



GANNAWARRA
SHIRE COUNCIL

E: Levee Bank Asset Management Plan – March 2015



This plan forms one part of a suite of Asset Management Plans that have been developed:

- A. Bridges
- B. Buildings
- C. Drainage
- D. Footpaths
- E. Levee Banks**
- F. Pools
- G. Recreation Reserves
- H. Roads

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1 Summary

This **Levee Bank Asset Management Plan** acts as a tool to support Council to deliver targeted, responsive and value for money maintenance and operational services for the community as a whole.

The plan covers the proposed levels of service, future demand, routine maintenance, renewal/replacement and augmentation of levee bank assets. It also outlines the financial requirements and the key assumptions made in the financial forecasts.

This Levee Bank Asset Management Plan should be subjected to a formal review every five years.

Service Background			
Council Plan Area of Achievement	3.5	Our community feels safe and is prepared for an emergency event.	
Service Area	Infrastructure		
Budget Area	Infrastructure		
Service Purpose and Description	The key purpose of this asset is to provide safety for the community by avoiding the adverse impacts of floods within the Kerang urban area. To achieve this Council is conducting a proactive and responsive inspection and maintenance program on the Kerang Township Protection Levee.		
Service Planning Responsibilities (as specified in the Functional Matrix)	Strategic Planning:	Manager Design and Projects	
	Maintenance & Construction:	Manager Operational Services	
Service Costs 2013/14			
Maintenance Expenditure	\$27,500		
Capital Income	\$0		
Capital Expenditure	\$0	Capital as % of rates	0.3%
Total Net Cost	\$27,500	Overall as % of rates	0%

2 Plan Format and Definitions

The Levee Bank Asset Management Plan is designed to provide a framework for the efficient management of Council owned and controlled levee banks.

2.1 Relationship with Other Planning Documents

- Council Plan 2013-17
- Gannawarra 2025
- Levee Design Construction and Maintenance (Department of Natural Resources and Environment 2002)
- Environment and Natural Resources Committee (ENRC) Inquiry into Flood Mitigation Infrastructure in Victoria - August 2012
- Flood Emergency Plan

2.2 Infrastructure Assets included in the Plan

Asset Category	Asset Components	Assets Included
Levees	Kerang Township Protection Levee	Earthen Bank
		Associated Drainage Infrastructure
		Walking Tracks
		Vehicular Access
		Associated Furniture (bollards, signage, gates etc.)

There are many levees throughout the municipality that vary widely in their strategic benefit and provide varying levels of protection.

This plan only relates to the Kerang Township Protection Levee. As other levees throughout the municipality become subject to an approved scheme they will be included in this asset management plan.

2.3 Assets not included in this Plan

Assets specifically excluded from this plan are:

- Levee banks that are either private or the responsibility of other Authorities.
- Levee banks not subject to an approved scheme.

3 Levels of Service

The levels of service are the required performance standard for an asset. Levels of service determine an asset's development, operation, maintenance, replacement and disposal. Factors that determine the level of service are primarily:-

- Whether alternative options exist
- Strategic and corporate goals. Council's goals and values as stated in policies, strategies, and in particular the Council Plan
- Level of protection
- Community safety
- Economic development potential

3.1 Customer Engagement and Expectations

Requirement	Example	How it is measured
Safety	Levee bank to provide flood protection	Banks will be designed and maintained above the flood design recurrence interval
Aesthetics	Banks should be tidy, ie. no long grass	Customer feedback Condition inspections
Condition	Condition of the levee bank and adjacent environment	Customer feedback Condition inspections Defect inspections
Environment	Free of pest plants and pest animals	Customer feedback Condition inspections

3.2 Key Performance Indicators

KPI	Levels of Service	Performance Measurement	Target Performance
Respond to a safety defect	Inspections are conducted bi-annually and as required following a flood event or customer inquiry.	Respond and repair when required	100% of work requests are entered into Confirm and works completed within the required timeframes
Condition	The bank will be of good condition and constructed to the design standards	Levee is able to withstand a 1% ARI	100% of levees with a minimum of freeboard above the 1% ARI

3.3 Asset Hierarchy

There is no defined asset hierarchy for levee banks.

3.4 Levels of Service

The elements required to be considered for each individual segment are as follows:

Community Levels of Service	Technical Target	Technical Measure
There will be flood protection for the Kerang township	Constructed levee bank present	Levee banks will be maintained to design standards. Currently this is only the Kerang Township Protection Levee. Levee banks will be designed for a 1% ARI with 600mm freeboard and 400mm freeboard at roadways
Levee banks will be maintained to provide a good appearance	Removal of litter and debris	Litter and debris will be removed which were identified during regular inspections
The bank will be free of pest plants and pest animals	Pest plants and pest animals will be treated	An ongoing annual program to manage pest plants and pest animals such as rabbits.

4 **Future Demand**

There are many factors influencing the future demand of assets from a changing population demographic to general community expectations as to what is acceptable. While Council will strive to meet demand for future asset class expansion this must be done in a sustainable way that meets the needs of the community as a whole. Currently, the only levee bank for which Council is responsible is the Kerang Township Protection Levee, however it is likely in the future that the other urban townships such as Quambatook and Koondrook will be included.

Factor Influencing Demand	Impact on the Service, Cost, Timing	Demand Management Plan Actions
Climate change	Climate change has the possibility of increasing the severity and /or frequency of flooding events	Monitor flood levels and ensure levee banks have appropriate freeboard and have not slumped
Residential development	New residential developments will add to the potential consequence of flooding.	Ensure all residential developments have consideration of flood protection
Alterations to existing rural drainage patterns	Land clearing, filling of existing channels and cropping changes can alter the flood levels and time of concentration	Monitor flood levels and ensure levee banks have appropriate freeboard and have not slumped
Infrastructure works within the floodplain	Works on roads, bridges, structures and rail can alter the flood levels and time of concentration	Ensure infrastructure works go through an appropriate approval process to ensure minimal change to the entire floodplain

4.1 Network Augmentation

Improvements and additions to the existing Kerang Township Protection Levee will be minimal as the levee now fully encompasses the town.

Expansion of flood mitigation to other towns such as Quambatook and Koondrook would be considered in line with the Environment and Natural Resources Committee (ENRC) Inquiry into Flood Mitigation Infrastructure in Victoria and as funding becomes available.

5 Risk Management

The identified risks associated with levee banks included in this plan are monitored through regular inspections of the network.

5.1 Asset Criticality

Asset criticality addresses assets that are both a high consequence of failure (being a major or catastrophic consequence) and have a high risk of failure. While the Kerang Township Protection Levee is not at high risk of failure the consequences of failure would potentially be catastrophic.

By definition all assets included in this plan are considered 'critical'. The corresponding management actions specified in this plan take this into account.

5.2 Legislative Requirements

Currently, there is no relevant legislation governing levee bank construction and maintenance.

- Local Government Act 1989
- Planning and Environment Act 1987

6 Lifecycle Management Plans

6.1 Asset Ownership

Council currently maintains 17km of constructed levee banks within the municipality, details of which are contained in Council's asset register. These levee banks are constructed entirely of compacted earth and may contain other infrastructure within the bank such as irrigation or stormwater pipes.

6.2 Asset Quantities Levee Banks

Location	Length
Kerang Town	17kms
Total	17kms

6.3 Asset Condition

The Kerang Township Protection Levee is assessed for defects bi-annually and maintained in a condition that would protect the Kerang township from a 1% ARI flood event.

6.4 Condition Ratings for Levee Banks

There is no established industry condition rating methodology for levee banks to assess them in-line with Council's standard condition rating scale of 0(new) to 10(end of life).

In assessing a levee for maintenance purposes the assessor may take into account a range of factors, including but not limited to:

- **Structural performance**
 - Loss of effective section (erosion)
- **Structural integrity**
 - Severity/extent defects (rabbit infestations, cracking, piping)
 - Slip/settlement/deformation
- **Structural durability**
 - Water penetration/loss of compaction/seepage
 - Vegetation (trees)
 - Debris
 - Exposure

6.5 Maintenance Planning

Maintenance activities may include:

- Repair of erosion and scours
- Minor filling and reinstatement
- Re-compaction
- Removal of debris, burrows and trees and saplings
- Mowing
- Removal of pest plants and pest animals

Defect, or maintenance inspections, are scheduled bi-annually and are undertaken by Council staff.

6.6 Asset Replacement Costs

The replacement cost of an existing levee is difficult if not impossible to determine accurately. Also, with regular maintenance and protection of the existing bank it is not expected that the levee would ever require full replacement.

Recent levee repair works have cost in the order of \$330 to \$830 per lineal meter depending on location and proximity to other infrastructure.

6.7 Construction Standards

Classification	Minimum Standards
Levee Bank	Crest width – minimum 3m Batter wet side – 2.5:1 Batter dry side – 2:1 Top protection –150mm FCR Freeboard – 600mm Roadway freeboard – 400mm

6.8 Replacement Standards/Process

Levee bank construction is undertaken in accordance with the Levee Design Construction & Maintenance Manual produced by the Department of Natural Resources and Environment.

6.9 Materials

Most levee banks constructed in the Gannawarra Shire are made from locally sourced earthen material. This has proved to be more cost effective than concrete walls or temporary shutters.

6.10 Programming and Recording of Works Undertaken

All defect inspections are recorded utilising Council’s asset management software “Confirm”. This will ensure an up to date and accurate record of the state of the network at any given time. Any works that are conducted in field, whether proactive or reactive must be issued with a corresponding accurate works order to enable recording of network improvements.

6.11 Predicted Future Condition

Given the long life of earthen levee banks and their continued maintenance regime there is not expected to be any noticeable change in condition over the next 10 years to 20 years.

6.12 Proposed Capital Budget

There is no current planned expansion or major replacement works scheduled for the Kerang Township Protection Levee. It is important however to continue to provide maintenance activities to the bank for control of pest plants and pest animals and maintaining the protective gravel top to ensure the banks function as required during a flooding event.

However in future years the Quambatook and Koondrook communities may require their township protection levees enhanced to meet current standards. This will be subject to the availability of external funding.