



**ASSESSMENT REPORT 34**

# **ALICE SPRINGS - EASTSIDE LEVEE PROPOSAL**

## **ENVIRONMENTAL ASSESSMENT REPORT AND RECOMMENDATIONS**

by the

**ENVIRONMENT AND HERITAGE DIVISION  
DEPARTMENT OF LANDS, PLANNING AND ENVIRONMENT**

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## **EXECUTIVE SUMMARY**

This report assesses the environmental impacts of a proposal by the Alice Springs Town Council to build a levee on the east bank of the Todd River between Spencer Drain and McMinn Street.

It reviews the Public Environmental Report (PER) submitted by the proponent and information, comments and advice provided by Northern Territory Government agencies and in public submissions

Environmental Impact Assessment is the process of determining those elements of the environment which may be affected by a development proposal and of determining the significance, risk and consequences of the potential impacts of the proposal. Recommendations arising from the assessment address methods to mitigate these impacts.

### **Major issues**

The principal environmental issues identified for the construction of the levee bank are;

- increased flood risk to seven properties,
- disturbance to parkland and aesthetics, and
- noise and dust during construction.

The principal benefit anticipated from this proposal is the reduction in flood risk for a further 160 properties in the event of a flood in excess of the 2% Annual Exceedence Probability (AEP) flood (referred to as the Q50 flood), up to the 1% AEP flood (Q100 flood). Additionally, the levee may offer a route for a raised cycleway. This option is supported.

### **Conclusion**

It is considered that all potentially significant environmental issues associated with the project have been identified. Most of the issues have been resolved through this assessment process, while the remainder will be addressed through the recommendations made in this Assessment Report.

The major direct environmental impact of the project is the aesthetic disturbance that the levee will introduce. Modelling has also indicated that in the event of a Q100 flood, five properties currently having a low risk of flooding will be inundated and two additional properties will be subject to greater levels of flooding.

The PER and recommendations detailed in this Assessment Report form the basis for the management of environmental impacts during the construction and maintenance stages of this project. The Environmental Management Plan (EMP), included in Recommendation 2, will provide more detailed information on issues that were not covered adequately in the PER. The EMP will be subject to approval by the Secretary, Department of Lands, Planning and Environment, before construction begins and will require review if substantial changes are made to proposed construction and operational techniques.

Provided that the environmental commitments and safeguards detailed in the PER are implemented and the recommendations in this Assessment Report are adopted then long term environmental impacts are expected to be minimal.

## **Recommendations**

It is acknowledged that during implementation, flexibility is necessary to allow for minor changes to the proposal from that described in the PER. Detailed designs and construction techniques are not yet available, and many of the environmental safeguards outlined in the PER are outcome oriented, consequently an Environmental Management Plan (EMP) will be required as outlined in Recommendation 2. The EMP is expected to detail construction practices and ongoing maintenance of the proposed structure, and will be a working document for the life of the proposal.

### **Recommendation 1**

**Alice Springs Town Council shall ensure that the proposal is implemented in accordance with the environmental commitments and safeguards identified in the Proposed Eastside Levee, Alice Springs, Public Environmental Report (summarised in Section 5.7 of the PER) and as recommended in this Assessment Report. All safeguards and mitigation measures outlined in the PER are considered to be commitments by Alice Springs Town Council.**

### **Recommendation 2**

**Before the project is permitted to proceed the proponent shall prepare an Environmental Management Plan (to the satisfaction of the Secretary, Department of Lands, Planning and Environment) for the construction phase of the project and maintenance of the levee and associated works. The EMP will be a working document for the life of the project. The EMP will**

- **outline how dust and noise will be managed during construction;**
- **detail how accidental spillage of fuel and lubricants will be prevented;**
- **include a landscape plan to minimise aesthetic impacts related to loss of mature trees and construction of the levee; and**
- **include a revegetation maintenance plan with details of the proposed walkway/cycleway, to ensure stability of the levee during flood events.**

# 1 INTRODUCTION AND BACKGROUND

This Report assesses the environmental impacts of a proposal by the Alice Springs Town Council to build a levee on the east bank of the Todd River between Spencer Drain and McMinn Street.

The proposed levee is one of a number of recommendations put forward in the *Alice Springs Flood Plain Study (Gutteridge, Haskins and Davey 1996)*, to mitigate the effects of flooding on the Alice Springs community.

This Environmental Assessment Report reviews the Public Environmental Report submitted by the Alice Springs Town Council and includes consideration of comments and advice provided in submissions from the public and from relevant Northern Territory Government agencies.

## 1.1 Environmental Assessment Process

Environmental impact assessment is based on adequately defining those elements of the environment that may be affected by a proposed development, and on quantifying the significance, risks and consequences of the potential impacts of the proposal at a local and regional level.

The Public Environmental Report (PER) provides a description of the existing environment in the area and the proposal, and evaluates the environmental impacts and proposed mitigating measures to minimise the expected impacts.

This Environmental Assessment Report (EAR) assesses the adequacy of the PER in achieving the above objectives, and evaluates the undertakings and environmental safeguards proposed by the proponent to mitigate the potential impacts. Further safeguards may be recommended as appropriate.

The safeguards may be implemented at various levels within the planning framework of a project. These include, but are not limited to

1. Site selection;
2. Design and layout of structures; and
3. Management of construction and maintenance activities.

The contents of this EAR form the basis of advice to the Northern Territory Minister for Lands, Planning and Environment on the environmental issues associated with the project.

## 1.2 Environmental Assessment History of the Levee Proposal

In June 1999 the Alice Springs Town Council submitted an application for funding of the levee under the Commonwealth Regional Flood Mitigation Program.

This application was accepted as a Notice of Intent for the project and it was determined that assessment would be required under the *Environmental Assessment Act* at the PER level. This level of assessment was considered necessary to obtain

adequate information on the levee's effect on downstream flows and the proposed landscaping of the levee, and to provide opportunity for public comment.

Draft guidelines for a PER were submitted for public and government review on 5 November, 1999.

A PER was submitted and placed on public review between 13 June and 7 July, 2000.

Six public submissions were received and representations were made in the *Centralian Advocate* newspaper. Four NT Government agencies also submitted comments.

## **2 THE PROPOSAL**

Alice Springs Town Council proposes to construct a landscaped embankment on the eastern bank of the Todd River along Sturt Terrace between Gosse Street and McMinn Street. The embankment will vary in height from 1900mm at Gosse Street, to 1300mm at Schwartz Crescent, 1200mm at Chewings Street and tapers to an end at McMinn Street. These heights provide a freeboard of 300mm to the Q100 flood. A manually operated floodgate will control the road crossing at Schwartz Crescent.

The levee will be established on Lots 5140 and 5806 which are classified as reserves under the *Crown Lands Act*. The land is described as being for municipal purposes, to be known as Reserve No. 1708.

The Federal Court has determined that the land is subject to Native Title rights and interests and the consent of the Native Title holders must be obtained before any works can commence.

## **3 ENVIRONMENTAL IMPACT ASSESSMENT**

### **3.1 Introduction**

The information provided in the PER has been assessed and then used, along with submissions from advisory bodies and public comment on the PER, to determine the adequacy of the information provided by the proponent and the accuracy and acceptability of predicted impacts and safeguards. This Environmental Assessment Report provides recommendations, based on submissions and comments from Government advisory bodies to reinforce environmental commitments by the proponent and to include additional safeguards not included in the PER.

It is acknowledged that during implementation, flexibility is necessary and desirable to allow for minor and non-substantial changes to the proposals outlined in the PER and examined as part of this assessment. It is considered that subsequent statutory approvals for this project could make provisions for such changes, where it can be shown that the changes are not likely to have a significant effect on the environment.

It is important for interpretation purposes that the recommendations (in bold) are not considered in isolation, as the text identifies concerns, suggestions and undertakings associated with the project.

Safeguards and mitigation measures undertaken by the proponent in the PER are summarised in Section 5.7 of the PER (pages 37-39). All safeguards and mitigation measures outlined in the PER are considered to be commitments by the proponent.

Subject to decisions that permit the project to proceed, the primary recommendation of this assessment is;

### **Recommendation 1**

**Alice Springs Town Council shall ensure that the proposal is implemented in accordance with the environmental commitments and safeguards identified in the Proposed Eastside Levee, Alice Springs, Public Environmental Report (summarised in Section 5.7 of the PER) and as recommended in this Assessment Report. All safeguards and mitigation measures outlined in the PER are considered to be commitments by Alice Springs Town Council.**

## **3.2 Major Environmental Issues**

The principal environmental issues identified by the proponent and this assessment report are:

- Increased risk of flooding.
- Disturbance to parkland and aesthetics.
- Noise and dust during construction.

### **3.2.1 Increased Risk of Flooding**

The levee has the potential to increase flood levels on the western side of the Todd by forcing more water down that section of the river controlled by the proposed levee.

The PER focuses on the effects of the levee during the Q100 design flood, quantifying adverse impacts as described below. It does not quantify the effects at other flood levels. This Environmental Assessment Report has drawn on hydrological expertise within the Department of Lands Planning and Environment to more fully describe the effects as follows.

The levee will not cause any increase in flood levels for events up to and including a Q50 flood.

For events slightly larger than the Q50, there will be a slight increase in water levels opposite the levee, that is from the Charles River junction down to Anzac Oval.

For progressively larger floods, the increase in water levels gradually becomes more significant until it reaches a greatest effect for an event just larger than the Q100. At this maximum, peak water levels are higher along the western side of the river from St Philips College down to Gregory Terrace.

For even larger floods, the increase in peak water levels becomes less significant.

When the effect is at its greatest (ie, for a Q100 event) the peak water levels on the western side of the river increase as follows:

- St Philips College precinct: 40mm higher than without a levee.
- JGGRS: 120mm higher than without a levee.
- River end of Wills Terrace: 70mm higher than without a levee.
- River end of Parsons Street: 40mm higher than without a levee.
- River end of Gregory Terrace: no higher than without a levee.

That is, all properties bounded by the Todd River, Wills Terrace, Hartley Street and Parsons Street which would have been flooded by a Q100 event in the absence of the levee, would be flooded to the same depth plus an extra 40-70mm after levee construction.

All properties bounded by the Todd River, Parsons Street, Bath Street and Gregory Terrace which would have been flooded by a Q100 event in the absence of the levee would be flooded to the same depth plus an extra 0-40mm after levee construction.

In smaller floods between Q50 and Q100, the impact on peak water levels is less.

As an additional result of levee construction, there are five properties in the CBD with floor levels (based on 1986 data) exactly equal to the predicted Q100 level in the absence of the levee. With the levee in place, the predicted peak water levels would be 30, 50, 50, 70 and 70mm above floor levels. That is, these five properties are at risk of flooding (albeit shallow) which would not have occurred in the absence of the levee.

The PER suggests that sandbagging and raised doorways would ameliorate these effects.

In the Q100 design case, the St Philips College precinct would have an increase in peak water level of 40mm. The Joint Australian/US Geological and Geophysical Research Station would have an increase in peak water level of 120mm, increasing the average depth over floors from 680mm to 800mm.

The PER does not provide a discussion of alternative options to mitigate the frequency of flooding in Alice Springs or justification of the chosen option. Public submissions questioned the option for flood mitigation that was presented in the PER.

This was not the role of the PER, as these issues have been extensively researched in the *Alice Springs Flood Plain Study (GHD 1996)*. In particular, the 1996 report stated that removal of bed level causeways would not have an identifiable effect on flood levels. It did state that the Taffy Pick crossing has an effect on flood levels for approx 600–800 metres upstream at flows between Q20 and Q10 floods. The public perceives that the impediments and constrictions to the existing river channel have raised the bed level of the river, although precise surveying shows that this is not the case.

### 3.2.2 Disturbance to Parkland and Aesthetics

A strip of land 15m wide and 550m long will have to be cleared of mature trees to facilitate construction. The AAPA clearance requires that this exclude river gums and other native trees. Topsoil will be set aside and used to cover the levee for replanting purposes. A curvilinear alignment is proposed for the levee to minimise the visual impact and to avoid mature gums as required under the clearance certificate. It is likely that tree clearing required for construction will involve the removal of a number of introduced species and revegetation with native riverine species, which is consistent with the *Todd and Charles River Masterplan* recommendations.

The *Alice Springs Flood Plain Study (GHD 1996)* rejected the construction of levees as a strategy for long term flood mitigation as inappropriate to the recommended theme for future development and care of the river resource through Alice Springs, as proposed in the *Todd and Charles River Masterplan*. The study did however recommend that a partial levee system be introduced to protect the eastside area of Alice Springs from Todd River overflows during floods in excess of the 2% AEP (Q50) event. The study expressed the view that with appropriate landscaping the levee is unlikely to conflict in a major way with the *Masterplan*.

An Environmental Management Plan (see Recommendation 2 below) should include a landscape plan to minimise aesthetic impacts related to loss of mature trees and construction of the levee bank.

### 3.2.3 Dust and noise

The PER states that a supply of non-potable water would be used for dust suppression during construction but no details are given of any enforcement of dust suppression by the contractor. Further, there is no consideration in the report of the noise levels to which nearby residents would be subject at various times of day.

The EMP should outline how levels of dust and noise during construction will be kept at acceptable levels.

## 3.3 Other Issues

### 3.3.1 Accidental spillage of fuels and lubricants during construction

The report states that an area of parkland would be required for storage of construction equipment. This may include the storage of fuel and lubricants.

The EMP should outline how the risk of accidental spillage of fuels and lubricants during construction will be managed.

### 3.3.2 Heritage and Significant Sites

The site contains a number of trees that have been recognised as Sacred Sites (AAPA Authority Certificate C1999/076). The PER outlined acceptable measures for the protection of these sacred sites, in that these trees are to be retained and protected from any disturbance. In addition, the levee will adopt a curvilinear alignment to ensure the protection of these and other mature trees.

While the PER recognises that there are no listed heritage sites on the proposed levee alignment, an archaeological survey was not conducted. The letter presented at Appendix E of the PER does not constitute a clearance for this issue. An archaeological survey is now being arranged for this proposal.

### 3.3.3 Landscaping and Levee Stability

The PER accepts that couch grass, *Cynodon dactylon*, is established on the river bed and banks, and that it would be difficult to eradicate from the levee site. Further, the PER recommends that couch and native grasses be used to rehabilitate and stabilise the levee. This Assessment Report suggests that in this situation the establishment of native grasses would not give the best outcomes for the project in regard to protection from erosion. It is recommended that the integrity of the levee would be enhanced by a monospecific planting of couch grass, which will help to prevent scour, and which will be consistent with the use of the area for highly frequented parkland. It is also recommended that the construction of a concrete walkway/cycleway be incorporated to assist in stabilising the levee against scour and subsequent failure during those rare floods which will overtop the levee (Q100 and greater).

The revegetation and maintenance of the grass covering the levee, and the construction of a walkway/cycleway to ensure the integrity of the levee during flood events including those greater than Q100, will be detailed as a part of the EMP.

### 3.3.4 Source of Fill Material and Rehabilitation of Extractive Areas

The PER does not address the consequences of removing 4000m<sup>3</sup> of material from a borrow area, nor does the PER identify the site from which material will be sourced. If the fill is to be sourced from a commercial operation, as suggested in the PER, this issue will be addressed by accepted industry codes of practice and regulations, and existing environmental requirements.

## **Recommendation 2**

**Before the project is permitted to proceed the proponent shall prepare an Environmental Management Plan (to the satisfaction of the Secretary, Department of Lands, Planning and Environment) for the construction phase of the project and maintenance of the levee and associated works. The EMP will be a working document for the life of the project. The EMP will**

- **outline how dust and noise will be managed during construction;**
- **detail how accidental spillage of fuel and lubricants will be prevented;**
- **include a landscape plan to minimise aesthetic impacts related to loss of mature trees and construction of the levee; and**
- **include a revegetation maintenance plan with details of the proposed walkway/cycleway, to ensure stability of the levee during flood events.**

## **4 CONCLUSION**

It is considered that the environmental issues associated with the project have been adequately identified. Most of the issues have been resolved through this assessment process, while the remainder will be addressed through the Environmental Management Plan for the construction phase and for maintenance of the levee and associated structures.

The PER and recommendations detailed in this Assessment Report form the basis for the management of environmental impacts during the construction and maintenance stages of this project. An Environmental Management Plan (EMP) referred to in Recommendation 2, will provide more detailed information on issues that were not covered adequately in the PER. The EMP will be subject to approval by the Secretary, Department of Lands, Planning and Environment, before construction begins and will require review if substantial changes are made to proposed construction and operational techniques.

Provided that the environmental commitments and safeguards detailed in the PER are implemented and the recommendations in this Assessment Report are adopted then long term environmental impacts are expected to be minimal.

## Appendix 1

### SUMMARY OF COMMENTS RECEIVED

AGENCY	COMMENTS
Parks and Wildlife Commission	<ul style="list-style-type: none"> <li>Visual intrusion on a natural river channel.</li> <li>Clarification needed on removal of Sacred Site trees.</li> </ul>
Police, Fire & Emergency Services	<ul style="list-style-type: none"> <li>Levee unlikely to impact operational effectiveness of the three services.</li> </ul>
Environment Australia	<ul style="list-style-type: none"> <li>Designation of the proposal under the <i>Environment Protection (Impact of Proposals) Act</i> is not required</li> </ul>
Power & Water Authority	<ul style="list-style-type: none"> <li>Possible impacts to water pipelines and electrical cables through construction or changes in river flow.</li> </ul>

INDIVIDUAL	COMMENTS
Tom Bird	<ul style="list-style-type: none"> <li>Would prefer to have some gum trees and the couch grass removed from the river.</li> <li>East side has only flooded once this century.</li> <li>More run off is channelled through the Todd as a result of development. Eight extra rivers disguised as storm drains.</li> <li>Raised causeways impede flow and cause build up of sand.</li> <li>River impeded by parking area north of Stott Terrace.</li> <li>Heavitree Gap narrowed by road and railway.</li> <li>Proved in the past that sand mining will not scour the Todd.</li> </ul>
Rod Cramer	<ul style="list-style-type: none"> <li>Insufficient detail on sourcing of extractive material.</li> <li>Earlier reports did not suggest there would be benefits in a Q50 flood.</li> <li>Why could East side residences not be protected with sandbags?</li> <li>Levee an <b>option</b> and not a <b>recommendation</b> of earlier reports.</li> <li>Suggested that PER comment on p2, 1.4 paragraph 3 is unsubstantiated and mischievous.</li> <li>Public meeting of 15 people when half were officials or media is not a public consultation.</li> <li>Rainfall that delivers run off locally rather than to the catchment would be a great disappointment in the levee bank's perceived effectiveness.</li> <li>No modelling on the effects of lowering the bed level of the Wills Terrace Causeway.</li> <li><b>Hinges</b> on a sliding gate.</li> <li>Little warning of large flash floods – not true.</li> <li>Hindrances to river flow (railway and road in Heavitree Gap) and increased run off from development should not be ignored in favour of flood mitigation. Silt build up would be alleviated by reducing hindrances to flow which would reduce flooding.</li> </ul>
Curly Batson	<ul style="list-style-type: none"> <li>Sand mining of the Todd and a general clean up.</li> <li>Remove the casino causeway.</li> <li>Spencer drain adds volume to the river.</li> <li>Schwartz Crescent should not be closed because it carries too much traffic.</li> <li>Last flood was 3.048 metres above the Wills Terrace causeway and yet East side did not flood.</li> <li>Same flood rose to the doorstep of Casa Nostra but did not enter the shop.</li> <li>Floodwater gates at the causeway (Schwartz Crescent) and yet Gosse Street is the highest part of Eastside. This is because the proposal comes from Carter who lived there. Therefore the Town needs a Ward system for election of aldermen.</li> </ul>

Yvonne Clissold	<ul style="list-style-type: none"> <li>• Nothing being done to alleviate flooding where it commonly occurs.</li> <li>• Would like to see couch grass removed and a channel dug along the river course.</li> <li>• Taffy Pick crossing should be raised and have the culverts removed and replaced by a structure that allows freer movement of water.</li> <li>• Public might feel that members of the Town Council should be resident in an area for any flood mitigation to occur there.</li> </ul>
Brendan Heenan	<ul style="list-style-type: none"> <li>• Strongly objects to a levee on one side of town. Only a band aid solution.</li> <li>• Will cause more flooding in the CBD and further down the Todd River.</li> <li>• What would happen in a 100 year flood?</li> <li>• Flood mitigation dams along the Todd and Charles should be looked at.</li> <li>• The money would be better spent on sand mining to remove the mounds in the river.</li> <li>• When the Spencer drain backs up in a flood the water from it will spread out into East side.</li> <li>• Water will back up from around the downstream end of the levee.</li> </ul>
Russell Goldflam and Pip McManus	<ul style="list-style-type: none"> <li>• The proposal will not cause significant harm to other town residents or their property.</li> <li>• Ratepayers on the East side should pay 5% extra on their rates for next ten years to help defray the cost.</li> <li>• The Town Council should assist the five CBD ratepayers who will be affected.</li> <li>• Residents should be informed that the levee would have a beneficial effect as a whole by keeping insurance premiums down for everyone.</li> <li>• The Town Council should continue to investigate and implement further flood mitigation measures.</li> <li>• Consultation with the Native Title Holders will be a great opportunity for practical reconciliation.</li> </ul>

## Appendix 2

### SUMMARY OF COMMITMENTS MADE IN PER

Potential Impact	Commitment
Deterioration of Sturt Terrace and other roads due to construction traffic.	<ul style="list-style-type: none"> <li>Restoration of damaged road surfaces to be a requirement of contract (PER p3).</li> </ul>
Temporary loss of vegetation cover in areas required for storage of contractor's equipment and materials, and stockpiling of fill material.	<ul style="list-style-type: none"> <li>Restoration of damaged areas to be a requirement of contract (PER p3).</li> </ul>
Removal of existing vegetation.	<ul style="list-style-type: none"> <li>All trees identified in AAPA Certificate C1999/076 are to be retained and protected from any disturbance (PER p4).</li> <li>All healthy River Red Gums and other endemic species to be retained and protected from any disturbance (PER p4).</li> <li>Where trees need to be removed to provide a sufficiently wide corridor, the alignment will be selected so that weed species, introduced species, recent plantings and/or sick plants require removal (PER p4).</li> <li>The levee itself and all disturbed areas will be rehabilitated with grasses immediately after construction (PER p4).</li> </ul>
Construction related impacts.	<ul style="list-style-type: none"> <li>Control extent of clearing and vegetation stripping (PER p4).</li> <li>Ensure construction vehicle access is via approved routes only (PER p4).</li> <li>Monitor condition of access roads (PER p4).</li> <li>Ensure compliance with AAPA certificate (PER p4).</li> </ul>
Longer term impacts related to construction.	<ul style="list-style-type: none"> <li>Monitor levee embankment for erosion, structural damage and impact of pedestrian damage. Repair when necessary (PER p4).</li> <li>Monitor condition of vegetation on levee. Water and mow as necessary. Control the spread of weeds (PER p4).</li> <li>Undertake regular testing and maintenance of Schwarz Crescent floodgate (PER p4).</li> </ul>
Soil Management (PER p37)	<p>Design</p> <ul style="list-style-type: none"> <li>Provide embankment slopes of 1 in 6 or flatter.</li> </ul> <p>Construction</p> <ul style="list-style-type: none"> <li>Strictly control the extent of clearing.</li> <li>Define Contractors equipment storage area and work areas.</li> <li>Stockpile top soil stripped from the construction area and used for later rehabilitation.</li> <li>Schedule construction for mid-year to reduce chances of heavy rainfall interfering with construction.</li> </ul> <p>Ongoing Management</p> <ul style="list-style-type: none"> <li>Inspect levee after significant rainfall events to check for soil scouring and stability.</li> <li>Routinely inspect pedestrian impact in regard to soil stability and erosion.</li> <li>Repair scoring when evident.</li> </ul>

Vegetation Management (PER p38)	<p>Design</p> <ul style="list-style-type: none"> <li>Specify re-seeding and replanting of earth levee and other disturbed areas with local native and introduced grass (<i>Cynodon dactylon</i>).</li> <li>Clearly identify in contract documentation trees and plants to be retained and protected during construction.</li> </ul> <p>Construction</p> <ul style="list-style-type: none"> <li>Strictly control extent of vegetation stripping.</li> <li>Clearly define contractor's equipment storage area and work area.</li> </ul> <p>Ongoing Management</p> <ul style="list-style-type: none"> <li>Monitor and manage establishment of vegetation cover after levee construction.</li> <li>Maintain levee with watering and mowing to ensure adequate and stable vegetation cover.</li> <li>Monitor levee area for pedestrian impact to ensure minimal vegetation loss.</li> <li>Monitor and regularly control the spread of weeds over the levee.</li> </ul>
Flood Level Increases (PER p38)	<p>Design</p> <ul style="list-style-type: none"> <li>Identify functional buildings inundated by the Q100 flood after levee construction, but not under existing conditions.</li> <li>Provide flood protection against incremental flooding for properties identified above.</li> </ul>
Sacred Sites Management (PER p39)	<p>Design</p> <ul style="list-style-type: none"> <li>Plan levee alignment to avoid known areas of significance.</li> <li>Clearly identify sites of significance on construction plans.</li> </ul> <p>Construction</p> <ul style="list-style-type: none"> <li>Ensure that works are carried out in accordance with the conditions set down in AAPA Certificate C1999/076.</li> </ul>
Visual Appearance (PER p39)	<p>Design</p> <ul style="list-style-type: none"> <li>Plan levee alignment to blend into the natural topography.</li> <li>Specify native grasses and shrubs for rehabilitation of the levee so that the vegetation will blend in with the natural surroundings.</li> </ul> <p>Construction</p> <ul style="list-style-type: none"> <li>Minimise area of land clearing and disturbance during construction.</li> </ul> <p>Ongoing Management</p> <ul style="list-style-type: none"> <li>Manage soil erosion and vegetation growth as detailed above.</li> </ul>
Levee Operation (PER p39)	<p>Ongoing Management</p> <ul style="list-style-type: none"> <li>Manage soil erosion and vegetation growth as detailed above.</li> <li>Undertake regular maintenance of floodgates.</li> <li>Undertake annual testing of the floodgate to confirm that it is operational.</li> </ul>