Queensland Government
Department of Infrastructure

Hinze Dam Stage 3 Project

Terms of Reference
for an
Environmental Impact Statement

Under Part (4) of the Queensland *State Development and Public Works Organisation Act 1971*

The Coordinator-General, Department of Infrastructure

April 2007

PREAMBLE

Project Proponent

The proponent for the Hinze Dam Stage 3 Project is the Gold Coast City Council (GCCC). The Council has appointed the Hinze Dam Stage 3 Alliance, a consortium involving Thiess Pty Ltd, Sinclair Knight Merz Pty Ltd and URS Australia Pty Ltd, to assist with delivery of the project.

Project Summary

The Project to which this Terms of Reference applies involves the augmentation of Hinze Dam to the Stage 3 height.

Based on the adopted design option, the Hinze Dam Stage 3 Project (HDS3) proposes the raising of the Hinze Dam embankment from 93.5 metres to 108.5 metres, raising the Full Supply Level by 12.3 metres to 94.5 metres and providing a total capacity of in excess of 300,000 million litres. The upgrade will provide an additional 79,000 million litres of flood storage capacity and increase the dam's yield by at least an additional 16 million litres a day. The project will also provide greater flood mitigation for properties downstream of the Dam and will make the structure compliant with current dam safety design guidelines and standards.

The project scope of works for the dam raising will also include upgrades to the embankment, spillway and intake towers; establishment of site offices, storage, stockpile and lay down areas; establishment and operation of quarry activities to provide construction materials; establishment of construction roads; clearing of vegetation in inundation areas and for establishment of quarries; and upgrading and relocating or replacing of ancillary services and structures including parks, car parks, recreational facilities, roads and bridges, including sections of the Nerang-Murwillumbah Road and Gold Coast-Springbrook Road.

Hinze Dam is located approximately 15 km southwest of Nerang on the Nerang River and supplies the majority of the water needs for Gold Coast City, a rapidly growing urban centre with a healthy economy. In addition to being a major water source for the region, the Hinze Dam catchment provides significant and appreciable benefits to the community through flood mitigation, environmental protection, tourism and recreation. The Hinze Dam was initially completed in 1976, and upgraded to stage 2 in 1989. The Dam impoundment, Advancetown Lake, has a storage capacity of 161,070 million litres, surface area of 9.77 km^2 and a catchment area of 212 km^2.

GCCC has prepared an Initial Advice Statement (IAS), which provides further detail relating to the Project. The IAS can be viewed at www.infrastructure.qld.gov.au.

Administrative Details for these Terms of Reference

On 20 October 2006 the Hinze Dam Stage 3 Project was declared a significant project by the Coordinator-General (CG) pursuant to Section 26 of the *State Development and Public Works Organisation Act 1971* (the 'SDPWOA') for which an Environmental Impact Statement (EIS) is required. GCCC is now required to prepare an EIS about the project to address the Terms of Reference (ToR) when they are finalised.

On 22 December 2006, the GCCC referred the project to the Commonwealth Minister for the Environment and Heritage (now the Minister for the Environment and Water Resources) for a

decision as to whether the project constitutes a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) ('the EPBC Act'). The Commonwealth Department of the Environment and Water Resources determined on 17 January 2007 that the project is a controlled action and therefore the Project will require approval under Part 9 of the EPBC Act before it can proceed.

As assessment is also required under the EPBC Act, the EIS will be required to address both State and Commonwealth requirements. The EIS will be undertaken in accordance with requirements of the bilateral agreement between the Australian Government and the Queensland Government which accredits Queensland's assessment process for significant projects under the SDPWO Act.

State and Local Government representatives will be invited to participate in the EIS process as Advisory Agencies for the EIS and in the first instance were invited to examine the IAS and provide comment on the draft ToR. The IAS and draft ToR were also advertised in national and state newspapers and public comment was invited from 26 February to 28 March 2007. The CG had regard to the comments received from the Advisory Agencies and the public in finalising the ToR for the EIS. The ToR were then provided to GCCC to prepare the EIS.

When GCCC has prepared the EIS to the satisfaction of the CG, it will be made available for public comment (including to the Advisory Agencies) and submissions on the document will be invited. The submissions will be provided to GCCC to consider and respond to the issues raised in the submissions. The CG may request that the proponent prepare a supplementary report to the EIS to address any issues raised in submissions.

When the CG has sufficient information to evaluate the EIS, the CG will prepare a report evaluating the EIS and make recommendations or conditions about the project. The CG's report will be made publicly available on the Department of Infrastructure's website and will be provided to relevant government decision makers.

The ToR provides information in two broad categories:

Part A – Information and advice on the preparation of the EIS.
Part B – Specific requirements – Content of the EIS.

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The Coordinator-General, Department of Infrastructure, publicly invited comments on the draft ToR for the EIS from 26 February 2007 to 28 March 2007 and submissions received were considered and incorporated herein into the finalised ToR.

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Part A – Information and advice on preparation of the EIS

Purpose of the Terms of Reference

These Terms of Reference (ToR) are for the preparation of an EIS for the HDS3 project, and relate to the assessment of the impacts on the environment of the proposals as initially described in the project's IAS. It is important to note that these ToR apply to the proponent's requirement to prepare an EIS on the HDS3 project and do not seek to address the impacts of the existing Hinze Dam structure.

The ToR essentially outline the issues that should be considered in preparing the Environmental Impact Statement (EIS). Furthermore, the ToR provides a framework for the EIS, including information on the purpose and role of the EIS, and the factors considered to be most significant for the proposal. It indicates the types of necessary studies and the data that should be provided.

All potentially significant impacts of the proposed development on the environment are to be investigated, and intentions for the mitigation of any adverse impacts are to be detailed in the EIS. Any prudent and feasible project alternatives should be briefly discussed and treated in sufficient detail and reasons for selection of the preferred option should be clearly identified.

The nature and level of investigations should be relative to the likely extent and gravity of impacts. The guidelines should, however, not be interpreted as excluding from consideration any matters which are currently unforeseen, which may arise during ongoing scientific studies or which may arise from any changes in the nature of the proposal during the preparation of the draft EIS, the community consultation process and associated documentation.

The EIS must address as a minimum the requirements as set out in the ToR. The proponent may be required to prepare a Supplementary Report on the EIS subsequent to the EIS's release should it be determined by the Coordinator-General that further information on the project is required.

EIS Guidelines

The objective of the EIS is to identify potential environmental impacts and to ensure that impacts are avoided where possible. Where unavoidable, impacts must be examined fully and addressed so that the development is based on sound environmental protection and management criteria.

An EIS should provide:

- The project's specific objectives and justification for the proposal.
- A description of the relevant aspects of the existing social, economic, natural and built environment.
- A description of the development proposal and means of achieving the development objectives, including timelines.
- Strategic, economic and environmental implications of the proposal including its:

- effectiveness as a flood mitigation measure;
- effect on short, medium and long term water production and consumption; and
- impacts on regional supply security.

- Impact on other water infrastructure and downstream water entitlement holders due to increased storage and supply.
- Analysis of a 'no project' option.
- A framework against which State and Federal Government decision–makers can consider the environmental components impacted by the proposal and set conditions for approval to ensure environmentally sound development.
- Definition and analysis of all significant environmental, social and economic impacts and measures proposed to avoid and/or mitigate adverse effects and offset any residual adverse effects.
- Recommendations on the need for and consents required for the construction environmental management plan and operational environmental management plan to mitigate adverse effects and provide structure on best practice procedures to be followed, particularly during construction by all involved with the project. A draft environmental management plan is to be included in the EIS.
- The project's compatibility with the National Water Initiative, Government Ecologically Sustainable Development (ESD) policy, Queensland Natural Resources (Water) Policy, National Strategy on Conservation of Australia's Biological Diversity; with water reform under the National Competition Policy; the *Water Resource (Gold Coast) Plan 2006*; and any other relevant policies.

The term 'environment' refers to:

a) ecosystems and their constituent parts, including people and communities;

b) all natural and physical resources;

c) the qualities and characteristics of locations, places and areas, regardless of size, that stimulate biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community;

d) the social, economic, aesthetic and cultural conditions which influence, or are affected by, the entities and attributes mentioned in paragraphs (a) to (c); and

e) the local, regional, Queensland and Australian populations and labour markets.

EIS Objectives

Having described the methodology of the EIS, a succinct statement should be made of the objectives of the EIS. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. The reader should be able to distinguish the EIS as the key environmental document providing advice to decision-makers considering approvals for the project.

While the ToR provide guidance on the scope of the EIS studies, they should not be seen as exhaustive or limiting. It is important for proponents and their consultants to recognise that there cannot be perfect knowledge in advance of undertaking an EIS of what the EIS studies may find.

If it transpires during the preparation of the EIS that previously unforeseen matters not addressed in the ToR are found to be relevant to the assessment of impacts of the proposal, those matters should be included in the EIS.

In addition, it is essential that the main text of the EIS should address all relevant matters concerning environmental values, impacts on those values and proposed mitigation measures. No relevant matter should be raised for the first time in an appendix or the draft Environmental Management Plan (EMP).

When considering whether an impact is or is not significant, the proponent should take account of the likelihood, intensity and risk of the impact and the context in which it would occur.

The EIS is a public document. Its purpose is not only to provide information to regulatory agencies, but also to inform the public of the scope, impacts and mitigation measures of the proposal. As such the main text should be written in plain English avoiding jargon as much as possible. Additional technical detail may be provided in appendices. The main text should not assume that a reader would have a prior knowledge of the project site. It should not be necessary for the reader to have visited the site to understand the issues involved in the proposal.

The EIS objectives should be to provide public information on the need for and likely effects of the project, to set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values, and demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values. Discussion of options and alternatives and their likely relative environmental management outcomes is a key aspect of the EIS.

The role of the EIS in providing the project's draft EMP should also be indicated, with particular reference to the EMP's role in providing management measures that can be carried over into conditions that would attach to any approvals, environmental authorities and permits for the project.

In summary, the key objectives of the EIS are as follows:

- For interested persons and bodies: a basis for understanding the Project, prudent and feasible alternatives, affected environmental values, impacts that may occur and measures to be taken to mitigate all adverse impacts.
- For groups or persons with rights or interests in the land: an outline of the effects of the Project on that land including access arrangements.
- For government agencies: a framework for decision-makers to assess the environmental aspects of the Project with respect to legislative and policy provisions and based on that information to make an informed decision on whether the Project should proceed or not and if so, on what conditions, if any.

- For the Federal Minister for the Environment and Water Resources: information to determine the extent of potential impacts of the Project on matters of national environmental significance, in particular the controlling provisions under the EPBC Act:

  Sections 18 and 18A (Listed threatened species and communities)

- For the proponent: a mechanism by which the potential environmental impacts of the Project are identified and understood. Information to support the development of management measures including an Environmental Management Plan, to mitigate the adverse effects of residual environmental impacts of the development.

ToR Glossary

The following abbreviations have been used in this document:

AHD	Australian Height Datum
ACH Act	*Aboriginal Cultural Heritage Act 2003*
ANCOLD	Australian National Committee on Large Dams
ANZECC	Australia and New Zealand Environment and Conservation Council
AS	Australian Standards
ASS	Acid Sulphate Soils
BPA	Biodiversity Planning Assessment
CAMBA	China-Australia Migratory Bird Agreement
CHMP	Cultural Heritage Management Plan
CO	Carbon Monoxide
CG	The Coordinator-General of the Department of Infrastructure of the State of Queensland
CLR	Contaminated Land Register
DEW	Department of the Environment and Water Resources (Commonwealth)
DI	Department of Infrastructure (formerly the Office of the Coordinator-General)
DLGPSR	Department of Local Government and Planning, Sport and Recreation
DNRW	Department of Natural Resources and Water
DPI&F	Department of Primary Industries and Fisheries
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMR	Environmental Management Register
EPP	Air Environmental Protection (Air) Policy 1997
EPP	Noise Environmental Protection (Noise) Policy 1997
EPP	Waste Environmental Protection (Waste Management) Policy 2000
EPP	Water Environmental Protection (Water) Policy 1997
EPR	*Waste Environmental Protection (Waste Management) Regulation 2000*
EP Act	*Environment Protection Act 1994*
EPA	Environment Protection Agency
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
ERA	Environmentally Relevant Activity
ESD	Environmentally Sustainable Development
FSL	Full Supply Level
GCCC	Gold Coast City Council
HAT	Highest Astronomical Tide
HDS3	Hinze Dam Stage 3 Project

IAS	Initial Advice Statement as described in Part 4 of the *State Development and Public Works Organisation Act 1971*
IDAS	Integrated Development Assessment System
ILUA	Indigenous Land Use Agreement
IPA	*Integrated Planning Act 1997* (Qld)
JAMBA	Japan-Australia Migratory Bird Agreement
LNCS	Local Nature Conservation Strategy
MR	Department of Main Roads
NEPM	National Environment Protection Measure
NES	National Environmental Significance as defined by the *Environment Protection & Biodiversity Conservation Act 1999* (Commonwealth)
NTRB	Native Title Representative Bodies
PHA	Preliminary Hazard Assessment
PRW	Purified Recycled Water
PSI	Preliminary Site Investigation
QH	Queensland Herbarium
QH Act	*Queensland Heritage Act 1992*
QHC	Queensland Heritage Council
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
SEQ	South East Queensland
SDPWO Act	*State Development and Public Works Organisation Act 1971*
SEQRWSS	South East Queensland Regional Water Supply Strategy
ToR	Terms of Reference as described in Part 4 of the *State Development and Public Works Organisation Act 1971*
VMA	*Vegetation Management Act 1999*
WRP	Water Resource Plan

Part B – Specific Requirements - Content of the EIS

The EIS will be used to inform the public, decision-makers and relevant stakeholders of the potential impacts of the project, and the management of those impacts. The EIS should be written in a clear, plain English, in a style easily understood by the general reader. Text within the report should be referenced and where appropriate, supported by coloured maps, plans, diagrams and other descriptive details.

The report should be supported by appendices, which include detailed results of technical studies and results of community consultation (including detailed submissions where appropriate, summaries of submissions, comments and inputs provided, details of individuals and organisations consulted).

An overview of the methodology used to undertake the various assessments should be provided in each section.

It is strongly recommended that the EIS follow the heading structure of these Terms of Reference to facilitate cross-referencing.

Executive Summary

The Executive Summary should be written as a stand-alone document, able to be reproduced on request for interested parties who may not wish to read or purchase the EIS as a whole. The structure of the executive summary should follow that of the EIS, though focus strongly on the key issues allowing the reader to obtain a clear understanding of the HDS3 Project, its environmental and socio-economic implications and management objectives. The summary should include:

- The title of the Project;
- Name and contact details of the Proponent, and a list of previous projects undertaken by the Proponent, their environmental record and commitment to effective environmental management;
- A concise statement of the aims and objectives of the Project;
- The legal framework, decision-making authorities and advisory agencies;
- An outline of the background to and need for the Project, including the consequences of not proceeding with the Project;
- An outline of the alternative options considered and reasons for the selection of the proposed development option;
- A brief description of the Project (pre-construction, construction and operational activities) and the existing environment, utilising visual aids where appropriate and including timelines; and
- An outline of the principal environmental impacts predicted and the proposed environmental management strategies (including water quality and waste minimisation and management) and commitments to minimise the significance of these impacts.

Glossary of Terms

A glossary of technical terms, acronyms and references should be provided in the EIS.

EIS format

The EIS should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. The EIS document should not contain watermarks across the body of the text. The EIS should also be provided on CDROM/DVD.

Two separate CDROM/DVD copies should be provided:

1. CDROM/DVD copies resolution equivalent to the printed document for distribution to stakeholders; and
2. CDROM/DVD copies for placement on the internet:

Copies should be in Adobe® PDF format for placement on the internet. All compression must be down-sampled to 72 dpi. PDF documents should be no larger than 2MB in file size. The executive summary should be supplied in HTML 3.2 format with *.jpg graphics files. Text size and graphics files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the 500 KB file size.

The final nature and number of EIS copies required to be submitted and made available, should be discussed and agreed with the CG Project Manager in the early stages of the EIS process.

1. Introduction

The Introduction to the EIS should detail the key drivers and reason/s for the EIS, the audience who will be reviewing the document, the approval process and legislative context, and structure of the document.

1.1 Project Proponent

This section should describe the experience of the Project Proponent (and associated project entities), including the nature and extent of business activities, experience and qualifications, and environmental record including the Proponent's environmental policy. The proponent's and project alliance's previous history with water infrastructure projects should be included.

This section should also provide contact details (postal; email and telephone) for key Project staff from GCCC and the Alliance, detailing their primary function and areas of expertise.

1.2 Project Description

This section should provide a brief description of the project, including a summary of any major infrastructure requirements associated with the project.

1.3 Project Objectives and Scope

This section should provide a statement of the objectives which have led to the formulation of the project and brief outline of the events which have influenced the formulation of the project. This should include a brief discussion of feasible alternatives, including demand management, proposed time frames for implementation and expected project life, anticipated

establishment costs and relevant actions already undertaken in relation to the Project. The additional capacity and supply the project will deliver should be listed here.

1.4 Need for the Project

This section should briefly discuss justification and need for the project with respect to regional, State and national contexts. This section will relate to the flood mitigation requirements and the local and state government identified requirements for additional water resources including within the Gold Coast Water Future and the South East Queensland Regional Water Supply Strategy (SEQRWSS). Particular reference should be made to environmental, economic and social costs and benefits.

1.5 Relationship to other Projects

This section should also describe how the project relates to any other water infrastructure projects including any strategies outlined in the SEQRWSS. The project's relationship with other measures listed within the *Water Amendment Regulation (No.6) 2006*, for example but not limited to, water harvesting into Hinze Dam and the transfer of 20 ML/day via Logan, is to be briefly discussed.

As announced by the Premier of Queensland on 28 January 2007, in the best interest for our region and its residents, purified recycled water (PRW) will be a permanent and ongoing part of South East Queensland's potable water supplies. Therefore the project's relationship with potential PRW initiatives relating to the Hinze Dam should also be indicated.

1.6 Alternatives

This section should describe all feasible alternatives that have been investigated, as well as the option of taking no action i.e. of not upgrading the dam. Sufficient detail should be provided to establish an understanding of the reasons for preferring certain options and rejecting others. Indication of the following should be provided:

- the consequences of not proceeding with the project;
- identification of feasible alternatives, including:
  - Alternative structure augmentation sizes and capacities. Impacts associated with shortlisted design options and alternative sources (i.e. onsite and offsite) of construction materials, including impacts both of extraction and transporting, should be discussed;
  - Provision of flood mitigation for the lower Nerang River;
  - Demand management strategies; and
  - Alternative water supply scenarios as identified in the GCCC Water Future report.
- Identify the methodology adopted to discern between feasible options. The alternative options should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others.

1.7 Cost and Benefits of the Project

This section should summarise:

- The economic costs and benefits to industry and the wider community, including directly affected enterprises. Analysis should be conducted at the local, regional, state and national levels.
- Regional social impacts including community disruption, related land use changes, employment, skills development and any workforce accommodation issues.
- Benefits to the region in terms of regional water security and levels of service

1.8 The Environmental Impact Assessment Process

This section will clearly identify which legislative process is relevant and the methodology being adopted to comply with the relevant legislation.

1.8.1 Methodology of the EIS

This section should include a description of the impact assessment process steps, timing and decision making process for the relevant stages of the Project. This should also include a description of how the consultation process will be integrated with other elements of the impact assessment, including timing and opportunities for public input and participation.

The information in this section is required to ensure:

- that relevant legislation is addressed;
- readers are informed of the process to be followed; and
- that stakeholders are aware of any opportunities for input and participation.

1.9 Public Consultation Process

This section should outline the public consultation process that has taken place during the EIS's preparation, including details on how public submissions on the draft EIS will be invited, considered and addressed in the decision making process and anticipated timelines for the process. The results of such consultation should also be listed.

The public consultation program should provide opportunities to encourage and facilitate active community involvement and education through public meetings, interest group meetings, production of regular summary information and updates, and other consultation mechanisms.

The public consultation process should identify broad issues of concern to the local community and interest groups at all stages from project planning, through construction, commissioning, operations and final decommissioning. This section should also detail how outcomes of the consultation process have been incorporated into the project design and/or management.

1.9.1 Objectives of Community Consultation

The objectives for community consultation for the EIS are to:

- Enhance community awareness and understanding of the project, with the provision of adequate and appropriate information;
- Identify key stakeholders (including representatives of stakeholder groups), their needs and values;
- Facilitate involvement by the community into the project's development;
- Provide information on the EIS process;
- Seek input in terms of key issues and concerns and suggestions to mitigate these concerns;
- Seek feedback on the preferred concept;
- Provide information on the outcomes of project studies; and
- Demonstrate how issues of concern to the community will be sourced, identified and considered during the EIS process.

1.9.2 Stakeholders for the Project

To facilitate the assessment process, the Proponent is strongly encouraged to regularly consult with Advisory Agencies and other appropriate stakeholders throughout the EIS process.

It is the responsibility of the Proponent, in consultation with Advisory Agencies, to identify legislation, policies and methodologies relevant to the EIS process, and to determine appropriate parts of the community which should be consulted during the EIS preparation stage. It is recommended that an open community consultation process be carried out in addition to the legislated environmental impact assessment process. Copies of the EIS will be provided to all advisory agencies, elected representatives and on request to relevant individuals and peak groups with an interest in the Project.

Advisory Agencies

Advisory agencies include government departments, authorities, agencies and key service providers. These organisations will need to be consulted to obtain their view and identify any statutory requirements they consider relevant to the study. Advisory agencies will include, but not be limited to:

- Commonwealth Department of the Environment and Water Resources
- Environmental Protection Agency
- Queensland Water Commission
- Department of Natural Resources and Water
- Department of Primary Industries and Fisheries
- Department of Main Roads
- Department of Transport
- Queensland Police Service
- Department of Public Works

- Department of Emergency Services
- Department of State Development and Trade
- Department of Local Government, Planning, Sport and Recreation
- Department of Employment and Industrial Relations
- Queensland Health

Advisory agencies were asked to provide input to the draft ToR and have been provided with copies of the final ToR for the EIS which incorporated agency feedback. A copy of the finalised ToR should also be included as an appendix to the draft EIS.

Advisory agencies will also be invited to consider the draft EIS and provide submissions on the document.

Other Stakeholder, Community and Special Interest Groups

Relevant stakeholder, community and special interest groups should be identified and consulted. Such groups include:

- Local authorities;
- Relevant local progress associations and other resident organisations;
- Indigenous and Native Title Claimant organisations;
- Relevant community groups such as ratepayers association, business owners, environmental and heritage groups;
- Service providers; and
- Recreational and commercial fishers.

1.10 The General Community

The general community who are not represented by established interest groups are also key stakeholders for the project. The consultation process on the EIS should also include appropriate mechanisms targeted at ensuring adequate involvement of the general community both in the study area and in the broader Queensland region as appropriate.

1.11 Planning Context

This section should discuss the project and provide an assessment of the project's consistency with relevant planning policy for the area and region. This information is required to demonstrate how the proposal conforms to State, regional and local policies for the area. This section should include an assessment of the project's consistency with the following:

- the GCCC local planning scheme. It should be indicated that much of the project area is already subject to a Community Infrastructure Designation (CID) and pending final decision on the matter by Council, should it be the case that an application will be made by GCCC to seek the CID being extended to cover the additional impoundment area, no Gold Coast City Council Planning Scheme approvals will be required within this area.
- planning controls, by-laws and policies relating to the study area and adjacent lands, including Water Resource Planning and Entitlements;

- regional strategies or plans that relate to existing land uses or long term policy framework for the area or proposal (these include those that are in preparation) particularly in relation to the SEQ Regional Plan and the SEQ Regional Infrastructure Plan and Program; the Regional Water Supply Strategy; the State Coastal Management Plan 2001 and the SEQ Regional Coastal Management Plan 2006 (if applicable), and with legislation, standards, codes or guidelines available to monitor and control operations on site. It should refer to all relevant State and regional planning policies; and
- its relationship to other significant developments (existing or proposed) in the study area, surrounding locality and South East Queensland region.

1.12 Project Approvals: legislation and policy requirements

This section should identify and explain the federal, state and local legislation and policies controlling the approvals process. Triggers for the application of each of these should be indicated and relevant approval requirements should be identified. This information is required to assess how the legislation applies to the proposal, which agencies have jurisdiction, and whether the proposed impact assessment process is appropriate.

At the State level, the project will be subject to a number of approvals under various legislation. As the HDS3 project was declared by the Coordinator-General (CG) in October 2006 to be a significant project pursuant to Section 26 of the *State Development and Public Works Organisation Act 1971* (the 'SDPWOA'), the project's approvals process will be facilitated by the CG through the EIS process.

The ToR should note that the relevant legislation includes, but is not limited to:

- *State Development and Public Works Organisation Act 1971;*
- *Integrated Planning Act 1997;*
- *Integrated Planning Regulation 1998;*
- *Vegetation Management Act 1999;*
- *Environmental Protection Act 1994*;
- *Water Act 2000;*
- *Water Amendment Regulation (No.6) 2006;*
- *Fisheries Act 1994;*
- *Nature Conservation Act 1992;*
- *Aboriginal Cultural Heritage Act 2003;*
- *Queensland Heritage Act 1992;*
- *Transport Infrastructure Act 1994;*
- *Transport Planning and Coordination Act 1995*; and
- *Land Act 1994*.

The draft EIS should describe the approval process resulting from the gazettal of this project as a significant project pursuant to the SDPWOA and outline the linkage with the IDAS process under the IPA. The draft EIS should indicate the level of approvals anticipated by the

proponent under the IPA and intentions to seek an amendment to the existing Community Infrastructure Designation to extend its boundary to include the additional impoundment area.

This outline should describe the public notification processes and appeal rights that will be available in the anticipated approval process.

The EIS should note that the project has been listed as an emergency water supply measure for the SEQ region within the *Water Amendment Regulation (No. 6) 2006* (the 'water emergency' regulation). The Regulation instructs that the project must be delivered by the end of 2010.

A description of all Environmentally Relevant Activities (ERAs) necessary for the Project should also be given.

The project's relationship with the *Water Resource (Gold Coast) Plan 2006* should also be indicated in this section.

As the project is a controlled action under the Commonwealth EPBC Act, any requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* should also be indicated in this section.

A list provided of the approvals required for the project and the expected program for approval of applications should be provided.

The project's compatibility with the National Water Initiative, the *South East Queensland Regional Plan 2005-2026*, Government Ecologically Sustainable Development policy, Queensland Natural Resources (Water) Policy, National Strategy on Conservation of Australia's Biological Diversity; with water reform under the National Competition Policy; and any other relevant policy, should be described.

2. Description of the Project

The purpose of this section is to provide a description of the Project through its construction, operation and maintenance stages.

2.1 Location and General Description

The project should be described in the local, regional and national contexts. The following should be addressed:

- Project area description: The overall project area should be described, including upstream and downstream natural and anthropogenic environments of the Hinze Dam and Nerang River catchments.
- Current structure and facilities: The current structures and facilities at and around Hinze Dam and upstream locations should be described.
- Construction footprint: The area to be affected by the construction and operation of the dam should be described in detail including details of the area to be directly affected such as the areas to be inundated, quarries, construction sites, road upgrades, areas to be

cleared, land requirements for ancillary facilities, road relocation and realignment, infrastructure and recreational facilities.

Maps at suitable scales should be provided showing the precise location of the project area, the location and boundaries of the project footprint, and location and boundaries of land tenures. The features described above should be overlain on a rectified air photo enlargement to illustrate components of the Project in relation to the natural and built features of the area.

A schedule of the overall Project duration and expected timing of works is to be provided.

2.2 Proposed Works

A description of the proposed works for the Project should be provided.

The following information should be detailed and be supported by detailed plans where appropriate.

2.2.1 Barrier/Embankment Structures

The following should be provided through text and design plans:

- general arrangement of proposed works;
- maximum (final) embankment crest heights;
- length and width of embankment crest;
- details and dimensions of the proposed downstream chute, plunge pool, dissipaters and other structures within the chute;
- offtake and outlet works for downstream discharge;
- details of the (existing) hydro-electric facility in relation to the upgraded spillway;
- basic spillway dimensions and capacity, including spillway crest length and spillway discharge capacity;
- any changes to the shape or discharge properties of the spillway crest;
- surface area of storage area at full supply level;
- details of any changes or upgrades to flow control or energy dissipation devices downstream of the spillway;
- estimated headwater and tailwater levels at different flows including tailwaters in the absence of spilling flows;
- frequency of spill (include comparison with current frequencies);
- capacity and maximum depth;
- average depth;
- estimated water yields (with appropriate allowances for environmental requirements);
- the dam's dead storage level;
- details of any provision for fish passage in the design;
- details on the effectiveness of the proposed fish transfer mechanism/s, drawing on examples used on other dams or similar proposals and including a cost-benefit analysis;

- details and dimensions of any additional existing water impoundment or control structures that may be augmented as part of the overall Project;
- a comparison of differences between the existing and upgraded structures; and
- details of any temporary waterway barrier works to be installed downstream during the construction phase.

2.2.2 Site Details including Increased Inundation Area

For clarity, the existing structure and impoundment's footprint should be provided and related to the proposed increases in size and scope and changes in downstream flow regime.

The following details should be provided:

- impacts on the stream bed downstream of the barrier (e.g. presence of any deep pools, riffles etc);
- impacts on the stream bed upstream of the barrier (e.g. presence of natural features likely to be impacted);
- inundation area for a range of water levels;
- areas inundated (and depth) and the frequency of inundation, including plan with tenure details and current land use;
- length of stream (and tributaries) inundated (taking account of varying supply levels); and
- the extent of the buffer zone around the inundation area.

2.2.3 Pre-Construction Activities

A description of the pre-construction activities should be set out in this section, including:

- Upgrading or relocation of roads (e.g. Gold Coast to Springbrook Road), railways and other infrastructure;
- Clearing, including clearing and establishment of quarry areas; and
- Location and site establishment requirements for construction facilities.

2.2.4 Construction Activities and Infrastructure

Full details on the proposed on-going operation and management of the dam during construction of the project should be described.

The following details on construction of the Project should be provided:

- general construction requirements including source and extraction of construction materials, and access routes to these materials;
- details of the method of construction of the dam wall augmentation and volumes of material required;
- details of how the integrity of the existing dam wall will be ensured during construction activities;
- details of the method for handling flood events during construction;
- any staging of construction activities;
- construction, realignment and/or upgrading of roads;

- size and source of construction workforce and construction camp requirements and location (if proposed);
- works needed within the impoundment including tree clearing (by manual methods and by inundation) and tree clearing strategies to maximise fish habitat maintenance (but minimise adverse water quality issues), blasting, excavation, dredging and transport infrastructure works;
- works downstream including erosion protection;
- type, source, quantity and method of transport of construction materials;
- general construction standards and site management including environmental and safety management;
- timetable for construction;
- details of any potential disruption to flows in the waterway during construction and any diversion works required;
- the hours of operation;
- emergency aid/medical facilities to be provided on site;
- the construction methods and containment/disposal of construction spoil;
- Any works proposed for downstream to protect water quality - e.g. sediment traps;
- solid and liquid waste handling (including effluent disposal and any licensing required); and
- the number and type of vehicles, machinery and equipment used for excavation, construction and operation.

2.2.5 Auxiliary Infrastructure Requirements

This section should provide descriptions of requirements for constructing new infrastructure and upgrading or relocating of existing auxiliary infrastructure relating to the project. The matters to be considered include a fishway or fish transfer devices/methods, pipelines (e.g. requirements for any new pipelines, or augmentation to existing water transfer infrastructure), roads, bridges, tracks and pathways, power lines and recreational facilities.

How the project's auxiliary infrastructure requirements have been determined in consideration of linkages with projects indicated within section 1.5 of this ToR should also be indicated.

Consideration of measures to be taken to prevent the transfer of aquatic flora and fauna between catchments through associated pipeline infrastructure and the economic and efficiency impacts of these measures should also be included in the EIS.

2.3 Proposed Water Storage Operation

Full details on the proposed on-going management of the augmented dam, inundation area and buffer zone should be provided including:

- Consideration of how the operation of the water storage will comply with the *Water Resources (Gold Coast) Plan 2006* and the subsequent Resource Operations Plan;
- arrangements for operation of the works, e.g. flow releases (environmental, irrigation etc, operation of gates (if relevant)), the anticipated pattern of inundation, operation of outlet works including details of operation and administration, including proposals for remote operation, and any proposed changes to existing staffing arrangements, etc;
- consideration should be given to how existing seasonal flows will be managed, drawing on baseline or predictive studies, in the operation stage of the Project;
- water treatment arrangements for provision for urban supply requirements and environmental flow requirements. This should include a description of how water will be sourced (water offtake operation), treatment facilities, associated infrastructure, and treatment methods. This should also describe the integration of operations within the catchment;
- details of any proposed changes to the operational workforce numbers and personnel type;
- details of the maximum drawdown level and likely extraction regime, e.g. when water will be sourced and expected demands versus yield, including likely release timings;
- proposed access points associated with the increased storage;
- infrastructure for recreational purposes;
- proposed operation of the fishway and/or other fish transfer mechanisms.

This section should provide details on the timing of the construction of the Project including planning, impact assessment, construction, monitoring, EMP, etc, anticipated establishment and ongoing costs and the Project life. Costs should include monitoring and environmental mitigation/management costs.

The location and design of any existing or new water distribution infrastructure (e.g. pump stations, canals, pipelines etc.) should be described. The capacity of the existing water infrastructure to accept additional loadings resulting from new or increased allocations of water should also be described. As above, consideration of ways in which the inter-basin transfer of aquatic flora and fauna can be prevented through associated pipeline infrastructure and associated costs of this technology.

2.4 Rehabilitation and Decommissioning of Construction Works

Section 3.1.2.3 requires that the EIS should describe the options, strategies and methods for progressive and final rehabilitation of all environmental values disturbed by the Project.

3. Environmental Values and Management of Impacts

This section should provide information on the physical, biological social and economic environment in the vicinity of Hinze Dam (such as land, water, nature conservation, cultural heritage, social and economic, air, noise, waste, transport and traffic, and hazards and risk).

The EIS should assess the impacts of pre-construction, construction and operation, decommissioning of redundant infrastructure, and rehabilitation of disturbed lands.

Aspects of the environment should be described to the extent necessary for the assessment of potential impacts of the Project. Baseline information from relevant studies should be used and referenced where appropriate. Any relevant studies undertaken and commitments given in relation to previous studies should be identified and assessed for their relationships to the Project. The impacts associated with potential ongoing maintenance, access and servicing resulting from the development and any other facilities required for the Project should also be assessed.

The functions of this section are to:

- To describe the existing environmental values of the area which may be affected by the Project. Environmental values are defined in section 9 of the *Environmental Protection Act* 1994, Environmental Protection Policies and other documents such as the ANZECC 2000 guidelines. Environmental values may also be derived following recognised procedures, such as described in the ANZECC 2000 guidelines and Queensland Water Quality Guidelines 2006. Environmental values should be described by reference to background information and studies, which should be included as appendices to the EIS.
- Describe potential adverse and beneficial impacts of the proposal on the identified environmental values.
- Any likely harm on the environmental values should be described.
- Present environmental protection objectives and the standards and measurable indicators to be achieved.
- Examine viable strategies for managing impacts.
- Demonstrate whether there is sufficient baseline data to determine impacts on or changes to the existing environmental components and against which the success of mitigation measures can be evaluated.

Environmental protection objectives may be derived from legislative and planning requirements which apply to the Project including Commonwealth strategies, State planning policies, local authority strategic plans, environmental protection policies under the *Environmental Protection Act 1994*, and any catchment management plans prepared by local water boards or land care groups.

Special attention should be given to those mitigation strategies designed to protect the values of any sensitive areas and any identified ecosystems of high conservation value within the area of possible proposal impact.

It is strongly recommended that the EIS follow the heading structure shown below. The mitigation measures, monitoring programs, etc., identified in this section of the EIS should be used to develop the Environmental Management Plan for the project (see Section 5).

3.1 Land

3.1.1 Description of Environmental Values

This section describes the existing environment values of the land area that may be affected by the Project, including additional area to be inundated, quarries and any construction areas. It should also define and describe the objectives and practical measures for protecting or enhancing land-based environmental values, describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

3.1.1.1 Topography and Geomorphology

Description of Environmental Values

Maps should be provided locating the Project in both State, regional and local contexts. The topography of the proposal site should be detailed with contours at suitable increments, shown with respect to Australian Height Datum (AHD) and in relation to the FSL and buffer zone for the project. Significant features of the locality should be included on the maps. Such features would include any locations subsequently referred to in the EIS (e.g. sensitive locations, significant environmental features) that are not included on other maps for this section. Commentary on the maps should be provided highlighting the significant topographical features.

3.1.1.2 Geology and soils

Description of Environmental Values

The EIS should provide a description and maps of the geology of the Project area and briefly discuss the current dam wall foundations and any geological limitation in raising the wall. The availability and suitability of locations in the vicinity of the impoundment for quarry material is also to be identified. Particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of any ground disturbance should be listed.

Soils in the project area involved in construction works should be mapped at a suitable scale and described according to the Australian Soil and Land Survey Field Handbook (Gunn et al 1988 and McDonald et al, 1990) using the Australian Soil Classification (Isbell, 1996). An appraisal of the field texture, colour, mottles, drainage, permeability and water holding capacity characteristics, soil structure, erosion hazard rating and pH should be undertaken.

Information should also be provided on soil stability and suitability to construction of all facilities and infrastructure. The availability and suitability of rock, clay, sand and gravel for use as construction materials should also be briefly discussed.

3.1.1.3 Land use

Description of Environmental Values

The EIS should provide a description of current land uses in the proposal area, with particular mention of land with special purposes. Maps at suitable scales showing existing land uses and tenures, reserves, roads and road reserves, and the proposed inundation areas should be provided for the entire area that could be affected by the Project. Also indicate locations of gas and water pipelines, power lines and any other easements.

The maps should identify locations of local, regional and state conservation values as identified by the EPA's Biodiversity Planning Assessment (BPA) and the Gold Coast City Council's Local Nature Conservation Strategy (the Council's LNCS), existing dwellings and recreational areas, and the zoning of all affected lands according to any existing town or strategic plan.

3.1.1.4 Native Title

Description of Environmental Values

Areas covered by native title determinations or applications for native title determination, including traditional and contemporary uses of land and water by Aboriginal people, should be described. A description of Native Title Representative Bodies (NTRB) boundaries should be provided. The EIS should identify whether there are any necessary notifications required to the Representative Bodies or if there is evidence that Native Title is not an issue for the areas involved.

3.1.1.5 Infrastructure

Description of Environmental Values

All existing infrastructure at the existing dam wall and any to be affected by the project both upstream and downstream of the impoundment should be identified and locations indicated on a suitably scaled map. This section may be cross-referenced to section 2.2 Proposed Works.

3.1.1.6 Sensitive Environmental Areas

Description of Environmental Values

The EIS should identify all sensitive environmental areas that are proximal to the proposal or could be directly affected by the proposal. In particular, the EIS should indicate if the land affected by the proposal is, or is likely, to become part of the protected area estate, or is subject to any treaty. Consideration should be given to national parks, conservation parks, declared fish habitat areas, wilderness areas, aquatic reserves, heritage/historic areas or items, national estates, world heritage listings and sites covered by international treaties or agreements (e.g. Ramsar, JAMBA, CAMBA), areas of cultural significance, both indigenous and non-indigenous, and scientific reserves.

3.1.1.7 Landscape and Visual Amenity

Description of Environmental Values

This section should describe existing landscape character and features, panoramas and views for the Project area, in particular from the existing dam wall and recreational areas. Information in the form of maps, sections, elevations and photographs is to be used, particularly where addressing the following issues:

- major views, view sheds, existing viewing outlooks, ridgelines and other features contributing to the amenity of the area, including assessment from private residences in the affected area along the route;
- focal points, landmarks (built form or topography), gateways associated with project site and immediate surrounding areas, waterways, and other features contributing to the visual quality of the area and the project site; and
- character of the local and surrounding areas including character of built form (scale, form, materials and colours) and vegetation (natural and cultural vegetation) directional signage and land use.

3.1.1.8 Land Contamination

Description of Environmental Values

A search of the EPA's Environmental Management Register (EMR) and Contaminated Land Register (CLR) should be undertaken to determine the requirements for management under the *Environmental Protection Act 1994*. The history of the site should be investigated including analysis of historical aerial photographs and determination of past and current land uses. The EIS is to include an assessment of land that has been used, or is being used, for a Notifiable Activity as listed in Schedule 2 of the *Environmental Protection Act 1994*, or is potentially contaminated or is on the Environmental Management Register (EMR) and Contaminated Land Register (CLR) and is within the impoundment areas and adjacent zones, including the location of ancillary services and structures.

A Preliminary Site Investigation (PSI) of the site consistent with the EPA's "Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland" (Queensland EPA, 1998) should be undertaken to determine background contamination levels. The results of the PSI should be summarised in the EIS and provided in detail in an appendix.

Should the PSI identify the possibility of contamination, a detailed site investigation is to be undertaken and a remediation plan developed in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (EPA, 1998). It will be necessary that no affected land will be on the EMR or CLR prior to inundation. Any results of site investigations, remediation and validation must be certified by a Third Party Reviewer prior to being published in the EIS.

3.1.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing the land-based environmental values identified through the studies outlined in the previous section. The potential for the construction and operation of the Project to change any existing and potential uses of the project's impoundment area and adjacent areas, and the measures to minimise these impacts should be described.

3.1.2.1 Land Resources and Infrastructure

Potential Impacts and Mitigation Measures

- Identify the Project in the context of major topographic features and any measures taken to avoid or minimise impact to such (if required).
- The objectives to be used for the Project in re-contouring and landscaping, especially any quarries and recreational areas should be described. Consideration should be given to the use of threatened plant species during any landscaping and revegetation.

3.1.2.2 Land Use and Tenure

Potential Impacts and Mitigation Measures

- The potential for the construction and operation of the Project to change existing and potential land uses of the proposal project areas should be detailed.
- The full extent of land that is required for the project's buffer zone should be documented. The process of acquisition and/or resumption (if applicable) of land should be outlined. The method, by which ownership, control or owners'/custodians' consent is to be acquired, should be presented.
- The potential implications of the proposal for future developments in the impact area including constraints on surrounding land uses should be described.
- Indicate the range of measures to be taken to minimise the described impacts on surrounding land uses that will arise as a result of the project.
- Include the extent of the project's impacts on, and implications for, the Numinbah State Forest.

3.1.2.3 Land Disturbance – Rehabilitation and Decommissioning of Construction Works

The EIS should describe:

- The means of decommissioning the Project, in terms of the removal of plant, equipment, structures and buildings, including interim transport sites created to transport source materials, concrete footings and foundations, hardstand areas, storage tanks (including any potential for reuse of these facilities), and material source extraction site(s), including any required removal of processing plant and infrastructure.
- A preferred rehabilitation strategy for all environmental values disturbed by the Project, developed with a view to minimising the amount of land disturbed at any one time, should be included in the project's construction EMP. Section 3.5.2 contains further requirements to be included in the rehabilitation strategy.
- The final topography of the Project site and material extraction site(s) should be described in relation to the identified local, regional and state conservation/biodiversity values of the site and should be shown on plans at a suitable scale.
- Options and methods for the disposal of wastes from the demolition of plant and buildings, in sufficient detail for their feasibility and suitability to be established, should be described.

3.1.2.4 Soil Erosion

Potential Impacts and Mitigation Measures

For all permanent and temporary landforms in the project area, erosion management techniques should be described. For each soil type identified, erosion potential (wind and water) and erosion management techniques should be outlined. Methods proposed to prevent or control erosion should be specified and should be developed to prevent soil loss in order to maintain land condition, and to prevent significant degradation of local waterways and in particular, Lake Advancetown, by suspended solids. Soil erosion factors should be addressed via reference and in accordance with measures detailed in Soil Erosion and Sediment Control Engineering Guidelines for Queensland Construction Sites (1996) or similar publications.

Methods proposed to prevent or control erosion should be specified and should be developed with regard to (a) preventing soil loss in order to maintain land

capability/suitability, and (b) preventing significant degradation of the water quality within Hinze Dam by suspended solids.

A detailed erosion and sediment control plan should be included in the construction and operational Environmental Management Plan.

3.1.2.5 Acid Sulphate Soils

Potential Impacts and Mitigation Measures

The potential for acid generation by disturbance of acid sulphate soils during earthworks and construction should be indicated and measures for management of soils and mitigation of impacts should be:

- Proposed for all site earthworks and construction activities.
- Where required, management measures should be outlined in an Acid Sulphate Soils Management Plan prepared in accordance with QASSIT Guidelines and the requirements of SPP 2/02 in consultation with officers of NRW and EPA.

3.1.2.6 Contaminated Land

Potential Impacts and Mitigation Measures

The EIS should describe the possible contamination of land from aspects of the proposals including waste, reject product, acid generation from exposed sulphidic material and spills at chemical and fuel storage areas.

The means of preventing land contamination (within the meaning of the Queensland *Environmental Protection Act 1994*) should be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land should be outlined.

Intentions should be stated concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination on the land, processing plant site and product storage areas after proposal completion.

If the results of the preliminary site investigation indicate potential or actual contamination, a detailed site investigation progressively managed in accordance with the stages outlined in Appendix 5 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* should be undertaken.

3.1.2.7 Landscape and Visual Amenity

Potential Impacts and Mitigation Measures

- Describe the potential impacts of the project landscape character of the site and the surrounding area. Particular mention should be made of any changes to the broad-scale topography and vegetation character of the area.
- This section should analyse and briefly discuss the visual impact of the proposal on particular panoramas and outlooks. It should be written in terms of the extent and significance of the changed skyline as viewed from places of residence, work, and recreation, from road, cycle and walkways, from the air and other known vantage points.
- Detail should be provided of all management options and measures to be implemented and how these will avoid or mitigate the identified impacts.

3.2 Climate

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall) within the region of the proposal. The vulnerability of the area to natural hazards such as floods should also be addressed with particular reference to water management at the proposal site. Reference must be made to any studies undertaken in relation to flooding vulnerability and discussed in more detail in the subsequent section 3.3.2.2. The relative frequency, magnitude and risk of these events should be considered.

3.3 Water Resources

3.3.1 Description of Environmental Values

3.3.1.1 Surface Water and Waterways

A description should be given of the surface watercourses and their quality and quantity within the Nerang River catchment. Details provided should include a description of existing and projected surface drainage patterns, flows in major streams (including downstream of the spillway) and wetlands.

Also provide details of the likelihood of flooding, history of flooding including extent, levels and frequency, and a description of present and potential water uses downstream of the areas affected by the proposal. Flood studies should include a range of annual exceedance probabilities for affected waterways, where data permits.

An assessment is required of existing water quality in the impoundment and waterways and wetlands likely to be affected by the proposal. The basis for this assessment should be a monitoring program, with sampling stations located upstream and downstream of the proposal. Complementary stream-flow data should also be obtained from historical records (if available) to aid in interpretation.

The water quality should be described, including records of blue-green algal blooms, seasonal or other variations or variations with flow where applicable. A relevant range of physical, chemical and biological parameters should be measured to gauge the environmental harm on any affected creek or wetland system.

A description of the environmental values of the surface waterways of the affected area (upstream, within and downstream of the dam) should be provided in terms of:

- values identified in the Environmental Protection (Water) Policy 1997 and ANZECC 2000;
- sustainability, including both quality and quantity;
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form;
- any Water Resource Plans (including reference to Environmental Flow Objectives outlined in the *Water Resource (Gold Coast) Plan 2006*), land and water management plans relevant to the affected catchment;
- passage opportunities for fish upstream and downstream of the impoundment;
- fish habitat;
- recreational and commercial fisheries;
- any estuarine/marine features in the region that may be affected by the change in the flow regime. For example, sediment supply to the coast, extent and significance of estuarine areas, etc.;

- environmental values and Water Quality Objectives for the Nerang River upstream and downstream of the dam; and
- any values that may be affected by the influx of recycled water.

3.3.1.2 Groundwater

Description of Environmental Values

The EIS should review the quality, quantity and significance of groundwater in the proposal area. The possible significance of the Project to groundwater depletion or recharge should be identified.

The review should include a survey of existing groundwater supply facilities (bores, wells, or excavations) within the groundwater area impacted by the Project.

3.3.2 Potential Impacts and Mitigation Measures

This section is to assess potential impacts on water resource environmental values identified in the previous section. It will also define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

Key water management strategy objectives include:

- maintenance of quantity and quality of surface waters to protect existing authorised downstream users and the environment, including compliance with the *Water Resource (Gold Coast) Plan 2006* (including maintenance of in-stream biota and the littoral zone); and
- minimisation of impacts on flooding levels and frequencies both upstream and downstream of the project.

3.3.2.1 Waterways and Water Quality

Potential Impacts and Mitigation Measures

The potential impact of the Project on the water quality of the dam and local/downstream waterways including estuarine waters should be indicated.

Water quality characteristics listed should be those appropriate to the downstream and upstream water uses that may be affected. The Australian and New Zealand Environment an Conservation Council (ANZECC, 2000) National Water Quality Management Strategy, Australian Water Quality Guidelines for Fresh and Marine Waters and the Environmental Protection (Water) Policy 1997 should be used as a reference for evaluating the effects of various levels of contamination.

The potential impacts on water quality within the dam for potable supply as a result of construction activities needs to be addressed and mitigation measures proposed.

The use of a monitoring program to assess the effectiveness of management strategies for protecting water quality during the construction, operation and, if applicable, decommissioning of any temporary structures should be indicated.

The potential environmental harm to the flow and the quality of surface waters, in particular the biota and fisheries of the current impoundment during the construction phase of the Project should be discussed, with particular reference to their suitability for the current and potential downstream uses, including the requirements of any affected riparian area, wetland,

estuary, littoral zone, and any marine and in-stream biological uses. The impacts of surface water flow on existing infrastructure should be considered. Refer to the Environmental Protection (Water) Policy 1997 and *Water Act 2000*.

The environmental flow regime downstream of the dam wall should be reviewed in detail to outline the project's impacts on reduced flooding and the possible reduction of water quality in the Nerang River. This should occur in the context of the *Water Resource Plan (Gold Coast) 2006*. proposed methods for ongoing monitoring downstream of the raised dam wall to ensure that environmental flow objectives are appropriate and are maintaining or improving aquatic ecosystem health in the Nerang River should be indicated.

The impacts of storm events on the capacity of waste containment systems (e.g. site bunding/stormwater management) should be addressed with regard to contamination of waterways and with regard to the design of waste containment systems proposed to be utilised by the project.

3.3.2.2 Hydrology and Flooding

Description of Environmental Values

Description of the historical and current flow regime including seasonal flow patterns, flood peaks, flow volumes and flow duration at the site and downstream of the site.

Details of current or proposed flow management schemes for the waterways.

Potential Impacts and Mitigation Measures

The hydrological impacts of the proposal should be assessed, particularly with regard to scouring and erosion.

Flooding extent, exceedances probabilities and areas inundated both upstream and downstream of the project after the dam is modified at various event frequencies should be indicated. Changes to flooding levels and frequencies should be assessed. When flooding levels will be affected, modelling of headwaters upstream of the dam and incremental effects of the dam on downstream flooding should be provided and illustrated with maps. Flooding studies should be undertaken over an appropriate range of rainfall events.

Describe potential changes in flow patterns at the site and downstream of the site including changes in frequency, volumes and duration and changes in flows reaching estuarine waters. These should be compared with current and pre-regulation flows in the system at a meaningful scale.

Comparisons of flood levels or inundation maps between the existing and upgraded structure for similar sized rainfall events should also be indicated.

Assessment of impacts on the flow and the quality of surface waters and effects on ecosystems should include an assessment of the likely effects on mangrove and other estuarine habitats as a result of changes in flooding regimes. It should also include changes in fish passage opportunities across barriers downstream of the proposed works.

Evaluate the impacts of potential water for fishway operational requirements, on the yield of the proposed storage and its viability, and the cost of construction, monitoring, operation and maintenance of a fishway.

3.3.2.3 Groundwater

Potential Impacts and Mitigation Measures

The EIS should include an assessment of the potential environmental harm caused by the Project to local groundwater resources, particularly with reference to vegetation clearing, sedimentation and salinity. An assessment of the potential to contaminate groundwater resources and measures to prevent, mitigate and remediate such contamination should be identified.

3.4 Potential Impacts on Matters of National Environmental Significance

As discussed, this project is a controlled action under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In this regard, the Commonwealth has accredited the State's EIS process for the purposes of the Commonwealth's assessment under Part 8 of the EPBC Act.

When a State EIS process has been accredited, it is necessary for the terms of reference to address potential impacts on the matters of National Environmental Significance (NES) that have been identified in the 'controlling provisions' when the project was declared a controlled action. In this case the NES matters are as follows:

Sections 18 and 18A (Listed threatened species and communities).

Care must be taken to identify only the potential impacts from the project itself are described, to the extent that the raising of the dam wall, consequent increased potential impoundment, and altered downstream flooding regime have the potential to affect matters of NES.

The matters of NES to be specifically addressed under the requirements of the EPBC Act are the project's impacts and mitigation measures relating to, but not limited to, the following species:

Birds

Lathamus discolor
Swift Parrot

Rostratula australis
Australian Painted Snipe

Xanthomyza phrygia
Regent Honeyeater

Frogs

Mixophyes fleayi
Fleay's Frog

Mixophyes iteratus
Southern Barred Frog, Giant Barred Frog

Mammals

Dasyurus maculatus maculatus (SE mainland population)
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (south-eastern mainland population)

Petrogale penicillata
Brush-tailed Rock-wallaby

Reptiles

Coeranoscincus reticulatus
Three-toed Snake-tooth Skink

Plants

Arthraxon hispidus
Hairy-joint Grass

Diploglottis campbellii
Small-leaved Tamarind

Endiandra floydii
Floyd's Walnut

Endiandra hayesii
Rusty Rose Walnut, Velvet Laurel

Floydia praealta
Ball Nut, Possum Nut, Big Nut, Beefwood

Hicksbeachia pinnatifolia
Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak

Macadamia integrifolia
Macadamia Nut, Queensland Nut, Smooth-shelled Macadamia, Bush Nut, Nut Oak

Owenia cepiodora
Onionwood, Bog Onion, Onion Cedar

Plectranthus nitidus

Syzygium hodgkinsoniae
Smooth-bark Rose Apple, Red Lilly Pilly

Westringia rupicola

A stand-alone report addressing the matters of NES should be provided as an appendix to the EIS (see Appendix 8.3) that exclusively and fully addresses the issues relevant to the controlling provisions. This stand alone section should include the following:

A Description of the Affected Environment Relevant to the Matters Protected
It is important that the current status of the matters protected under the EPBC Act be described in sufficient detail, to inform the analysis of the Project's impact on these matters.

For listed threatened species, the description of the environment should include:

- the species' current distribution;
- relevant information about the ecology of the species (habitat, feeding and breeding behaviour etc);
- information about any populations of the species or habitat for the species in the area affected by the proposed action;
- current pressures on the species, especially those in the area to be affected by the proposal; and
- relevant controls or planning regimes already in place.

Assessment of Relevant Impacts and Mitigation Measures
In this section, the impacts and potential impacts on the matters protected should be described, and the possible mitigation measures for each impact need to be analysed. If alternative ways of taking the action have been identified, the relative impacts of these alternatives should also be considered.

When effective mitigation measures are not available, the discussion should be broadened to include compensatory measures to offset unavoidable impacts.

The identification of impacts to the matters protected should address all relevant impacts, and provide sufficient justification for all conclusions reached on specific impacts.

In some cases impacts may be relevant to more than one matter protected. For example when the species is listed as both a migratory and threatened species under the EPBC Act. In such cases the impacts may be addressed together, clearly stating the relevance of the impact to the different matters protected.

Potential Significant Impacts on Matters of National Environmental Significance (NES)
The following potential impacts may need to be addressed in the EIS. The impacts are provided as a guide for specific matters of NES. Not all of these headings will apply to all proposals.

Impact on a listed threatened species

Potential impacts vary depending on whether the species is extinct in the wild, endangered or vulnerable but are generally as follows:

- lead to long term decrease in the size of a population;
- reduce the area of occupancy of the species;
- fragment an existing population into two or more populations;
- adversely affect habitat critical to the survival of the species;
- disrupt the breeding cycle of a population;
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to the species becoming established;
- introduce disease that may cause the species to decline;
- interfere with the recovery of the species or ecological community; or
- consistent with any recovery plan.

3.5 Terrestrial Flora

This section should detail the existing terrestrial flora and vegetation values of the Project area in terms of:

- integrity of ecological processes, including habitats of rare and threatened species;
- biological diversity, including habitats of rare and threatened species;
- integrity of landscapes and places including wilderness and similar natural places;
- threatened terrestrial ecosystems;

- the existence of important local and regional weed species should also be identified.

The EIS should identify any actions of the Project which would require an authority or be assessable development for the purposes of the *Nature Conservation Act 1992* and *Vegetation Management Act 1999.*

The flora communities should be described, in particular those that are rare or threatened, in environmentally sensitive localities, including riparian zones, littoral zones, rainforest remnants, old growth indigenous forests and wilderness areas. The description should include species lists.

Reference should be made to both State and Commonwealth legislation and policies on threatened species and ecological communities, Ramsar wetlands and World Heritage areas.

All surveys undertaken should be in accordance with best practice advice from the EPA and should include consideration of seasonality, potential for occurrence of significant species, rarity of species and the sensitivity of the species to disturbance.

This section should also identify all likely direct environmental harm on flora and vegetation communities.

3.5.1 Description of Environmental Values

The terrestrial vegetation communities within the Project area should be described at an appropriate scale (i.e. 1:10,000) with mapping produced from aerial photographs and ground-truthing, showing the following:

- Location and extent of vegetation types using the EPA's regional ecosystem type descriptions in accordance with the Regional Ecosystem Description Database (REDD) available at the EPA website.
- Location of species listed as Protected Plants under the *Nature Conservation (Wildlife) Regulation 1994* and subsequent amendments.
- Sensitive or important vegetation types should be highlighted and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types identified.

Details of any riparian and rainforest vegetation, and their value for fauna habitat (including aquatic communities), and conservation of specific rare floral and faunal assemblages or community types, from both a local and regional perspective, should be provided. This should include extent and width of riparian vegetation. Any special landscape values of any natural vegetation communities should be described.

Conduct targeted surveys for legislatively or otherwise significant flora species listed under State and Commonwealth legislation within areas to be permanently and periodically inundated. Flora surveys should be undertaken within each defined vegetation community to be affected by the project and methodology should be discussed with the EPA, the following should be used as a guide:

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database. Vegetation mapping and data should be submitted to the Queensland Herbarium to assist the updating of the CORVEG database;
- information should be recorded for community structure, assemblage and diversity;
- a complete list of plant species present at each site should be recorded;
- the relative abundance of plant species present should be recorded;

- any plant species of conservation, cultural, commercial or recreational significance should be identified; and
- specimens of species listed as protected plants under the *Nature Conservation (Wildlife) Regulation 1994*, other than common species, are to be submitted to the Queensland Herbarium for identification and entry into the HERBRECS database.

Methodologies used for flora surveys should be specified in an appendix to the EIS. Any existing information should be revised and comments provided on whether the areas are degraded, cleared or affected in ways that would affect their environmental value.

The occurrence of pest plants (weeds), particularly declared plants under the *Land Protection (Land and Stock Route Management) Act 2002* should be shown on a map at an appropriate scale.

3.5.2 Potential Impacts and Mitigation Measures

This section should identify all foreseen direct effects on terrestrial flora and the potential level of environmental impact identified. Action plans for protecting rare or threatened species and vegetation types identified as having high conservation value should be described, and any obligations imposed by State or Commonwealth biodiversity protection legislation or policy should be indicated.

With regard to the Project area this section should include:

- Identify necessary permits/authorities required by the Project including clearing permits under the *Vegetation Management Act 1999*.
- Development of mitigation plans to address anticipated impacts arising from land clearing and temporary inundation should be outlined. This can include identification of suitable areas for offsets (in consultation with GCCC and NRW if required by relevant legislation and policy) to compensate vegetation loss. A description of offsets or principles of selection, securing and retaining of offsets should be indicated.
- Plans to support and allow for the maintenance or enhancement of habitat and corridor functions in the area should also be outlined.
- Where required, outline rehabilitation strategies for any compensatory habitat areas and provisions for protecting such areas. As indicated in section 3.1.2.3, a rehabilitation management strategy is to be included in the construction EMP.
- Within the strategy, describe the methods to ensure rapid rehabilitation of disturbed areas following construction including the species chosen for revegetation which should be consistent with the surrounding associations. Include details of any post construction monitoring programs and what benchmarks will be used for review of monitoring.
- Identify the ability of identified stands of vegetation to withstand any increased pressure resulting from the Project. In relation to periodic inundation events the EIS should briefly discuss the likelihood of long-term impacts, such as dieback occurring.
- The future use (such as erosion control or habitat) or method of disposal of cleared vegetation should be detailed.
- Inclusion of a weed management plan in the EMP is advised. The weed management plan should be developed in consultation with local government environmental officers, to cover construction, rehabilitation and operation periods.

- Describe methods of minimising the potential for the introduction and/or spread of weeds, including:
  - Identification of the origin of construction materials, machinery and equipment.
  - The need for vehicle and machinery washdown and any other hygiene protocols.
  - Staff/operator education programs.

3.6 Terrestrial Fauna

The terrestrial and riparian fauna occurring in the areas affected by the Project should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. Wildlife corridors and habitat along the proposed route should be identified and mapped.

Detail should be provided on the existing nature conservation values of the Project area in terms of:

- integrity of ecological processes, including habitats of rare and threatened species; and
- biological diversity, including habitats of rare and threatened species.

The EIS should identify any actions of the Project that require an authority under the *Nature Conservation Act 1992.* The description should indicate and map any areas of state or regional significance identified in an approved Biodiversity Planning Assessment (BPA) produced by the EPA and any areas of local significance identified in the GCCC's LNCS.

Reference to policies on threatened species and ecological communities including any species protected under bilateral agreements between Australia and Japan (JAMBA) and between Australia and China (CAMBA) should also be included.

As with terrestrial flora, all surveys undertaken should be in accordance with best practice advice from the EPA and should include consideration of seasonality, potential for occurrence of significant species, rarity of species and the sensitivity of the species to disturbance.

This section should also discuss all likely direct environmental harm on fauna communities in terrestrial environments in sensitive areas in the project area.

3.6.1 Description of Environmental Values

The terrestrial, and riparian fauna occurring in the areas affected by the proposal should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. The description of the fauna present or likely to be present in the inundation area should include:

- species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats;
- any species that are poorly known but suspected of being rare or threatened;
- habitat requirements and sensitivity to changes; including movement corridors and barriers to movement;
- the existence of feral or exotic animals;
- existence of any rare, threatened or otherwise noteworthy species/communities in the study area, including identification of range, habitat, breeding, recruitment, feeding and

movement requirements, and current level of protection (e.g. any requirements of protected area management plans);

- use of the area by avian and terrestrial fauna;
- identify Glossy Black Cockatoo feeding tree locations, and provide measures to retain these trees where possible;
- habitat for priority or endangered, vulnerable or rare taxa as identified by the EPA's Biodiversity Planning Assessments;
- essential habitat for endangered, vulnerable or rare fauna as identified in the Department of Natural Resources and Water's regional ecosystem maps.

Surveys should be conducted at the appropriate time of day and year when the species are known to be present on the site, so that identification and location of these species is optimal.

The EIS should indicate how well any affected populations are represented and protected elsewhere in the subregion where the Project occurs.

Site data should be recorded in a format compatible with EPA WildNet databases.

3.6.2 Potential Impacts and Mitigation Measures

This section should identify all foreseen direct effects on terrestrial fauna including any obligations imposed by the State. Strategies for protecting rare or threatened species should be described, and any obligations imposed by State or Commonwealth endangered species legislation or policy should be outlined.

Impacts during construction and operation of the Project should be assessed. Short term and long term durations should be considered. Measures to mitigate the impact on habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains should be described. Any provision for buffer zones and movement corridors should be indicated.

- Identify any impact the proposal may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values.
- Identify suitable areas for compensatory habitat (in consultation with Gold Coast City Council, EPA and NRW) that will maintain/enhance wildlife habitat and bioregional and local corridor functions in the area.
- Development of mitigation strategies to provide information on the following should be investigated:
  - Construction activities that will minimise fauna, including reptiles, becoming trapped or harmed,
  - use of cleared vegetation for ground-level habitat;
  - provision of fauna spotter during clearing activities;
  - detail of measures proposed to minimise wildlife capture and mortality during construction; and if accidental injuries should occur the methodologies to assess and handle injuries;
  - fauna management actions for quarry sites; and
  - removal/retention of identified nesting trees/locations and provision of nest hollows.

Details of the proposed fauna management and mitigation strategies discussed above should be included in the EMP.

The method of minimising the introduction/ongoing management of feral animals, and other exotic fauna should be described.

3.7 Aquatic Biology

3.7.1 Description of Environmental Values

This section should outline aquatic values affected by the proposal, noting the patterns and distribution in the dam impoundment, waterways and downstream associated freshwater and estuarine environments. The description of the aquatic fauna and flora present or likely to be present in the area should include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area, and downstream estuarine environment;
- any rare or threatened marine species in downstream environments;
- a description of fish habitat at representative sites upstream of the proposed impoundment, within the impounded area and downstream as far as the effect of the dam/weir will extend. This should include features such as distribution of pool and riffle formations: presence of snags; presence of overhanging vegetation; presence of aquatic macrophytes; sediment type; river profile (bank width and depth); presence of sand and gravel bars; and water quality.
- a description of fish and crustacean species (recreational, commercial and other) at representative sites upstream of the proposed impoundment, within the impounded area and downstream as far as the effect of the dam/weir will extend. This should include distribution, diversity, some population descriptors (*eg.* size classes / length frequency) and relative abundance. Historical information (eg. former distribution, diversities *etc.* should be included where available. Comparison between the main Nerang River and a control (tributary) fish community may be valid.
- discussion of fish habitat requirements and usage at the site and up and downstream of the site, including life cycle, seasonal or flow related variations in those requirements
- fish movement requirements through the site (upstream and downstream) need to be determined. Flow, seasonal and temperature related movement should be identified.
- a description of recreational and commercial fisheries at the site and up and downstream of the site including impoundment, riverine, estuarine and near coastal fisheries
- aquatic invertebrates occurring in the waterways within the Project area;
- identification of the sensitivity of fish habitats to disturbance, including potential disturbances and changes resulting from the proposed works, e.g. changes in water quality (including in regard to changes in water level and flow regimes);
- aquatic plants;
- aquatic and benthic substrate;
- habitat downstream of the project or potentially impacted due to changes in flooding regimes on associated lacustrine and marine environments; and
- identification of any critical migration/breeding requirements for native aquatic species.

Discuss the requirement or otherwise for a fishway to be constructed as part of the project and the process for determining with DPI&F if a Waterway Barrier Works Approval is required.

Discussions with DPI&F on the appropriate methodology for aquatic studies to determine the requirement for a fish way should occur prior to aquatic surveys being completed.

3.7.2 Potential Impacts and Mitigation Measures

- Detail strategies for protecting the Moreton Bay Marine Park and Ramsar Wetland as a result of changes in downstream flooding regimes.
- Any rare or threatened species should be described, and any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations (i.e. JAMBA, CAMBA) should be outlined. Emphasis should be given to potential environmental harm to downstream benthic and intertidal communities, seagrass beds and mangroves.
- Determine the potential impacts of the proposal on fish habitat at the site and up and downstream of the site as far as the effect of the dam will extend, including impacts on features such as: riparian vegetation; aquatic flora; distribution of pool and riffle environments; water quality; estuarine and near coastal fish habitat (including mangrove, and seagrass communities etc); instream and bank (freshwater and estuarine) profiles; floodplain habitat (such as wetlands, waterbodies) etc.
- Determine the potential for the introduction of or facilitation of exotic, non-indigenous and noxious plants or exotic or non-indigenous or noxious aquatic fauna (including fish and crustaceans) through the construction and operation of the proposed structure.
- Determine the potential impacts of the proposal on aquatic faunal communities (including fish) at the site and up and downstream of the site as far as the effect of the dam will extend (including estuarine and near coastal aquatic communities). These should include: downstream passage opportunities across the dam and passage opportunities along the Nerang River to the base of the dam.
- Indicate effects of changes to flow regime downstream, including the effect of changes in water quality, salinity, habitat structure and flora.
- Determine effects of increased level in the impoundment and projected variations in the level of the impoundment on aquatic fauna, particularly in creeks flowing into the impoundment.
- Discussion of the sensitivity of fish habitat at the site and up and downstream of the site to disturbance, including potential disturbances and changes resulting from the proposed works (e.g. in water quality, flow regimes, water levels, proposed land use).
- Determine the potential impacts on commercial and recreational fisheries, addressing issues such as access, changes to stocks (species, population numbers and structure, recruitment to fishery), and any potential for fish kills and mitigation strategies. Consultation with relevant local groups such as the Hinze Dam Fish Management Advisory Committee should be undertaken.

3.8 Cultural Heritage

3.8.1 Description of Environmental Values

This section should describe the existing cultural heritage values that may be affected by the Project activities. Acknowledgement that a Cultural Heritage Management Plan (CHMP) will be developed by the project should be indicated.

A cultural heritage study will be required and will describe indigenous and non-indigenous cultural heritage sites and places, and their values. The study must be conducted by an appropriately qualified cultural heritage practitioner and must include the following:

- liaison with the Aboriginal party/ies for the area concerning:
  - places of significance to that community (including archaeological sites, natural sites, story sites etc;
  - appropriate community involvement in field surveys;
- any requirements by the Aboriginal party/ies relating to confidentiality of site data must be highlighted. Non-indigenous communities may also have relevant information;
- a a comprehensive cultural heritage survey or study of the area involving the Aboriginal party/ies for the area;
- significant assessment by the Aboriginal party/ies of any cultural heritage sites/places located;
- the impact of the proposed development on cultural heritage values;
- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations; and
- the involvement of the Aboriginal party/ies is required under the *Aboriginal Cultural Heritage Act 2003* when undertaking the cultural heritage survey/study in order to meet the cultural heritage duty of care

3.8.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing cultural heritage environmental values, describes how nominated quantitative standards and indicators may be achieved for cultural heritage management, and how the achievement of the objectives will be monitored, audited and managed.

3.8.2.1 Cultural Heritage Management Plan (Part 7, Aboriginal Cultural Heritage Act 2003)

It is a requirement of the project that a Cultural Heritage Management Plan (CHMP) be developed and approved under Part 7 of the *Aboriginal Cultural Heritage Act 2003* which sets out the way in which harm to Aboriginal cultural heritage will be avoided or to the extent it cannot be avoided will be minimised.

The environmental harm to cultural heritage values in the vicinity of the project should be managed under a CHMP developed specifically for the project. The CHMP will provide a process for the management of cultural heritage places both identified and sub-surface at the project sites. It is usual practice for the CHMP to be based on information contained in archaeological reports. The CHMP should address and include the following:

- a process for including the Aboriginal party for the area in the assessment, protection and management of their cultural heritage;

- processes for mitigation, management and protection of identified cultural heritage places and material in the Project area, including associated infrastructure developments;
- cultural awareness training or programs for project staff;
- a conflict resolution process; and
- any other matters agreed with the Aboriginal party for the area.

The development of the CHMP must be negotiated directly with the Aboriginal party for the area. The Department of Natural Resources and Water can provide further advice on this process and gazetted CHMP guidelines.

The EIS should note that cultural heritage artefacts removed from the area are the property of the Aboriginal party for the area.

3.9 Air Environment

3.9.1 Description of Environmental Values

This section should describe the existing air environment, which may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994* and Environmental Protection (Air) Policy. It should also describe air quality goals contained in the National Environment Protection Measure (NEPM) Ambient Air Quality 1998.

Ambient air quality conditions in terms of particulate matter should be described for any sensitive sites (residences) in proximity to the dam and associated infrastructure development areas, including any baseline monitoring results.

3.9.2 Potential Impacts and Mitigation Measures

The following air quality issues should be considered:

- Impacts of dust generation from construction activities, especially from blasting activities associated with quarries and in close proximity to residences;
- Identification of climatic patterns that could affect dust generation and movement;
- Predicted changes to existing air quality at sensitive receptors and dust generation during construction;
- List potential are quality impacts from vehicle emissions and any other sources; and
- Propose any amelioration or mitigation measures for each identified impact relating to dust generation, vehicle and equipment emissions and gaseous emissions.

3.10 Greenhouse Gas Impacts

This section of the EIS should:

- provide an inventory of projected annual emissions during construction for each relevant greenhouse gas, with total emissions expressed in 'CO2 equivalent' terms;
- briefly describe method(s) by which estimates were made.

The Australian Greenhouse Office Factors and Methods Workbook (available via the internet) can be used as a reference source for emission estimates and supplemented by other sources where practicable and appropriate.

An assessment of the type and volume of greenhouse gases emitted by the Project during construction and operation and the measures taken to reduce emissions in line with national and state abatement policies and guidelines should be provided.

3.11 Climate Change Adaptation

Climate change, through alterations to weather patterns and rising sea level, has the potential to impact in the future on developments designed now. Most developments involve the transfer to, or use by, a proponent of a community resource in one form or another, such as the granting of a non-renewable resource or the approval to discharge pollutants to air, water or land.

Therefore, it is important that the project design be adaptive to climate change so that community resources are not depreciated by projects that would be abandoned or require costly modification before their potential to provide a full return to the community is realised.

Consequently, the EIS should provide an assessment of the project's vulnerabilities to climate change and describe possible adaptation strategies for the activity including:

- a risk assessment of how changing patterns of rainfall and hydrology, temperature and extreme weather may affect the viability and environmental management of the project;
- the impacts of storm events and climate change on the capacity of waste containment systems (e.g. site bunding/stormwater management) should be addressed with regard to contamination of waterways and with regard to the design of waste containment systems proposed to be utilised by the project;
- preferred and alternative adaptation strategies to be implemented; and
- commitments to undertaking, where practicable, a cooperative approach with government, other industry and other sectors to address adaptation to climate change.

It is recognised that predictions of climate change and its effects have inherent uncertainties, and that a balance must be found between the costs of preparing for climate change and the uncertainty of outcomes. However, proponents should use their best efforts to incorporate adaptation to climate change in their EIS and project design.

3.12 Noise and Vibration

3.12.1 Description of Environmental Values

This section describes the existing environment values that may be affected by noise and vibration from the proposal.

The identification of potential noise sources from the conduct of the project are to be identified. Project activities, especially in regards to quarry operation could adversely impact on noise and vibration at proximal sensitive receptors and baseline monitoring should be undertaken at a selection of sensitive sites potentially affected by the proposal. Noise sensitive places are defined in the Environmental Protection (Noise) Policy 1997. The locations of sensitive sites should be identified on a map at a suitable scale. The results of any baseline monitoring of noise and vibration in the proposed vicinity of the proposal should be described.

Comment should be provided on any current activities near the proposal area that may cause a background level of ground vibration (for example: major roads, quarrying activities, etc.).

3.12.2 Potential Impacts and Mitigation Measures

- The potential environmental harm of noise at all potentially sensitive places, in particular any places of work or residence, should be quantified and compared with objectives, standards to be achieved and measurable indicators. This should also include environmental harm on terrestrial animals.
- Proposals to minimise or eliminate these effects should be provided, including details of any screening, lining, enclosing or mounding of construction sites, or timing schedules for construction that would minimise environmental harm and environmental nuisance from noise and vibration.
- Community consultation procedures to be employed to notify residents of blasting events should be detailed.
- Assessment should be made of the potential emission of low-frequency noise (noise with components below 200Hz) from major construction equipment. If necessary, measures should be described for reducing the intensity of these components.
- A discussion should be supplied on blasting which might cause ground vibration or fly rock on, or adjacent to, the site. The magnitude, duration and frequency of any vibration should be indicated.
- Measures to prevent or minimise environmental nuisance and harm should be identified.
- Assessment should be made of the potential impacts (including compliance with relevant legislation) of blasting required, including potential buffers to minimise or eliminate these effects. Blasting noise and vibration limits are provided in section 61 of the *Environmental Protection Regulation 1998.* Reference should also be made to the EPA Guideline: Noise and Vibration from Blasting.

3.13 Hazard, Risk and Safety

3.13.1 Hazard Analysis

This section of the EIS should describe the potential hazards and risks that may be associated with the Project. A preliminary hazard analysis should be conducted for the Project.

The preliminary hazard analysis should incorporate possible hazards, accidents, and abnormal events that may arise for the Project, both during construction and in operation, including:

- Vulnerability of the Project area to flooding, bushfire, and landslip.
- Seismic stability of the Project area.
- Identification of all hazardous substance to be used, stored, processed or produced and the rate of usage.
- Accidental release of hazardous goods or other materials.
- Security of equipment and materials stored at the project site and identification of ramifications for e.g. public safety should security be breached.
- Explosions and fires associated with incidents arising from the Project activities.
- Work injuries.

- The effects of predictable climatic extremes (droughts, floods) upon the structural integrity of the containing wall, causing Dam wall overfilling and failure.
- An outline of the public liability of the Council and/or State for private infrastructure and visitors on public land.
- Indication of cumulative risk levels to surrounding land uses.
- Any potential incremental hazards that may arise from the project that accounts for the augmentation of an existing structure.
- Possible frequency of potential hazards, accidents, spillages and abnormal events occurring during all stages of the Project should be indicated.

3.13.2 Risk Assessment

A preliminary risk assessment for all components of the Project (including, but not limited to, dam wall, quarries, clearing, downstream flooding) shall be undertaken as part of the EIS process in accordance with appropriate parts of ANCOLD and Queensland Dam Safety Regulator guidelines and AS/NZS Risk Management Standard 4360:1999. While it is anticipated that risk assessment will mainly be undertaken as part of the dam design process, where risk criteria/processes are not defined in recognised guidelines, a preliminary risk assessment may need to be included in the EIS.

Discussion of project delivery risk should be indicated, including failure to deliver the required outcome or for the project to deliver future supply requirements.

The EIS should deal comprehensively with on-site risks. External risks to the Project should also be considered. External risks from natural hazards could be determined on the basis of AS/NZS Risk Management Standard 4360:1999. The EIS should indicate that the project will comply with relevant risk assessment and management guidelines.

The study should assess risks during the construction, decommissioning of temporary construction works and operational phases associated with the Project. These risks should be assessed in quantitative terms where possible.

Analysis of the consequences of each of the events identified in Section 3.13.1 Hazard Analysis on safety and environmental damage in the Project area should be conducted, including:

- Injuries, illness and death to workers and to the public.
- Direct harm to the environment as a result of project hazards.

The analysis should examine the likelihood of these consequences being experienced, both individually and collectively. Quantitative levels of risks and risk contours should be presented from the above analysis.

Details should be provided on the safeguards that would be employed or installed to reduce the likelihood and severity of hazards, consequences and risks to persons, fauna and environmentally sensitive sites within and adjacent to the Project area. The information should include the reduced level of risk that would be experienced with these safeguards in place.

A comparison of assessed and mitigated risks with acceptable risk criteria for land uses adjacent to the Project area should be presented.

3.14 Emergency Management Plan

An outline of the proposed emergency management procedures is to be provided for the range of situations identified in the above risk assessment as providing measurable risks. An Emergency Management Plan is to be developed in consultation with the relevant emergency services and included in the Environmental Management Plan.

The following should be presented in the Plan:

- contingency plans to deal with hydrocarbon (e.g. diesel, lubricating oils) oil spills during construction;
- contingency plans to account for natural disasters such as storms, floods and fires during the construction, operation and maintenance phases;
- plans for involvement of the relevant State agencies (such as the Queensland Ambulance Service) in relation to emergency medical response and transport;
- plan to ensure access for emergency services vehicle/s to and into the site; and
- first aid matters.

3.15 Waste Management

Having regard for best practice waste management strategies, the Environmental Protection (Waste Management) Policy 2000 (EPP Waste) and the Environmental Protection (Waste Management) Regulation 2000 (EPR Waste), the proposals for waste avoidance, reuse, recycling, treatment and disposal should be described.

This section should discuss waste management strategies, including reduction, reuse, recycling, storage, transport and disposal of waste, including measures to minimise attraction of vermin, insects and pests.

This section should assess the potential impact of all wastes to be generated during construction and operation and provide details of each waste in terms of:

- operational handling and fate of all wastes including storage;
- on-site treatment methods proposed for the wastes;
- methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes;
- the potential level of impact on environmental values;
- measures to ensure stability of the waste storage areas and impoundments;
- methods to prevent, seepage and contamination of groundwater from stockpiles and/or storage areas and impoundments; and
- market demand for recyclable waste (where appropriate).

The EIS should address waste minimisation techniques and processes proposed and the market demand for recyclable waste (where appropriate).

3.16 Transport and Roads

3.16.1 Transport Methods and Routes

The EIS should describe the existing road network and intersections of the surrounding region specifying current traffic volumes, including, but not limited to, the Gold Coast-Springbrook, Nerang-Murwillumbah and Nerang-Beaudesert road networks.

The EIS should also describe and assess the stability and durability of existing bridges/culverts and embankments.

The EIS should discuss transport methods and routes for delivering construction and operational equipment and materials, other necessary goods and consumables and workforce transportation. Information should include:

- The likely impacts and mitigation strategies of increased traffic on local and regional road networks (with appropriate directional distributions), with reference to:
  - Traffic volume.
  - Vehicle size and types, including heavy vehicle access.
  - Usage rates.
  - Road safety issues, including safe access to construction sites and the potential impacts of dust (e.g. consideration of the need for turning lanes, improved sight lines, waiting areas, off-road parking locations).
  - Reduced efficiency of traffic flows or intersections along key routes, especially during construction.
  - Additional wear/reduced life of pavements requiring additional or accelerated rehabilitation and maintenance if any.
  - The proposed traffic management arrangements and plans, especially within rural residential areas and steps to be taken to prevent public access to construction access ways not provided on public roads.
  - Site depot location and access.
  - Construction traffic on local road networks, daily movement patterns and emergency access, especially in rural residential areas.
  - Methods to be adopted to avoid obstruction to other road users during construction.
- The impacts of construction with regard to seasonal considerations such as potential for road impacts during wet weather.

Findings of studies and assessments should be incorporated into a road management strategy including Transport and Traffic Management Plans.

The EIS should detail any proposals to provide centralised staff transport to site and include the provision that relevant authorities such as the Queensland Police Service will be advised in advance and included in consultation on staff transit methods and procedures.

Reference should be made to any relationship between Project road works and works proposed in the current Road Implementation Program(s) of MR. Road infrastructure impacts should be described and assessed according to MR's Guidelines for Assessment of Road Impacts of Development (2006). Reference should be made to other MR planning documents.

The EIS should describe the existing public transport network, including school bus services, and discuss the likely impacts and mitigation strategies of increased traffic on the safe provision of school bus services in the project area.

An analysis of impacts on traffic, road networks and road users and suggested mitigation strategies if construction activities and quarrying needs to be undertaken offsite should be indicated.

3.16.2 Road Relocations: Potential Impacts and Mitigation Measures

Assessment of impacts for the entire area impacted by the Project should identify the following:

- The likely impacts and mitigation strategies of new roads or road realignments that are required as a result of the Project, including impacts on all stakeholders along the routes.
- Within this section the following should be identified:
  - Road realignment requirements, clearly indicated on maps with existing infrastructure and planned realignments indicated;
  - Associated land requirements;
  - An assessment of the potential to isolate communities (such as Springbrook);
  - An assessment of the potential to disrupt community access to any health, education or government services, and any relevant facilities such as shops, churches, clubs as a result of the realignments.

4. Socio-Economic Environment

4.1 Social values

This section describes the existing social values that may be affected by the proposal.

Description of Environmental Values

The social amenity and use of the proposal area for recreational, fishing, sporting, educational or residential purposes should be described. Consideration should be given to:

- community infrastructure and services, access and mobility;
- population and demographics of the affected community;
- local community values, vitality and lifestyles;
- recreational, cultural, leisure and sporting facilities and activities in relation to the affected area;
- local businesses in relation to the affected area, including the kiosk and Cedar Lake Country Resort;
- sports clubs, groups and community facilities in the area;
- current property values; and
- number of properties and owners directly affected by the project.

Potential Impacts and Mitigation Measures

The social impact assessment of the project should consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the project's impact, both beneficial and adverse, on the local community. The impacts of the project on local residents, community services and recreational activities are to be analysed and briefly discussed. The nature and extent of the community consultation program are to be described and a summary of the results incorporated in the EIS.

The EIS should address the following matters:

Community

- An assessment of impacts on local residents, current land uses and existing lifestyles and enterprises.
- An assessment of the inundation of existing community and recreational facilities during construction and discussion on the relocation/re-establishment of recreational and sporting facilities and any community requirements identified during the community consultation process.

Workforce

- The EIS should address impacts of both construction and operational workforces and associated contractors on housing demand, community services and community cohesion. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be identified.

Flood Mitigation

- An assessment of downstream flooding on residential, commercial and community facilities, and anticipated reduction in flooding potential and associated reduction in flood damage costs.
- For the construction and operational phases of the development, describe the effects of the proposal on local residents, including flooding, land acquisition and road relocation issues and property valuation and marketability, community services and recreational activities.

For identified impacts to social values, suggest mitigation and enhancement strategies and facilitate initial negotiations towards acceptance of these strategies. Practical monitoring regimes should also be recommended.

Social, economic and cultural values are not as easily separated as physical and ecological values. Therefore it may be necessary for some material in this section to be cross-referenced within sections 3.8: Cultural Heritage, 4.2: Economy, and 3.13: Hazard, Risk and Safety.

4.2 Economy

This section describes the existing economic environment that may be affected by the project.

The economic analysis component of the EIS should consider:

- the significance of this Project on the local and regional economic context;

- the anticipated increased supply and reliability of water within the Gold Coast region and flow on effects;
- the cost to all levels of government of any additional infrastructure provision;
- an outline of the economic flows of the project expenditure on the regional and state economies;
- any negative economic impact on affected local individuals or businesses from the construction of the project;
- any negative economic impact on the project viability due to the cost of the long-term provision of fish passage. Where fish passage is a requirement, it will be for the life of the structure of the dam (as opposed to the commercial life of the dam); and
- the use by the project of locally sourced goods and services as described in the Department of State Development Local Industry Policy.

4.3 Employment and training

This section should provide details on the employment requirements and skills base of the required workforce for both the construction and operations phases of the project. The report should also describe the deployment strategies proposed for the workforce over the construction period.

Information should be provided on the accommodation requirements for the workforce, (if any), and if applicable, of their family members.

In particular, with regards to anticipated workforce impacts, the following should be addressed:

- estimates should be provided of:
  a) construction workforce - i.e. the number of workers to be employed on-site during the construction activities, including the number of sub-contractors and an outline of the recruitment schedule and policies for the recruitment of workers

  b) operational phase workforce - i.e. the number of any additional workers to be employed on-site during operational activities.

- If camp sites are to be used to accommodate the workforce, provide details on the number, location (shown on a map), proximity to the construction site and typical facilities for these sites. Information should include data relating to facilities for:
  - Food preparation and storage;
  - ablution facilities;
  - vector and vermin control;
  - fire safety;
  - indoor air quality; and
  - dust and noise control in relation to proximity of camp site to the construction area.

If applicable, outline local government approvals required for establishment and operation of such camps.

On the matter of workforce training, the EIS should describe the project's relation and use of strategies responding to Government Policy relating to:

- The level of training provided for construction contracts on Queensland Government building and construction contracts - The State Government Building and Construction Contracts Structured Training Policy (the 10% Policy).
- Indigenous employment opportunities - Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects (the 20% Policy).

5. Environmental Management Plan

An Environmental Management Plan (EMP) should be provided detailing the measures to be adopted to address identified impacts during the construction, operation and maintenance phases of the Project. The EMP should detail:

- Environmental element – the environmental aspect requiring management consideration.
- Potential impacts – potential impacts identified in the EIS.
- Performance objective – the target or strategy to be achieved through management.
- Management actions – the actions to be undertaken to achieve the performance objective, including any necessary approvals, applications and consultation.
- Performance indicators – criteria against which the implementation of the actions and the level of achievement of the performance objectives will be measured.
- Monitoring – process of measuring actual performances.
- Responsibility – assign responsibility for carrying out each action to a relevant person/organisation.
- Reporting – the process and responsibility for reporting monitoring results.
- Corrective action – the action to be implemented in the case of non-compliance and the person/organisation responsible for action.

An EMP should commit to manage, enhance or protect identified environmental values. The commitments should contain the following components for performance criteria and implementation strategies:

- Environmental protection objectives for enhancing or protecting each relevant value.
- Indicators to be measured to demonstrate the extent to which the environmental protection objective is achieved.
- Environmental protection standards (a numerical target or value for the indicator), which defines the achievement of the objective.
- An action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
  a. Continuous improvement;
  b. Environmental auditing;
  c. Monitoring;
  d. Reporting;
  e. Staff training; and

f. A decommissioning program for land proposed to be disturbed under each relevant aspect of the proposal.

6. Conclusions and Recommendations

The EIS should make conclusions and recommendations with respect to the Project, based on the studies presented, the Environmental Management Plans and conformity of the proposal with ESD policy. This should include reference to proponent commitments for the management and operation of the project.

7. References

References should be presented in a consistent and recognised format.

8. Recommended Appendices

Items that should be located in the Appendices should include, but not be limited to, the following:

8.1 Final Terms of Reference for the EIS

A copy of the final ToR should be included in the EIS. Where it is intended to bind appendices in a separate volume from the main body of the EIS, the ToR at least should be bound with the main body of the EIS for ease of cross-referencing. A summary, cross-referencing specific items of the ToR to the relevant section of the EIS, should also be provided in the EIS.

8.2 Statutory Permits and Development Approvals

A list of all the approvals required by all phases of the project should be presented along with their corresponding regulating legislation and the approving authority.

8.3 Potential Impacts on Matters of National Environmental Significance

The EIS should provide a stand-alone report that exclusively and fully addresses the issues relevant to the matters of national environmental significance (NES) that were identified in the 'controlling provisions' when the project was declared a controlled action under Part 3, Division 1 of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).

The report should provide a:

- description of proposed action (as it would impact on NES matters);
- description of the Affected Environment Relevant to the Controlling Provisions (i.e. describe the features of the environment that are NES matters protected under the EPBC Act); and
- assessment of Impacts on NES Matters and Mitigation Measures.

8.4 Consultation Report

A list of advisory agencies should be provided in a summary Consultation Report, which should also list the Commonwealth, State and Local government agencies consulted, and the individuals and groups of stakeholders consulted. A summary of the issues raised by these groups, and the means by which the issues have been addressed, should be provided in the text of the EIS.

The EIS should summarise the results of the community consultation program, providing a summary of the groups and individuals consulted, the issues raised, and the means by which the issues were addressed. The methodology used in the community consultation program, including criteria for identifying stakeholders and the communication methods used should also be indicated.

Information about identifying affected parties (as defined by the EPBC Act) and interested and/or affected persons (as defined by the EP Act) should be included.

8.5 Project Study Team Qualifications and Experience

The qualifications and experience of the study team and specialist sub-consultants should be provided.

8.6 Research Reports and Specialist Studies

Any projects for researching alternative environmental management strategies or for obtaining any further necessary information should be outlined in an appendix.

All reports generated on specialist studies undertaken as part of the EIS are to be included as appendices. These may include:

- geology;
- soil survey and land suitability studies;
- contaminated land register findings;
- surface water hydrology and quality;
- groundwater;
- flora and fauna studies;
- economic studies; and
- hazard and risk studies.

8.7 List of Proponent Commitments

Each section of the EIS is to conclude with a set of commitments made by the Proponent relevant to the section's impacts and mitigation measures.

Additionally, a list of all commitments made by the Proponent in the EIS (in addition to the performance criteria stipulated in the EMP) should be provided along with a reference to the relevant section in the EIS, as an Appendix.