MITCHELL SHIRE.

Seymour Flood Mitigation Project

Project Summary - December 2015

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MITCHELL SHIRE COUNCIL

Seymour Flood Mitigation Project

Background

The Seymour Flood Mitigation Project is being developed by Mitchell Shire Council to provide protection to the town of Seymour against a 1-in-100-year flood event from the Goulburn River.

The area concerned contains a large part of Seymour's commercial activities and essential services including the hospital and police station. The flood protection will also allow for the removal of flood-related town planning constraints and is likely to create an impetus for the growth of businesses. The Seymour Chamber of Commerce has previously expressed its belief that the existence of the planning constraints is a major contributing factor to inhibiting business development in this area of Seymour.

In 2010, Mitchell Shire Council resolved to complete a planning scheme amendment to obtain the required land for the levee. Council has since undertaken a number of investigations to determine the best alignment for the levee and to examine the areas of land that may need to be acquired to construct the levee and its associated works. The levee design is being developed to provide a positive benefit to the community of Seymour and the wider Mitchell Shire, including those outside the levee system.

Functional designs and alignment for the levee are now available and will be considered simultaneously with the Structure Plan for Seymour and the community 'Vision for the Town'. The levee will be designed to ensure that, as much as possible, it does not create a barrier to enjoyment of the Goulburn River and includes provision for walking and cycling paths linked to the wider regional network.

This document provides a summary of investigations so far as well as some preliminary functional design and alignment information.

Project Milestones

2009	**Preliminary Design Report prepared**
2010	**Council agreed to proceed with recommendations in the Preliminary Design Report and seek funding for design and construction**
2011	**Funding secured through Natural Disaster Resilience Grants Scheme for Stage 1 investgiations and modelling**
2013	**Archaelogical Report prepared** **Costing of potential land acquisition prepared** **Preliminary construction cost estimated prepared**
2014	**Cost-Benefit Analysis Complete**
2015	**Funding secured through Regional Growth Fund** **Ecological Report complete** **Draft Cultural Heritage Management Plan prepared** **Preliminary Levee Alignment and Designs prepared** **Seymour Structure Plan consultation started**
Next steps	**Designs finalised** **Planning Scheme Amendments prepared including any land acquisitions required** **Funding confirmed and construction begins**

Significant Flood Events

It is estimated that 400 properties are currently vulnerable to flooding from a 1-in-100-year average recurrence interval (ARI) event in the Goulburn River. Of these, previous investigations have found that over 90% would experience above-floor flooding.

Seymour has a history of flooding dating back to its establishment in the 1800s.

Initial development within the township occurred on the floodplain of the Goulburn River within the vicinity of Emily Street.

The 1870 flood resulted in significant inundation of the entire town, demonstrating the vulnerability of the area to flooding impacts.

Flooding in 1870, 1916 and 1917 forced relocation of the town commercial centre to Emily Street.

The 1916 flood event was the largest flood recorded in the town's history.

In 1974 the town suffered major flooding from the Goulburn River, with one death and nearly 200 buildings suffering direct damage from floodwaters. This event was the most recent major flood the township has experienced (and is considered to be a 1-in-a-30-year occurrence).

In 1993 there was localised flooding of low lying areas.

The levee will protect 400 individual properties from being inundated during a 1-in-100-year flood event. It will also free up other land for development and create a cycling and walking path along the levee with views retained where possible.

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Previous reports

Council has undertaken a number of investigations to determine the benefits, impacts and constraints associated with the proposed levee.

REPORT	SUMMARY
October 2009 Seymour Flood Mitigiation Porject - Preliminary Design Report *John Webb Consulting*	This report indicates that the levee is able to be constructed and identifies the additional items that need to be considered to progress the project. The report identified the general profile of the levee and the expected cost and benefits.
March 2013 Mitchell Shire Council – Seymour Flood Mitigation Project: Draft Report *GHD*	This report provides advice to Council on the strategy to proceed with a PAO for the project and provides advice on additional approvals and investigations that may be required.
June 2013 Letter report on the cost of compensation to landowners for land acquisition *PW Newman P/L*	This report undertook a kerbside assessment of property values for the purposes of acquiring an easement or the entire property.
July 2013 Archaeological Assessment of a Proposed Levee at Seymour *Heritage Insight*	This report assess archaeological aspects of the project. The archaeological team walked nearly the entire proposed alignment of the levee. A number of sites in proximity to the alignment were noted as significant. The report recommended appropriate management actions to be taken in each specific location. These included supervision by a qualified Archaeologist and avoidance of some features as part of the construction process.
September 2013 Seymour Flood Mitigation Project – Preliminary Cost Estimate *Flagstaff Consulting Group*	This report is a comprehensive and detailed assessment of the proposed construction methodologies, costs and scheduling to deliver the preliminary levee design.
November 2013 Letter report on the outcomes of flood modelling *BMT WBM*	This report describes the analysis of flood impacts as a result of the proposed levee, both along the Goulburn River and Whiteheads Creek, including areas upstream of the railway line. The report includes a long section of the alignment showing the proposed levee heights. The minimum levee height is approximately 1 metre near High Street and the maximum levee height is approximately 4.3 metres just south of Emily Street, west of the township

REPORT	SUMMARY
November 2013 Seymour Flood Mitigation Project – Preliminary Construction Methodology *Flagstaff Consulting Group*	This report provides advice to council regarding the methodology and staging of construction activities associated with the levee. The report recommends four work stages that enable the most flexibility in the funding and construction approach. The report details the methods for constructing the earthen levee and temporary barriers at key locations. The report estimates that the project construction time would be between 7 and 14 months.
May 2014 Letter report on increase in land values from rezoning *PW Newman P/L*	This report quantifies the expected increase in land values in Seymour as a result of removing the Land Subject to Inundation Overlay and Urban Floodway Zone as a result of the levee completion.
May 2014 Memorandum – Seymour Flood Mitigation Cost Benefit Analysis *Aither*	This report is a cost-benefit analysis to assess the economic viability of the project. The analysis included an examination of the methodology used to calculate flood damages in previous reports. The report updated the flood damage curves to be consistent with the latest Australian information, and found that the costs of flooding were significantly increased compared to the previous estimates. The benefit-cost ratio for the project is calculated 2.5:1, including the increase in land value.
April 2015 Terrestrial and aquatic assessment for the proposed Seymour levee – proposed realignment *Ecology and Heritage Partners*	This report assess the impacts of the project on the local ecology. The report found that no species of significance with regard to flora or fauna were identified during the site investigations. A number of mitigation measures are recommended in the report. These will be incorporated in the functional design and tender process as appropriate.
July 2015 Proposed Flood Levee, Seymour - Draft Cultural Heritage Management Plan *Heritage Insight*	The CHMP for the project is an exhaustive document that includes three rounds of assessment and significant consultation with representatives of the Taungurung Clans. The CHMP undertook a standard assessment for the entire levee area, consisting of a 28m corridor along the proposed alignment. A complex assessment, including subsurface excavations was completed for identified priority areas. A number of mitigation options were recommended for the design phase and construction phases of the project.

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Levee alignment

The levee is proposed to follow an alignment that protects the largest area possible whilst facilitating access to the road network for properties affected by the levee bank.

The alignment has also been chosen to improve ease of construction and the construction cost in when delivering the project.

Impact on flood levels

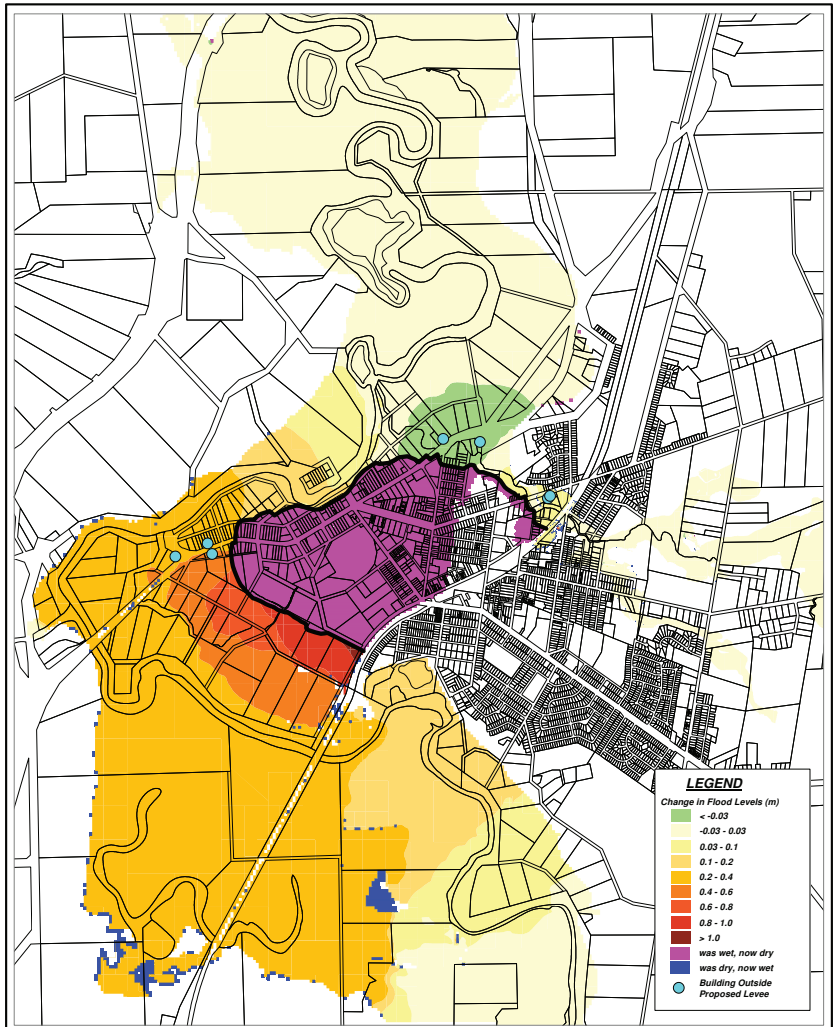
Council has examined the impact on the levee on flood levels in Seymour and the surrounding area through the use of detailed computer modelling.

The models provide the best indication of the expected flood behaviour after the levee has been constructed. To ensure that all changes are properly identified, Council also assessed the Whiteheads Creek system for impacts.

The report found that the levee causes the following flood impacts:

> Increases in flood levels along the Goulburn River peak at 1m near the connection to the rail embankment of the western edge of Seymour.
> At Emily Street, increases are in the order of 0.4m above the existing levels and are 0.1m above at Robert Street.
> At Bolton Street, Level in the Goulburn are effectively unchanged from the existing conditions
> Downstream of levee, there are minor reductions in flood level in the vicinity of the Whiteheads Creek confluence.
> On Whiteheads Creek, increases in flood level as a result of the levee are no greater than 0.1m with the majority of flood level changes being less than 0.03m.
> No additional properties along Whiteheads Creek are inundated as part of the works
> The two properties previously flooded by Whiteheads Creek on High Street have increased in flood level by 0.04m above the existing condition. These properties are currently subject to flooding.

The figure below shows the expected change in flood levels in the 1-in-100 year flood event.



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Stormwater

Local stormwater flows will be impacted by the levee as water can become trapped behind the levee and back up the drainage network. Heavy thunderstorms can cause flooding that no longer has a direct outfall to the Goulburn River. These are common design issues with levees across Victoria and are well understood. The functional design process will ensure that there are no adverse impacts with regard to stormwater drainage.

If a local thunderstorm occurs when the Goulburn River is not flooded, the stormwater pipes that extend through the levee will be able to cater for most flood events. Additional culverts or pipes through the levee may be required to ensure that overland flows do not cause additional flood impacts on properties inside the levee. The depth of flooding from local thunderstorm events would be significantly less than the depth of flooding from events associated with the Goulburn River.

If local rainfall occurs while the Goulburn River is in flood, pump wells and water storages would be included to allow water to be discharged over the levee into the Goulburn. This type of approach was adopted in Nathalia and is proposed for the Myrtleford Flood Levee. The exact volume of the water storages and the required pump rates will be confirmed as part of the functional design process.

The township is protected from flooding from the Goulburn River entering the levee area through the stormwater system by one-way valves at the end of the drainage infrastructure. These valves only allow water to flow from the township to the river.

Environmental impacts

The effect on the environment and ecology of the proposed levee was assessed using qualified ecologists. They undertook site investigations and surveys to identify the local flora and fauna that could be impacted by the levee and how any impacts could be minimised. The findings included:

- A Flora and Fauna Guarantee Act permit will be required for the project;
- 75 flora species were recorded in the project area; no species of significance were identified;
- 50 fauna species were identified; no significant fauna species were recorded;
- The project is in proximity to suitable habitat for the Growling Grass Frog. Targeted surveys recorded no instances of the frog during breeding season;
- No Flora and Fauna Guarantee Act ecological communities were recorded in the study area; and
- Some native vegetation will be removed as a result of the project. An offset area that must be protected and replanted with equivalent vegetation will be required.

The analysis included a number of mitigation measures that will be included in the design of the levee and recommended actions to occur as part of the construction process. Council is committed to implementing these actions as the project progresses.

Cultural Heritage

Council has commissioned reports that assess the impact of the project on the cultural heritage values and archaeological sites of significance in the vicinity of the proposed works. This includes the development of a Cultural Heritage Management Plan for the works that has been completed with the significant consultation and involvement of representatives from the Taungurung Clans.

The investigations found:

> A number of sites in proximity to the alignment were noted as archeologically significant including:
  - Vacant lot between Royal Hotel and Hanna Street
  - The former River Goulburn Brewery/Butter Factory site (Hanna Street)
  - Seymour Park pilings
  - Stone and brick building on Robert Street
  - A eucalypt at 2 Hanna Street
> Five areas of Aboriginal Cultural Heritage to be included on the Victorian Aboriginal Heritage Register (VAHR), including three artefact scatters and two low density artefact distributions.
> The proposed levee cannot be completed in such a way to avoid harm to the five identified VAHR areas.
> The design of the proposed levee can minimise the harm to the VAHR locations.

The report makes specific recommendations for each of the VAHR sites identified to minimise harm. These include construction methods and design considerations.

Works on the levee, not associated with the key of the levee, are unlikely to disturb artefacts, as the excavation depths are expected to be no more than 0.1 metres.

The analysis included a number of mitigation measures that will be included in the design of the levee and recommended actions to occur as part of the construction process. Council is committed to implementing these actions as the project progresses.

Benefits

The proposed levee will protect more than 400 individual properties from being inundated in a 1-in-100-year flood event. This flood event has a 1 per cent chance of occurring in any given year.

For comparison purposes, the 1974 flood that occurred in Seymour is considered to be approximately equivalent to a 1-in-30-year flood event. This flood event has a 3 per cent chance in any given year.

The protection provided by the levee will reduce the annual average flood damage in Seymour from $1.17 million dollars to $56,000. This is one of the primary benefits of the project.

The levee will enable the removal of many flood planning controls for the area that it protects. This increases the land values in the protected area by $2.5 million; an average increase of 20 per cent.

The levee will also reduce the insurance premiums for properties protected as the risk of flooding is significantly reduced.

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For people and properties in Seymour that are not directly impacted by the reduction in flood levels, there are a number of indirect benefits.

These include:

> Disruption to the town centre as a result of flooding no longer occurring;
> Improved emergency response and public safety during a flood event;
> Protection of public assets, including roads, schools, parks and recreation facilities; and
> Increased economic activity in the township, both from the direct impact of the levee works and benefits from the rezoning of land, allowing development to occur.

The benefit-cost ratio for the works is 2.5 to 1, meaning that for every dollar spent, there is two and half dollars in benefit to the community.

Cost and construction

Based on the preliminary design report, a detailed costing and construction methodology has been developed for the project.

This includes an analysis of the expected construction methods for various aspects of the proposal, the type of equipment used, the project timeline and schedule and estimates of the material quantities for the levee.

The reports indicate that there are no issues that would prevent construction of the levee, generally in accordance with the preliminary design.

The proposed methodology for the project includes splitting the levee into a number of separate stages, enabling the greatest flexibility in the delivery of the project. The methodology also limits the width required to construct the project, reducing the required area for land acquisition. The estimated cost of the works is $7.32 million dollars (+/- 25%) as at December 2015.

Land acquisition

Where possible, the levee alignment is in public land or on undeveloped land but some land will be required to facilitate appropriate maintenance and ownership of the levee.

Council is in the process of developing a Planning Scheme Amendment to introduce a Public Acquisition Overlay for land in private ownership that will be required for the levee.

Based on the preliminary design, and after a technical review of the available information, the general extent of the Public Acquisition Overlay will be a 30 metre wide corridor along the path of the levee. The land to be acquired includes provision for an access track on the landward side of the levee.

A small number of properties will need to be acquired in full as the levee will block access to these properties and/or cover a significant portion of the property. The exact area of land to be acquired will be finalised as part of the further design process of the levee. Council is committed to reducing the area of private land acquired to as small as practically possible. The estimated cost of the land acquisition is approximately $2 million.

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Next steps

The reports and studies undertaken by Council provide certainty that the project is viable and that it has significant community benefits.

There are a number of steps that need to be completed prior to construction of the levee including:

> A functional design of the levee. The functional design will:
  - finalise the exact shape, footprint and height of the levee
  - how the levee is integrated into the existing environment
  - determine the required works to ensure stormwater drainage is not impacted
  - minimise the risks to identified cultural heritage, archaeological and environmentally important areas and assets
  - finalise the quantities of materials used to construct the works
> Begin the process to implement the Planning Scheme Amendment for the acquisition of land
> Determine the best method to fund Council's contribution to the levee cost
> Complete a social impact assessment for the levee
> Continue the ongoing community consultation process

The aim is to begin the levee construction in the 2016-2017 financial year subject to finalisation of the Planning Scheme Amendment and securing funding.

More information

More detailed information is available at www.engagingmitchellshire.com

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