimentation
E	Erosion / scour to floodplain
F	
G	
H	
I	
J	

Environmental Criteria - Calculation of Weightings

	A	B	C	D	E						SCORE	RANK	CALCULATED WEIGHT	ADOPTED WEIGHT
A											2	#NAME?	20%	
B	A										3	#NAME?	30%	
C	A	B									0	#NAME?	0%	
D	D	B	D								3	#NAME?	30%	
E	E	B	E	D							2	#NAME?	20%	
												100.00%		

Additional Submission by Barry Ehrke

From: [Barry Ehrke OAM](#)
To: [bond.rowan@gmail.com](#); [hillend7@bigpond.com](#); [barry.ehrke@bigpond.com](#); [steve@coopershardware.net](#); [baldy@hotmail.net.au](#); [johnlee092@bigpond.com](#); [dianne.bailey7@bigpond.com](#); [rkamsler@bigpond.com](#); [hmdayman@optusnet.com.au](#); "Jon and Jill Carman"; [john.olsen6@bigpond.com](#); [Robyn Laing](#); [Rob Marshman](#)
Subject: Flooding
Date: Friday, 18 October 2013 12:21:04 PM
Attachments: [image001.png](#)

Hi everyone,

Firstly my apologies for not doing a cull on responses received as my home computer is being repaired. What I believe we should be concentrating on is the flood mitigation responses received and leave the other issues raised such as EWS to the BRC or we could look at them as a secondary response if time permits. Now to get to the main reasons of my email and to save some time at our next meeting I would like to make a statement and give the reasons for this statement. As someone who holds a Marine Engineer Grade 1 Qualification which is one down from Chief Engineer on ships, part of this qualification deals with water and hydraulic systems and flows while this does not give me the type of qualifications that Dwayne and Ben have it give me a very good understanding of rivers and river flows along with this I spent considerable amount of my time as operation manager following severe cyclone Yasi in North Queensland clearing and cleaning out rivers and creeks so that they had better flows and lessened the flooding of homes and properties.

Attached is part of an email I received from the Manager of Herbert River Canegrowers after Cyclone Oswald's passed Ingham on its way south, the road bridges referred to in the email are notorious for flooding and cutting the Bruce Highway during cyclone and flooding rains.

While we have some very good suggestions on what could be done to alleviate flooding upstream we would be wasting our time if we first did not address the problem at the mouth of the river, the river mouth has been made narrower over time by reclamation works to develop the PORT of Bundaberg and the placement of training walls in this area. History and the past works that I have done clearly show that if you don't have a wide and open river mouth to allow water to escape you will have major problems upstream in large rain events.

I believe we should be concentrating on having Skyringville passage reopened or the construction of a diversion channel which starts somewhere near the old molasses wharf and connects again with Skyringville passage this would give flood waters more of an escape route before it needs to break its banks to escape the river proper. One or more of these channels may need to be constructed as the larger the escape area the better it is.

The other comment I would like to make is that if a diversion channel or channels were to be constructed the soil dug out to form the channel could not be left on the side of the channel as it would act as a levee bank and cause other problems. If the recommendation to open up the mouth of the river was implemented they could then progress up stream with some of the other proposals received.

I hope my comments have not offended anyone or make it look as if your comments are unimportant as this was not my intention I'm only speaking from what I have seen and done. If anyone would like to discuss further please give me a call and I hope to have my home computer

back again this afternoon

Regards

Barry Ehrke OAM
Industry Recovery Officer
M: 0419 841 696
E: behrke@bundabergbec.org.au



Cnr Quay & Tantitha Streets
(PO Box 1662)
BUNDABERG QLD 4670
P: 07 4153 2333
W: www.bundabergbec.org.au



As the flood water from the major rainfall event throughout the catchment but especially the Abergowrie area makes its way downstream the swollen Herbert River has broken its banks in several places along the lower Herbert including a usual break out point at Palm Creek where the town of Ingham is divided by flood water.

The river is still rising slowly and inundating large areas of cane land that only a week ago was hot and dry.

The size and duration of the event has massively exceeded the crop's needs.

Only when the flood waters subside will it be possible to gain a better appreciation of the extent of the damage and likely impact on yield.

Whilst established sugar cane can tolerate a lot of water, this crop is in the early stages of growth after a long dry spring and early summer when it is most vulnerable to water damage.

CANEGROWERS Herbert River encourages growers to call the office or send an email and report observations and experiences from this flood event so we can duly represent the district's situation.

Work done to clean Cattle and Frances creeks prior to the wet season has been a resounding success. Whilst the highway was closed to the south for a relatively short period essentially as a precaution last night when there was water over the road near the rest area and near the Pennas Road intersection, the bridges themselves were trafficable throughout and the morning papers were duly delivered to Ingham from Townsville on time at approximately 2 am.

The Bruce Highway is closed because of water over the road at Townsville Road. There is still a road block at Frosty Mango that prevents non-residents of Ingham from attempting to get through when they can't without local knowledge.

Peter E Sheedy

Manager,

CANEGROWERS Herbert River,

P.O. Box 410, INGHAM 4850

ABN 55 106 007 925

Phone: 07 47765350 Fax: 07 47765380

Mobile: 0418186691

Email: peter_sheedy@canegrowers.com.au

Caring for our Land - Caring for our Reef

If you would prefer not to receive emails from CANEGROWERS Please send a reply email to the sender with UNSUBSCRIBE in the subject heading. Go to http://www.canegrowers.com.au/page/Industry_Centre/Privacy_Policy for additional information.

Additional Submission by John Carman

North Bundaberg Levee Proposal

Levees -

- Twin-bridges (raise rail line)
- North round about to Mariners Way (North)
- Other areas along Perry Street (possibly simply raising road height by 50cm)
- Have a series of spillways and/or floodgates along northern levee about 300mm lower than break-through height along town reach of river and at twin bridges
- Road on top of levee with links into North Bundaberg.

Identified Needs -

1. Raise Hinkler Avenue to keep Tallon Bridge open.
2. Provide an evacuation route for as long as possible
3. Provide evacuation centre – may be best to evacuate to South side
4. Keep railway open for as long as possible and reduce damage to tracks
5. Minimize inundation of lower North Bundaberg
6. Reduce/minimize scour of lower North Bundaberg
7. Reduced insurance premiums and repair costs for residents, businesses, service providers and BRC.

Design -

- Deepen drainage through Paddy's Creek (spoil behind the levee)
- Deepen/widen north bank of river (spoil behind the levee)
- Spoil behind the levee will provide gentle ramps to make access easier
- Possibly spoil from Fairymead channel/removal of lower Burnett levees
- Require drainage to be 'sealed' to prevent backflow.

Main concern - possible increase in flood height



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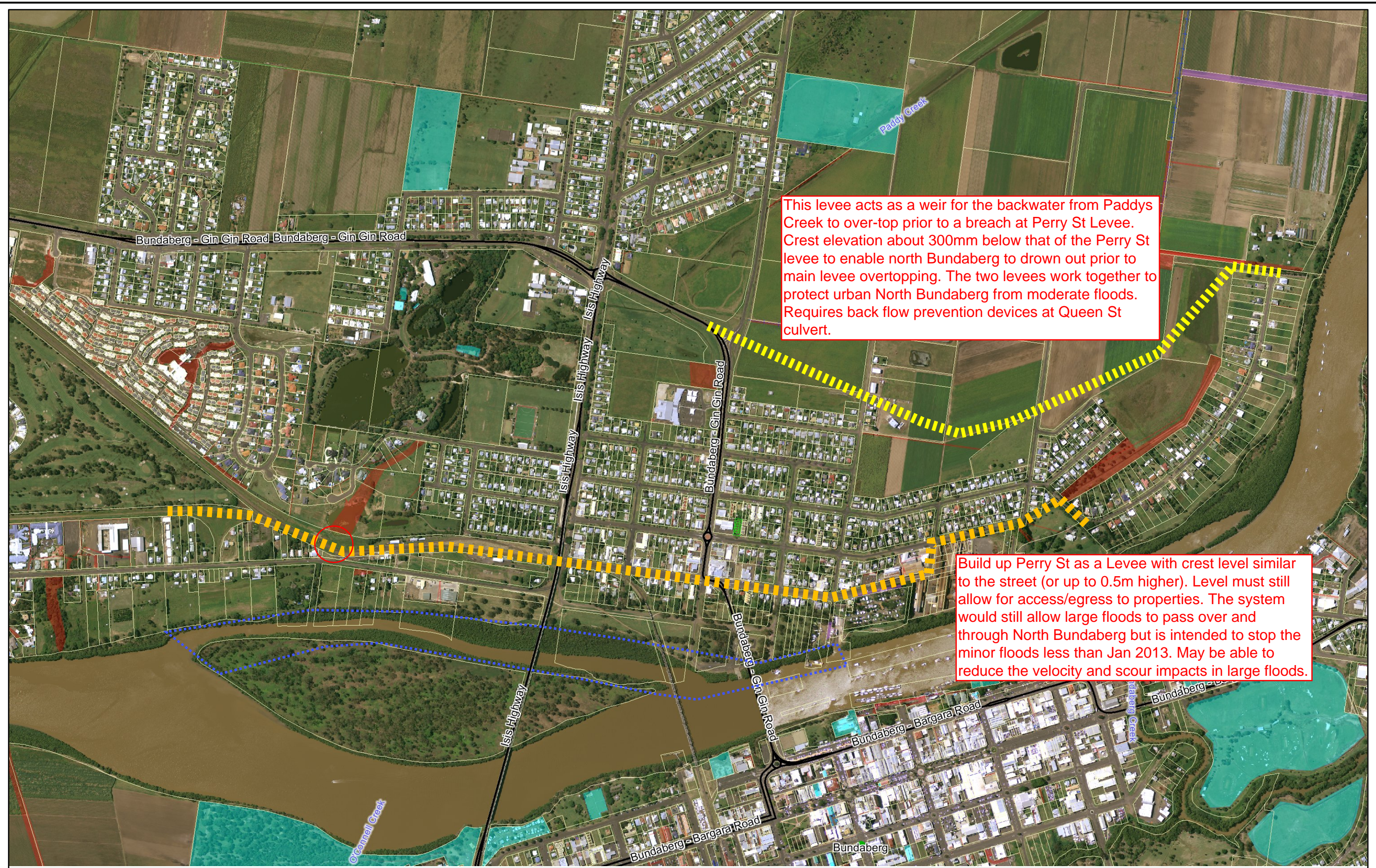
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Printed by: dwayneh
 Printed on: Oct 22, 2013 8:01:35 AM



Fairymead Area

Scale = 1:61,849
 on A3 Sheet



This levee acts as a weir for the backwater from Paddys Creek to over-top prior to a breach at Perry St Levee. Crest elevation about 300mm below that of the Perry St levee to enable north Bundaberg to drain out prior to main levee overtopping. The two levees work together to protect urban North Bundaberg from moderate floods. Requires back flow prevention devices at Queen St culvert.

Build up Perry St as a Levee with crest level similar to the street (or up to 0.5m higher). Level must still allow for access/egress to properties. The system would still allow large floods to pass over and through North Bundaberg but is intended to stop the minor floods less than Jan 2013. May be able to reduce the velocity and scour impacts in large floods.



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North Levees

Jon Carman – CRG

Scale = 1:10,706
on A3 Sheet

**GHD's response to flood modelling questions
tabled by John Olsen**



Memorandum

17 October 2013

To	Rowan Bond (CRG)		
Copy to	Robyn Laing (BRC), Dwayne Honor (BRC), Ben Regan (GHD)		
From	Daniel Copelin	Tel	0733163608
Subject	Response to Modelling Questions from John Olsen	Job no.	41/26909

GHD acknowledges receipt of a memorandum titled "Modelling questions" from CRG member John Olsen (attached). We value this feedback and appreciate the opportunity to engage with the community on this matter. During the CRG meeting of 8th October 2013, Dan Copelin (GHD) discussed some of the items raised in the memo with the group. This letter is intended as a formal response to the questions raised.

As background, GHD has recently completed the Burnett River Flood Study and this document has been submitted to Council in its final form. This document is, or will shortly be, available to the public through Council's website. Contained in this document is a full description of the scope of the study, as well as technical detail on the input data used, the setup of the various computer models, the calibration of said models, and the subsequent findings.

The primary aim of the Burnett River Flood Study was to develop a series of calibration flood models and then to estimate the flood levels associated with a range of design storm events (including the 2%, 1%, 0.5% and 0.2% AEP events plus the Probable Maximum Flood). The most important baseline for the study is therefore the current conditions of the river and floodplain. Estimates of design flood event levels are based on our best representation of the riverbed, floodplain, artificial structures, development, river mouth, dredging, etc., as they exist at the present.

John Olsen's modelling questions relate to the representation of the river in its natural, unmodified state. Mr Olsen refers to artificial structures such as the training walls at the port as well as the infilling of natural creeks and streams, and how these may have altered the flow of the river and the movement of sediment. The questions are posed in the context of needing "to know, (as best we can), to what extent human activity has elevated river heights during floods, and to what extent the duration of flooding has changed."

GHD's responds to these questions as follows:

1. As described above, the important baseline for estimating design flood levels is the present state of the river. Moreover, this is also the relevant baseline for testing the impact of any proposed floodplain mitigation options. We need to understand how a particular levee, for example, is going to change flood levels compared to present conditions. This is reflected in the original scope of the flood study, and is in line with the industry-standard approach to such investigations. While human activity has clearly had an impact on the Burnett River during the period since settlement, it is less important to understand the exact nature of these changes than it is to have a sound understand of how the river currently behaves during a flooding.

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2. The flood study is exactly that: a hydrologic and hydraulic investigation of significant to extreme flood events on the Burnett River. As such, particulars such as the long-term movements of sediments and beach erosion are outside the scope of the study. Nonetheless, the study does include a range of “sensitivity analysis” scenarios whereby the potential impact of changes in bed levels, sea level and other factors are modelled to gauge their relative impact on flood level estimates. The results of these “what-if” scenarios can inform decision making if it becomes clear the river is changing away from its present state.
3. There would be significant technical difficulty in modelling the river in a natural, undisturbed state, primarily due to a lack of data. There exists no detailed survey of the river and floodplain prior to settlement (certainly nothing of sufficient detail to enable an accurate computer model to be built). On top of that, we have no way of knowing how the river would have naturally evolved over the last 160 years without human intervention.
4. Despite the difficulty described above, floodplain management can learn many valuable lessons from nature and, sometimes, better outcomes are achieved where the natural course of the river is respected. As part of the current Floodplain Risk Management Study, we are intending to assess a range of options suggested by the community, such as removing the Fairymead Levees, reopening Skyringville Passage and removing the Ben Anderson Barrage. Through this process, we will be able to determine if such changes would have a significant impact on flood levels during significant events.
5. As a final note, we wish to highlight that the scope of the current Floodplain Risk Management Study is to assess the existing level of flood risk and then to assess options that help to reduce the adverse impacts of significant floods. Therefore, in accordance with the agreed criteria and weightings, options that have improved environmental health or other goals as their primary or only outcome will not rank highly against other options that directly improve flooding conditions. Options that have both environmental and flood mitigation benefits will obviously be assessed more favourably.

Regards

Daniel Copelin

Modelling questions

FROM JOHN OLSEN...

I personally have questions to ask before being convinced that the scope of the modelling is sufficiently rigorous to cover all bases.

- . Does the modelling date from a period where natural conditions occurred, and before impoundments changed the river?
- . If the modelling does not do that, then the results could well be skewed in relation to rainfall volume v river height reached during flood events past and present.

Why?

- . Because the river heights of a natural system are the base line factor. They have become elevated due to the influences of the human activity. We need to know, (as best we can), to what extent human activity has elevated river heights during floods, and to what extent the duration of flooding has changed.

Other modelling concerns and questions.

- . Has the modelling accounted for cm capacity of river narrowing caused by the installation of training walls? How much water capacity has been displaced by training walls?
- . The model needs to consider the changed tidal influences at play since the training walls were put in place across the mouth of Skyringville Passage. Skyringville pass was the natural northern entrance of the river. The training walls have changed the exhaust direction of the river.
- . It seems implausible that were the northern entrance re-opened, that the silt level deposits in the Port Bundaberg sea leads area would not be significantly reduced.
- . This is because the sedimentary drift of silt etc is carried in the direction the water is flowing.
- . Therefore, whilst a simplistic example, it follows that were the north wall breached to permit say, 30% of the tidal flow to escape in its natural water course, then approx. 30% less silt should build up in the Port sea leads. At the very least, dredging should be reduced by a comparative margin, and shipping access could be achieved at an earlier date, and at a lesser cost.

. Some learned locals are saying that Moore park beach is eroding away because the water carrying the sand which used to be carried by tide from the river through Skyringville Passage no longer replenishes the beach front because the tidal flow has been modified. The sand now finds it's way east into the sea leads and settles there, instead of being transported northward to replenish the Moore Park beaches.

. Does the modelling take into account the creeks and streams which were filled in and subjected to development over time?

These streams were nature's drainage system, the system which helped drainage occur at the earliest possible period after rainfall.

. In terms of flood relief, the CRG could identify specific problem areas. Some of these will be mentioned in public submissions, whilst others may not.

It would be helpful to identify solutions as well. Again I stress that necessary items such as early warning systems are a must. However they in no way relate to flood level relief.

Removal of debris from waterways
by John Olsen

From: [John Olsen](mailto:John.Olsen@bigpond.com)
To: [Robyn Laing](mailto:Robyn.Laing@bigpond.com); bond.rowan@gmail.com
Cc: behrke@bundabergbec.org.au; crestkit@me.com; hillend7@bigpond.com; baldy@hotkey.net.au; johnlee092@bigpond.com; hmdayman@optusnet.com.au; [Rob Marshman](mailto:Rob.Marshman@bigpond.com); rkamsler@bigpond.com; carman79@bigpond.com
Subject: RE: Flooding
Date: Wednesday, 23 October 2013 8:01:32 AM

Robyn, am having some computer difficulties. Would you mind forwarding to members of the group. John

Rowan,

am having difficulties with accessing the floodplain crg@gmail website , haven't yet succeeded. Haven't found the relevant item for use of pin.

Also, whilst we talk about many major flood items, we seem to miss one of the serious peripheral issues.

You may recall that there was much urgency attached to removing mangroves from the river bank post flood.

(This was a mistake in my view). It will increase river bank erosion.

However, now that the mangrove removal project is done, the immense build up of rubbish and debris along the river foreshore seems largely to be forgotten.

There are debris build ups metres in height and depth strewn along the edge of the waterways for many a mile which will potentially increase flood levels even further in future events.

If not that I am such a cynic, I would tend to think that the removal of mangroves seemed to be a gift to Council, who leaped onto opportunity with glee.

Over past weeks /months there has been chat about possibly having to remove even more mangroves.

The volume of debris being ignored would far exceed the volume of mangroves being removed. Yet this largely ignored. Why?

It will potentially INCREASE flood levels if it remains there.

The debris probably extends far up the river as well as to Burnett Heads.

I think Council is being selective in their approach to management of the river environment.

Could I suggest that the Abbot Government's green army, (proposed 1500 strong pre election?), is a potential answer?

If we could get a team of say, 150 personnel for this project, (riverside debris removal)and a few trucks etc a great deal of progress could be made in a short time).

Whilst ever that debris remains, it takes the form of a unwanted levy bank that will get bigger after each flood event if not removed.

This is not a flood mitigation proposal-it is an opportunity though to stop the river from elevating even further in height if we don't remove the debris.

John Olsen

From: Rowan Bond [mailto:bond.rowan@gmail.com]
Sent: Friday, 18 October 2013 8:27 PM
To: John Olsen
Subject: Re: Flooding

John

Many thanks for that. I rely on you guys to teach me all things Burnett and am never