The project

The Queensland Government is progressing the Bundaberg 10-year Action Plan to determine how best to reduce flood risk in the Bundaberg region and improve the safety of the Bundaberg community.

Funding of $4M has been allocated to progress flood mitigation initiatives and develop the 10-year Action Plan which will build on projects previously undertaken by the Bundaberg Regional Council. Together with input from the local community, experts and government, the action plan will address cost-effective flood mitigation solutions for the people of Bundaberg, their homes, businesses and the local economy.

The four projects in the action plan aim to deliver benefits for affected residents and businesses during a flood event. These projects include a mix of works that involve changing flood behaviour and measures that will enable residents to respond to a flood event.

Bundaberg East Levee

We are currently in the concept design stage of this project for a proposed new levee that will run parallel to the southern bank of the Burnett River and across Saltwater Creek and a small unnamed creek behind the sugar mill and distillery known locally as Distillery Creek. The proposed levee will be made up of a concrete wall that would be about the level of a flood event like 2013. There will be two main sections; the city alignment and the sugar mill alignment.

The City alignment would be approximately one kilometre long, beginning at the northern edge of Quay Street near the intersection with Toonburra Street, across Bundaberg Creek and following Quay Street East to the intersection of Scotland Street. The alignment then follows Scotland Street to the intersection of Cran Street.

The Sugar Mill alignment is approximately 700 metres long and extends from the intersection of Cran Street and Scotland Street running east along Cran Street, then parallel to the river bank ending north of the Sugar Mill.

A pump station, flood gate and separate equipment building is proposed to be constructed at the Saltwater Creek crossing with a flood gate at the Distillery Creek crossing.

Progress

Site investigations and surveys have progressed since the launch of the action plan and several design options have been assessed.

The concept designs took into consideration feedback from previous consultation with stakeholders in the community during 2015 and 2016. Together with community feedback, the proposed design was workshopped with key authorities including Bundaberg Regional Council, Department of Transport and Main Roads, Queensland Fire and Emergency Services, Queensland Parks and Wildlife and Queensland Reconstruction Authority.

Key features of the levee

- proposed new levee to consist of two segments:
  - City alignment
  - Sugar Mill alignment
- flood doors for vehicle and pedestrian access through the levee wall
- pump station with flood gates and separate equipment building at Saltwater Creek crossing
- flood gates at Distillery Creek crossing
- trash racks at the pump station to protect capacity and prevent debris interfering with operation of the pump
- possible emergency access and egress for local residents at Petersen Street

Benefits of the levee

The proposed concept plan aims to benefit the community by:

- increasing flood protection from a Burnett River flood event similar to 2013 levels
- mitigating damage from a Burnett River flood within Bundaberg East, Bundaberg South and the CBD without increasing flood issues in other areas of Bundaberg
- delivering a flood resilient community for future generations
- enhancing future economic development and opportunities for both Bundaberg and the Wide Bay Region
- opportunity for the community to provide input to the social amenity and local use in Bundaberg East
- potential new pedestrian and cycle path across Saltwater Creek.

Not government policy
Frequently asked questions

What is a levee?
A levee is an earthen bund or wall which controls water levels and can be designed to blend into the surrounding environment. Location of a levee and costs generally dictate the type of levee chosen for a particular situation.

What is a floodgate?
A floodgate is a set of movable watertight steel doors built into the design of a levee. They can be left open to allow local creek flood waters to escape into the river, and then closed when river levels start to rise. The gates remain closed during large flood events, and open when river levels return to normal.

What is a flood door?
A flood door is an opening that is required for vehicle or pedestrian access through the levee wall. Flood doors will remain open at all times except when flood conditions are occurring.

What feedback was received from the community for this project during the consultation phase in 2015 and 2016?
In summary, the community indicated general support for the Bundaberg East Levee and recognised that it would have positive impacts on businesses.

Why has the proposed concept design changed from the original proposal?
Based on feedback from the community and from local government and authorities, CDM Smith investigated three different options for the proposed City alignment and two for the proposed Sugar Mill alignment as part of their assessment.

CDM Smith recommended:
- City alignment along northern edge of Quay Street, and
- Sugar Mill alignment along Cran Street and parallel to the river bank to the Distillery.

What work has been done to inform the development of the concept design?
During development of the concept design, options were considered against multiple criteria including:
- reduction to flood risk and flood damages
- protect the Bundaberg East area from a 100-year flood event from the Burnett River
- geotechnical conditions
- environmental impacts
- cultural heritage impacts
- social impacts including meeting community expectations, emergency services and back to business
- impact to local residents and business; and
- financial impacts including construction costs and future maintenance costs.

Who has developed the concept designs?
The Bundaberg East Levee concept design has been developed by engineering firm CDM Smith who are internationally recognised as leaders in the design and construction of levees.

CDM Smith evaluated a range of options and drew on the experience in the US and other countries to produce a design for the levee which also represents best international practice. In May 2018 CDM Smith Senior Vice President, Mike Schmidt inspected the potential site for the Bundaberg East Levee and presented the levee design to the local community.

When did site investigations take place?
CDM Smith undertook site investigations in November 2017.
What was involved in the concept design phase?

- hydrologic and hydraulic analysis on pump operations and capacity including flood gate sizing
- hydrologic and hydraulic analysis of Burnett River flooding
- analysis of historical floods to better understand the dynamics of the Burnett catchment
- determination of the 100-year flood level, and development of a levee design to protect against this flood level
- geotechnical investigations near the two creeks and proposed wall alignment.

How will flood doors operate during a flood event?

There are a variety of methods that can achieve a watertight closure ranging from stop logs that are manually installed before and removed after a flood event, to swinging, sliding or overhead roll-up flood doors that can be remotely activated.

Further assessment will be made as part of the detailed design stage with feedback from the community being taken into consideration.

What is a trash rack?

A trash rack protects pumps from large debris that could prevent the pumps working at full capacity and from damaging parts in the pump.

What pumps are proposed for the pump station?

Three pumps are proposed – two as operational and one as a reserve.

What happens if a flood event is higher than the top of the floodwall?

The proposed levee will reduce the risk to the local community from Burnett River flooding and has been designed to provide protection against large floods.

It is possible that in the future, a rare but extreme flood may occur which would cause the levee to be overtopped.

It is important that the community understands this risk, and that there will be a management plan in place to respond to a rare overtopping scenario should it occur.

The Bundaberg East Levee is proposed to be built 300mm higher than an event similar to the 2013 flood. The higher a levee, the lower the risk of it overtopping in any given time period.

Generally, it is impractical to build a levee high enough to completely eliminate the possibility of overtopping. A risk-based approach is therefore required to balance the level of protection afforded by a levee (i.e. minimising the chance of it overtopping) against the practicality and cost of its construction.

To some extent, this balance reflects the communities’ willingness to pay now for a reduction in future impacts. Minor flood events are relatively common, and major floods such as the January 2013 event are likely to happen within any given lifetime, although extreme events are rare.

Will building the levee push water elsewhere and flood someone else or make flooding worse?

The proposed levee has been designed to ensure that its construction will not make flooding worse elsewhere.

The hydraulic model of the Burnett River was used to address this very issue for a range of potential levee options. The potential levees were modelled, and the change in flood level outside of the levee was measured.

In general, it is possible to displace water from areas like Bundaberg Creek and Kendall Flats but not from areas like the Burnett River and the North Bundaberg floodplain.

The suitability of a particular location for a levee depends on the existing patterns of flow during a major flood.

Is there any work being done on local storm water drains?

Bundaberg Regional Council investigates stormwater drainage issues across the region. Where upgrades are identified, they are assessed to ensure they also address community safety and resilience.

To find out about proposed stormwater drainage projects in the Bundaberg region, contact the Council on 1300 883 699 or ceo@bundaberg.qld.gov.au.
Why is a levee proposed for Bundaberg East but not Bundaberg North?

A range of potential levees in Bundaberg North were considered as part of the initial preliminary options assessment report.

Following an engineering assessment, these levees were found to significantly increase flood levels and velocities in other parts of the community. The increased flood levels could also cause the levees to overtop, with potentially catastrophic consequences for the Bundaberg North community.

During a major flood event the Burnett River naturally breaks out of its banks and flows through the Bundaberg North area. The volumes and speed of floodwater passing through Bundaberg North are high during major floods. There is little that can be done to block, divert or otherwise displace these flows without causing severe impacts elsewhere.

This is in contrast to Bundaberg East, where the flooding is caused by backwaters entering the area via Bundaberg Creek. Modelling has shown that the proposed East Levee and floodgates will not displace fast-flowing floodwaters and will have not have significant adverse impacts outside of the levee.

Bundaberg East Levee and floodgates will prevent river water entering my property, could I still get flooded from Bundaberg and Saltwater Creeks?

Parts of Bundaberg East, South and Central are at risk of flooding from two sources: the Burnett River and the local creeks.

The levee and floodgates are designed to mitigate the risk of Burnett River flooding, while minimising any potential exacerbation of local creek flooding.

Will there be a requirement to remove trees to construct the levee?

It has been identified that some trees and vegetation will most likely need to be removed from private land on the Distillery Creek alignment.

Further investigations will be carried out at the detailed design stage to confirm all vegetation and landscaping requirements.

Have underground services been considered as part of the design?

Yes. The proposed levee will be located near existing services such as water, sewer and gas mains, storm water line and power lines at various points. This means, some services will need to be relocated.

All service relocations will be investigated as part of the detailed design stage to limit disruption to residents and businesses.

What is the “100-year flood”, how often will it occur and how is it calculated?

The 100-year flood is defined as a flood event that has a chance of occurring once, on average, in any 100 year period.

There is no guarantee that it will occur exactly once in 100 years – it may occur more often, or not at all.

The 100 year flood is calculated by using knowledge of the historical flood record. For the Burnett River, the flood record goes back 128 years to 1890.

Why can’t the proposed wall be located along the river?

A wall along the river has many drawbacks, including:

- poor ground conditions, making construction difficult and significantly more expensive
- reduced or eliminated access to existing river berths
- construction on private properties
- a taller levee wall, due to the low ground elevations along the river, increasing construction cost; and
- larger impacts upon flood levels, as the wall would create an obstruction to flow in the river channel.

Is the proposed location of the levee the most cost effective option?

Yes. The proposed location has the best ground conditions and is located on the highest terrain. This makes it more cost effective to construct than the other locations considered.
**Will the flood gates affect water quality?**
It is unlikely that the flood gates will affect water quality. The gates will remain open during non-flood conditions, creating little change to the flow of flood water in the creek.

**Will there be any impacts to local residents during the operation or maintenance of pump stations and flood gates?**
During flood conditions, the operation of the flood gates and pumps may lead to increased noise and light levels. Periodic maintenance of the pump station will occur from time to time, which may also cause increased levels of noise and light for short durations.

**Have dams been considered in other areas to mitigate flooding?**
Previous studies have looked at the possibility of using dams to provide flood mitigation. These studies found building dams solely to provide flood mitigation to Bundaberg are not cost effective and provide limited benefits.

**How will the pumps work and where will the water go?**
During flood conditions when the floodgates are closed, the pumps will help to remove local water runoff to maintain low water levels in the creeks behind the levee. Water will be pumped up and over the levee to the Burnett River.

**Quay Street bridge is heritage listed, can this bridge be changed?**
The concept levee design does not require any changes to the bridge.

**Were other options considered for the levee alignment?**
Yes. Other options involved alignments along the river front and on the low-lying land through Kendall flats. In both cases, the ground conditions were not suitable for levee construction, costly to construct and would have impacts to river access, private property and increase flood levels.

**Will projects in the action plan “flood proof” the community?**
Like many Queensland cities, it isn't possible to flood-proof Bundaberg but, we can improve safety and resilience.

The Bundaberg 10-year Action Plan recognises that there is no one project that will solve flood risk. While it is not possible to eliminate the risk of future flooding, there is a lot we can do to reduce that risk, improve community resilience and improve our ability to respond in future floods.

The action plan will bring all levels of the government and community together to deliver sustainable solutions for the people of Bundaberg.

**How do I provide feedback?**
A feedback form will be available at the community information session and members of the project team will be available to assist if required. Alternatively, please visit www.qld.gov.au/bundabergactionplan to complete the online feedback form by Friday 22 June 2018.

**What will happen with the feedback I provide?**
Feedback will be collated into a report which will be considered and incorporated where possible into the detailed final design.

**What will happen next?**
Following the community information sessions for this project, the community will be kept informed as the action plan progresses.