Coordinator-General's Report

Hinze Dam Stage 3 Project

Report evaluating the Environmental Impact Statement, pursuant to Section 35 of the *State Development and Public Works Organisation Act 1971* (Queensland)

October 2007

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Coordinator-General's Report: Synopsis

With the Hinze Dam Stage 3 Project, the Gold Coast City Council is proposing to augment the existing Hinze Dam. The dam's embankment will be raised by 15 metres from 93.5 metres to 108.5 metres, increasing the dam's capacity to over 309,700 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.

Development of the Hinze Dam Stage 3 Project is in line with key government strategic commitments as described in *Water for South East Queensland: A long-term solution* (2006) and the *South East Queensland Regional Water Supply Strategy: Stage 2 Interim Report* (2005). It is also listed within the Gold Coast City Council's Water Futures Report as a key element to contribute to security of water supply for the region in the long-term.

As an 'emergency measure' under the *Water Amendment Regulation (No.6) 2006*, the project's completion date and increase in yield are mandated, which acknowledges the project's significance in contributing to the adequacy of water supply for the South East Queensland region.

On 20 October 2006 the Hinze Dam Stage 3 Project was declared a 'significant project' for which an Environmental Impact Statement (EIS) is required in accordance with Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

On 16 January 2007 the Commonwealth Minister for the Environment and Heritage[1] determined that the Hinze Dam Stage 3 Project constituted a "controlled action" likely to affect matters of National Environmental Significance under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Australian Government has accredited the EIS process to be conducted under the SDPWO Act within a Bilateral Agreement between the federal and state governments. The EIS therefore requires assessment by both levels of government.

[1] Now the Minister for the Environment and Water Resources.

The EIS for the Hinze Dam Stage 3 Project was advertised for public comment from 9 June until 9 July 2007. A Supplementary Report on the EIS which addressed the 37 submissions made on the EIS was finalised on 31 August 2007.

This Report has been prepared pursuant to s.35 of the SDPWO Act to evaluate the environmental effects of the Project.

Having regard to the documentation and information provided during the EIS process for the Hinze Dam Stage 3 Project, I am satisfied that the requirements of the Queensland Government for impact assessment in accordance with the provisions of Part 4 of the SDPWO Act and Part 5 of the *State Development and Public Works Organisation Regulation 1999* (SDPWO Regulation) have been met.

I have determined that the Gold Coast City Council, working in partnership with the Hinze Dam Alliance, has achieved this requirement as demonstrated by information provided during the EIS process. During this process the key matters the project will affect have been identified and investigated. Impact management strategies and procedures that include quantitative measures for air and water quality, noise impacts and vibration from blasting have been developed.

The proponent has demonstrated responsiveness to the need to manage and reduce impacts, from developing an extensive Compensatory Habitat Strategy to mitigate impacts on over 318ha of remnant vegetation that will be inundated as a result of the dam upgrade, to various mitigation methods and harm-minimising procedures enshrined within the EIS, Supplementary Report to the EIS (SREIS) and construction Environmental Management Plans (EMP).

I am satisfied that the EIS process has provided sufficient information to all stakeholders to allow for a considered evaluation of the potential environmental impacts that could be attributed to the project. It is my view that there are no insurmountable issues that would prevent me from recommending that the project proceed.

It is therefore recommended that the proposed development of the Hinze Dam Stage 3 Project proceed, subject to a decision on the project by the Commonwealth. I further recommend the conditions and recommendations as included at Appendix 1 of this report will apply to the project.

These conditions and recommendations may be applied in accordance with the following provisions of the SDPWO Act:

- Section 39, 'Application of Coordinator-General's report to IDAS'
- Section 43, 'Application of Coordinator-General's report to Designation'
- Section 52, 'Application of Coordinator-General's report to other approval process'
- Section 54B, 'Report may impose conditions'.

This report will now be provided to the Commonwealth Minister for the Environment and Water Resources, pursuant to section 17(2) of the SDPWO Regulation, to enable a decision on approval of the controlled action for this Project pursuant to section 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

A copy of this report will be provided to the proponent and concurrence agencies for relevant approvals, and will also be made publicly available on the Department of Infrastructure and Planning's website, at www.infrastructure.qld.gov.au.

I would like to take this opportunity to thank all individuals, organisations and advisory agencies that have contributed to the EIS process by providing submissions on the EIS and SREIS. This input has contributed to the development of appropriate and reasonable conditions that are to apply to the project to ensure best practice. I would particularly like to thank advisory agencies for their prompt, informed and considered responses to my requests for advice, information and input which has greatly assisted the timely completion of this report.

Colin Jensen
Coordinator-General
Acting Director-General
Department of Infrastructure and Planning

/ October / 2007

1. Introduction

1.1 Environmental impact assessment requirements under Queensland legislation

On 20 October 2006 the Coordinator-General declared the Hinze Dam Stage 3 Project to be a Significant Project pursuant to section 26 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). The Coordinator-General further determined that it was a Significant Project for which an Environmental Impact Statement (EIS) was required to be prepared and assessed.

1.2 Environmental impact assessment requirements under Commonwealth legislation

As decided by the Commonwealth Minister for the Environment and Water Resources, the project is a 'controlled action' under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The EIS process has been undertaken in accordance with requirements of the bilateral agreement between the Commonwealth and Queensland State Government which accredits Queensland's assessment process for significant projects under the SDPWO Act. Therefore the EIS was required to address both State and Commonwealth matters.

1.3 Environmental impact assessment documentation

This Report is prepared in accordance with section 35 of the SDPWO Act to evaluate the environmental effects of the project and any other related matters.

In preparing this report information contained in the EIS and the Supplementary Report on the EIS (SREIS) has been assessed. In addition, all properly made submissions on the EIS as provided to the Coordinator-General; comments on the SREIS from Advisory Agencies, stakeholders and members of the public; matters raised in correspondence with the proponent, State and Commonwealth agencies and local Government; legal and independent advice and other materials relevant to the project have been considered.

2. Project details

2.1 The project

The Hinze Dam is located approximately 15km South West of Nerang on the Nerang River in South East Queensland. It supplies the majority of the water needs for Gold Coast City, a rapidly growing and productive urban area.

In addition to being a major water source for the region, the Hinze Dam catchment provides significant and measurable benefits to the community through flood mitigation, environmental protection, tourism and recreation. The Hinze Dam was initially completed in 1976, and upgraded to the stage 2 height in 1989. The dam's 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.

The project which is the subject of this report involves the augmentation of the existing Hinze Dam to the structure's Stage 3 height.

Based on the adopted design option, the Hinze Dam Stage 3 Project proposes the raising of the Hinze Dam embankment by 15 metres from 93.5 metres to 108.5 metres, raising the Full Supply Level by 12.3 metres to 94.5 metres. This will increase the dam's capacity to over 309,700 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 early works such as establishment of site offices, crib (lunch) rooms, and a security fence; preconstruction activities such as establishment of storage, stockpile and lay down areas; core construction activities associated with upgrades to the embankment, spillway and intake towers; establishment and operation of quarry activities to provide construction materials; establishment of construction roads; clearing of vegetation in the increased 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.

Subsequent to a decision on the project by the Commonwealth pursuant to the *Environment Protection and Biodiversity Conservation Act 1999*, construction could commence in November/December 2007 and continue until December 2010.

Construction work will be limited to the hours of 6:30am to 6:30pm Monday to Friday. One Saturday each month, work will be undertaken between 8am and 6:00pm. No work will be undertaken on Sundays or public holidays. An evening maintenance shift in the workshop is proposed from 3pm to midnight.

The project's Target Out-turn Cost (TOC), including TOC development, as approved by Gold Coast City Council in May 2007, is $395 million. An anticipated 1,451 direct and indirect employment positions will contribute to the project's development and construction phases. The construction workforce will peak at approximately 240 people between April 2008 and August 2009.

All earthworks will be completed on site with a quarry and borrow pit, together with a crushing plant to be established within the project area. The crushing plant will also produce aggregate for use in concrete production. This will greatly reduce the amount of material required for earthworks purposes that will need to be imported to site. Fine materials such as sand, fly-ash and cement will still need to be transported in.

The EIS provides that for the total duration of the project, approximately 128 vehicle trips will be made to site to deliver and remove equipment such as excavators, trucks, cranes, a scraper, a barge, form work and site offices, with 31 of these trips being for oversize loads of indivisible construction equipment. These oversize trips may be escorted depending on the items being transported.

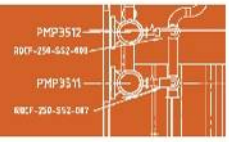
In addition, a maximum of eight vehicle trips per day (four in and four out) will be made to transport construction materials that are not able to be sourced on site. Four service vehicle trips each day (two in, two out) for postal deliveries, Council waste removal trucks and canteen and office supplies deliveries are anticipated.

The construction workforce will create additional traffic to and from site equating to approximately 200 light vehicle trips per day and 34 heavy vehicle trips per day. These numbers take into account a proposal by the proponent to make available a shuttle bus service to transport construction personnel to and from the site twice a day during peak hours.

2.2 The proponent

The project's proponent is the owner of Hinze Dam, the Gold Coast City Council. The Council is delivering the project as part of an Alliance arrangement whereby it is working in partnership with Theiss, SKM and URS within the Hinze Dam Alliance to deliver the project.

Alliance members such as SKM have made substantial inputs into the development of the EIS documents. For ease of discussion in this document, use



of the term 'the proponent' refers to the Hinze Dam Alliance, which incorporates Gold Coast City Council as the project owner.

The Queensland State Government is currently undertaking reform of water infrastructure asset ownership in South East Queensland, which currently is expected to eventually result in the Hinze Dam being transferred to a state-owned authority. The timeframes for this process, and a decision on at what stage the project will be transferred, have not yet been formalised.

Should Gold Coast City Council no longer be the proponent for the project prior to construction end, the new proponent would, where necessary, need to seek approval from the relevant statutory administrators to transfer relevant project approvals and permits to reflect the changed ownership arrangements. In order to ensure the project was compliant with local, state and federal laws, a review of approvals that the project is currently exempt from requiring (due to the Council's status as a local authority) would also need to be undertaken.

2.3 Project rationale

Gold Coast City Council has developed the project to achieve the following outputs:

1. Additional water supply. Upgrading the dam's Full Supply Level from 82.2 Australian Height Datum (AHD) to 94.5 metres AHD will increase the dam's yield by at least an additional 16 million litres a day.

   The project's completion date and increase in yield are mandated within the *Water Amendment Regulation (No.6) 2006*, otherwise known as the 'water emergency regulation'.

   Within this regulation the project is listed as a drought contingency measure which, as one of a suite of 26 infrastructure projects and initiatives being undertaken by local and state government departments and corporations, will contribute to ensuring adequacy of water supply for the South East Queensland region.

2. Flood mitigation. The project will provide for an additional 79,000 million litres of flood storage, achieving greater flood mitigation for properties downstream of the Dam. Currently 4,441 properties downstream of Hinze Dam could be affected in a 1 in 100 year Average Recurrence Interval (ARI) flood event. The effect of raising the dam in respect to flood mitigation is a reduction of 1 in 100 year ARI flood impacts on 3,284 properties.

3. Dam safety. The dam's current structure is not compliant with recently revised dam safety guidelines (*Guidelines on Acceptable Flood Capacity for Dams* (DNRW 2007c)). While inherently safe, the new standards relate to the structure's capability to pass a Probable Maximum Flood (PMF) event without overtopping the dam crest. The proponent has been provided by the Department of Natural Resources and Water until 2015 to make the structure compliant, therefore substantial works to the dam's embankment and spillway must occur.

3. The impact assessment process

3.1 Declaration as a Significant Project and Controlled Action

On 20 October 2006 the Coordinator-General declared the Hinze Dam Stage 3 Project to be a Significant Project pursuant to section 26 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act) for which an Environmental Impact Statement (EIS) was required.

On 22 December 2006 the proponent referred the project (reference 2006/3211) to the Commonwealth Minister for the Environment and Heritage for a decision on whether the project constituted a controlled action under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

On 16 January 2007, the Minister for the Environment and Water Resources[2] determined that the project was a controlled action due to potential impacts on listed threatened species and communities (sections 18 and 18A, EPBC Act) and therefore approval under Part 9 of the EPBC Act is required before the project can proceed.

3.2 Terms of Reference for the Environmental Impact Statement (EIS)

The Coordinator-General publicly invited comments on the draft Terms of Reference (ToR) for an Environmental Impact Statement (EIS) from 26 February 2007 to 28 March 2007. Submissions received were considered and incorporated into the finalised ToR which were provided to the proponent on 25 April 2007.

3.3 The EIS and Supplementary Report to the EIS (SREIS)

An EIS was prepared by the proponent and following a review process whereby the Coordinator-General determined that it substantially addressed the ToR, was advertised in The Courier Mail and The Australian on 9 June 2007 and provided to

[2] Formerly the Minister for the Environment and Heritage.

Advisory Agencies. The Coordinator-General invited the public and Advisory Agencies to provide submissions on the document from 9 June to 9 July 2007.

The proponent subsequently prepared a Supplementary Report on the EIS (SREIS) to address comments received on the EIS. The SREIS was submitted to the Coordinator-General on 21 August 2007 and distributed to advisory agencies and members of the public who provided a submission on the EIS. An addendum to the SREIS was subsequently issued by the proponent and distributed to SREIS recipients on 31 August 2007.

3.4 Public consultation on the project

The proponent conducted an extensive and dedicated public information and consultation program throughout the EIS process, as documented in Volume 1 of the EIS.

Consultation has included activities such as:

- formation of and regular meetings with a Community Advisory Committee (CAC) with representation including interest groups and members of the public;
- a series of design and optimisation workshops involving Gold Coast City Councillors and CAC members;
- public and concept design and project information displays;
- newspaper advertisements, media releases and letter drops;
- conduct of community information briefings, feedback sessions and onsite meetings;
- individual consultations with property owners, interest groups and individuals;
- stakeholder and government agency briefings;
- a Hinze Dam Alliance community liaison officer based at Hinze Dam and available to the community to discuss project matters and issues; and
- a free-call project information available via the Gold Coast City Council (GCCC) 1300 contact line and online information available via the GCCC website.

3.5 Public review of the EIS

The EIS was advertised in local, state and national papers on 9 June 2007 with public comment on the document invited from 9 June to 9 July 2007.

Hard copies of the EIS were made available at five local public libraries, the Gold Coast State Development Centre and two Gold Coast City Council administrative centres. Public display points were staffed by the proponent at various times and a public information meeting was conducted on the document. While the EIS was made available online, hard copies of the document were able to be purchased from the proponent for $100. CD copies were made available for no charge.

The EIS was distributed by the Coordinator-General to the following government agencies[3] for review and a response on the document was requested:

- (Commonwealth) Department of the Environment and Water Resources
- Queensland Water Commission
- *Environment Protection* Agency
- Department of Natural Resources and Water
- Department of Primary Industries and Fisheries
- Department of Main Roads
- Queensland Transport
- Queensland Police Service
- Department of Emergency Services
- Department of State Development
- Department of Local Government, Planning, Sport and Recreation
- Department of Industrial Relations
- Queensland Health

3.6 EIS public review outcomes

A total of 37 responses to the EIS were received by the Coordinator-General during and after the end of the public review period. Appendix A of the SREIS documents the names of advisory agencies, organisations and individuals that made submissions on the EIS.

An additional submission by an advisory agency and two secondary submissions by local residents were made subsequent to finalisation of the SREIS, which, while not included in the SREIS or the numbers detailed below, have been considered in the making of this report. In response to my request on the matter, the proponent

[3] Note that due to Machinery of Government changes subsequent to events described in this report, some agencies' names now differ.

provided additional information on these late submissions where required. The responses from the proponent have also informed this report.

Submissions were received from the following groups:

Submitter	Submissions
Government (Federal and State) advisory agencies	9
Community, environmental organisations	3
Gold Coast City Council employees	3
Private individuals or companies	22
Total	**37**

Key issues raised in submissions in relation to the project's construction phase were:

- Dust impacts on air quality and domestic water tank quality
- Construction noise impacts
- Vibration issues due to quarry blasting
- Loss of vegetation and habitat
- Impacts on threatened species
- Compensatory habitat strategy
- Fish passage and fish impacts
- Construction traffic impacts due to closure of upper Gilston Road and permanent closure of the dam wall access road
- Construction of an alternate access route to avoid construction traffic using Advancetown Road
- Construction hours
- Dam safety; general safety issues such as fire hazard due to cleared vegetation
- Ancillary road upgrades works impacts on fauna and flora
- Impacts on local businesses
- Potential negative impacts on property values due to construction activities and/or duration
- Compensation for nearby landholders (due to land devaluation; noise impacts; amenities loss)
- Sources of construction materials
- Land impacts
- Erosion
- Water storage quality impacts
- Requests from advisory agencies for further information related to development approvals.

These issues are addressed either individually or collectively in Sections 4 and 5 of this report, and in conditions placed on the project in Appendix 1. For ease of reference, mention of 'EIS' in this report may refer to either the EIS document or the Supplementary Report to the EIS (SREIS).

3.7 Stakeholder review of the Supplementary Report on the EIS (SREIS)

All submissions received by the Coordinator-General on the EIS were provided to the proponent for consideration. In some cases, where submissions raised major concerns or queries, the Hinze Dam Alliance contacted respondents directly to further discuss input received.

A Supplementary Report on the EIS (SREIS) was subsequently produced to address issues raised. The SREIS was provided to the Coordinator-General on 21 August 2007 and the first available print quota was distributed on the same date to advisory agencies and was made available on the websites of the Coordinator-General and Gold Coast City Council.

An addendum to the SREIS was subsequently issued and sent to all respondents to the EIS by the Hinze Dam Alliance on 31 August 2007. The addendum was issued largely to address numbering errors on diagrams and errors in cross-referencing of submission issues to relevant document sections.

Advisory Agencies were invited to comment on the SREIS and to provide specific advice to the Coordinator-General to be considered for inclusion as conditions or recommendations in this Report. Comments from Advisory Agencies were initially requested by the close of business on 4 September 2007, however due to the issue of the addendum to the SREIS, negotiations were made to provide additional time for key agencies to finalise suggestions for conditions to be made on the project.

Agency responses to the SREIS were forwarded to the Hinze Dam Alliance for information and where necessary, additional comment, clarification or input. For example, additional traffic data were provided to the Department of Main Roads for consideration. The Hinze Dam Alliance also responded to a request for further information from the Environment Protection Agency regarding stormwater management. Similarly, the Alliance has responded to my requests to provide further information to inform conclusions reached within this report.

Additional information was provided by the proponent after release of the SREIS on matters relating to fish passage. This was provided to the Department of

Primary Industries and Fisheries and has been included at Appendix 3 of this report.

On the matter of construction traffic impacts on Advancetown Road, the proponent has also provided additional material on analysis of a potential alternative access road for potential use for both construction and operational purposes. The additional material involved construction noise modeling information. The additional material included data and findings that were discussed with local residents in the course of consultation regarding construction impacts, but not included in the SREIS. On this issue, eight members of the public who had made submissions on the EIS responded to the SREIS findings. These submissions have been considered in the development of this report.

4. Evaluation of the Environmental Impact Statement: Management of specific issues

As described in section 35 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act), this report provides an evaluation of the environmental effects of the project and places conditions and recommendations on the project for the satisfactory management and mitigation of these impacts.

The SDPWO Act defines 'environment' as including ecosystems and their constituent parts, including people and communities, all natural and physical resources, and the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community.

'Environmental effects' means 'the effects of development on the environment, whether beneficial or detrimental'. These effects can be direct or indirect, of short, medium or long-term duration and cause local or regional impacts.

The following section outlines the major environmental effects raised during the EIS process, in submissions to the EIS and in consultation with advisory agencies and other key stakeholders.

Comments have been provided on these effects and, where necessary, conditions to mitigate the impacts are provided. The requirements made in this report are intended to flag the preferred management of particular issues identified during the EIS process and to ensure a place for these matters on the public record.

The Hinze Dam Alliance is to implement these requirements in line with best practice methods to either avoid or mitigate specific impacts of the project.

In forming decisions made within this report, I have considered the following materials:

- Hinze Dam Stage 3: Environmental Impact Statement (2007) Hinze Dam Alliance, Volumes 1-4
- Hinze Dam Stage 3: Environmental Impact Statement Supplementary Report (2007) and addenda
- Comments made in submissions on the EIS

- comments from Advisory Agencies on the SREIS
- comments from individuals on the SREIS
- Additional information provided by the proponent at my request
- Advice sought from Agencies
- Legal advice
- Findings from an independent review on construction traffic.

Also considered were the following key state government policy documents, which consider the project:

- South East Queensland Regional Plan 2006–2026 (2006) Office of Urban Management, Department of Infrastructure and Planning (DIP), State Government of Queensland.
- South East Queensland Infrastructure Plan and Program 2007-2026 (2007) Office of Urban Management, DIP, State Government of Queensland
- South East Queensland Regional Water Supply Strategy — Stage 2 Interim Report (2005) South East Queensland Regional Organisation of Councils and Department of Natural Resources and Mines, State Government of Queensland
- Water for South East Queensland: A long-term solution (2006) Department of Natural Resources and Water, State Government of Queensland

The proponent has presented within the EIS a list of Commitments which is included in this report at Appendix 2. These commitments include actions beyond those required to meet statutory approvals and their implementation would enhance the mitigation of potential adverse environmental impacts made by the project. I have directed in a condition within this report at Appendix 1, Schedule D, that the commitments must be adhered to, to the best of the project's ability.

These commitments have been considered in reaching a conclusion on the acceptability or otherwise of the management of potential impacts of aspects of the Project. Where necessary, I have extended particular commitments into further conditions or recommendations which direct that the proponent is to implement and undertake specific actions in accordance with best practice environmental management.

These conditions are included at Appendix 1.

4.1 Terrestrial ecology

The EIS details that the project study area was found to support 628 species of terrestrial flora including 20 plant species listed as Endangered, Vulnerable or Rare (EVR) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and/or the (Queensland) *Nature Conservation Act 1992*.

The main habitat features within the study area are indicated at Section 9.4.3 of the EIS. The EIS notes that although a significant amount of habitat within the project study area was lost through inundation from Stages 1 and 2 of development of the Hinze Dam, relatively extensive areas of remnant eucalypt open forest and rainforest remain in the areas surrounding the dam, and provide substantial habitat opportunities for native fauna. This vegetation is reported as being in relatively good condition, however, varying levels of disturbance due to vehicular access tracks and from weeds, fire events and past logging and grazing activities were evident during field studies.

Weeds are present across the study area, in particular along the banks of the dam's Advancetown Lake (where a single species, Setaria sphacelata dominates) and in the forest communities where recolonisation of weeds (mainly lantana) has occurred after disturbance from fire.

The remnant vegetation within the study area is of significance due to its link within interconnected forests in the region. These forests include the Numinbah Forest Reserve, Springbrook National Park, Lamington National Park, Border Ranges National Park and Canungra Land Warfare Centre.

The EPA's Biodiversity Planning Assessment (BPA) for the study area shows that the majority of the vegetation surrounding the dam is classified as having regional significance. The vegetation in the south-western corner of the study area has state significance and forms part of a declared State Wildlife Corridor. The corridor provides connectivity for flora and fauna between the forests of Springbrook and Lamington National Park in the south, through Numinbah Forest Reserve to Canungra in the west.

4.1.1 Vegetation management

The project will involve the clearing of vegetation for the establishment of site infrastructure and to allow commencement of operation of the quarry and clay borrow area. Vegetation removal below the new Full Supply Level (FSL) will occur in selected areas around the dam's perimeter to ensure water quality.

The EIS provides that the overarching environmental objective in dealing with vegetation is the implementation of vegetation clearance, stockpiling, recycling or disposal practices that maximise the re-use of native vegetation and minimise environmental harm.

The EMP provides robust vegetation management strategies to minimise impacts on vegetation, ranging from identifying exclusion zones and prohibiting construction activities such as storage, vehicle parking, stockpiling or refuelling in these exclusion zones; minimising damage to retained vegetation by, in part, clearly marking these individuals; providing adequate sediment and erosion control; weed management strategies; protecting retained trees within construction zones with fences and trunk girdles and to undertake works in consultation with a qualified arborist or horticulturist.

The EIS indicates that approximately 318 ha of remnant vegetation[4] will be lost as a result of the project, with most of this impact due to the increase of the FSL. The affected remnant vegetation is comprised of six regional ecosystems listed as either Of Concern (total of 20.67ha) or Not of Concern (297.67ha)[5]. No endangered regional ecosystems are to be affected.

The affected vegetation contains mapped essential habitat and additional areas of known or potential habitat for Endangered, Vulnerable or Rare (EVR) flora and fauna species listed under the *Nature Conservation Act 1992*.

As the administering agency of the Vegetation Management Act 1999 (VMA), the Department of Natural Resources and Water (DNRW) has determined that clearing in relation to the majority of vegetation impacted by project is exempt[6] from the need to obtain a permit for Operational Works for the Clearing of Native Vegetation. The exemption arises due to the designation of the dam site (Lot 4 SP164198) as a special facilities zone under an *Integrated Planning Act 1997* planning scheme.

As indicated below, despite the existence of the exemption, I am establishing conditions that will require the vegetation of conservation significance to be addressed in a vegetation offset strategy that has been proposed by the proponent.

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[4] & [5] As per the definition provided in the *Vegetation Management Act 1999*

[6] Pursuant to Section 74 of the *Vegetation Management Act 1999*

The exemption does not apply to some smaller areas affected by the dam's new FSL at the southern-most edges where the inundation will eventually extend outside of Council land and on to state land and the Numinbah Forest Reserve.

The relevant areas outside Lot 4 SP164198 will not be impacted until construction of the dam is completed and the water impoundment area expands to the new FSL level after 2010. This provides approximately 2 years for the details of these aspects of the offset arrangements to be refined and agreed to prior to the project's completion. The proponent and DNRW have agreed that the VMA application process should commence in 2008 and the dam will not be able to be operated at its new FSL level until the offset strategy is finalised to the satisfaction of DNRW.

I note that the Environment Protection Agency (EPA), the administering authority for the Numinbah Forest Reserve, is being consulted in the establishment of a suitable offset to replace the impacted vegetation located within the reserve. The offset area will be sourced from the southern portion of the dam site within Lot 4 SP164198, which is adjacent to the Numinbah Forest Reserve, or an alternative area that may be proposed by the proponent with similar conservation significance. The final proposal will need to be approved by EPA.

Compensatory Habitat Strategy

In order to mitigate the loss of over 300 hectares of vegetation and habitat for native fauna, the proponent has committed to a Compensatory Habitat Strategy to offset the project's core environmental impacts. The proponent has also committed to finalising the Strategy's detailed implementation arrangements in consultation with key government agencies.

The compensatory habitat strategy will involve the following key elements:

1. Identification, purchase and protection of privately-owned land that contains, or has the potential to support, significant flora and fauna species and threatened regional ecosystems.

2. Restoration and rehabilitation of key riparian vegetation within the Nerang River valley. In addition to investigating new initiatives that could be undertaken at strategic locations within the area, existing restoration programs that are performing well may also be co-funded and resourced to enhance outcomes.

3. The translocation and propagation of flora species of National Environmental Significance (NES) will also be included in the compensatory habitat strategy.

I have conditioned at Appendix 1 that the areas to be addressed by action 1 and 2 above must collectively total at least 318 ha.

The proponent proposes to develop species-specific translocation plans and area-specific rehabilitation plans for the newly acquired 'offsets' sites, the Nerang River catchment rehabilitation areas, and the translocation sites.

The EIS indicates that the compensatory habitat strategy will complement procedures included in the construction Environmental Management Plan (EMP) for the management of weeds and fire for the retained habitats to ensure best environmental outcomes.

The proponent has committed that areas containing significant flora species listed under the EPBC Act in the path of the new FSL will not be cleared with machinery. This vegetation will be subject to inundation post-construction, which will protect flora individuals outside the increased FSL from possible impacts of nearby construction works. I support this approach as minimising unnecessary environmental harm.

Recommendations and Conditions provided in Appendix 1, Schedule D, provide requirements for the Compensatory Habitat Strategy, stakeholder involvement and timelines for its completion and development.

A submission made on the EIS raised concern with the loss of established trees due to clearing required to establish the clay borrow area. Planted in the late 1980s after Stage 2 of the Dam raising, three individual Crow's Ash trees have been identified as by the proponent as needing to be cleared. While the trees have no status under the *Nature Conservation Act 1992*, the proponent acknowledges in a separate response on the matter that they have significance to the community. While it is not feasible to relocate the trees, their timber will be used in an interpretative centre to be established as part of the new recreation facilities the project will complete. The proponent has undertaken to investigate planting advanced replacement specimens in a new park area which is part of the project works.

A further submission raised points regarding vegetation clearing due to a section of the proposed haul road which is not located within Council land. The proponent is currently in negotiations with the land owner to acquire a portion of the land, on which approximately 10 *Macadamia integrifolia* trees are located.

In separate correspondence where I have asked for more information on the matter, the proponent acknowledges the personal significance of the trees, but proposes that while the species is listed in State and Commonwealth legislation as rare or threatened, these particular trees are not wild and therefore have little conservation value.

The proponent has undertaken to avoid the larger of the trees in the creation of the haul road and to rehabilitate and restore the area to parkland which incorporates the remaining trees on completion of the project.

I am satisfied that the following commitments provided by the proponent are adequate to address impacts on established vegetation at the northern face of project activities:

- Existing vegetation will be retained on site and only removed where necessary. In particular, a buffer should remain between the clay borrow area and Duncan Road.
- Rehabilitation of the quarry and clay borrow area be completed as site works are completed. Rehabilitation will incorporate a selection of indigenous and fast growing plant species that are endemic to the site.
- The proponent will ensure that areas where vegetation is removed for construction activities that the areas are progressively rehabilitated to reduce visual impacts.

I have provided in the Conditions as placed on the project within this report at Appendix 1, Schedule D, that the proponent is bound to undertaking all commitments as included in Appendix G of the EIS.

4.1.2 Fauna

The EIS provides that a total of 204 species of terrestrial vertebrate fauna were recorded in the project area, including 17 amphibians, 23 reptiles, 131 birds and 36 mammals. The following eight EVR fauna species were confirmed as present during study area field investigations:

- Giant Barred Frog (*Mixophyes iteratus*);
- Grey Goshawk (*Accipiter novaehollandiae*);
- Glossy-black Cockatoo (*Calyptorhynchus lathami*);
- Red-browed Tree-creeper (*Climacteris erythrops*);
- Sooty Owl (*Tyto tenebricosa*);
- Tusked Frog (*Adelotus brevis*);
- Koala (*Phascolarctos cinereus*);
- Grey-headed Flying Fox (*Pteropus poliocephalus*) (also a listed species under the EPBC Act); and
- Brush-tailed Rock Wallaby (*Petrogale penicillata*) (also listed under the EPBC Act).

The proponent acknowledges that the main risks to fauna will occur during site establishment clearing and resultant potential risks of erosion and weed

establishment; and direct and indirect impacts due to loss of approximately 318ha of remnant vegetation resulting from the increased FSL.

To minimise construction impacts on fauna, the proponent proposes a number of measures including the following, which are contained in the draft construction Environmental Management Plan (EMP):

- fauna inspection by a qualified fauna spotter will be conducted prior to construction and clearing activities
- flushing of denning fauna by a qualified spotter prior to construction
- works in progress to be halted if native fauna is present until the spotter is able to safely relocate the animal
- careful planning in order to minimise the amount of land cleared
- vegetation to be retained wherever possible, and retained vegetation, including that with occupied nesting hollows, to be clearly marked
- injured fauna to be immediately taken for treatment at an approved Fauna Rehabilitation Unit
- limiting travel around the construction area to onsite vehicles only allowed to travel within the defined construction areas and on the dedicated haul roads.

With regard to indirect impacts to fauna related to tree clearing, the draft EMP provides measures including the following:

- trees inspected by qualified arbourist/ecologist with a view to retaining trees wherever possible
- exclusion zones around trees suitable for retention
- Flushing of animals prior to construction works
- staged removal of habitat trees, with smaller habitat trees cleared 3-5 days prior to larger habitat trees, providing fauna with a disturbance stimulus to minimise human intervention in relocating fauna
- fauna-responsive removal of tree hollows for fauna that cannot be relocated, with fauna placed elsewhere where it would be safe for them to relocate
- a number of dead trees, particularly those with hollows, to be left in the area for habitat purposes
- remaining hollow logs not to be mulched until thoroughly inspected by ecologist
- Well defined construction areas with tape and markers, and clearing areas to be discussed during site walks with management prior to works commencing
- rehabilitation measures taken once construction is complete
- use of approved seed mix to avoid the introduction of weeds

- preferring pushing of trees during felling, and onto other felled trees to minimise harm to occupying fauna not detected during pre-clearing
- environmental training of appropriate personnel regarding EMP requirements on fauna and flora management.

Submissions received on the EIS mentioned concerns with impacts of ancillary road works associated with the project on the Tusked Frog, a species listed within the Nature Conservation Act as vulnerable, that has habitat in the little Nerang Creek situated near one point of the upgrade works.

While the EIS states that no habitat of the Tusked Frog will be lost due to the works, the proponent has undertaken to ensure procedures are in place to ensure all plant, equipment, vehicles and shoes of contractors working at the Little Nerang Creek site must be sterilised to prevent the spread of Chytrid fungal disease. All activities on site will be consistent with the NSW National Parks and Wildlife Service Hygiene protocol for the control of disease in frogs.

In addition, the proponent proposes that Environmental Management Plans will be developed for all works adjacent to Little Nerang Creek to prevent increased sedimentation, erosion, weed invasion and nutrient and chemical pollution. Also, if possible, construction works should be completed outside of the breeding season of this species to reduce potential impacts on breeding dispersal movements.

Comments in submissions were also received on the project's impacts on avifauna such as butterflies and the Glossy-black Cockatoo. The SREIS provides detailed response on mitigation measures for these species and I am satisfied with the response provided, which is based on mitigation measures listed in dot points on the previous page as well as the intent to undertake a targeted response to species-specific beneficial revegetation within the Compensatory Habitat Strategy, which is conditioned within this report.

In the submission received from the EPA, comment was made on the need to ensure procedures take account of possible impacts on koalas due to construction activities. Conditions included at Appendix 1, Schedule D provides specific measures to mitigate effects on this species.

In terms of practical mitigation measures that will be undertaken by construction personnel, I am satisfied that the strategies contained within the EMP for managing impacts on fauna due to construction activities are extensive and practical measures that actively seek to reduce and/or remove the occurrence of harm, and I provide that the commitments related to fauna management which underline the intent of the proponent to minimise impacts, are to be adhered to.

Conditions included at Appendix 1, Schedule A, C & D provide how impacts to fauna will be managed and mitigated.

4.2 Aquatic ecology

While there are many important factors to be taken into consideration in assessing dam projects, determining aquatic ecology impacts and related suitable mitigation measures tends to represent one of, if not the most, challenging matters to resolve in relation to dam projects. This is certainly the case in this instance.

Through the course of the EIS process, the Department of Primary Industries and Fisheries (DPI&F) and the proponent have effectively engaged in a rigorous and thorough debate about the facts, circumstances and interrelationships affecting ecological processes within the Nerang River and about how available data should be interpreted. All of the people that have been involved should be commended for their dedication to consideration and attempting to resolve these important matters in a constructive manner.

The debate and examination was conducted through meetings between the two parties, written exchanges of information and viewpoints as set out within the EIS, SREIS, submissions and related correspondence. The post-SREIS correspondence is included within Appendix 3 of this report. As a result, of these exchanges of information, I observe that there a number of important points of fact and/or opinion that are not being contested by DPI&F or the proponent.

The important non-contested points, relating to present conditions and impacts of the proposed dam raising, are as follows:

- The construction of the Hinze Dam in 1976, along with other developments, has substantially modified and separated the natural habitats within the Nerang River;
- There is no ability for fish to move upstream from below the dam wall to access the good condition habitat areas in the upper reaches of the Nerang River;
- The habitat upstream of the dam remains in good condition;
- In a general sense, the habitats downstream of the dam are in poor condition due to a number of factors, only some of which relate to the presence of the dam (other factors largely relate to the urban development and water diversions);
- Downstream riparian zones and aquatic macrophyte communities are characterised by the presence of pest species, with large numbers of exotic fish species being encountered and thick mats of algae visible on stretches of the river surface;
- Historical factors and the community consultation and scientific assessment processes as part of the development of the Gold Coast Water Resource Plan 2006 (WRP) have led to the mandating of an environmental flow

release of 7.25ML of water per day from the Hinze Dam and the release will be maintained into the foreseeable future with or without the dam raising;

- While no protected flora or fauna species, listed under, and protected by, State and Commonwealth legislation, have been found in surveys conducted during the EIS process, two State-listed species are assumed to be present;
- Up to approximately one dozen fish and eel species would be likely to benefit from measures that would enable passage from the downstream side of the dam wall to the upstream side;
- Prior to any consideration of mitigation measures, the raised dam is likely to drown some further important riparian vegetation and marginally decrease the opportunities for the downstream movement of fish and eels as a result of spill events (i.e. times when flood waters flow over the dam's spillway);
- The impact mitigation measures being proposed by the proponent are expected to improve ecological conditions relative to the existing situation largely because there is to be a net gain in terms of the quality and quantity of important riparian vegetation and upstream fish passage is to be made possible, from the area below the dam, for the first time since 1976.

Section 3.5.2 of the EIS and Section 3.9, Appendix E of the SREIS provide a detailed explanation of the key design criteria and about how the trap and transfer system will operate. Section 3.9 of the SREIS explains how riparian vegetation impacts are to be offset.

DPI&F and other respondents to the EIS raised concerns with the potential fish-related impacts associated with the amount of riverine habitat that will be lost through inundation of upstream waterways. The SREIS confirms that approximately 40ha of riparian vegetation will be inundated. This area largely consists of Queensland Blue Gum and Flooded gum open forests and woodlands.

The proponent has undertaken to provide offsets for riverine habitat impacts as part of the Compensatory Habitat Strategy. The SREIS provides that the offset area is likely to be comprised of the management and/or rehabilitation of riparian habitats upstream from the Dam. Conditions provided in Appendix 1, Schedule D provide for this issue.

The EIS indicates the key criteria for the fish transfer system are:

- the entire environmental flow of 7.25ML/day, after passing through the on-site hydro-electric plant, is available to facilitate fish transfer;
- the fish transfer system is to be designed to accommodate fish sizes ranging from elvers each weighing a few grams up to occasionally large eels of up to 1 metre or greater in length;
- the fish transfer system design and operation is to be flexible to accommodate potential variation in the number of fish to be transferred; and

- fish trapping and transfer facilities are to be operable for floods up to the 1 in 20 year Annual Exceedence Probability (AEP) flood.

The important essentially non-contested points, relating to measures that are likely to improve ecological conditions in the Nerang River, are as follows:

- A trap and transfer method is to be implemented to enable upstream fish passage and that this approach is the best available option on the basis of considerations such as the configuration of the existing dam, design practicalities, construction and operational costs, flow patterns and the characteristics and needs of the species that are expected to benefit from upstream movement;
- While examples of the use of this method of enabling fish passage is limited in Australia, it is used extensively and successfully in North America;
- While DPI&F initially had concerns about the trap and transfer method, upon further consideration of factors, such as the established spillway and outlet design configurations, the proponent and DPI&F both have effectively concluded that there are valid reasons in this case for departing from DPI&F's position of general opposition to trap and transfer and preference for structural fishways;
- Sufficient ongoing staffing and maintenance commitments to enable the effective operation of the transfer system will need to be maintained for the life of the dam structure;
- A design and operation optimisation process of approximately 18 months duration will need to be implemented jointly by the proponent and DPI&F following the construction and commissioning of the transfer system.

I consider that there is one remaining point of substantive disagreement between the proponent and DPI&F.

This disagreement relates to the need for a specific downstream fish transfer mechanism, similar to the upstream system, which will provide for downstream transfer opportunities in addition to those provided by spill events.

DPI&F is not contesting the need for the raising to proceed but it has advised me to essentially mandate the development of a downstream transfer system, subject to the collection and analysis of data over a period of approximately 3 years.

I note that within its responses to the EIS and SREIS, DPI&F that has indicated that its policy in regard to fish passage over high structures is to facilitate both upstream and downstream fish passage. I understand that this position is largely underpinned by a view that definitive data does not exist to indicate with any certainty whether a downstream fish passage system would or would not have a substantive positive impact on aquatic species.

I accept that this is a valid position for DPI&F to take given its responsibility and specific focus on promoting benefits for fisheries. However, I am persuaded, on the basis of the proponent's explanations and analysis, that there is a high probability that mandated investments in a downstream passage system would not generate any material gains from an ecological perspective. In addition, in the absence of a soundly based estimate or reasoned analysis of likely benefits, the imposition of an open-ended, imprecisely-specified and potentially costly condition could be reasonably considered to be an impractical burden on the proponent and current and future owners of the dam. I cannot identify any strong basis to support an expectation that the absence of any such condition (i.e. mandating a downstream passage system) would cause a material deterioration in fish or eel populations relative to the current situation.

I am of the view that the information provided by the proponent in the EIS, the SREIS and the correspondence within Appendix 3, provides compelling reasons to support the Alliance's commitment to only providing an upstream fish passage system.

The Alliance has established a case that a downstream fish transfer facility is not feasible/desirable for the following reasons:

- Studies undertaken in the course of the environmental impact assessment process demonstrate that downstream fish passage is not required to sustain the fish population dynamics in the Nerang River system which, due to the existing dam, urbanisation and water draws by users downstream of the dam, in a degraded and constrained condition.
- The raised dam will not significantly modify the flow regime in the river below the dam.
- Investigations indicate current legislated environmental flow releases from the dam at 7.25 ML/day are not sufficient to operate a downstream passage device successfully.
- Additional releases are not within the parameters of the existing Gold Coast Water Resource Plan 2006 (WRP) and could compromise the additional water supply as required to be provided by the project within the *Water Amendment Regulation (No. 6) 2006*.
- Investigations by the Alliance and scientific experts working for the Alliance, indicate alternate methods for downstream fish passage involving the development of attraction flows within the impoundment to simulate dam releases have had limited success in dams of similar size in Australia and America and are expensive to construct and operate. Similar types of facilities in the USA have been found to be inefficient and costly to operate and are still largely considered experimental in nature many years after they were implemented.

My conclusions on this matter have been re-enforced by a consideration of the credentials of the scientific experts commissioned by the alliance to analyse the above matters and provide expert advice and opinion during the EIS process and in relation to the construction and operation of any necessary fish transfer systems. I understand that these experts are recognised by DPI&F and others as pre-eminent specialists in the relevant fields.

The credentials of these experts, in summary, include:

- leadership in the field of fish passage, including fish migrations and fishways technology, for over 20 years;
- involvement in the design of 30 new fishways in New South Wales and Queensland;
- leading roles in a range of important fish-passage innovations including the development and testing of vertical-slot, rock-ramp, Denil and lock fishways specific to Australian conditions;
- being at the forefront of key scientific and technical debates in Australia that resulted in acceptance of the critical importance of fish passage in managing freshwater environments and freshwater fisheries;
- holding esteemed positions such as the Head of the Environmental Hydraulics and Fisheries Engineering Program for the United States Bureau of Reclamation (USBR);
- 25 years-plus of experience in researching, designing and field monitoring of upstream and downstream fish passage and design of entrainment protection structures.

On the basis of my conclusions as explained above, the conditions provided by the Coordinator-General to be attached to the development approval(s) granted by the Assessment Manager(s) under the *Integrated Planning Act 1997* are as detailed in this report at Appendix 1, Schedule B.

I am satisfied that the conditions included in this report on this matter will improve the ecological conditions in the Nerang River. I further recommend that these conditions must be applied, where applicable, in accordance with the following provisions of the SDPWO Act:

- Section 39, ‘Application of Coordinator-General’s report to IDAS’
- Section 43, ‘Application of Coordinator-General’s report to Designation’
- Section 52, ‘Application of Coordinator-General’s report to other approval process’
- Section 54B, ‘Report may impose conditions’.

4.3 Construction traffic and road impacts

Traffic issues were at the forefront of matters raised within submissions made on the EIS by local residents, particularly regarding use of the local road network by construction traffic. Quite reasonably, people living in the vicinity of the proposed construction activities have significant concerns that their rural-residential amenity will be disrupted for a considerable duration, given the project's construction phase will be undertaken over a three-year period.

Current conditions

The current access to the Hinze Dam is via two roads, Gilston and Advancetown Roads, which, combined with the Spillway Road that runs over the dam embankment, provide 'loop' access. The state road Nerang-Murwillumbah Road passes near to the site with mostly privately-owned land fronting it. Advancetown Road, which connects to the Hinze Dam, intersects with the Nerang-Murwillumbah Road. This intersection has recently been upgraded by the Department of Main Roads with slip lanes and improved site distances introduced.

Advancetown Road is fronted by private property until it intersects with the Gold Coast Council Hinze Dam property boundary. This road continues within the Dam site and ultimately intersects with the road that traverses the dam wall (Spillway Road).

On the eastern side of the dam wall the road links with Gilston Road which, in turn, travels to the north to intersect with Nerang-Murwillumbah Road. Advancetown Road is currently used by local residents, Gold Coast City Council's operation and maintenance personnel, people using the dam for recreational use, and local residents using the loop road as a short-cut alternative to other local roads.

Proposed changes to local road network

The proponent is proposing to make the following changes to the dam access network:

- Spillway Road has previously been available for public use, however due to the raising of the embankment by 15 metres, the proponent is proposing to close it to public vehicles. Bikes, pedestrians, emergency and service vehicles will still be able to use this road.

- The proponent is proposing to close off Gilston Road where it enters Council land. It is deemed not feasible to make a road connection between the upgraded Spillway Road and Gilston Road as the gradients would exceed standards for safe vehicle use. Gilston Road will be able to be used

by the community to access a new recreational bike and walking track area to the east of the embankment that will be constructed as part of the project works.

- Upgrade of Advancetown Road to allow safe use by construction vehicles such as B-double trucks. The intended upgrade includes widening on some horizontal curves (curves that change the alignment or direction). No change is planned for the vertical curves (those that change the slope). The proponent provides that all private property access to Advancetown Road will be examined to ensure each access point is safe and works performed if required. A part-way footpath will be installed to provide safe passage for residents. Special liaison with business owners such as an equestrian centre will be undertaken to ensure safety and minimise disruption.

  The upgrade is to be designed to meet current design standards such as Austroads guides, Queensland Department of Main Roads Design Manuals, and Australian Standards.
- For safety reasons, access to the Dam has been closed to the public from 1 October 2007 until construction completion.

Advancetown Road construction traffic use

The SREIS states that the weekend peak on Spillway Road is access made by 975 vehicle trips[7] per day, whilst the weekday peak is 449 vehicle trips per day (based on a 7 day count). The report also states that the current traffic on Advancetown Road is 337 vehicle trips per day (based on a 1 day count).

I understand that Advancetown Road is in a relatively sound condition with a pavement width of approximately 7 metres with 1 metre shoulders. It has a 60kmph speed limit.

The SREIS provides that daily traffic along Advancetown Road is expected to increase by approximately 55 vehicle trips per day.

In addition to road improvements discussed at dot point 3, above, the proponent provides the following commitments to minimise impacts on Advancetown Road due to construction traffic:

- To reduce construction traffic in the Gilston and Advancetown areas the Proponent will operate a bus service to shuttle the construction work force between the construction site and key transport hubs on the Gold Coast. Four trips a day (two in; two out) will be provided during peak hours.

[7] Refers to each vehicle pass past a point of measure – i.e. one car driving in and out would equate to two vehicle trips. Due to the measure however, one vehicle might make multiple passes past the measure point.

- Prior to construction commencing a safety audit of transport routes will be undertaken and works undertaken to ensure the safe passage of construction vehicles (eg raising overhead wires, local road widening).
- An education program will be implemented for the workforce to raise and maintain awareness of issues safety and courtesy issues within the local community. Topics will include speed and minimising noise.
- As part of the Construction Communication Program a system of complaint reporting, investigation and response will be initiated allowing the local community the opportunity to provide feedback on traffic and safety issues.

An undertaking has also been made to limit large construction traffic travelling to and from site along local roads to 40kmph.

Alternative access road proposal

A number of residents responded to the EIS in submissions that proposed an alternative access road be added to the project's scope of works in order to remove the use of Advancetown Road by construction traffic. Some submissions raised that an additional road would restore the 'loop' access and therefore enhance traffic safety and to provide an additional exit and entry point during times of emergency. Residents were also concerned with long-term impacts when recreational users recommenced using the dam post-construction.

The proposed alternative access would extend from Nerang-Murwillumbah Road and bisect greenlands vegetation on Gold Coast City Council property, providing access to the western side of the dam where the saddle dam, quarry and workshop are located.

The proponent considered the proposal and provided an assessment of its feasibility in the SREIS. Figure 22, page 3-106 of the SREIS provides the access route which the proponent analysed. In summary, the analysis found the following:

- Cost: approximately $5M to $6M (to standard for post-construction use)
- Time: 6-9 months to complete
- Key issues:
  - considerable drainage structures required due to topography
  - extensive clearing of vegetation (approximately 55,000 m2 to be cleared)
  - extensive earthworks (59,000 m2 material excavated).

Subsequently, an Advancetown Road resident, acting on behalf of approximately 10 other residents, made a response to the SREIS which included application to me to consider mandating that an alternative access road be provided.

The resident proposed that the road considered in the SREIS differed from that identified on a map provided in his submission on the EIS and therefore the SREIS had not adequately addressed the matter. The resident had concerns that the option chosen by the proponent was considerably longer and over more irregular terrain than the residents' option, which they perceived to be a lower cost solution.

In a response to my request for further information, the proponent provided that an analysis of a route that approximated the residents' alternative access had also been undertaken based on the same time/cost/key issues criteria of the route discussed in the SREIS. While this route option was discussed with residents at a neighbourhood meeting held between the Hinze Dam Alliance and local residents in August 2007, it was not addressed in the SREIS. The Alliance has subsequently responded that the engineered version of an alternative route was progressed within the SREIS.

Consideration of impacts: Safety, noise, dust, additional cost, environment

Further information was sought from the Hinze Dam Alliance and additional advice was requested of the Department of Main Roads and Gold Coast City Council as the managing body of local roads. I also sought an independent review of all information on the matter by an external consultant with considerable civil engineering experience in roads infrastructure.

In determining State and Local Government policy on the requirement for loop road access for a structure such as Hinze Dam, the Department of Main Roads (MR) confirmed that the department does not have a policy requirement for this type of access. Its concern is that the intersection between Advancetown Road and the state-controlled Nerang-Murwillumbah Road be adequate to safely convey traffic due to any changes that result from project use of the road.

As Advancetown Road will only be leading to the dam and therefore is not 'state significance' according to the definition of MR policy, MR advised it should remain as a local government controlled road, whether it is used as a the sole point of access to the dam or otherwise. MR have further stated that if Gilston Road is to be terminated at the entrance to the Dam, it should be re-categorised to transfer it from state control to a local council control. I am of the view that this process should occur outside of the provisions of this Report with consultation to be undertaken between MR and GCCC.

Gold Coast City Council similarly confirmed it does not have policy that requires loop access to the dam for community use. Council will require access for operation and maintenance at each side of the dam, which will be afforded by the dam access network changes discussed at the previous page.

In addition, the Department of Emergency Services (DES) has considered the proponent's undertaking that vehicular access will be provided across the dam wall and saddle dams for Department of Emergency Services vehicles. Access will also be provided to existing fire trails immediately east of the saddle dam. Therefore DES has provided that it is satisfied with the level of access that will be allowed for their vehicles by the project as described in the EIS and SREIS.

Independent review outcomes: Cost of alternative road

The independent review on this matter found that the proponent's analysis of engineering required for the access road as described in the SREIS was sound. Similarly, the cost plan applied by the proponent was found to be adequate, with the reviewer finding that the cost of $5M to be a reasonable minimum provision for the comparative alternative access road.

Safety

The SREIS indicates that the Austroads Guide recommends a minimum Level of Service (LoS) of 'C' for a rural road such as Advancetown Road. The modelling within the SREIS (page 3-99) concludes that the LoS of Advancetown Road during the construction phase (post-road modifications) will be at level 'A', and post-construction, on weekdays will be level 'A', and weekends level 'B'.

Therefore, given the design and construction of the modifications to Advancetown Road by the proponent are completed in accordance with appropriate standards, the review supported that traffic operations of Advancetown Road will meet safety standards in both the short-term and long-term.

Noise

Further information requested of the proponent by the independent reviewer on noise impacts along Advancetown Road provided that modelling undertaken on the location confirmed that noise, at the Advancetown Road properties, is anticipated to be significantly less than the permitted value (L10 18hr set at 63dB(A) for roads other than state controlled roads). The proponent advised that the output of the noise modelling was a 1dB(A) increase from 54dB(A) to 55dB(A) from pre-project conditions to the construction phase. The proponent provides that measures indicated in the EIS and SREIS to control traffic noise such as limiting use of air brakes and limiting heavy vehicle speeds to 40km/hr will actively reduce noise levels. The review noted that at 55dB(A) the human ear cannot normally detect a 3dB(A) increase.

Recommendation

The independent review concluded that there is no evidence to suggest that the use of Advancetown Road as the sole access for both construction and permanent traffic post-construction will not meet road safety standards and dust and noise standards. There will be a slight increase in noise for Advancetown Road residents, but this increase does not exceed contemporary standards for roads of this type. In respect of noise the increase is small and is unlikely to be detected by the human ear (subject to the restrictions on trucks detailed in the SREIS being instigated).

The review concurred that an alternative access road would reduce the impact on Advancetown Road residents due to construction traffic. However further information provided by the proponent confirmed that impacts to flora and fauna for the new road would be significant, with the removal of between 44,000 and 55,000 square metres of trees fragmenting a section of intact remnant vegetation with known koala and Glossy Black Cockatoo[8] populations, and due to subsequent road mortality impacts.

The review concluded that, having regard to all stakeholders requirements and all information provided, the use of Advancetown Road as access to the Hinze Dam both during and post-construction, is the optimum solution.

In conclusion, while it is acknowledged that traffic will change along Advancetown Road as a result of the project, the results of the independent review confirm that data and conclusions presented by the proponent are sound and reasonable. I am therefore of the view that this conclusion means that I have no strong basis to require the project proponent to incur the increased expenditure that would be involved in developing a “greenfield” access road.

Recreational use of the dam will be altered as a result of upgrades to recreational facilities within the project works. Some traffic will be removed from Advancetown Road due to the facilities upgrades, as boat access will no longer be provided within the area near the dam wall and boat ramps will be moved to south of the dam’s lake, with ramps accessed by main roads located in the vicinity.

An outdoor recreation and mountain bike area with walking tracks will be accessible via the Gilston Road side of the dam, with users able to access this area by parking at where Gilston Road will terminate close to the Dam. An information centre, park and picnic area will be located to the west of the dam and will be directly accessible from Advancetown Road, however users will still be able to approach it on bike and on foot over the Dam’s embankment.

[8] Both species listed under the *Nature Conservation Act 1992* as protected species

With closure of the dam during construction to the public, the project is effectively replacing recreational users' road use with construction road use. Impacts will therefore result in an altered traffic use scenario for the road, rather than adding an additional layer of road use.

I am satisfied with the EIS's presentation that impacts on Advancetown Road will not be outside of Level of Service provisions and will be manageable with the undertaking of sound mitigation measures as proposed by the proponent and conditioned within this report at Appendix 1, Schedules C and D. I will provide a copy of the independent review to all residents that addressed the issue of traffic impacts on Advancetown Road, for their information.

I have conditioned within this report the commitments made by the proponent on minimising traffic impacts as discussed at the beginning of this section. On the matter of the proposal that two morning and two evening shuttle buses be provided for the construction workforce in order to lessen traffic, I note that while use of these buses cannot be enforced, I advise the proponent to actively promote use of the services and if feasible, to incentivise its use.

4.4 Noise and Vibration

22 submissions were received from members of the public, with many of these being from residents located in the area at the top of the dam wall who will be in proximity to the core construction works. Key issues were raised in submissions on the EIS regarding amenity impacts due to noise, vibration effects from blasting, dust and air quality, particularly given the three-year span of the construction phase.

All of these issues relate to the construction phase of the project, with operational amenity issues unlikely to be evident post-construction completion.

As provided in the EIS, the area at the north of the dam embankment is largely rural-residential and I respect the concerns of the residents who have moved to the location to seek amenity. I note that aerial and ground surveys indicate the nearest residence is located approximately 500 metres from the embankment works; 125 metres from the workshop; 50 metres from a site office and 40 metres from a curve in the haul road.

The construction program described in the EIS provides that construction noise will be restricted to between the hours of 6:30am and 6:30pm Monday to Friday, and for one Saturday each month, between 8am and 6:00pm. An evening maintenance shift in the workshop is proposed from 3pm to midnight, Monday to Friday.

Measures to mitigate noise impacts have been proposed in the EIS and include:

- 24 hour monitoring of noise levels at closest residential areas, and a commitment to remedial actions if data exceeds permitted noise goals
- Scheduling of activities, such as blasting, to ensure reasonable noise objectives are met. Scheduling to be determined in consultation with local community requirements
- Construction works to be undertaken in accordance with Australian Standard 2436-1981: Guide to noise control on construction, maintenance and demolition sites
- Identification of noise impacts and subsequent remedial actions to be undertaken in consultation with impacted residents
- Code of conduct for employees working in the workshop from 3pm-midnight to address noise-sensitive practices for undertaking work and exiting the site
- Education program for workers to raise and maintain awareness of safety and courtesy issues within the local community, including minimising noise impacts
- A commitment to managing any noise impacts on surrounding residents on a case-by-case basis, which may include use of measures such as acoustic barriers
- Design of the haul road to minimise need for gear changes and braking
- Alignment and attenuation of buildings, such as the maintenance workshop, to design performance standards to minimise noise travel
- Community feedback on noise to be recorded, addressed and responded to
- For construction traffic along Advancetown Road:
  - ☐ speed limits of 40km/hr for trucks and heavy vehicles; 50km/hr for other construction vehicles
  - ☐ deliveries to site to be limited to within project construction hours, with no pick ups from site after 4pm
  - ☐ regular site deliveries to be coordinated to occur at the same time each day (mid-morning)

Blasting

The EIS describes that one blast per day will occur at the quarry area to extract rock for construction use, with the nearest residence being approximately 900 metres away. The proponent has undertaken that a comprehensive assessment of blasting impacts will be undertaken prior to the commencement of works.

Some submissions received on the EIS were from residents who lived in the area during Stage 2 works in the late 1980s. In submissions and within further discussions with residents, it has been expressed that blasting during Stage 2 was invasive and vibration from blasts caused some damage such as cracks to buildings in the area.

I have conditioned the proponent to undertake its commitment regarding managing blasting works, which indicates:

To ensure that construction works do not cause adverse impacts on sensitive receivers the proponent will undertake pre-construction condition surveys at potentially affected properties. Monitoring during initial blasting trials will be undertaken at key locations to ensure that any impacts are within or below acceptable limits.

The proponent has undertaken to time the daily blasting event in consultation with the local community. This timing will be particularly mindful of the needs of a local equestrian centre, to minimise disturbance to horses and undertaking of the business of the facility. Accordingly, subsequent to release of the SREIS the proponent has provided that wherever possible, blasting will occur between 5:00pm and 5:30pm.

While I acknowledge concerns raised by submitters on blasting impacts, I am confident that legislative provisions which the project must comply with to undertake blasting are more rigorous than those the stage 2 raising were subject to, therefore acoustic and vibrationary impacts should be less acute. Appropriate actions by the proponent and conditioning within this report which link to approvals the proponent must obtain prior to undertaking the works will work to minimising impacts of blasting activities.

Noise

The Proponent, following consultation with EPA, has established target goals for noise and vibration levels to guide construction planning and management. These are conditional for the obtaining of relevant approvals under the *Environment Protection Act 1994* and Regulation and are set out as conditions at Appendix 1, Schedule A. These conditions include that no audible construction noise will be evident from 6:30pm to 6:30am, Monday to Saturday, and all hours on public holidays and Sundays.

An assessment by the EPA has found that the goals are reasonable and generally able to be achieved. In instances where it is unavoidable that the goals are likely to be exceeded for a period of time due to construction activities, the proponent has indicated that it will implement mitigation measures to manage the impact on affected residents.

While submissions to the EIS have requested the erection of mitigation measures such as acoustic barriers and relocation of residents, I find that it would be inappropriate for me to condition such actions based on perceived impacts prior to construction commencing.

I respect the position of submitters in suggesting such measures but find this will be best managed through effective community consultation practices undertaken by the proponent, including the commitment to engage with the community on project impacts and to investigate solutions to minimise disturbance.

I am confident that while noise will not be able to be eliminated, given the strategies provided in the EIS and processes within the EMP regarding noise mitigation, together with appropriate conditioning as described within this report, effects can be minimised.

4.5 Air and water quality

Water

The proponent has proposed a series of commitments, included in this report at Appendix 2, to protect water quality in the dam and downstream of any construction areas. The EIS provides that construction of the dam upgrade using techniques to ensure water quality and that security of water supply to Gold Coast City is maintained. Erosion and sediment control plans are to be included in the construction EMP. The project will implement a site water management system made up of a series of sediment dams, developed in consultation with EPA. Site water quality will continue to be monitored during the construction phase.

Additionally, the vegetation clearing regime between the existing and increased FSL has been designed to ensure water quality through removing the majority of vegetation which would otherwise be inundated and deoxygenate the reservoir.

The construction EMP provides suitable strategies for water quality management, and monitoring of groundwater impacts, within the Environmental Plan: Water Quality and Environmental Plan: Groundwater.

The conditions set down in Appendix 1 must attach to any development approval to ensure water quality values are maintained.

Air

The EIS confirms that air emissions will result from project activities, particularly dust from excavation, drilling and blasting and from vehicles using the haul roads. Small quantities of gaseous pollutants will be emitted from internal combustion engines in construction equipment but ambient concentrations of these

substances are expected to be low compared to compliance levels advised in relevant guidelines.

Table 11-6, section 11 of the EIS indicates assessment of impacts likely to be generated by a 'worst case' construction scenario predicted a maximum offsite dust deposition rate of between 76 mg-124 mg/m2/day (including background conditions) compared to the EPA's *Environment Protection* (Air) Policy 1997 of 120 mg/m2/day. The upper bound estimate indicates what a residence near the construction haul road may experience in a scenario where dust was not being actively minimised.

To reduce dust impacts and comply with EPA standards, the proponent has developed a range of mitigation measures to be included in the construction EMP as an Air Quality Environmental Plan. Measures include:

- regular watering of the haul roads to dampen dust, with particular focus on the section of the haul road near residences
- Trucks travelling to site will have loads secured and covered
- Speed limiting of trucks travelling to and from the site and on haul roads
- The concrete batching plant will have an air cleaner to minimise particulates
- Rehabilitation of cleared areas will be re-seeded and stabilised quickly to minimise erosion
- Regular monitoring of particulates and dust deposition levels at nearest residences within a Dust Monitoring Program.

I note also the proponent's undertaking that an enclosure will be placed around the crushing area if dust becomes problematic. I support this undertaking if it is undertaken with due regard for the health and safety of workers attending the area.

A number of submissions to the EIS indicated concerns with potential degradation of water quality in nearby domestic water supply tanks from dust and pollution generated by construction and machinery.

I find that the EIS's analysis of impacts on this issue demonstrates that personal water quality will not be compromised as a result of project activity. The SREIS indicates that while there may be some entry of particulates to water tanks, given the worst case scenario for a house located closest to the construction site, suspended solid concentrations in tank water may increase to an amount that would equate to approximately 10-15 percent of the water quality objective as described in EPA's *Environment Protection (Water) Policy 1997*.

The conditions set down in Appendix 1, Schedule A, must attach to any development approval granted for the project to minimise environmental nuisance at any dust-sensitive place resulting from activities during the construction phase of the project.

4.6 Safety, hazard and risk

The EIS and SREIS identify the hazards associated with construction activities of the raised dam and its ongoing operation, quantifies the risks of occurrence of such hazards and details the appropriate disaster planning and management measures.

A comprehensive set of design, planning and operational procedures and measures relating to the range of possible hazards are specified and comprehensively discussed in the draft EIS and SREIS.

I find that hazard identification, planning and management matters are adequately addressed in the EIS and SREIS. It is considered that issues raised in submissions such as those relating to terrorism and fire danger from cleared vegetation have also been adequately addressed.

I have conditioned at Appendix 1, Schedule D, that the proponent must undertake all hazard and risk recommendations and commitments made in Section 14 and Appendix G of the EIS, the EMP and section 3.13 of the SREIS, particularly those relating to compliance with current ANCOLD Guidelines for Dam Safety Management.

The implementation of the necessary actions is to be in cooperation with dam safety regulators in DNRW. DNRW has indicated its satisfaction with information provided on dam safety within the EIS process and has provided conditions to apply to the Operational Works – Referable Dam permit the proponent is to secure. The conditions are included at Appendix 1, Schedule B of this report.

4.7 Cultural Heritage and Native Title

The EIS indicates that consultation with Aboriginal Parties with connection to the Gold Coast area has occurred in line with requirements of the *Aboriginal Cultural Heritage Act 2003.*

59 endorsed parties were identified as well as three indigenous groups that hold a connection to the Gold Coast area, being the Eastern Yugambeh, Komumerri and Ngarang-Wal.

I note that discussions are continuing with these indigenous groups in the development of a Cultural Heritage Management Plan (CHMP) in accordance with the *Aboriginal Cultural Heritage Act 2003*.

The EIS provides satisfactory commitments relating to Cultural Heritage (see Appendix 2). The proponent undertakes to meet the duty of care standards set by the *Aboriginal Cultural Heritage Act 2003.*

Mitigation measures to address indigenous cultural heritage issues are proposed to be confirmed through development of a Cultural Heritage Management Plan (CHMP) for the project's construction phase, providing heritage awareness in worker induction programs regarding obligations for the protection, or where impacts are unavoidable, the correct dealing with cultural heritage values that occur in the project footprint.

I have included a direction at Appendix 1, Schedule C, which must be undertaken by the proponent to ensure compliance with the *Aboriginal Cultural Heritage Act 2003.*

Non-indigenous cultural heritage

Whilst the EIS found that there are no sites of non-indigenous cultural heritage within the project area listed on the Register of the National Estate or the Queensland Heritage Register, a key European feature of note identified within the project area is gravesites of the Guinea family, located half-way down the western arm of the dam site. The gravesites will be inundated by the proposed new Full Supply Level (FSL) after the raised dam is completed. Two known individuals, possibly three, were buried on the site over 100 years ago.

The EIS includes a commitment that project works will include relocation of the graves and establishment of a memorial park in memory of the Guinea family near the new boat ramp on the western arm of the dam's impoundment. The proponent further provides that the relocation will be done sensitively and in consultation with members of the Guinea family, interested local community members and relevant government agencies. This commitment, included at Appendix 2 of this report, has been conditioned within this report as a necessary action.

Gold Coast City Council approval is required to exhume and inter the remains and from further information provided by the proponent, I understand a member of the Guinea family is working with the proponent and the relevant Council work unit regarding the exhumation and is providing advice and counsel on the relocation. I note the proponent's undertaking that at the family's request, a small memorial marker will be included in the park.

4.8 Land impacts, values

Land impacts: freehold properties

No landholders will be displaced as a result of the project, however some sections of freehold land or easements will need to be acquired.

Section 6 of the EIS states that the revised 1 in 100 year ARI flood level will temporarily inundate portions of 5 freehold properties on Gold Coast-Springbrook Road adjacent to little Nerang Creek. Additionally, a small portion of a haul road at the top of the dam works will be undertaken on the edge of private property, which will need to be acquired. Easements are proposed for the areas inundated in a 1 in 100 year ARI flood and the proponent provides that all efforts will be made to obtain these through voluntary agreement with the land owners.

Numinbah Valley Environmental Education Centre

Submissions on the EIS raised concerns with the impacts of the project on the Numinbah Valley Environmental Education Centre. The new FSL of the dam will inundate an area adjacent to the Centre that its staff has rehabilitated and used as an outdoor teaching site. The proponent has responded in the SREIS that investigations are underway to provide for impacts to this area, either through providing funding for rehabilitation of an area nearby as part of the Compensatory Habitat Strategy, or alternative measures such as providing a bus to transport teachers and staff to an alternative outdoor teaching area.

The SREIS further provides that an access road to the Centre is close to the new FSL and therefore is likely to be impacted by waters each time the spillway overtops. Therefore the proponent will provide access to the Centre that achieves 1 in 100 year flood event immunity prior to completion of raising of the spillway and embankment.

Numinbah State Forest

Section 4.1.1 of this report provides detail on the project's impact on a section of the Numinbah State Forest due to the increased FSL and how this effect will be addressed.

Land values

Submissions were made on the EIS by landholders who raised that the project has the potential to adversely affect the value of properties located nearby. Most issues raised related to construction impacts due to the nature and duration of the

works involved, with the project's location in a rural residential setting indicated as an additional motivator for these concerns.

Issues cited in submissions as informing this position included:

- Construction traffic
- Construction activities such as noise, dust and fumes
- Structural damage to homesteads and other structures due to blasting vibration
- Loss of visual amenity due to view of construction activities
- Loss of amenity due to closure of the dam site during construction
- Traffic impacts due to road closures.

Many submissions requested information on any proposals by the proponent to make compensation available as a result of impacts on residents and on property marketability. The SREIS responds to this issue adequately, by providing that any requests for compensation for project impacts would be considered on a case by case basis.

I have discussed my findings in relation to potential impacts from the project on the amenity of neighbouring residents from dust, noise, vibration, lighting and infrastructure associated with the construction and operation of the proposed raising of the dam wall in previous sections of this report.

I am satisfied that the should the project as described in the EIS and SREIS proceed, subject to adherence to the project's Construction Environmental Management Plan and specific conditions and recommendations set down in this report, that the potential impacts of the project on property values would be minimal.

Additionally, I note from the EIS's Economic Impact Assessment (Section 16) the wider benefits the project will bring to the community, such as increased water supply and reduction of flooding impacts on 3,284 residences (including commercial/industrial) with associated economic impacts of $124.8M. The EIS further provides that overall, the project will result in direct and indirect benefits to South-East Queensland of $534.6 million, with $423.5 million of this applying to the Gold Coast area. Both as a direct result of the project and indirectly, through temporary recruitment and assistance, the project will result in work for 1,451 individuals.

5. ASSESSMENT OF THE RELEVANT PROJECT IMPACTS ON MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

5.1 Introduction

This section addresses the requirements as expressed in Part 5 of the *State Development and Public Works Organisation Regulation 1999*. In part, the SDPWO Regulation determines specifications for the Coordinator-General's Report for project proposals that are:

- Declared as a significant project for which an EIS is required; and
- For which the Commonwealth has accredited assessment of the relevant impacts pursuant to the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

5.2 The Project

The proponent of the project is the Gold Coast City Council, working in partnership with Theiss, SKM and URS within the Hinze Dam Alliance to deliver the project.

Based on the adopted design option, the Hinze Dam Stage 3 Project proposes the raising of the existing 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 309,000 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 early works such as establishment of site offices, crib (lunch) rooms, and a security fence; preconstruction activities such as establishment of storage, stockpile and lay down areas; core construction activities associated with upgrades to the embankment,

spillway and intake towers; establishment and operation of quarry activities to provide construction materials; establishment of construction roads; clearing of vegetation in the increased 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.

The project's Target Out-turn Cost (TOC), including fees for TOC development, is $395 million. An anticipated 1,451 direct and indirect employment positions will be required over the project's development and construction phases. The construction workforce will peak at approximately 240 people between April 2008 and August 2009.

Hinze Dam supplies the majority of the water needs for Gold Coast City, a rapidly growing urban centre with a positive 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 project is listed as an emergency water supply measure for the South East Queensland region within the *Water Amendment Regulation (No. 6) 2006*. The Regulation instructs that the project must be delivered by the end of 2010 and mandates the project's additional water supply yield.

5.3 Places affected by the project

The majority of project construction activities will occur on, or close to, the existing Hinze Dam spillway and embankment, located on the Nerang River at 36.4km AMTD. The dam impoundment is located approximately 15km south west of Nerang on freehold land (Lot 4 SP164198) which is owned by the proponent. The land is subject to an existing Community Infrastructure Designation under the *Integrated Planning Act 1997* .

As a result of the increased inundation level of the dam, the Full Supply Level (FSL) and 1 in 100 ARI flood levels will extend outside of Council land within the Community Infrastructure Designation and on to Unallocated State Land and additional Council freehold land on the lower eastern arm of the dam (extending 300 metres for the FSL and 1.7kms for the 1 in 100 year flood event) and into the Numinbah Forest Reserve on the lower western arm (extending 2.9kms for the FSL and 4.1km for the 1 in 100 year event).

Other project activities to be undertaken outside of GCCC land include:

- A small portion of a haul road at the top of the dam works will be undertaken on the edge of private property, which will need to be acquired
- road upgrade works to local access roads leading to the dam for construction traffic security of use and road safety
- the deck level of the Pocket Road Bridge will be raised for flood immunity
- A section of Gold Coast-Springbrook Road, located approximately 250 metres east of Little Nerang Creek, will require upgrading to provide 1 in 10 year flood immunity
- Other road upgrade works (mostly embankment fortification) may be undertaken depending on outcomes of further studies.

5.4 Controlling provisions of the project

On 16 January 2007 the Commonwealth Minister for the Environment and Heritage[9] determined that the Hinze Dam Stage 3 Project (EPBC reference 2006/3211) constituted a "controlled action" likely to affect matters of National Environmental Significance under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The controlling provisions of Part 3, Division 1 of the EPBC Act that apply to the project are Sections 18 and 18A: Listed threatened species and communities.

Flora

The EIS indicates that field studies confirmed five flora species listed as either endangered or vulnerable under the EPBC Act as being present within the study area.

These are:

Queensland nut (*Macadamia integrifolia*)	EPBC status:	vulnerable
Macadamia nut (*Macadamia tetraphylla*)		vulnerable
Onion wood (*Owenia cepiodora*)		vulnerable
Plectranthus nitidus		endangered
Spiny gardenia (*Randia moorei*)		endangered

Fauna

Of the 14 EPBC listed fauna species desktop studies revealed may potentially occur within the study area, field studies detailed in the EIS revealed that two were

[9] Now the Minister for the Environment and Water Resources.

considered to be known inhabitants of the study area, and four were considered possible inhabitants of the area.

The confirmed listed species are:

Brush-tailed rock-wallaby (*Petrogale penicillata*)	vulnerable
Grey-headed flying-fox (*Pteropus poliocephalus*)	vulnerable

The listed species that may be present are:

Swift Parrot (*Lathamus discolor*)	endangered
Australian Painted Snipe (*Rostratula australis*)	vulnerable
Spotted-tail Quoll (*Dasyurus maculatus*)	endangered and
Threetoed Snake-tooth Skink (*Coeranoscincus reticulatus*)	vulnerable

Impacts and mitigation measures relating to flora and fauna including those listed under the *Nature Conservation Act 1992* are discussed in Section 4 of this report.

5.5 Summary of the project's relevant impacts and proposed mitigation measures

For the purpose of assessing the impacts of the project on matters of National Environmental Significance, this section describes the relevant impacts as defined by section 82 of the EPBC Act.

In the case of the Hinze Dam Stage 3 Project, the relevant impacts are those that the project has, will have, or is likely to have, on the controlling provisions. The relevant impacts of the project are summarised below for the controlling provision.

Listed Threatened Species and Communities

The following project activities have the potential to compromise environmental values during the construction phase:

- vegetation clearing within the new inundation level;
- construction of embankments and spillway;
- construction of the fish passage device;
- raising of intake towers;
- operation of workshop (fixed and mobile);
- relocation of boat ramps and recreational areas;
- operation of the site office;
- use of vehicles and equipment on site;
- operation of the quarry, borrow pit and screening areas;
- operation of the concrete batching plant;

- construction and use of haulage roads; and
- upgrade of roads and associated infrastructure.

Flora

While approximately 318ha of remnant vegetation will be impacted by the project, this impact is almost entirely due to the increased Full Supply Level of the augmented dam. Core project activities such as spillway and embankment works will occur on existing structures. The workshop, quarry and clay borrow will be re-established on sites used for these purposes in previous stages of the project and on which remnant vegetation has previously been cleared. While there will be some impacts on vegetation due to works around the existing dam wall, no matters of NES were identified in these areas.

The EIS provides that no endangered regional ecosystems will be affected as a result of the project's impacts. Habitat that will be lost is located around the rim of the existing woodlands edge. Substantial forest interiors will remain in place with limited fragmentation occurring.

The EIS indicates that impacts on the five EPBC Act listed species, the Queensland nut, the Macadamia nut, Onion wood, *Plectranthus nitidus* and Spiny gardenia due to inundation will be significant. Details of forecast impacts are detailed at Section 9 and Appendix C of the EIS.

In response to the project's impact on approximately 318 ha of vegetation and the associated implications for native fauna species due to loss of habitat, the proponent has committed to undertake and complete an extensive Compensatory Habitat Strategy. The detailed recommendations and conditions that must be addressed prior to the finalisation of the strategy are set out in Appendix 1, Schedule D. In summary, the requirements that the proponent must address include the following:

- The development and implementation of a compensatory habitat strategy to offset the unavoidable loss of 318 ha of mapped remnant vegetation to be cleared and/or flooded below the proposed FSL, to enable permanent inundation for the water storage.

- The development and implementation of species-specific Translocation Plans (and associated management plans for specific translocation sites) for the five impacted EPBC Act listed significant flora - the Spiny Gardenia, Onion Cedar, *Plectranthus nitidus* and Roughshelled Bush Nut.

  It is intended that suitable translocation sites be identified within the study area (above the proposed new FSL), and that propagated individuals of the target

species be planted at several sites. These sites will be subject to active management to reduce threatening processes such as weed invasion and fire.

- Collection of seeds and cuttings and propagation trials for significant flora known from the study area and the establishment of ex-situ populations of those species will be implemented. Pilot propagation and planting trials will be initiated as soon as practicable to determine the translocation potential of the target species.

While submissions on the EIS requested that the Compensatory Habitat Strategy be finalised and described prior to the completion of the EIS process, I agree with the SREIS's response that the strategy will need to be tailored to best utilise land parcels which will be purchased or covenants secured on for the strategy's use, and note that consideration of suitable land options is currently being progressed.

I further note the EIS's proposal that the Compensatory Habitat Strategy will be developed and implemented over a 12 month period from the date of the Commonwealth's decision on the project and key government stakeholders will be consulted with in its development.

Subject to a final decision on the controlled action and any subsequent input from the Commonwealth Department of the Environment and Water Resources (DEWR) on the suggested conditions and recommendations, I have conditioned development of the Compensatory Habitat Strategy to formalise the proponent's approach to offsetting impacts to key NES species that will occur as a result of the project. I am satisfied that the proponent has provided a strong and feasible case for mitigating impacts on significant species and ensuring the 'no net loss' commitments are translated into tangible outcomes.

Field studies undertaken to inform the EIS have benefited scientific knowledge of the prevalence and habitat for significant species under the EPBC Act, with two additional populations of *Plectranthus nitidus* identified, which adds to the five existing communities confirmed in Queensland; for the spiny gardenia, only 15 individuals were known in Queensland, however studies found 1,500 in the study site; and several hundred *Macadamia tetraphylla* and *Bosista transversa* were found outside of the impact area. It is reasonable to suggest that knowledge to be gained from the propagation and translocation of significant species as part of the Compensatory Habitat Strategy will contribute valuable understanding to the field of native species conservation.

The proponent has committed that areas containing significant flora species in the path of the new FSL will not be cleared with machinery. This vegetation will be subject to inundation post-construction, which will protect individuals outside the increased FSL from possible impacts of nearby construction works. I support this approach as minimising unnecessary environmental harm.

In response to the EIS, DEWR requested that the SREIS include a discussion of alternatives to the inundation of areas containing a number of NES species, such as building infrastructure to prevent inundation[10].

The proponent has addressed this suggestion as a possible mitigation measure to reduce impacts within the SREIS and I concur with the findings of analysis that, given the remoteness of the locations of the NES species[11], to erect structures in their vicinity would most likely endanger more individuals than would otherwise be inundated, given the need to clear access tracks with considerable benching likely to be required due to the area's topography; to install electricity, clear space for a barrier wall, and install temporary construction service areas.

Fauna

Brush-tailed rock-wallaby (Petrogale penicillata): vulnerable

I note from the EIS that the Brush-tailed Rock Wallaby, located on Pages Pinnacle in the project study area, is an introduced community which is separated from the nearest similar community (and associated benefits to genetic diversity) by 100km. This makes its long-term viability uncertain.

The EIS confirms that project activities will not be undertaken in vicinity to the species and it is not anticipated that there will be any direct impacts to individuals or the community's habitat. Indirect impacts such as the introduction of invasive species or disease to the area are also unlikely.

Grey-headed flying-fox (Pteropus poliocephalus): vulnerable

The project will result in the loss of habitat used seasonally by the Grey-headed flying-fox. Thirteen colonies of the species were confirmed in the general study area, with two camps being located nearby to the spillway and embankment works.

[10] It should be noted that these comments are restricted to the adequacy of the information provided in the EIS and do not encompass DEWR's assessment of the impacts of the actions.

[11] Refer Figure 2-2, Appendix C of the EIS

The EIS provides that impacts from loss of vegetation due to project clearing are expected to be minimal, given that the species is highly mobile and that a large forest interior will be maintained for communities to utilise. While the species is especially sensitive to disturbance towards the end of the female's gestation period (September to November), the EIS indicates that the two camps located closest to construction works of the recreational facility and saddle dam are over 5kms away from the project footprint.

For species listed under the EPBC Act that may be present, such as the Swift Parrot, the Australian Painted Snipe, the Spotted-tail Quoll, and the Threetoed Snake-tooth Skink, the EIS provides that remaining substantial areas of habitat will provide resources for these species to use should they be present.

For all fauna species potentially impacted by the project, habitat gains made through the Compensatory Habitat Strategy program of works may provide some benefits.

In response to submissions made on the EIS regarding treatment of habitat that may contain the eight fauna species listed under either State or Commonwealth legislation confirmed as living in the area in vegetation to be cleared, the proponent has made an undertaking that all areas containing EVR fauna species will not be subject to mechanical clearing works. That is, this vegetation will be left standing and will be subject to inundation post-2010, allowing fauna the opportunity to relocate without human intervention.

Notably, the remnant vegetation in the project area links to a large area of interconnected forests of diverse habitats. I am satisfied that the potential impacts to native fauna during construction of the dam will be minimised by the proximity of wooded areas as refuges for wildlife.

Environmental elements addressed in the draft Environmental Management Plan (EMP) include management of water quality, groundwater, terrestrial flora, terrestrial fauna, rehabilitation management, weed and pest management, aquatic ecology, noise and air quality, waste minimisation and hazardous substances handling. The EMP has been conditioned in this report to be reviewed by the Environment Protection Agency (EPA) prior to construction to ensure compliance with industry standards for environmental management.

Implementation of appropriate mitigation and conservation measures as described in the EIS and SREIS is expected to significantly mitigate the impacts of the raised dam on significant species that were identified in the field surveys or those that may be found in the project area. As a result, no significant long-term impact is expected on the controlling provisions of the project as described under the EPBC Act.

I am satisfied that the SREIS has adequately addressed matters relating to terrestrial flora issues raised in submissions made on the EIS, such as matters relating to revegetation, clearing of vegetation and weeds. In considering the strategies cited in the EIS and the SREIS, I am of the opinion that the effects of the project on associated significant fauna species will be minimal and able to be managed through best practice strategies included in the project's finalised EMP.

In relation to significant flora species and important habitats within the riparian vegetation and fringing forest communities to be affected, revegetation, propagation and restoration works as part of the Compensatory Habitat Strategy will provide a strong focus on enhancing conservation values. These works will involve the implementation of targeted, species-specific mitigation measures to reduce impacts on significant species. In the coming years, results of the propagation and translocation program will no doubt add to existing learnings on the species.

5.6 Project alternatives

The proponent considered a number of alternative options to the project in section 2.3.2 of the EIS. The alternatives were categorised according to the three key criteria for raising the existing Hinze Dam embankment:

Dam safety

The EIS describes that the dam is not compliant with latest State Government dam safety guidelines (Guidelines on Acceptable Flood Capacity for Dams (DNRW 2007c)) relating to its capability to pass a Probable Maximum Flood (PMF) event. The proponent has been provided until 2015 to make the structure compliant, therefore the 'no project' option is not feasible given that substantial works to the dam's embankments and spillways must occur.

Flood mitigation

Currently 4212 existing residences and 229 commercial/industrial properties downstream of Hinze Dam could be affected in a 1 in 100 year ARI flood event. Raising the dam for flood mitigation purposes would reduce the number of properties affected by this flood by 3284 to 1157 properties. The proponent as a local government body looked at a range of alternative flood management measures including dredging, water diversion, bridge improvements and augmentation of the Benowa flood channel. Preliminary economic social and environmental impact assessment of the range of options considered identified that the most effective physical flood mitigation measure was the raising of Hinze Dam.

Water supply

The Hinze Dam raising is one of a suite of demand management and supply provision measures that will provide additional water supply for the South East Queensland region. The EIS at section 2 (table 2-2) analysed a range of possible measures, as well as initiatives currently underway, that could be or are being undertaken to avoid additional water being supplied by Hinze Dam. However, the outcome of this would be a reduction in available water supply to the Gold Coast and the larger South East Queensland region.

While the proponent, as a local government agency, has identified the feasibility of supporting the project as a local water supply measure, the project's inclusion within the *Water Amendment Regulation (No. 6) 2006* acknowledges its status as a regionally significant initiative that has been identified as such at the state government level.

Dam design

A number of different dam upgrade designs were considered prior to the preferred design option being selected. One of the criteria considered in choosing the final design was impacts on significant species and the wider environment. Similarly, the proponent's decisions in siting ancillary temporary works such as site offices, car parks and crib rooms has been to do so in previously established, non-remnant areas.

5.7 Project approvals

Relevant legislation applying to the project includes:

State Development and Public Works Organisation Act 1971;
Environment and Biodiversity Protection Act 1999; *(Cwlth)*
Integrated Planning Act 1997;
Integrated Planning Regulation 1998;
Vegetation Management Act 1999;
Environment Protection Act 1994;
Environment Protection Regulation 1998;
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 majority of project works which are located in the Community Infrastructure Designation (Lot 4 SP164198) is exempt development under the GCCC Planning Scheme and therefore does not require a development application for a material change of use. However, Material Change of Use permits under the *Integrated Planning Act 1997* may be required for construction works associated with the relocated and re-established recreational facilities.

Apart from approval under section 133 of the EPBC Act to undertake a controlled action, other key statutory approvals necessary for development of the project are:

- Operational Works – Constructing or Raising a Waterway Barrier under the *Integrated Planning Act 1997* and the *Water Act 2000*
- Operational Works – Referable Dam under the *Integrated Planning Act 1997* and the *Water Act 2000* for increasing the storage capacity of the dam by greater than 10 percent
- Operational Works – Clearing of Remnant Vegetation under the *Vegetation Management Act 1999* for vegetation outside of Lot 4 SP164198. Process for obtaining of these permits is to commence in 2008 and required to be secured prior to practical completion of construction works.
- Operational Works – Interfering with Water under the *Water Act 2000*. An exemption for the requirement of a Resource Entitlement, which would usually have to be established before submission of an IDAS Form K3 – Water Storage, has been provided by DNRW.
- Permits, under the *Transport Infrastructure Act 1994*, to work in, or interfere with, a state-controlled road as well as approval for closure and diversion of sections of roads.

Approval under the *Environment Protection Act 1994* and associated Regulation, to enable for temporary Environmentally Relevant Activities associated with the construction of the proposed pipeline:

- ERA 7: Chemical Storage
- ERA 11: Petroleum Storage
- ERA 19: Dredging

- ERA 20: Extracting Rock or Other Material
- ERA 22: Screening Materials
- ERA 28: Motor Vehicle Workshop
- ERA 62: Concrete Batching
- ERA 84: Regulated Waste Storage

- A Cultural Heritage Management Plan/s or agreements under the *Aboriginal Cultural Heritage Act 2003*

- Approval to disturb, harm or destroy any listed species under the *Nature Conservation Act 1992*

The Department of Natural Resources and Water has advised that as a Local Authority who is to be either carrying out and/or supervising the works, the proponent is exempt from the requirement to obtain Riverine Protection Permits to carry out works within a watercourse. However, the activities associated with the works are to be carried out in accordance with the DNRW guideline: *Activities in a watercourse, lake or spring carried out by an entity.*

Harbour Master notification may also be required for boating exclusion zones due to construction activities.

5.8 Proposed conditions to address impacts to matters of national environmental significance

This report will be provided to the Commonwealth Minister for the Environment and Water Resources, pursuant to section 17(2) of the State Development and Public Works Organisation Regulation, to enable a decision on approval of the controlled action for the project pursuant to section 133 of the *Environment Protection and Biodiversity Conservation Act 1999.*

Within this decision on approval, should the Commonwealth find the project is able to proceed, appropriate conditioning of the project will be applied by DEWR to provide for best practices to ensure protection of species of National Environmental Significance (NES).

In providing conditions and recommendations at Appendix 1, Schedule D, regarding the Compensatory Habitat Strategy which will seek to address the project's impacts on approximately 318ha of remnant vegetation, I have

recommended the part the Strategy is to play in dedicating a program of work towards ensuring no net loss to NES species.

However, I respect that nothing within the recommendations or conditions I have made limits the Commonwealth from providing otherwise with regard to matters that are protected within the *Environment Protection and Biodiversity Conservation Act 1999.*

5.9 Early works

In August 2007 the proponent commenced discussion with the Commonwealth Department of the Environment and Water Resources (DEWR) to pursue revision of the original proposal for the Hinze Dam Stage 3 Project which defined the proposed actions the project would take. As previously discussed in this report, the proposal had been submitted to DEWR by the proponent in December 2006 for consideration on if the project was a 'controlled action' under the EPBC Act. In January 2007, DEWR determined the project was a controlled action that may cause harm to listed threatened species and communities (section 18 and 18A, EPBC Act).

With this determination, the proposed actions then became the controlling provisions which lawfully, were not able to be undertaken by the proponent until the Commonwealth completed its assessment of the project as a controlled action under the EPBC Act. With consideration of legislated timeframes for consideration of the project and the time required by the agency to conduct its due process on the project, the Commonwealth's decision on the matter is not anticipated before November 2007.

Part of the original proposal for the project included the establishment of site offices, lunch rooms, and a security fence, all on Gold Coast City Council land, in previously established areas. These activities are what the proponent sought to remove from the definition of the project, to enable them to be undertaken once the Coordinator-General had completed the State's assessment of the project.

The proponent identified that, subject to obtaining all necessary approvals, a preferred construction start date for early works activities of October 2007 was necessary in order to comply with the project's mandated completion date[12] of December 2010. The proponent had determined a range of matters were likely to impact on construction start date and delay this until early 2008.

[12] Pursuant to the *Water Amendment Regulation (No. 6) 2006*

A key potential program risk identified by the proponent was a three-week embargo on the moving of large construction vehicles on the road network over the Christmas and New Year period. Other risks, such as procurement of long lead items within a regional marketplace competing for equipment, the Christmas holiday period impacting on recruitment and resourcing, while issues that are faced by all major projects, would impact on the Hinze Dam Stage 3 Project significantly due to its start date being just prior to the holiday break. The proponent had identified that up to three months slippage on the project's schedule may result. Additional (after hours) shifts may have needed to be investigated in order to get the project back on target.

On 25 September 2007, under section 156A of the EPBC Act, DEWR granted a variation to the proposal for the project which removed activities such as the establishment of site offices, lunch rooms, and a security fence from the definition of the project. By my direction, the proponent was not permitted to undertake these works prior to the completion of this report, which marks the end of the assessment of the project's EIS by key State Government agencies and concludes if there are any critical issues that would prevent me from recommending to the Commonwealth that the project proceed.

DEWR's decision to vary the project's proposal was done essentially at the proponent's risk as it does not constitute approval of the project by the Commonwealth; rather, it is recognition that the early works, being undertaken on the proponent's land, in previously established areas, and at a distance of approximately 1km from key flora species listed under the EPBC Act, could proceed in the absence of an approval decision by the Minister for DEWR on the broader project actions. The proponent has acknowledged that this decision to vary the original project proposal does not preempt any future decision by the Minister for DEWR on whether the action may, or may not be, approved.

The proponent has sought counsel from local indigenous groups to determine if the early works would impact on any cultural heritage issues and a Level 1 survey as per the Cultural Heritage Duty of Care guidelines was undertaken. The surveyors have confirmed that no impacts are likely to result from the limited early works activities.

The proponent has undertaken that any necessary permits will be secured prior to starting the site establishment activities. I have advised the proponent that communication on the early works must be undertaken with the local community subsequent to the finalisation of this report. I have conditioned at Appendix 1, Schedule D, parameters for undertaking this communication to ensure nearby residents are aware of what activities are being commenced.

Appendix 1: Stated conditions for the Hinze Dam Stage 3 Project

Schedule A: Conditions for Environmentally Relevant Activities for development permits pursuant to the Integrated Planning Act 1997

pages 60 to 81

The Environment Protection Agency (EPA) is concurrence agency for the conditions contained in Schedule A.

Schedule B: Conditions for Development Approvals under IDAS

pages 82 to 99

The Department of Natural Resources and Water is nominated as the assessment manager for the approvals addressed within Schedule B.

Schedule C: Conditions Relating to Other Legislative Matters

pages 100 to 102

Schedule D: Imposed Conditions

pages 103 to 116

Conditions not directly related to legislative provisions that seek to promote best practice and minimise project impacts

Schedule A: Conditions for Environmentally Relevant Activities for development permits pursuant to the Integrated Planning Act 1997

I nominate the Environment Protection Agency (EPA) as concurrence agency for the conditions contained in Schedule A.

ERA 7(b) Chemical storage – storing chemicals (other than crude oil, natural gas and petroleum prouducts), including ozone depleting substances, gases or dangerous goods under the dangerous goods code in containers having a design storage volume of 1 000 m3 or more.

ERA 11(b) Crude Oil or Petroleum product storing – storing crude oil or a petroleum product in tanks or containers having a combined total storage capactity of 500 000 l or more.

ERA 20(c) - Extracting rock or other material - extracting rock (other than rock mined in block or slab form for building purposes), sand (other than foundry sand), clay (other than clay used for its ceramic properties, kaolin or bentonite), gravel, loam or other material (other than gravel, loam or other material under a mining authority) from a pit or quarry using plant or equipment having a design capacity of 100 000t or more a year.

ERA 22(c)- Screening etc. materials - screening, washing, crushing, grinding, milling, sizing or separating material extracted from the earth (other than under a mining authority) or by dredging using plant or equipment having a design capacity of 100 000t or more a year..

ERA 28 Motor vehicle workshop – operating a workshop or mobile workshop in the course of which motor vehicle mechanical or panel repairs are carried out in the course of a commercial or municipal enterprise (other than on a farm) or on a commercial basis.

ERA 62 Concrete batching - producing concrete or a concrete product by mixing cement, sand, rock, aggregate or other similar materials in works (including mobile works) having a design production capacity of more than 100 t per year.

ERA 84 Regulated Waste Storage – operating a facility for receiving and storing regulated waste.

Environment Protection Agency (EPA) Interest: General

Prevent and/or minimise likelihood of environmental harm

(PG1) In carrying out an ERA to which a development approval relates, all reasonable and practicable measures must be taken to prevent and/or minimise the likelihood of environmental harm from being caused.

Maintenance of Measures, Plant and Equipment

(PG2) Ensure that:

a. all measures, plant and equipment necessary to ensure compliance with the conditions of this approval are installed; and

b. such measures, plant and equipment are operated and maintained in a proper condition.

Display of Development Approval

(PG3) A copy of the development approval must be kept at the approved place in a location readily accessible to personnel carrying out the activity.

Definition of Extraction Area

(PG4) The only areas permitted to be extracted under this approval are those shown in the Environmental Impact Statement, Supplementary Report, August 2007, Figure 1 or any subsequent approved versions of this plan within Lot 4 on SP164198.

(PG5) This development approval remains in effect until the completion of works associated with the Hinze Dam Stage 3 project.

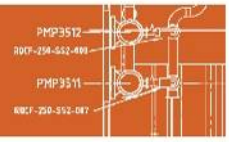
Monitoring

(PG6) Record, compile and keep for a minimum of five years all monitoring results required by this development approval and make available for inspection all or any of these records upon request by the administering authority.

(PG7) Where monitoring is required by this development approval, ensure that a suitably qualified person(s) conducts all monitoring.

Alterations

(PG8) No change, replacement or operation of any plant or equipment is permitted if the change, replacement or operation of the plant or equipment increases, or is likely to substantially increase, the risk of environmental harm above that expressly provided by this development approval.



Calibration

(PG9) All instruments and devices used for the measurement or monitoring of any parameter under any condition of this development approval must be calibrated, and appropriately operated and maintained.

Trained/Experienced Operator(s)

(PG10) The registered operator of the ERA to which this approval relates, including but not limited to employees and contract staff, must be:

a) trained in the procedures and practices necessary to:

- comply with the conditions of this development approval, and
- prevent environmental harm during normal operation and emergencies; or

b) under the close supervision of such a trained person.

Spill Kit(s)

(PG11) Appropriate spill kit(s) and relevant operator instructions/emergency procedure guides for the management of wastes and chemicals associated with the ERA must be kept at the site.

Spill Kit Training

(PG12) Anyone operating under this approval must be trained in the use of the spill kit(s).

Site Based Management Plan

(PG13) From commencement of an ERA to which this approval relates, a site based management plan (SBMP) must be implemented. The SBMP must identify all sources of environmental harm, including but not limited to the actual and potential release of all contaminants, the potential impact of these sources and what actions will be taken to prevent the likelihood of environmental harm being caused. The SBMP must also provide for the review and 'continual improvement' in the overall environmental performance of all ERAs that are carried out. The SBMP must address the following matters:

(a) Environmental commitments - a commitment by senior management to achieve specified and relevant environmental goals.

(b) Identification of environmental issues and potential impacts.

(c) Control measures for routine operations to minimise likelihood of environmental harm.

(d) Contingency plans and emergency procedures for non-routine situations.

(e) Organisational structure and responsibility.

(f) Effective communication.

(g) Monitoring of contaminant releases.

(h) Conducting environmental impact assessments.

(i) Staff training.

(j) Record keeping.

(k) Periodic review of environmental performance and continual improvement.

(PG14) Details of any amendment of the SBMP must be submitted to the administering authority with the annual return which immediately follows the enactment of any such amendment.

(PG15) The SBMP must not be implemented or amended where such implementation or amendment would result in a contravention of any condition of this development approval.

(PG16) A copy of the SBMP must be kept at the approved place in a location readily accessible to personnel carrying out the activity.

Cease Activities in Event of Material or Serious Environmental Harm Occurring

(PG17) If the registered operator of the ERA to which this approval relates becomes aware of material environmental harm or serious environmental harm as a result of carrying out the environmentally relevant activity (ERA) then the said activities must cease immediately.

(PG18) An Agreement for Use of Recycled Water incorporating a Recycled Water Management Plan (RWMP) must be in place with the Gold Coast City Council before recycled water from the Gold Coast City Council waste water treatment plants is accepted for use on the approved premises.

EPA Interest: Air

(PA1) The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the ERA must not cause a nuisance at any nuisance sensitive or commercial place.

(PA2) The release of dust and/or particulate matter resulting from the ERA must not cause an environmental nuisance at any nuisance sensitive or commercial place.

(PA3) Take the necessary measures to prevent the release of dust from vehicles used for transporting aggregate from the site.

(PA4) Trafficable areas must be maintained to prevent or minimise the release of windblown or traffic generated dust to the atmosphere.

(PA5) Take the necessary measures to prevent or minimise the release of dust to the atmosphere from crushing and screening equipment and material conveyor systems.

(PA6) Stockpiles must be maintained to prevent or minimise the release of windblown dust to atmosphere.

(PA7) The concrete batching plant must be operated and maintained using all reasonable and practicable measures necessary to minimise the release of wind blown dust to the atmosphere.

(PA8) An effective static precipitator system must be installed to provide a dust extraction system to collect and contain dust generated in the loading and unloading areas for the cement and fly-ash silos.

(PA9) A test circuit for simulating high level conditions in the silos is to be used before each bulk delivery.

(PA10) The filling of all silos must be controlled by automatic devices which prevent silos from being filled beyond their nominal capacity.

(PA11) Not withstanding condition PA2, dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place:

(a) dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS3580.10.1 of 2003 (or more recent editions); or

(b) a concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM10) suspended in the atmosphere of 150 micrograms per cubic metre over a 24-hour averaging time, at a nuisance sensitive or commercial place downwind of the site, when monitored in accordance with;

- Australian Standard AS3580.9.6 of 2003 (or more recent editions) "Ambient Air- Particulate Matter - Determination of suspended particulates PM10 high-volume sampler with size inlet gravimetric Method" or
- Any alternative method of monitoring PM10 which may be permitted by the "Air Quality Sampling Manual" as published from time to time by the administering authority.

(PA12) When requested by the administering authority, dust and particulate monitoring must be undertaken to investigate any complaint or environmental nuisance caused by dust and/or particulate matter, and the results notified within 14 days to the administering authority following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially sensitive place and upwind sites and the report must include:

(a) dust deposition for a complaint alleging dust nuisance; and

(b) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM10) suspended in the atmosphere over a 24 hour averaging period.

(PA13) Where it is determined by an authorised person that dust and particulate monitoring results indicate environmental nuisance, the following must occur:

(a) address the complaint, including the use of appropriate dispute resolution if required; and

(b) immediately implement dust abatement measures so that emissions from site activities do not result in further nuisance.

Agency Interest: Water

Release of Contaminants to Waters

(PW1) Contaminants must not be directly or indirectly released from the approved place to any waters or the bed and banks of any waters unless otherwise authorised by a condition of this approval

(PW2) Effluent treatment system located within the crib hut in the quarry is to be maintained and emptied by a licenced waste contractor.

High Level Alarms

(PW3) The operator of an ERA to which this approval relates must ensure that effective and appropriate measures are used to prevent the overfilling of vessels or containers containing petroleum products and prevent the spillage of material during material transfer operations. Effective and appropriate measures may include but are not limited to the use of high level alarms and operator diligence.

(PW4) A tank overfill protection system is to be installed with a mechanical shut off valve and visual/audible alarm for all petroleum product storages.

Maintenance and Clean Up

(PW5) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas where contaminants cannot be released into any waters, roadside gutter or stormwater drainage system to an extent that would cause environmental harm.

Stormwater Management

(PW6) Diversion drains and or contour banks must be designed, installed and maintained to minimise the potential for stormwater runoff to enter areas disturbed by the ERA.

(PW7) A first flush system must be established in the concrete batching area to collect the first 20mm of contaminated waters and to diver clean stormwater runoff to the external stormwater drainage.

Erosion Protection Measures and Sediment Controls

(PW8) Effective erosion and sediment control structures must be designed, installed and maintained wherever necessary to prevent the erosion of disturbed areas and the release of sediment to waters.

(PW9a) The total storage volume of any sedimentation basin for the rock quarry catchment must be the larger of either: 450m3 for every hectare of the catchment area of disturbed land; or one and a half times the volume of water that will enter the basin during six minutes of a five year ARI one hour rain event. The storage depth must be at least one metre over two thirds of the basin area. Sediment must be removed when accumulated sediment reaches 33% of the total volume. A depth indicator for 33% must be set into the internal banks of sedimentation basins and a spillway at 100% with a minimum 750mm freeboard for the banks above the spillway. Sedimentation basins for the rock quarry catchment must discharge over the primary spillway outlet directly into the reservoir behind Hinze Dam.

(PW9b) The volume of any sedimentation basins other than for the rock quarry catchment must be 700m3 for every hectare of the catchment area of disturbed land. Depth indicators for 20% and 50% must be set into the internal banks of sedimentation basins and a spillway at 100% with a minimum 750mm freeboard for the banks above the spillway. The retained sediment must be removed when it has reached 20% of the total volume. When water has reached 50% of the total volume, it must be flocculated with gypsum (applied as a slurry at 32kg/100m3), retained for at least 2 days then the clear supernatant pumped out from near the surface and discharged or used for dust suppression on-site.

(PW9c) All sedimentation basins with a total storage volume larger than 2,000m3 or with a bank height of 2m or more must be designed by a suitably qualified and experienced engineer.

(PW10) Stockpile areas must be bunded to direct runoff from such areas to the settlement ponds on the site.

Oil Separators

(PW11) Collected waste oil and sludge removed from each separator must be disposed of in a manner which does not cause contamination of any waters or land.

(PW12) A record must be maintained of the time and date of the desludging and maintenance of each oil interceptor.

(PW13) Collected waste oil and sludge is to be removed from site by a licensed waste contractor in accordance with condition PT4

(PW14) Detergents or other emulsifying agents must be prevented as far as practicable from entering the separator.

Quality Characteristics Of Release to Waters

(PW15) Monitoring must be undertaken and records kept of contaminant releases to waters from the discharge locations indicated in Figure 1 for the quality characteristics and not less frequently than specified in Table 1 - Contaminant release limits to water. All determinations of the quality of contaminants released must be:

a) made in accordance with methods prescribed in the latest edition of the Environment

Protection Agency Water Quality Sampling Manual; and

b) carried out on samples that are representative of the discharge.

(PW16) The release must not produce any slick or other visible evidence of oil or grease, nor contain visible floating oil, grease, scum, litter or other objectionable matter.

(PW17) The method of measurement and reporting of the quality of contaminants released to waters must comply with the latest edition of the *Environment Protection* Agency's Water Quality Sampling Manual.

Groundwater

(PW18) The extraction of materials must not have a detrimental impact on groundwater quality or levels.

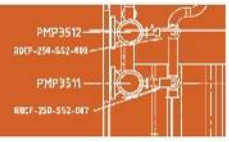
EPA Interest: Land

Preventing Contaminant Releases to Land

(PL1) Contaminants must not be released to land

(PL2) Spillage of all chemicals and fuels must be contained within an on-site containment system and controlled in a manner that prevents environmental harm.

NOTE: All petroleum product storages must be designed, constructed and maintained in accordance with AS 1940- Storage and Handling of Flammable and Combustible Liquids.



Tank Dewatering

(PL3) Contaminants arising from tank dewatering operations must not be released within any tank bund.

(PL4) Contaminants arising from tank dewatering operations must not be released to land.

(PL5) Contaminants arising from tank dewatering operations must not be released to waters except in accordance with the requirements of this development approval.

Land Rehabilitation

(PL6) Topsoil must be removed and stockpiled prior to carrying out the ERA.

(PL7) Rehabilitation of disturbed areas, apart from those areas currently being utilised for the ERA, must take place progressively and must commence within six weeks of cessation of the ERA in an area.

(PL8) Native seeds endemic to Lot 4 SP164198 must be collected and propagated for use in revegetation.

(PL9) Excavations that are to remain after cessation of the ERA on the site must be made safe and accessible to native animals.

(PL10) The water quality of any residual water bodies must comply with the water quality guidelines for livestock drinking water stated in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000.

(PL11) The site (including all disturbed areas such as the clay extraction pit, slopes, haul roads, sedimentation dam(s) and stockpile areas) must be rehabilitated in a manner such that:

(a) suitable native species of vegetation are planted and established;

(b) effective erosion control measures are implemented in rehabilitated areas;

(c) the quality of stormwater, other water and seepage released from the site is such that releases of contaminants such as suspended solids, turbidity, total dissolved salts, pH, total iron, total aluminium and total manganese are not likely to cause environmental harm;

(d) the likelihood of environmental nuisance being caused by release of dust is minimised;

(e) the water quality of any residual water body meets relevant criteria for the post-site use and does not have the potential to cause environmental harm;

(f) the final land form is stable and not subject to slumping; and

(g) any actual and potential acid sulphate soils in or on the site are either disturbed; or submerge, or treated so as to not be likely to cause environmental harm.

(PL12) At least six (6) months prior to ceasing carrying out the environmentally relevant activities at the approved place, the proponent must submit a Draft Site Rehabilitation and Decommissioning Report to the administering authority in accordance with the matters prescribed in condition PL14.

(PL13) At least three (3) months prior to ceasing carrying out the environmentally relevant activities at the approved place, submit a Final Site Rehabilitation and Decommissioning Report to the administering authority. The Final Site Rehabilitation and Decommissioning Report must include any amendments made to the Draft Site Rehabilitation Report arising from consultation with the administering authority.

(PL14) The Site Rehabilitation and Decommissioning Report must address at least the following matters:

- description of what is ultimately proposed for the site;
- where appropriate revegetation of the site, including ground preparation, species used, methods, density, irrigation, weed control, use of native species endemic to the area where appropriate, staging and timing of revegetation works;
- the proposed landform design to be implemented, including design profile and batter slopes;
- nature of materials utilised and techniques to be employed for any proposed backfilling of extracted areas such as filling, compaction, topsoiling, overburden return and any other soil amelioration leading to vegetation establishment;
- stability of the final landform, including assessment of any changes to the flood gradient, assessment of the stability of slopes and susceptibility to soils slumping;
- stability of the final land surface (i.e. erosion control) including assessment of susceptibility of soils to erosion and anticipated erosion control measures;
- provision and protection of riparian and wildlife corridor widths and any appropriate linkages to other habitat areas;
- identification of any habitat areas that have been formed either directly or indirectly as a result of the extractive works or associated activities that may be adversely affected by decommissioning works, for example, any habitat pools upstream and downstream of a weir or causeway, and measures to protect these areas;

- potential long term impacts on environmental values and measures proposed to address these, for example, restoration of desired environmental values;
- expected short term and long term water quality within any lakes or ponds, with reference to likely uses of the waters, environmental values, appropriate water quality criteria, proposed remedial measures in the event that criteria are not met, and who will be responsible for maintenance of the water bodies in the long term;
- a proposed maintenance program, including maintenance of erosion control measures, vegetation being established (e.g. watering, weed control, fencing, site security) and water quality of any lakes or ponds;
- in the event that actual or potential acid sulfate soils are present, appropriate management measures for the soils including avoidance, submergence and treatment;
- prevention or minimisation of windblown dust from overburden stockpiles, remnant raw material stockpiles and rehabilitation earthworks;
- prevention or treatment of the release of contaminated stormwater runoff from remnant material stockpiles, disturbed areas and any lakes or ponds created to the bed or banks of any watercourse;
- a proposed monitoring program, for example, plant growth, plant health, stormwater quality, water body water quality, erosion protection measures and stability;
- records to be kept and reporting of outcomes, including the monitoring program results and rehabilitation outcomes achieved;
- the staging and timing of the expected work;
- any bonds kept for rehabilitation, for example, by the local authority; and
- submission of written advice to the administering authority within fourteen (14) days of completion of site rehabilitation and decommissioning works

(PL15) The proponent must provide a written report to the administering authority at the completion of site rehabilitation and decommissioning works within thirty (30) days of completing the required works.

Rehabilitation of Quarrying, Clay Borrow and other disturbed areas – particular treatment as required by EPA

An application for an Environmentally Related Activity under the *Environment Protection Act 1994* would be required for quarrying and clay borrow areas and as such detailed conditions for site rehabilitation would be determined as part of this approval.

The site rehabilitation plan should outline rehabilitation and regeneration measures for koala habitat and be consistent with the Nature Conservation (Koala)

Conservation Plan 2005. For other identified species the rehabilitation plan should be consistent with (but not limited to) the following:

Suggested Rehabilitation Plan Guidelines

1. Introduction
2. Rehabilitation Objective
3. History of the Site
4. History of Rehabilitation
5. Rehabilitation Plan
6. Implementation Strategies
    - 6.1 Contouring
    - 6.2 Surface Preparation
    - 6.3 Use of Fertilisers
    - 6.4 Revegetation (including species lists)
    - 6.5 Planting
    - 6.6 Watering
    - 6.7 Weed control
    - 6.8 Seed Collection and Dispersal
7. Monitoring
8. Performance Criteria
9. Remedial Actions

Table: Rehabilitation Schedule

Map: Conservation Buffer Zones

Map: Rehabilitation Areas

Agency Interest: Noise

Emission of Noise

(PN1) Noise from the ERA must not cause an environmental nuisance, at any sensitive or commercial place.

(PN2) Noise monitoring must be undertaken as directed by the administering authority to investigate any complaint about noise nuisance being caused by the ERA, which complaint in the opinion of an authorised person is not frivolous, vexatious nor based on mistaken belief, and the results there of notified to the administering authority. The administering authority must be notified of the results within 14 days following completion of monitoring. For the purposes of this condition, noise monitoring must be done by a competent person in accordance with the latest edition of the Environment Protection Agency Noise Measurement Manual and include;

(a) LAeq, 1hr;
(b) LAbg, T (or LA90, T);
(c) LA1, adj 10 mins;
(d) LA10, adj 10 mins;
(e) relevant background sound level (bg);
(f) the level and frequency of occurrence of impulsive or tonal noise;
(g) effects due to extraneous factors such as traffic noise;
(h) atmospheric conditions including wind speed and direction;
(i) location, date and time of measurements;
(j) effects due to extraneous factors such as traffic noise; and
(k) details of measurement instrumentation and measurement procedure.

(PN3) Not withstanding condition PN1, noise from site activities must not exceed the criteria specified in Table 2.

(PN4) Where it is determined by an authorised person that noise monitoring results indicate environmental nuisance, you must:

(a) address the complaint, including the use of appropriate dispute resolution if required; and
(b) immediately implement noise abatement measures so that emissions of noise from site activities do not result in further environmental nuisance.

(PN5) Equipment having directional noise characteristics are to be oriented such that noise is directed away from sensitive areas.

(PN6) Acoustic barriers are to be incorporated around the crushing and screening plant as outlined in section 3.3.5 of the Environmental Impact Statement Supplementary Report.

(PN7) Where possible all mechanical plant is to be silenced by best practical means using current control technology.

(PN8) All mobile and stationary equipment containing internal combustion engines are to be fitted with a suitable muffler.

(PN9) Reversing alarms for mobile equipment are to have their acoustic range limited to the immediate danger area.

(PN10) The internal lining of the mechanical workshop is to be covered in a foil faced insulation to reduce reverberant noise within the space to provide a minimum sound attenuation of 26dB(A) through three (3) sides and the roof.

(PN11) Not withstanding any other condition of this development approval, no drilling, blasting, extraction and crushing of extracted material may be carried out:

(a) outside the hours of 6.30 am to 6.30 pm Mondays to Saturdays;
(b) on Sundays; and
(c) on public holiday(s).

Explosive blasting nuisance

(PN12) Explosive blasting for the ERA must not cause a nuisance at any sensitive place.

(PN13) Explosive blasting on the site shall be carried out within the times specified in Table 3 unless otherwise approved from time to time by the administering authority due to meteorological conditions.

(PN14) Every explosive blast for the ERA shall be designed by a suitably qualified person to achieve the criteria specified in Table 3.

Explosive blasting monitoring

(PN15) Noise monitoring must be undertaken for explosive blasting. For the purposes of this condition monitoring must be done by a competent person in accordance with Australian Standard 2187.2 – Explosives Storage, Transport and Use - Part 2 Use of Explosives, and include:

(a) peak particle velocity (mm/s);
(b) air blast overpressure level (dB linear peak);
(c) location of the blasting within the site;
(d) atmospheric conditions including temperature, relative humidity, wind speed and direction;
(e) affects due to extraneous factors; and
(f) location, date and time of measurements.

(PN16) Noise from blasting shall be measured using noise measurement equipment with a lower limiting frequency of 2Hz (- 3dB response point of the measurement system) and a detector onset time of not greater than 100 microseconds as assessed in accordance with AS –1259.1 clauses 8.5 and 10.4.

(PN17) Vibration instrumentation must be capable of measurement over the range 0.1mms-1 to 300mms-1 with an accuracy within 5 percent and have a frequency response flat to within 5 percent over the frequency range of 4.5Hz to 250Hz.

(PN18) All relevant information pertaining to the design of every explosive blast for the ERA in relation to the criteria specified in Table 3 shall be kept in written and diagrammatic form.

EPA Interest: Waste

(PT1) Effective procedures must be implemented to ensure that wastes generated on the site are minimised, recycled, sorted, handled, and transferred in a proper and efficient manner. Disposal of such waste must be at a facility lawfully able to accept such waste

(PT2) All regulated waste removed from the site must be removed by a person who holds a current authority to do so under the *Environment Protection Act 1994*.

(PT3) Waste and/or vegetation must only be burned on site following consultation with the Queensland Rural Fire Service and Queensland Parks and Wildlife Service.

Off-site Movement of Waste

(PT4) Where regulated waste is removed from the site (other than by a release authorised under another condition of this development approval), the registered operator must monitor and keep records of the following:

(a) the date, quantity and type of waste removed;
(b) the name of the waste transporter and/or disposal operator that removed the waste; and
(c) the intended treatment/disposal/destination of the waste.

Note: Records of documents maintained in compliance with a waste tracking system established under the *Environment Protection Act 1994* or any other law for regulated waste will be deemed to satisfy this condition.

Notification of Improper Disposal of Regulated Waste

(PT5) If a person removes regulated waste associated with activities at the site and disposes of such waste in a manner which is unlawful, the registered operator must notify the administering authority of all relevant facts,

matters and circumstances known concerning the disposal as soon as practicable.

Agency Interest: Notification

(PO1) The registered operator of the ERA to which this approval relates must telephone the EPA's Pollution Hotline as soon as practicable after becoming aware of any release of contaminants not in accordance with the conditions of this development approval or any event where environmental harm has been caused or may be threatened.

Notification Information (including spills)

(PO2) The registered operator of an ERA to which this approval relates must provide written advice detailing the following information must be provided to the administering authority within fourteen (14) days following any notification in accordance with condition PO1:

(a) the name of the registered operator, including the development approval number;
(b) the name and telephone number of a designated contact person;
(c) the location of the release / event;
(d) the time of the release / event;
(e) the time the operator became aware of the release / event;
(f) the suspected cause of the release / event;
(g) a description of the resulting effects of the release / event;
(h) the results of any sampling performed in relation to the release / event;
(i) actions taken to mitigate any environmental harm and or environmental nuisance caused by the release / event; and
(j) proposed actions to prevent a recurrence of the release / event.

DEFINITIONS

Words and phrases used throughout this section are defined below. Where a definition for a term used is sought and the term is not defined within herein the definitions provided in the relevant legislation shall be used.

"administering authority" means the Environment Protection Agency or its successor.

"annual return" means the return required by the annual notice (under section 316 of the Environment Protection Act 1994) for the section 73F registration certificate that applies to the development approval.

"approval" means 'notice of development application decision' or 'notice of concurrence agency response' under the *Integrated Planning Act 1997* .

"approved plans" means the plans and documents listed in the approved plans section in the notice attached to this development approval.

"authorised place" means the place authorised under this development approval for the carrying out of the specified environmentally relevant activities.

"commercial place" means a place used as an office or for business or commercial purposes.

"dredge spoil" means material taken from the bed or banks of waters by using dredging equipment or other equipment designed for use in extraction of earthen material.

"dwelling" means any of the following structures or vehicles that is principally used as a residence –

- a house, unit, motel, nursing home or other building or part of a building;
- a caravan, mobile home or other vehicle or structure on land;
- a water craft in a marina.

"*Environment Protection* Agency" means the department or agency (whatever called) administering the *Coastal Protection and Management Act 1995* or the *Environment Protection Act 1994*.

"intrusive noise" means noise that, because of its frequency, duration, level, tonal characteristics, impulsiveness or vibration –

- is clearly audible to, or can be felt by, an individual; and annoys the individual.
- In determining whether a noise annoys an individual and is unreasonably intrusive, regard must be given to Australian Standard 1055.2 – 1997 Acoustics – Description and Measurement of Environmental Noise Part 2 – Application to Specific Situations.

"**L**Aeq, 1hr" means the time average A-weighted sound pressure level, within the meaning given by AS 1055.1, for a one hour time interval.

"**L** Abg,T or (L A90,T)" Background sound pressure level L A90,T is the A-weighted sound pressure level obtained using time-weighting 'F' exceeded for 90 percent of the measuring period 'T'.

"**LA 1, adj, 10 mins"** means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 1% of any 10 minute measurement period, using Fast response.

"LA max, adj, **T"** means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.

"land" in the "land schedule" of this document means land excluding waters and the atmosphere.

"**mg/L"** means milligrams per litre.

"noxious" means harmful or injurious to health or physical well being.

"nuisance sensitive place" includes –

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- a motel, hotel or hostel; or
- a kindergarten, school, university or other educational institution; or
- a medical centre or hospital; or
- a protected area under the *Nature Conservation Act 1992*, the Marine Parks Act 1992 or a World Heritage Area; or
- a public thoroughfare, park or gardens; or
- a place used as a workplace, an office or for business or commercial purposes and includes a place within the curtilage of such a place reasonably used by persons at that place.

"offensive" means causing offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive.

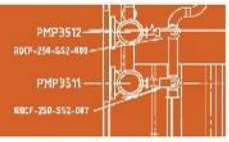
"protected area" means –

- a protected area under the *Nature Conservation Act 1992*; or
- a marine park under the Marine Parks Act 1992; or
- a World Heritage Area.

"quarry material" means material on State coastal land, other than a mineral within the meaning of any Act relating to mining. Material includes for example stone, gravel, sand, rock, clay, mud, silt and soil, unless it is removed from a culvert, stormwater drain or other drainage infrastructure as waste material.

"regulated waste" means non-domestic waste mentioned in Schedule 7 of the *Environment Protection* Regulation 1998 (whether or not it has been treated or immobilised), and includes -

- for an element - any chemical compound containing the element; and
- anything that has contained the waste.



"site" means land or tidal waters on or in which it is proposed to carry out the development approved under this development approval.

"watercourse" means a river, creek or stream in which water flows permanently or intermittently-

- in a natural channel, whether artificially improved or not; or
- in an artificial channel that has changed the course of the watercourse.

"waters" includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part-thereof.

"works" or **"operation"** means the development approved under this development approval.

"you" means the holder of this development approval or owner / occupier of the land which is the subject of this development approval.

"80th percentile" means not more than one (1) of the measured values of the quality characteristic is to exceed the stated release limit for any five (5) consecutive samples for a sampling point at any time during the environmental activity(ies) works

Table 1 - Contaminant release limits to water

RELEASE POINT NUMBER/ SAMPLING MEASUREMENT POINT	QUALITY CHARACTERISTICS	RELEASE LIMIT / LIMIT TYPE	MONITORING FREQUENCY
Primary spillway outlets from sediment dams SD18, SD19, and SD21.	Turbidity	Discharge permitted from spillway without turbidity limit if constructed and operated within the requirements of conditions PW9, PW10 and PW11.	
Spillways from sediment dams SD11, SD12, SD15, SD22, SD23, SD25, SD26, SD27, SD35.	Turbidity	Discharge permitted from spillway without turbidity limit during significant rainfall events if constructed and operated within the requirements of conditions PW9, PW10 and PW11.	
Supernatant discharged by pumping from sediment dams SD11, SD12, SD15, SD22, SD23, SD25, SD26, SD27, SD35.	Turbidity	20 NTU (maximum)	At the start of pumping and at sufficient intervals during pumping to ensure limit is not exceeded.
Any discharge from sediment dams SD11, SD12, SD15, SD18, SD19, SD21, SD22, SD23, SD25, SD26, SD27, SD35.	pH.	6.5 - 8.0 (Range)	At the start of pumping and at least daily during pumping or spillway discharge.
	Dissolved Oxygen. (mg/L)	2.0mg/L (Minimum)	
	Petroleum Products, Scum or Litter	Not visible or other noticeable	
	Conductivity (uS/cm)	400µS/cm (maximum)	

Table 2 - Noise limits

Noise level dB(A) measured as	Monday to Saturday		Sundays and public holidays
	6:30am - 10pm*	10pm – 6:30am	Anytime
	Noise measured at a 'Nuisance sensitive place'		
LAeq, 1hr	58	Not audible	Not audible
LA1, adj, 10 mins	63	Not audible	Not audible
	Noise measured at a 'Commercial place'		
LAeq, 1hr	58	Not audible	Not audible
LA1, adj, 10 mins	63	Not audible	Not audible

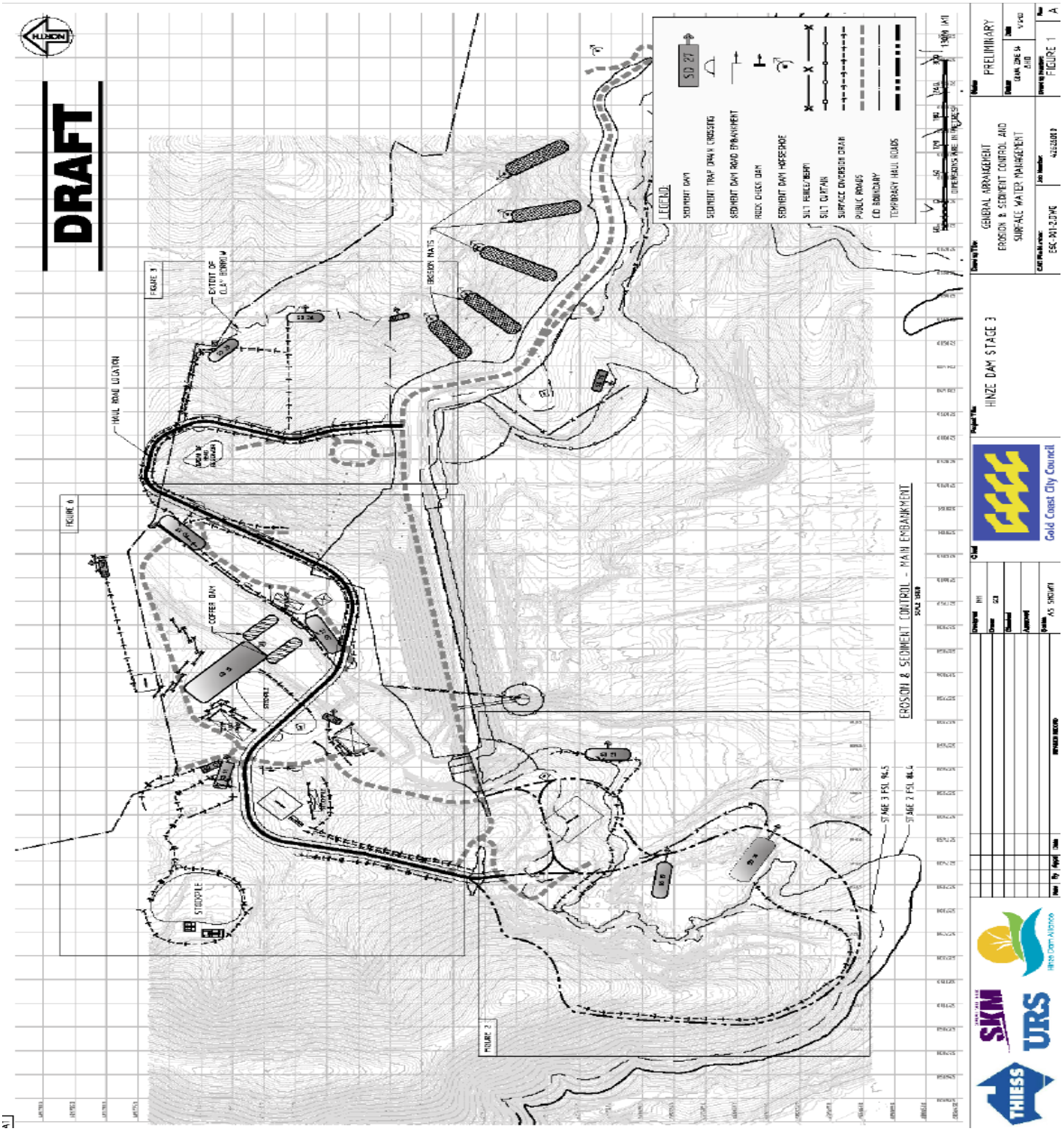
*After 6:30pm Monday-Saturday, only activities associated with motor vehicle maintenance are permitted.

Table 3 (Explosive blast design criteria and time limits)*

	Vibration measured at a 'sensitive place'	
	Monday to Friday 9am – 5.30pm Saturday 9am – 5.30pm	Other times and public holidays
Vibration (peak particle velocity)	5 mm/s for 9 out of 10 consecutive blasts and must not exceed 10mm/s for any blast	No blasting to occur
Air blast overpressure level (dB linear peak)	115dB(linear) peak for 9 out of 10 consecutive blasts and must not exceed 120dB(linear) peak for any blast	No blasting to occur

* Table 3 does not purport to set limits applicable to any particular explosive blast, rather sets design criteria for every explosive blast.

The following site map shows the location of various components of the Project.
Figure 1



Schedule B: Conditions for Development Approvals under IDAS

The Department of Natural Resources and Water is nominated as the assessment manager for the approvals addressed within Schedule B.

A. Operational works that will increase the storage capacity of a referable dam under the *Water Act 2000* by more than 10%

Dam Safety Condition Schedule

1. Referable Dam Category Assessment:

Failure Impact Assessment Category 2

2. Basic Description of the Dam:

Location:	Nerang River, (AMTD 36.4km)
Purpose:	Town Water Supply Flood Mitigation
MAIN EMBANKMENT	
Construction Type:	Zoned earth fill embankment
Total Length:	770m
Embankment Crest Level	EL 108.5
Maximum Embankment Height:	80m
SADDLE DAM	
Construction Type:	Zoned earth fill embankment
Total Length:	920m
Embankment Crest Level	EL 108.5
Embankment Crest Width	10m
Maximum Embankment Height	24m
Full Supply Level	EL 94.5
Storage Capacity	309,700Ml
Spillway – Fixed Crest Profile	Ogee Crest
• Fixed Crest Level	EL 94.5
• Length	75m

NOTE:

1. Levels quoted are to Australian Height Datum (AHD).

3. General

1. The dam is to be kept safe at all times.

4. Documentation

1. Any documentation prepared in order to comply with these conditions must be stored securely until such time as the dam is decommissioned.
2. The documentation must be made available for inspection by the chief executive, Department of Natural Resources and Water, within seven (7) days of a written request for access being received by the dam owner.
3. On change of ownership of the dam, all documentation prepared in compliance with these conditions must be transferred to the new owner.

5. Incidents and Failures

1. In addition to the requirements detailed within the Emergency Action Plan, the dam owner must report in writing all incidents and failures (as defined in the Queensland Dam Safety Management Guidelines – February 2002) to the chief executive, Department of Natural Resources and Water, within seven (7) days of becoming aware of the incident or failure.
2. The dam owner must advise the chief executive, Department of Natural Resources and Water of any proposed remedial actions in writing within thirty (30) days of the incident or failure.

6. Design Report

1. The Preliminary Design Report for Hinze Dam Stage 3 is Hinze Dam Stage 3 Upgrade Preliminary Design Report of May 2007.
2. The dam owner must update this design report in accordance with this condition and the Queensland Dam Safety Management Guidelines – February 2002, and provide a copy of the updated design report to the chief executive, Department of Natural Resources and Water, within one (1) month of the date of issue of the development permit for the works.
3. The update of the Design Report must show how the works will satisfy the design criteria given in initial Design Report.
    1. Results of any additional hydraulic model studies since the preliminary design phase.
    2. Results of foundation and other investigations carried out since the investigation and preliminary design phase.

3. Complete set of construction drawings and specifications.
4. Final Instrumentation arrangement for the dam.
5. Design modifications necessary as a result of information obtained during the construction phase
6. Managing risk during construction

7. Design and Construction

1. The dam is to be designed and constructed to comply with the Queensland Dam Safety Management Guidelines – February 2002.

2. The Hinze Dam Stage 3 must be constructed as per the Hinze Dam Alliance drawings listed below:

GEN-003 Rev A
GEN-004 Rev A
FDN-040 Rev A
FDN-041 Rev A
FDN-042 Rev A
FDN-060 Rev A
FDN-062 Rev A
FDN-063 Rev A
EMB-001 Rev A
EMB-002 Rev A
EMB-003 Rev A
EMB-004 Rev A
EMB-010 Rev A
EMB-040 Rev A
EMB-041 Rev A
EMB-050 Rev A
EMB-051 Rev A
EMB-052 Rev A
EMB-090 Rev A
INS-001 Rev A
INS-002 Rev A
INS-005 Rev A
INS-006 Rev A
INS-007 Rev A
INS-008 Rev A
INS-009 Rev A
SPL-001 Rev A
SPL-002 Rev A
SPL-003 Rev A

SPL-004 Rev A
SPL-005 Rev A
SPL-006 Rev A
SPL-007 Rev A
SPL-010 Rev A
SPL-011 Rev A
SPL-090 Rev A
SPL-091 Rev A
SPL-092 Rev A
OWK-001 Rev A
OWK-002 Rev A
OWK-003 Rev A
OWK-004 Rev A
OWK-005 Rev A
OWK-006 Rev A
OWK-101 Rev A
OWK-102 Rev A
OWK-103 Rev A
OWK-201 Rev A
OWK-202 Rev A
OWK-300 Rev A

Note: While the naming and numbering of the drawings listed above may change and more drawing may be added, it is the intent of the drawings listed above that must be adhered to during the construction of the dam.

3. The dam owner must advise the chief executive, Department of Natural Resources and Water of the 'practical completion of construction' of the works within seven (7) days of that point of construction being reached.
4. Construction of any temporary works must be carried out in accordance with current engineering practice and standards.
5. Any remedial works or reconstruction of the dam must be carried out in accordance with current engineering practice to ensure that the dam remains in accordance with the documentation listed within this condition.
6. Where remedial, reconstruction or upgrade works are proposed, a copy of the final design and construction methodology must be forwarded to the chief executive, Department of Natural Resources and Water for consideration no later than thirty (30) days prior to commencement of any construction works.

8. Data Book

1. A Data Book Hinze Dam, Data Book, August 2006 has been compiled for Hinze Dam Stage 2. This Data Book must be updated by the inclusion of information pertaining to Stage 3 of the dam.
2. The additional information to be incorporated in the Data Book must include all information as is required in the Queensland Dam Safety Management Guidelines – February 2002 including:
    a. All available documentation relating to the investigation, design, construction, operation, maintenance, surveillance, monitoring measurements and any remedial action taken during construction and subsequent operation of the dam.
    b. Known deficiencies such as seepage, cracking.
3. The dam owner must ensure the Data Book is reviewed (and if necessary updated) in accordance with the Queensland Dam Safety Management Guidelines – February 2002 by the 1st day of May of each calendar year.
4. A written notification confirming that the Data Book has been reviewed (and if necessary updated) must be signed by the dam owner and forwarded to the chief executive, Department of Natural Resources and Water by the 31st day of May of that same calendar year.

9. 'As Constructed' Documentation

1. The dam owner must develop 'as constructed' documentation for Hinze Dam Stage 3 in accordance with this condition and the Queensland Dam Safety Management Guidelines – February 2002.
2. The owner must provide one copy of the as constructed documentation to the chief executive, Department of Natural Resources and Water, on or within three (3) calendar months of "practical completion of construction".
3. The as constructed documentation must include:
    a. A record of any decisions to adapt the nominated design to suit actual field conditions;
    b. As constructed drawings indicating the actual lines, levels and dimensions to which the structure is built;
    c. A description of the construction process
    d. Systematically compiled and comprehensive photographs of the construction
    e. Material test results

f. Construction inspection reports

g. Initial instrumentation data

h. Certification by an RPEQ that the works have been constructed in compliance with all relevant engineering standards

10. Standing Operating Procedures

1. The Standing Operating Procedures (SOP) contained in Hinze Dam, Standing Operating Procedures have been compiled for Hinze Dam Stage 2. These SOP cover the activities listed:

SD51-01	Personnel Training and Procedural Issues (4 SOP)
SD51-02	Emergency Action Plan and Incident Reporting (5 SOP)
SD51-03	Monitoring and Surveillance (9 SOP)
SD51-04	Critical Operating Procedures (5 SOP)

2. These SOP are to be reviewed prior to the Full Supply Level for Hinze Dam being raised above EL 82.2 and updated and/or added to if necessary.

   a. Where amendments are made to any SOP, the updated documents are to be forwarded to the chief executive, Department of Natural Resources and Water within one month of the date of review.

   b. Where no amendments are necessary, a written notification confirming that the SOP have been reviewed shall be signed by the dam owner and forwarded to the chief executive, Department of Natural Resources and Water, within one month of the date of review.

3. The dam must be operated in accordance with the SOP as updated.

4. The dam owner must also ensure the SOP are reviewed by the 1st day of May of each calendar year.

   a. Where amendments are made to any SOP, the updated documents are to be forwarded to the chief executive, Department of Natural Resources and Water by the 31st day of May of that same calendar year.

   b. Where no amendments are necessary, a written notification confirming that the SOP have been reviewed shall be signed by the dam owner and forwarded to the chief executive, Department of Natural Resources and Water by the 31st day of May of that same calendar year.

11. Detailed Operation and Maintenance Manuals

1. An Operations and Maintenance Manual Hinze Dam, Operations and Maintenance Manual has been compiled for Hinze Dam Stage 2. This Operations and Maintenance and Maintenance Manual must be updated by the inclusion of information pertaining to Stage 3 of the dam.
2. The dam owner must ensure that the Operation and Maintenance Manual provides a comprehensive set of instructions on all equipment operated at the dam.
3. The dam must be operated and maintained in accordance with the Detailed Operations and Maintenance Manual as updated.
4. The dam owner must ensure the Detailed Operating and Maintenance manuals are reviewed, and if necessary updated, by the 1st day of May of each calendar year.
5. A written notification confirming that the Detailed Operating and Maintenance Manuals have been reviewed and/or updated shall be signed by the dam owner and forwarded to the chief executive, Department of Natural Resources and Mines by the 31st day of May of that same calendar year.

12. Special Inspections

1. When directed by the Chief Executive, Department of Natural Resources and Water, a Special Inspection must be carried out at the cost of the dam owner and a report must be prepared in accordance with the Queensland Dam Safety Management Guidelines – February 2002.
2. The chief executive, Department of Natural Resources and Water shall be advised in writing of the date of the inspection and may elect to observe any or all procedures involved in the inspection process.
3. The dam owner must provide one copy of the Special Inspection Report to the chief executive, Department of Natural Resources and Water within thirty (30) days of completion of inspection.

13. Annual Periodic Inspections

1. The dam owner must undertake an annual (periodic) inspection of the dam in accordance with the Queensland Dam Safety Management Guideline – February 2002 on or before the 1st day of May of each calendar year.
2. The chief executive, Department of Natural Resources and Mines shall be advised in writing of the date of the Annual inspection and may elect to observe any or all procedures involved in the inspection process.

3. The owner must produce a written record of these annual inspections and each written record is to be incorporated into the Comprehensive Inspection Report.
4. A written notification confirming that the Annual inspection has been carried out in accordance with the Queensland Dam Safety Management Guideline – February 2002 shall be signed by the dam owner and forwarded to the chief executive, Department of Natural Resources and Mines by the 31st day of May of that same Calendar year
5. In addition to the items listed in the Queensland Dam Safety Management Guideline – February 2002, the Annual Periodic Inspection Reports must address the following:
    a. Evidence of any concrete cracking, spalling, or other identified deficiency.
    b. Evidence of any leakage through the structure.
    c. Test operation of all equipment.
    d. Evaluation of all surveillance data.
    e. Any other issues the inspecting engineer considers appropriate.

14. Comprehensive Inspections

1. The dam owner must carry out a comprehensive inspection of the dam in accordance with the Queensland Dam Safety Management Guidelines – February 2002, within one (1) month of "practical completion of construction" for Stage 3 of Hinze Dam, and on or before every fifth anniversary thereafter.
2. The chief executive, Department of Natural Resources and Water shall be advised in writing of the date of the Comprehensive Inspection and may elect to observe any or all procedures involved in the inspection process.
3. A Comprehensive Inspection Report detailing the findings of the comprehensive inspection in accordance with the Queensland Dam Safety Management Guidelines – February 2002 must be submitted to chief executive, Department of Natural Resources and Water, within three (3) months after completion of the comprehensive inspection.

15. Safety Review

1. The dam owner must carry out a Safety Review in accordance with the Queensland Dam Safety Management Guidelines – February 2002 by the 1st day of May 2028.
2. The dam owner must prepare a Safety Review Report and provide one copy of the Safety Review Report to the chief executive, Department of

Natural Resources and Water within three (3) months of completing the review.

3. Further Safety Reviews are to be carried out at twenty (20) year intervals, but may be required at more regular intervals by the chief executive, Department of Natural Resources and Water in such cases as:
    a. An absence of adequate documentation;
    b. Detection of abnormal behaviours of the structure;
    c. Changes to design standards, construction standards;
    d. A regulatory requirement.

16. Emergency Action Plans and Event Reports

1. The Hinze Dam Stage 2 Emergency Action Plan (EAP) is Hinze Dam Emergency Action Plan. This EAP is to be progressively updated as the construction of Hinze Dam Stage 3 proceeds to meet the requirements of the Queensland Dam Safety Management Guidelines – February 2002.
2. The emergency events described in the EAP shall cover those events as outlined in the Queensland Dam Safety Management Guidelines – February 2002, and include such failure modes as:
    a. Sunny day embankment failure
    b. Overtopping embankment failure
    c. Saddle dam failure
    d. Failure of control structures such as intake and outlet works
3. Inundation mapping shall be developed as outlined in the Queensland Dam Safety Management Guidelines – February 2002, and shall be at a sufficiently large scale to easily identify those areas subject to possible danger. Mapping shall be developed for all failure modes described in the EAP.
4. The EAP must be disseminated to those who have responsibilities under the EAP and shall:
    a. Determine and identify those conditions that could forewarn of an emergency and specify the actions to be taken and by whom;
    b. Identify all jurisdictions, agencies and individuals who could be involved in the Emergency Action Plan (for example, local governments, the Queensland Police, State Emergency Services and downstream residents);
    c. Identify primary and secondary communication systems, both internal (between persons at the dam) and external (between dam personnel and outside entities);

d. Identify all resources, special tools, equipment, keys and where they can be located if required in an emergency;

e. List and prioritise all persons and entities involved (including contact details) in the notification process and the roles and responsibilities assigned to them (eg. A flow chart may be useful).

5. The dam owner must ensure the EAP is reviewed by the 1st day of May of each calendar year.

   a. Where amendments are made to any EAP, a copy of the updated document is to be forwarded to the chief executive, Department of Natural Resources and Water by the 31st day of May of that same calendar year;

   b. Where no amendments are necessary, a written notification confirming that the EAP has been reviewed shall be signed by the dam owner and forwarded to the chief executive, Department of Natural Resources and Water by the 31st day of May of that same calendar year.

6. If the EAP is changed between the normal review periods, the dam owner must provide one copy of the changed EAP to the chief executive, Department of Natural Resources and Water within thirty (30) days of the changes being made.

7. The dam owner must ensure that in addition to any copy or amended copy of the EAP provided to the chief executive, Department of Natural Resources and Water in compliance with this condition, current versions of the EAP are also provided to the following parties:

   a. Gold Coast City Council.

   b. Local Counter Disaster Coordination Committee.
   c. Any additional group with responsibilities under the Emergency Action Plan.

8. In all emergencies, the dam owner must respond in accordance with the Emergency Action Plan.

9. In the event of an emergency, the dam owner must notify the chief executive, Department of Natural Resources and Water within forty-eight (48) hours. The notification shall include a brief description of the event and the time of activation of the Emergency Action Plan.

10. Within thirty (30) days of the event the dam owner must prepare an Emergency Event Report and provide a copy of the report to the chief executive, Department of Natural Resources and Water. The Emergency Event Report must include:

    a. A description of the event.

b. Instrumentation readings (where appropriate).

c. Description of any observed damage.

d. Photographs.

e. Details of communication and actions which took place during the emergency.

f. How the EAP was implemented during the event and comment on the adequacy of the EAP and any changes proposed.

16. Decommissioning

1. The dam must not be taken out of service (decommissioned) except in accordance with a Decommissioning Plan accepted by the chief executive, Department of Natural Resources and Water.
2. The Decommissioning Plan must indicate how the dam is to be rendered safe in the long term and how the contents are to be drained in a controlled and safe manner.

Definition

'Practical completion of construction'

For the purpose of these conditions, the dam construction shall reach the stage of "practical completion of construction" when:

- The dam embankment is capable of storage to full capacity, and
- The inlet/outlet works are operational (minor components may not necessarily be installed)

B. Operational works that interfere with the flow water in a watercourse under the Water Act 2000

The proponent will be required to submit an IDAS Form K3 – Water Storage as part of its development application to DNRW.

Evidence of Resource Entitlement is normally required for this component of the application. However, on the 31 August 2007, Russ Robson, Acting Director, Water Management, delegate of the chief executive under the *Water Act 2000* provided a letter giving consent to the making of an application for a development permit under the *Integrated Planning Act 1997* for the works associated with the raising of Hinze Dam Stage 3 project.

Interfering with Water Condition Schedule

1. The permittee must notify the chief executive of the completion of the approved works within 30 business days after such completion. The notification must be given in writing to the chief executive of the Department of Natural Resources and Water.

2. The permittee must, to the satisfaction of the chief executive of the Department of Natural Resources and Water, and at the permittee's own expense, maintain the bed and banks of the watercourse adjacent to the permitted works.

3. The permittee must provide a copy of the permit to any person contracted to construct the works approved by this permit.

4. The works authorised by this permit must be located and constructed in accordance with the plan(s) and design reports identified in the Dam Safety Condition Schedule (condition numbers 6, 7, 8 and 9). identified in the Dam Safety Condition Schedule. Any plans in addition to those already mentioned will need to be included with the application for assessment.

5. The permittee must within 90 business days after construction of the authorised works provide the chief executive with two (2) copies of "as built" plans of the constructed works. These "as built" plans must be in the same scale and line form as the approved design drawings.

As stated in the Supplementary Report, if a new pump is required to take water from the Nerang River (at the Hinze Dam storage) under the current water entitlement for construction purposes, application must be made for an additional development approval to authorise these works. If water is required for construction, an estimate of the volume and location from where it is intended to be taken from should be available.

C. Operational works for vegetation clearing

DNRW understands that the applicant will be submitting the Operational Works application for clearing native vegetation on freehold land at a later date than the application to DNRW for Operational Works – for taking or interfering with water, for a referable dam and for raising waterway barrier works.

When submitting the application on IDAS Form J, please refer to Attachment 1 which provides information on what is required from the applicant to make the application 'properly made' and other requirements that need to be in place for DNRW's assessment of the application.

The following conditions will apply to the issuing of a Vegetation Clearing Permit by the Department of Natural Resources and Water, pursuant to the Vegetation Management Act 1999 for the Hinze Dam – Stage 3 development herewith known as 'the project'.

Vegetation clearing condition schedule

1. A vegetation management offset that meets the requirements of the Policy for Vegetation Management Offsets (dated 23 August 2007), must be legally secured within 12 months of the date of the issue of a permit from the Department of Natural Resources and Water to clear assessable vegetation on any State Land subject to the project, and on Lots 274-275 on W312359 and 11 on WD2914. Where applicable, any changes to the clearing footprint must be assessed in accordance with the Regional Vegetation management Code for Southeast Queensland Bioregion and the Policy for Vegetation Management Offsets to determine any implications for the total area required for offsets.

2. Clearing shall only occur to the extent that is necessary for the construction phase and operational phase of the project.

3. Any clearing or activities associated with clearing within the subject site must be by mechanical methods and inundation only.

4. Any clearing or activities associated with clearing within the subject site must not adversely impact on native vegetation outside the subject site.

5. Only designated tracks must be used when entering and exiting the subject site during construction and operation of the project.

6. All disturbed and excavated soil must either be contained within the project boundary or alternatively securely stockpiled or respread in a location where its placement will not result in the clearing of vegetation that is regulated under the Vegetation Management Act 1999.

7. All vegetation mechanically cleared must be stockpiled in a location where its placement will not result in the clearing of vegetation that is regulated under the Vegetation Management Act 1999.

8. Land clearing debris must not be pushed into gullies, watercourses, other drainage lines or waterlogged areas.

9. While it is understood that the Hinze Dam Alliance will not be clearing and removing trees by mechanical means from State Land:

   a) the Hinze Dam Alliance is required to provide NRW Forest Products and their supervising NRW Forest Products Officer, Mr Lance Stumm (telephone 07 4160 4205) with all reasonable assistance for Mr Stumm and other staff of NRW Forest Products to inspect, at mutually agreed times and dates, the area to be inundated on State Land;

   b) the Hinze Dam Alliance is to be supportive of, and not defer, NRW Forest Products and any applicable holder of a sales permit issued under the *Forestry Act 1959* if it is determined by NRW Forest Products that the remnant and non-remnant vegetation within the area to be inundated on State Land can be commercially harvested for log timber prior to inundation;

   c) NRW Forest Products will endeavour to arrange the prompt salvage operation to harvest and remove any commercial log timber on the area to be inundated on State Land; and

   d) NRW Forest Products will endeavour to ensure that the any holder of an applicable sale permit, as well their employees and contractors, are aware of the Hinze Dam Alliance's Workplace, Health and Safety procedures.

10. Where contractors, employees, subcontractors, agents or any other person, that is not the applicant are to be engaged or employed to carry out the clearing of any vegetation on the subject site, the Hinze Dam Alliance is to provide them with a copy of these conditions to ensure that they are aware of what clearing is authorised.

11. The Hinze Dam Alliance shall ensure that any and all employees, contractors, subcontractors, agents or any other person engaged or employed to carry out the clearing of any vegetation on the subject site comply at all times with the requirements of these conditions and do not clear any vegetation that is not approved to be cleared.

12. Any clearing or activities associated with clearing within State Land subject to the project, and on Lots 274-275 on W312359 and 11 on WD2914, and not specifically addressed within the preceding conditions set out above in

condition numbers 1 to 11, must be undertaken in accordance with the following management plans, which have been prepared in accordance with the Environmental Management Plan:

a) Water Quality;

b) Terrestrial Flora;

c) Terrestrial fauna;

d) Rehabilitation Management;

e) Pest management;

f) Weed management;

g) Aquatic ecology;

h) Geology and Soils;

i) Surface Water; and

j) Waste minimisation and management of hazardous substances.

13. Additional Information

a) The Development Permit does not authorise the clearing of any vegetation that would constitute a contravention of other laws. This includes:

- the *Coastal Protection and Management Act 1995*;
- the *Aboriginal Cultural Heritage Act 2003* and the *Torres Strait Islander Cultural Heritage Act 2003;*
- the *Environment Protection Act 1994* which regulates environmentally relevant activities;
- the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) regarding the protection of listed threatened species and ecological communities;
- the *Fisheries Act 1994* regarding the management of marine plants including mangroves;
- Local laws established by local government under the Local Government Act 1993;
- the *Nature Conservation Act 1992* regarding the management of protected plants and animals;
- the *Queensland Heritage Act 1992* which regulates the management of heritage sites;
- the *Soil Conservation Act 1986*; and
- the *Water Act 2000* regarding the removal of vegetation from the bed and banks of a watercourse.

It is recommended that the applicant check with relevant authorities including local government before undertaking any clearing to ensure compliance with other laws.

D. Conditions for Waterway Barrier Works

Upstream Fish Passage Facility

- The proponent will develop, construct and operate an upstream trap and transfer fish passage facility.

Trap and Transfer Fish Passage: Pilot Program

- Construction of the trap and transfer facility is to be prioritised within the project program and completed by mid-2009. The proponent will subsequently undertake no less than 18 months of pilot operation, monitoring, and refinement of the facility prior to completion of the project in December 2010.
- The proponent is to undertake ongoing liaison with the Department of Primary Industries and Fisheries (DPI&F) in relation to:

    1. development of the proposed monitoring program for the trap and transfer facility pilot program
    2. refinement of the trap and transfer facility during the pilot program
    3. system monitoring after completion of the dam project in December 2010.

Fish Transfer Management Plan

- Documentation of operation of the system will be detailed in a comprehensive Fish Transfer Management Plan (FTMP) developed in liaison with DPI&F for approval by the Coordinator-General prior to the commencement of operations of stage 3 of Hinze dam.
- A copy of the proposed FTMP is to be provided to DPI&F prior to construction of the trap and transfer facility's completion in mid-2009. The FTMP is to be refined as the pilot program progresses. Any refinements are to be included in the reporting detailed below.
- Within one month subsequent to completion of construction of the trap and transfer system, a copy of the proposed FTMP is to be provided to the Coordinator-General. By separate cover, subsequent to receipt of the draft FTMP, DPI&F's response to the adequacy of the document is to be provided to the Coordinator-General.
- The FTMP may be further modified over the life of the full monitoring program or as the need arises during operation of the fish transfer system.

Reporting

- Quarterly written reports regarding progress, performance and development of the trap and transfer facility pilot program are to be provided to DPI&F and the Coordinator-General.

- Post construction completion, the proponent is to provide six-monthly reports to DPI&F and the Coordinator-General on operation of the fish trap and transfer device until at least December 2015 unless otherwise notified in writing by the Coordinator-General.

Spillway works

- The proponent will develop proposed improvements to the spillway, stilling basin, and spillway chute works that will improve fish passage during overtop events and optimises ability of the fish to exit the spillway shute and move downstream.
- The proponent will consult with DPI&F during design and construction phases regarding the abovementioned spillway optimisation and modification works to enhance the prospects of fish survival and passage. The outcome of this process is to be included in the FTMP, which must be approved by the Coordinator-General prior to the commencement of operation of Hinze Dam stage 3.
- Monitoring of the spillway's function post-construction completion is to be made and reported to DPI&F over a range of overtopping events within the 6 monthly reports required in an earlier condition. The monitoring regime is to be developed in liaison with DPI&F.

Surveys: Fish biomass

- That as per its stated additional commitment, the proponent is to undertake ongoing surveys and analysis of the fish biomass in the vicinity of the transfer system, in the upstream and downstream reaches of Nerang River and a control site in Mudgeeraba Creek to provide better understanding of existing conditions and to inform ongoing optimisation of the transfer structure. This will include approximately seven seasonal and/or event-based surveys.
- Development of the survey regime is to be undertaken in consultation with DPI&F and EPA. Results of the survey work undertaken are to be provided to DPI&F and EPA as each survey is progressively finalised. An overview of survey findings and intended use of knowledge gained is to be provided to DPI&F within two months of completion of the final survey.

Environmental flow: Optimisation

- As per an additional commitment submitted by the proponent, the proponent is to investigate the potential to engineer more appropriate environmental flow sequences utilizing existing outlet works and the release volumes supported by the Gold Coast Water Resource Plan (WRP). The proponent is to liaise with DPI&F and the Department of Natural Resources and Water to undertake these investigations.
- If appropriate these revised operating rules for release of the Hinze Dam's environmental flow will be submitted to the Department of Natural

Resources and Water (DNRW) for inclusion in the Resource Operations Plan being developed as part of the WRP.

Definitions

Particular words and terms used in the conditions at this Schedule are defined as follows:

'Clear' means clear as defined under the Vegetation Management Act 1999.

'Legally secured' means legally secured as defined in the Policy for Vegetation Management Offsets, dated 23 August 2007.

'Mechanical methods' means using machinery such as a bulldozer or similar vehicle, a chain strung between bulldozers or similar vehicles or using a chainsaw.

'Non-remnant vegetation' means vegetation that is not remnant vegetation.

'Regional Ecosystem Map' means regional ecosystem map as defined under the Vegetation Management Act 1999.

'Remnant Vegetation' means remnant vegetation as defined under the Vegetation Management Act 1999.

'State land' means land that is owned or leased by the State of Queensland including unallocated State land.

'Vegetation' means vegetation as defined under the Vegetation Management Act 1999.

'Vegetation Management Offset' means a legal arrangement or agreement that, over time, guarantees to maintain the extent, structure and function of –

a) regional ecosystems;
b) essential habitat;
c) vegetation associated with-
    i. watercourses; and
    ii. natural wetlands; and
    iii. natural significant wetlands.

END OF SCHEDULE B CONDITIONS

Schedule C: Conditions Relating to Other Legislative Matters

Riverine Protection Permits - exemption
In relation to proposed haulage routes that traverse a watercourse as part of the above project, it is understood that the Gold Coast City Council will be carrying out and or supervising the works. Accordingly, DNRW has advised that Council will be exempt from the need to apply for a riverine protection permit as long as the activities associated with the works are carried out in accordance with the DNRW guideline: Activities in a watercourse, lake or spring carried out by an entity.

This guideline is available via the following link:
http://www.DNRW.qld.gov.au/water/management/pdf/rpp_guideline.pdf

It is also important to note that the guideline does not exempt the entity from legislative responsibilities as identified in Item 4 of the guideline. In relation the Council's responsibility under the *Native Title Act 1993 (Cwth)* the approvals processes under the Fisheries Act and or *Environment Protection* Act should address any Native Title procedural rights.

Condition 1: Aboriginal Cultural Heritage
A Cultural Heritage Management Plan (CHMP) under the *Aboriginal Cultural Heritage Act 2003* must be developed and approved, prior to any excavation, construction or other activity in an area that may cause harm to Aboriginal cultural heritage.

The proponent is to provide notices to the Coordinator-General and the Department of Natural Resources and Water within 6 months of the commencement of construction outlining the outcomes of the Cultural Heritage duty of care assessment.

I nominate the Department of Natural Resources and Water as the assessment manager for this condition.

Condition 2: Native Title
Native title must be addressed for the project in accordance with the Commonwealth *Native Title Act 1993* (NTA). It is the responsibility of the relevant State Government department or agency before granting any approval required for the project to appropriately address native title in accordance with the State Government Native Title Work Procedures which are based upon the NTA.

In some cases this will involve the provision of procedural rights to the relevant native title parties before the approval can be granted. Procedural rights for example under section 24HA of the NTA include both a Notification and an opportunity to comment (involving a 28 day notification period).

Where the proposal is outside the Special Facilities Zone, specifically regarding State Land and boundary watercourses, Native Title Notifications under the Native Title Act (Cwth) 1993 must be in place and the notification period finalised, prior to the commencement of the Decision Making Period under the *Integrated Planning Act 1997* .

Condition 3a: Roads and Traffic: Gold Coast-Springbrook Road Realignment
The Gold Coast-Springbrook Road between 250m and 950m east of Little Nerang Creek is to be realigned to achieve 1 in 50 year ARI flood immunity for the road. The designs for the works will be in accordance with Main Roads Planning and Design Manual. The proponent will require written approval (under section 33 of the *Transport Infrastructure Act 1994*) to undertake these works.

This approval process will include the requirement to prepare a Traffic Management Plan. The Traffic Management Plan may include (but is not limited to):

- Detail procedures for managing activities in a State-controlled road reserve
- Mitigation strategies designed to minimise any traffic impacts attributable to the project
- Indication of public notification and/or consultation strategies to
- broadcast road works information
- Indications of how pedestrian, equestrian and cyclist access at roads will be maintained.

Condition 3b: Roads and Traffic: Partial Embankment Inundation
On the matter of 15 embankments located along the Nerang-Murwillumbah Road and Gold Coast-Springbrook Road (shown on Table 39 of the SREIS) that may be impacted by the project and further geotechnical investigations to be undertaken to confirm the affected embankments – all embankments affected by the project works are to be stabilised by the proponent.

The proponent will require written approval (under section 33 of the *Transport Infrastructure Act 1994*) to undertake these works. This approval process will require the proponent to provide full geotechnical investigation factual reports, and

detailed designs (in accordance with Department of Main Roads Planning and Design Manual).

The proponent will also be required to prepare a Traffic Management Plan. The Traffic Management Plan may include (but is not limited to):

- Detail procedures for managing activities in a State-controlled road reserve
- Mitigation strategies designed to minimise any traffic impacts attributable to the project
- Indication of public notification and/or consultation strategies to broadcast road works information
- Indications of how pedestrian, equestrian and cyclist access at roads will be maintained.

Condition 3c: Roads and Traffic: Traffic Management
The proponent is to provide directional and service signage on the Nerang-Murwillumbah Road and surrounds in accordance with Main Roads Manual of Uniform Traffic Devices. The proponent will require written approval of their proposed signs and the locations on the State Controlled Road under section 50 of the *Transport Infrastructure Act 1994* prior to their installation.

Condition 3d: Roads and Traffic: Demaining of Gilston Road
Should the proponent proceed to terminate Gilston Road where it enters Gold Coast City Council land as part of project works, within one month from the start of construction activities, the proponent is to commence discussion with DMR regarding the Department's requirement that Gilston Road be transferred to the local authority as part of Council's gazetted road infrastructure network.

Condition 3e: footpath width
For the proposed provision of a footpath as part of upgrade works to Advancetown Road, the proponent must develop a final design that addresses appropriate Austroads standards, including minimum widths, for the approval of the Coordinator-General by 30 March 2008.

The proponent is to liaise with Queensland Transport (QT) and Gold Coast City Council in development of the proposed footpath design and outline how matters raised by QT and Council have been addressed when seeking approval from the Coordinator-General.

END OF SCHEDULE C CONDITIONS

Schedule D: Imposed Conditions

Note: While Recommendations 1c and 1d provided herein discuss matters of National Environmental Significance (NES), it is acknowledged that DEWR will impose its own conditions on these matters during the Commonwealth's consideration of the controlling provisions of the project subsequent to finalisation of this report.

Condition 1a: Compensatory Habitat Strategy
The Proponent will implement and undertake a Compensatory Habitat Strategy to offset the loss of approximately 318ha of mapped remnant vegetation that will occur as a result of the project works.

The Compensatory Habitat Strategy must involve the following actions in relation to at least 318 ha:

- the acquisition (and management) of freehold land containing advanced regrowth or remnant vegetation (or the potential to support remnant vegetation), ideally within the Gold Coast area;
- transfer of the acquired freehold land to State tenure with local government management or to local government tenure and management;
- translocation and propagation of affected NES species within parts of the above areas and/or Lot 4 SP164198 so that there is no net loss of these NES species (noting that any land used within Lot 4 SP164198 for these actions is not to be accounted as part of the 318 ha that must be acquired to satisfy the wider Strategy outcomes);
- revegetation and rehabilitation of existing cleared or disturbed areas within non-privately owned land within and adjacent to the study area.

If the proponent identifies, and demonstrates to the satisfaction of the Coordinator-General, practical difficulties in achieving the above actions in relation to at least 318 hectares of land, it may propose a suitable contribution of funds into the Queensland Trust for Nature Fund (administered by the EPA) or other green invest broker, to secure a proportion of the necessary offset outcome.

The Compensatory Habitat Strategy is to target no net loss to flora species, and no net loss of habitat for fauna species, listed as endangered, vulnerable or rare (EVR) under the EPBC Act or endangered under the NCA, taking account of the positive and negative impacts of the dam construction and operation and the implementation of the offset actions.

If detailed analysis and/or practice shows this is unavoidable for a particular species, then compensatory activities to enhance outcomes for other EVR species, as an alternative, should be proposed for approval by the Coordinator-General. This particular requirement expires at 31 December 2012.

The Compensatory Habitat Strategy is to provide offsets for project impacts to riverine habitat that equate over time to no net loss of habitat.

The Compensatory Habitat Strategy will be developed and implemented over a twelve month period from the date of the Commonwealth's decision on the controlling provisions for the project.

The details of this Strategy will be completed, in consultation with the EPA, by December 2010 and submitted to the Coordinator-General for approval.

Condition 1b: Compensatory Habitat Technical Advisory Group

The proponent is to form a Compensatory Habitat Technical Advisory Group (TAG) to develop the Compensatory Habitat Strategy and associated plans and programs. The TAG will meet at least bi-monthly (once each eight weeks) and is to be in place for a minimum of 15 months from the date of the Commonwealth's decision on the controlling provisions for the project.

Following disbanding of the Compensatory Habitat TAG, quarterly reporting on the Strategy's progress, achievements and knowledge gained as a result of the Strategy's various programs is to be made to former TAG members until December 2010. The TAG may be continued, revived or recalled at the proponent's discretion.

The TAG is to include (at the discretion of the following agencies) representation from the Environment Protection Agency (EPA), the Department of Natural Resources and Water (DNRW), Gold Coast City Council (GCCC), the Department of Primary Industries and Fisheries (DPI&F) and for representation on behalf of the Coordinator-General, the Department of Infrastructure and Planning (DIP). The Commonwealth Department of the Environment and Water Resources (DEWR) is to be provided with the ability to input via remote membership to the strategy's development, with particular focus on involvement of DEWR on discussion and decision on matters pertaining to species of National Environmental Significance (NES).

Final decisions on the strategy such as on land purchases and resource investment should be made by the proponent's senior management team. However, it is advised that to arrive at a strategy that will enhance long-term conservation values for the Gold Coast region, in the making of decisions on the strategy, any formal recommendations made by TAG members that seek to

maximise conservation benefits be tabled by the proponent as considered and addressed.

Development of the Compensatory Habitat Strategy is to involve an examination and prioritisation of options for offsetting project impacts to the following significant species as listed under the EPBC Act:

- Queensland nut (*Macadamia integrifolia*)
- Macadamia nut (*Macadamia tetraphylla*)
- Onion wood (*Owenia cepiodora*)
- *Plectranthus nitidus*
- Spiny gardenia (*Randia moorei*)

The version of the compensatory habitat strategy to be submitted to the Coordinator-General for approval must indicate how the following EPA preferences and recommendations have been investigated and/or addressed. If any of the preferences are not to be adopted, the submitted strategy document must contain a supporting explanation.

<u>EPA preferences</u>
In general, the compensatory habitat strategy should, if practical, consist of:

- Acquisition of freehold land and transfer to State tenure with local government management or to local government tenure and management
- Contribution of funds into the Queensland Trust for Nature Fund (administered by the EPA) or other green invest broker, to secure appropriate offsets.
- Freehold land under covenants protecting conservation values (e.g. Voluntary Conservation Agreement (administered by Gold Coast City Council), Nature Conservation Agreement).
- Secured (via an agreement) and managed revegetation projects.
- that the strategy should be consistent with, and preferably complement, the compensation package required for impacts on the Numinbah Forest Reserve.

Site-specific offsets should include:

- Unprotected areas of suitable habitat for identified species are secured for long-term protection through purchase or other mechanism.
- Degraded and impacted habitats are rehabilitated and/or acquired, with particular consideration given for EVR species including:

- koala food and habitat trees consistent with the requirements of the *Nature Conservation (Koala) Conservation Plan 2005*.
- glossy black cockatoo food trees (*Allocasuarina littoralis*). Seed is to be actively harvested from individual trees known to be preferred by glossy-black cockatoos and these seeds are to be grown and planted in revegetation works. At a minimum replace the lost number of trees. The number of species planted must at the least adequately replace the number lost to support the local glossy-black cockatoo population.
- Larval food plants for the Richmond birdwing butterfly including *Aristolochia praevenosa*.
- Other EVR species habitat such as grey-headed flying fox food trees/roost sites; swift parrot, Australian Painted Snipe, grey goshawk, red-browed tree-creeper and sooty owl habitat trees; and giant barred frog and tusked frog habitat.
- Lost connectivity of habitat through construction and inundation should be identified and strategies to reconnect habitat for fauna species including the koala should be implemented.

Where the proponent is unable to adequately compensate for lost habitat for the identified species, the following actions should be considered:

- Nature conservation agreements between the Gold Coast City Council and property owners to rehabilitate and covenant priority areas such as the Pimpama corridor directly north of Yawalpa Road, Pimpama, to enhance, protect and maintain koala habitat.
- Rehabilitation projects in partnership with landholders, Greening Australia, local conservation groups and SEQ Catchments Inc., which provide corridor/ habitat values.

[*End of EPA-specific recommendations pertaining to this condition*]

Development of the Compensatory Habitat Strategy should also consider DNRW's request that the department's *Policy for Vegetation Management Offsets* (revised version dated 23 August 2007), be considered in development of the Strategy.

Recommendation 1c: Compensatory Habitat Strategy: Propagation and Translocation Program

The proponent will develop and undertake a Propagation and Translocation Program of works with the intent to achieve a 'no net loss' outcome for project impacts on the following National Environmental Significant (NES) species:

- Queensland nut (*Macadamia integrifolia*)
- Macadamia nut (*Macadamia tetraphylla*)

- Onion wood (*Owenia cepiodora*)
- *Plectranthus nitidus*
- Spiny gardenia (*Randia moorei*)

Collection of seeds and cuttings and propagation trials for NES flora and the establishment of ex-situ populations of those species will be implemented. Pilot propagation and planting trials will be initiated as soon as practicable to determine the translocation potential of the target species.

Development of the framework for the Propagation and Translocation Program must be prioritised within progression of the overarching Compensatory Habitat Strategy. The Propagation and Translocation Program is to be developed in consultation with the Compensatory Habitat Strategy TAG.

The proposed draft Propagation and Translocation Program is to be submitted to DEWR for consideration and input within eight months from the date of the Commonwealth's decision on the controlling provisions for the project.

The Program is to be implemented within ten months from the date of the Commonwealth's decision on the controlling provisions.

Quarterly reporting on progress of the Program is to be made to members of the Compensatory Habitat TAG until December 2010, or unless otherwise requested by the Coordinator-General and/or DEWR.

Recommendation 1d: Compensatory Habitat Strategy: Propagation and Translocation Plans

The proponent must develop species-specific Propagation and Translocation Plans for the NES species indicated in the previous condition.

The Propagation and Translocation Plans are to be developed in consultation with the Compensatory Habitat Strategy TAG. These plans are to incorporate site-specific active management measures to reduce threatening processes such as weed invasion and fire. It is recognised that the Plans will be living documents that evolve over the life of the Propagation and Translocation Program.

A suitably qualified botanist/ecologist/scientist should be utilised to coordinate revegetation of the NES species with the aim of mitigating net loss and enhancing propagation and translocation success.

The proposed Propagation and Translocation Plans are to be submitted to DEWR for consideration and input with the draft Propagation and Translocation Program.

Condition 1e: Compensatory Habitat Strategy: Compensatory Habitat Rehabilitation Plans

For the works of the Compensatory Habitat Strategy that involves revegetation and rehabilitation of existing cleared or disturbed areas, the proponent must develop rehabilitation plans in consultation with the Compensatory Habitat Strategy TAG.

These plans must be site-specific and should specifically address the protection of populations of NES/EVR species that are identified as being present in the location, or that are to be introduced to the location as part of the propagation and translocation program.

The Compensatory Habitat Rehabilitation Plans will be developed and implemented over a twelve month period from the date of the Commonwealth's decision on the controlling provisions for the project.

Condition 2a: To address the assessment and management of endangered, vulnerable and rare species under the *Nature Conservation Act 1992*

The proponent is to prepare and implement a detailed flora and fauna management plan to be included in the Construction EMP. The plan should include measures to avoid and mitigate impacts to flora and fauna from the project, including, but not limited to those commitments described in Section 9 Appendix G of the EIS, and should address the following:

<u>Project Design</u>

The project should be designed and implemented to minimise and mitigate impacts on habitat for protected species, particularly:

- Giant Barred Frog (*Mixophyes iteratus*);
- Grey Goshawk (*Accipiter novaehollandiae*);
- Glossy-black Cockatoo (*Calyptorhynchus lathami*);
- Red-browed Tree-creeper (*Climacteris erythrops*);
- Sooty Owl (*Tyto tenebricosa*);
- Tusked Frog (*Adelotus brevis*);
- Grey-headed Flying Fox (*Pteropus poliocephalus*);
- Koala (*Phascolarctos cinereus*);
- Brush-tailed Rock Wallaby (*Petrogale penicillata*).

Road design and construction: Fauna underpasses/culverts should be installed where fauna, particularly koalas, are likely to cross. Exclusion fencing should be erected in conjunction with fauna underpasses where fauna crossings are identified.

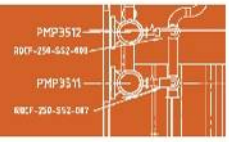
Underpasses should be designed to maximise the use of these structures by fauna and include the following:

- Ledges of a suitable width for movement of target fauna in culverts that are to also be used for water management and drainage. The ledges should be raised to an adequate height to remain dry except in rare circumstances and provide a means for fauna to enter and exit from the tunnel;
- 'Arbour tunnel' designs should be included in all culverts for koalas irrespective of the degree of inundation expected in the tunnel and they should also protrude into surrounding habitat to assist with predator avoidance;
- Permanent signage installed to increase awareness of koalas in the area and provide contact details of wildlife rescue groups for animals injured crossing the motorway. Temporary signs or mobile electronic displays should be utilised during construction.
- Replanting of areas adjacent to the fauna underpasses to facilitate their use by fauna.
- Replanting of areas to link existing habitat to areas adjacent to the tunnels and fauna underpasses.
- Rehabilitation/ replanting of local areas near the road works.

Tusked Frog

No tusked frog habitat is to be lost as a direct result of project-related road works. In order to mitigate the potential impacts on the tusked frog, the following strategies should be implemented:

- All plant, equipment, vehicles and shoes of contractors working at the Little Nerang Creek site must be sterilised to prevent the spread of Chytrid fungal disease. All activities on site must be consistent with the NSW National Parks and Wildlife Service Hygiene protocol for the control of disease in frogs.
- Environmental Management Plans must be developed for all works adjacent to Little Nerang Creek to prevent increased sedimentation, erosion, weed invasion and nutrient and chemical pollution.
- If possible, construction works should be completed outside of the breeding season of this species to reduce potential impacts on pre and post breeding dispersal movements. As the species may breed opportunistically and in response to periodic rainfall events, this would be difficult to predict.
- The road construction within tusked frog habitat should occur at a time which minimises impact.



Condition 2b: Listed Flora and Fauna Species (Endangered, Vulnerable or Rare)

Before there is any disturbance to listed flora and fauna species, permits for the removal of endangered, vulnerable or rare species listed under the *Nature Conservation Act 1992* are required.

The species lost to the any works/inundation should be replaced through seed collection/propagation and/or translocation into similar habitats within Gold Coast Shire. If this is not feasible then an enhanced habitat replacement for another EVR species should be considered in consultation with EPA.

Before there is any disturbance to listed flora species due to the project, a clearing permit, under section 30 of the Nature Conservation (Protected Plants) Conservation Plan would be required. Note that in being issued with a permit, the applicant must try to find a commercial or recreational use for the plants or the plants must be transplanted and maintained. Other conditions may be applied by EPA at the time of finalising the approval.

Condition 3a: Fauna and trenches

To minimise impacts on wildlife, the proponent must:

- install trench ramps and trench plugs in open trenches and pits to enable fauna to escape; and
- ensure that a qualified person trained in fauna handling procedures checks all open trenches and pits for trapped fauna each morning. Surviving fauna are to be relocated to suitable habitat by the qualified person.

Procedures for this Condition are to be included in the Fauna Management Plan within the EMP.

Condition 3b: Fauna spotter

A qualified fauna spotter is to be engaged to work ahead of the site clearing works at the commencement of vegetation clearing and quarrying and clay borrow activities.

In the event that native fauna is present, clearing works are to cease until such time as the fauna spotter is able to safely relocate the native fauna.

Procedures for this Condition are to be included in the Fauna Management Plan within the EMP.

Condition 4: Vegetation clearing
All areas within the land between the existing FSL and the new FSL containing flora and fauna species listed as endangered, rare or vulnerable under the EPBC Act and/or NCA will not be subject to mechanical clearing works. Vegetation in these areas will be left intact and subject to inundation.

Disturbance of vegetation at each construction site must be confined to the immediate construction footprint of the dam works and associated infrastructure. All areas to be cleared must be clearly marked and conform to the limits on design drawings to prevent damage to listed species outside the project area.

Condition 5a: Construction Environmental Management Plans
The draft construction Environmental Management Plan (EMP) as contained within the EIS, must be finalised in accordance with conditions and requirements indicated within this report.

The draft EMP must be submitted to the Environment Protection Agency (EPA) for comment three weeks prior to the commencement of core construction activities, such as establishment of the clay borrow, quarry, test blasting and vegetation clearing. Any comments received from the EPA on the draft EMP within the three week period, must be included in the final EMP.

The Construction Environmental Management Plan must be submitted to the Environment Protection Agency at least three weeks prior to the commencement of construction activities.

Condition 5b: Construction Environmental Management Plans: Land, flora and fauna
The proponent must provide to EPA to accompany its Material Change of Use development applications a site Environmental Management Plan which contains the following:

- Rehabilitation Management Plan
- Fauna Management Plan
- Vegetation Management Plan; and
- Erosion and Sedimentation Management Plan.

The plans should address all aspects of the project as outlined in the EIS documents and conditions within this report. They should include the following recommendations:

1. Sequential clearing of habitat that progressively removes habitat in a direction away from the dam and towards adjacent habitat to avoid isolating

and allow fauna to naturally disperse. For fauna other than koalas a translocation approval would be required. The proponent should be aware that EPA policy does not support the translocation of koalas and encourages natural dispersal.

2. A suitably qualified person, who can demonstrate to the satisfaction of the EPA their expertise in the identification and location of fauna in their natural habitat (usually via the issuing of a rehabilitation permit endorsed for spotting/catching), must inspect all habitat in the area to be cleared prior to the commencement of clearing.

   Any koala identified in the target area is to be left alone with their tree intact and allowed to move from the site under its own volition. The strategic retention of some habitat near this tree may be required to avoid isolating the animal and to encourage it to another area. The spotter must also be on site during clearing operations to inspect hollows and manage any fauna that may have been overlooked during the initial inspection of the area.

3. Other factors the proponent should consider during habitat removal are:

   - Timing of koala habitat clearing to avoid the peak in koala movements between the months of July and December;
   - Barriers around construction sites and other fencing should be designed to minimise impedance to koala and other faunal movement;
   - Trenches and pits capable of trapping animals should be temporarily fenced or structures provided for escape; and
   - Strategies to deal with disorientated animals entering or found at construction sites should be outlined, including access to appropriate handlers and potential locations for release.

4. Timing, construction and use of haulage routes should avoid peak breeding and/or movement times of fauna species.

Condition 6: Inundated vegetation to provide fish habitat

As per the recommendation made by DPI&F, the proponent is to consult with local fish stocking groups, angling groups and fishing charters to optimise the location and trim height of tree stands to be left between the existing FSL and the new FSL. Advice received is to be used by the proponent to find an adequate balance for the need to retain submerged vegetation to provide fish habitat, lake bed stability and to ensure water quality. The outcomes are to be reported in the FTMP as detailed in conditions relating to the Waterway Barrier Works.

Condition 7a: Community Engagement

To keep the community informed about the Project during the construction phase, a community engagement process as described in EIS is to be undertaken which includes, but is not limited to:

- The commitment to ongoing community information services (for example: toll-free telephone service and website);

- early and on-going engagement with owners and occupants of premises in the vicinity of the proposed works, during which proposed mitigation measures are discussed;

- a complaints process, which delivers a prompt response to community concerns with relevant information, action where required, and reporting of incidents, integrated within a wider environmental reporting framework established in the environmental management plan (EMP); and

- Specific procedures to respond to complaints, issues or incidents, such as face-to-face meetings and on-going communications with affected parties and a documented process for issues resolution.

Within the consultation process, there must be a formal process for receiving and dealing quickly and effectively with complaints about construction issues.

This process must be established before the commencement of construction works and should adopt a consultative and negotiated basis.

As a minimum, the complaints process must include procedures as described in the EIS for community engagement and address the following elements:

- A protocol establishing the responsibility for receiving and addressing complaints, and the means of notifying the community of this protocol (eg. publication of a complaints telephone service, website advice, and address for notices and other correspondence)

- Identification of the complainant, the identity of the person who received the complaint, the manner in which the complaint was made, the time and date on which the complaint was made, and the matter to which the complaint relates

- A process wherein, upon receipt of a complaint, an investigation commences forthwith into the cause of the complaint and any actions reasonably required to address the complaint. Consultation with anyone lodging a complaint must be conducted with confidentiality where requested by the individual.

Feedback to the complainant must be provided as soon as practicable about the action to be taken, and subsequently, the results of any action taken. Relevant authorities, if any, must also be notified of such actions.

Reporting to the Coordinator-General is to be made on progress of community engagement, complaints identification and resolution, including resolution timeframes. Reporting is to be undertaken quarterly until practical completion, unless otherwise specified by the Coordinator-General.

- A database for tracking complaints, issues, the subject of complaints, responses and corrective actions taken. A means of reporting each complaint, such as a complaints register, must include identification of the entity responsible for addressing the complaint,

- the time and date on which the complaint was addressed and closed out, a brief summary of any action taken to address the complaint, and a notation as to the satisfaction or dissatisfaction of the complainant with the outcome; and

- Monthly reporting of complaints as part of an overall performance and compliance report posted on the Project website.

Condition 7b: Early works communication program

As discussed within the report to which these conditions attach to, the proponent is proposing commencement of early site work activities subsequent to the Coordinator-General's Report on the EIS for the Hinze Dam Stage 3 Project being provided to the proponent.

The 'early works' are works associated with the establishment of a site office, security fence and crib rooms.

The proponent is to undertake a letter-box drop informing residents dwelling within a 1000 metre radius of the early works about the proposed activities. The residences notified must include all those dwelling on Advancetown Road, Mottee Court, Toula Court, Gilston Road, Prender Court, Red Oak Drive and Duncan Road.

The letter must be received at the place of residence at least 5 working days prior to physical commencement of the early works activities. In addition, the project's website is to contain information on the proposal at least 5 working days prior to the start of the works.

The letter and webpage must provide details of what early works are, on what date they will commence, and during what times they will be undertaken. Contact

details for any questions on the matter and wider project questions must be included in the letter.

A copy of the letter, with a cover letter detailing date of its delivery to residents, and a list of addresses the letter-box drop was delivered to, is to be provided to the Coordinator-General within one week of the action being undertaken.

Condition 8: Proponent's Project Commitments

The project commitments included within the EIS, and at Appendix 2 of this Report, are to be adhered to by the proponent in the undertaking of the project activities.

Should any Commitments be breached during the construction phase, a report is to be made to the Coordinator-General within four weeks of the event becoming known to management.

If any Commitments are contradictory to the conditions as contained within this Coordinator-General's Report, in such a circumstance, the proponent is to correspond with the Coordinator-General to propose remedial action and/or seek clarification within 1 week of the discrepancy becoming known to management.

Condition 9: Queensland Fire and Rescue Service (QFRS) matters

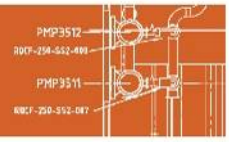
During the construction phase, any buildings constructed on site may require assessment by the QFRS under the *Integrated Planning Act 1997* .

QFRS recommend that an action plan be developed detailing the type and nature of explosives stored and the location of explosives storage. Additionally the plan should contain details of other hazardous materials on site and show the location of those materials. The plan when developed should be stored in a red HAZMAT box. The HAZMAT box should be located at the main entrance points to the site and secured with a 003 key type lock.

During the land clearing phase, if it is intended to burn off any vegetation a permit to burn will be required from QFRS.

Condition 10a: Emergency Management Plan

An Emergency Management Plan must be developed to the satisfaction of the Department of Emergency Services (DES) and submitted to DES prior to the commencement of construction activities.



Condition 10b: Safety Plan

A Safety Plan must be developed to address all safety and emergency issues identified in the EIS and SREIS and in accordance with the principles of the Workplace Health and Safety Act 1995.

Condition 11: Numinbah Forest Reserve

Prior to the commencement of operations of stage 3 of Hinze Dam, and the commencement of the revocation process as outlined in the NCA Act, the proponent will finalise a compensation package to offset the conservation values affected within Numinbah Forest Reserve by the project's Full Supply Level. This package must be developed in consultation with EPA.

Condition 12: Construction traffic

For construction traffic along Advancetown Road:

- The project is to apply speed limits of 40km/hr for project construction trucks and heavy vehicles, and 50km/hr for other construction vehicles, traversing Advancetown Road
- deliveries to site are to be limited to occur between 6:30am and 6:30pm
- regular site deliveries are to be coordinated to occur at the same time each day
- The Employees' Code of Conduct is to address noise-sensitive practices for undertaking work and exiting the site, with a separate section addressing these issues for employees working the workshop shift from 3pm-midnight.

END OF SCHEDULE D CONDITIONS

Appendix 2: Proponent's Commitments

General

1.1 The Proponent will deliver the Project with the intention of compliance with the requirements of the *Water Amendment Regulation (No. 6) 2006*.

1.2 The Proponent will undertake the design of the dam and the development of operational arrangements in accordance with the Water Resource (Gold Coast) Plan 2006.

1.3 The Proponent will construct Hinze Dam Stage 3 in accordance with the Environmental Management System developed for the Project.

1.4 The Proponent will maintain an inventory of greenhouse gas emissions for the Project once construction commences, report greenhouse emissions and progress on greenhouse mitigation measures as well as maintain membership of the Commonwealth Government Greenhouse Challenge Program.

Section 4 - Topography, Geomorphology, Geology and Soils

4.1 Rehabilitation of the site following construction will be undertaken using soils capable of supporting vegetation communities suitable to the local environment. The disturbed land will be rehabilitated to a condition that is self – sustaining or to a condition where the maintenance needs are consistent with the post construction land use

4.2 A rehabilitation plan for the clay borrow area will be developed that considers mountain biking as an end use.

4.3 A topsoil management plan will be developed for the clay borrow area to assist with reestablishment of the area.

4.4 A quarry rehabilitation plan will be developed that reduces the impacts identified in the visual amenity section and facilitates use consistent with the Recreation master plan.

4.5 A landscaping plan for the new recreation area will be designed to accommodate the recreation activities described in the Recreation master plan.

4.6 Erosion and sediment control plans will be developed and implemented as part of construction EMPs for any vegetation clearing and/or soil disturbance as part of the construction activities.

4.7 The Engineering Guidelines for Queensland for Soil Erosion and Sediment Control (IEAust 1996) will be applied.

4.8 During the clearance of vegetation to the new FSL the use of blading and grubbing clearing methods will be avoided in order to minimise the impact on the dam water quality. The clearance works will also be staged to reduce the impact on water quality. The scheduling of clearance works outside summer months when high intensity storms are more prevalent will also be considered.

Section 5 – Land Contamination

5.1 The Proponent will conduct site investigations and assessments of potential contaminated sites identified to determine the extent of mitigation required.

5.2 Investigation, assessment and management of contaminated sites will be undertaken in cooperation with EPA's Contaminated Land Unit and in accordance with the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland (DEH, 1998), NEPM and national water quality criteria.

5.3 All investigations will be carried out by a suitably- qualified investigator in accordance with requirements of the EP Act (1994) and site investigation reports will be submitted with a statutory declaration by the investigator as required by the EPA.

5.4 All contaminated land remediation work will be subject to review and approval by an EPA approved Third Party Reviewer (TPR).

5.5 All required remediation and/ or site management will be completed and approved prior to the raising of dam water levels.

5.6 Any required long-term monitoring will be provided for in the dam's operation plans.

5.7 It is the specific intention of the Proponent that project construction and operation activities will not result in contamination that will result in the land requiring listing on the EPA's Contaminated Land Register (CLR).

5.8 Chemicals, fuels, oils and any other substances that, if spilled would cause pollution or contamination of the land or water, will be stored appropriately to minimise the risk of environmental impact.

5.9 Chemical storage will comply with Australian Standards and Material Safety Data Sheets (MSDS) requirements. MSDS for products kept on site will be readily available to employees and contractors.

5.10 Smaller quantities of chemicals, fuels and oils will be stored in self bunded pallets, within a bunded area in the workshop, or in a bunded container on the site.

5.11 Diesel will be kept in bulk quantities (up to 130,000 L) in double skinned tanks (self bunding).

5.12 Waste products, (e.g. oil/water separator waste, sludges and residues), will be contained within weatherproofed, sealed and bunded areas to ensure stability of the waste containment receptacles and prevent any leakages or spills causing environmental harm to soils, surface water or groundwater.

5.13 Regular inspections will be carried out of the tanks, bunds and storage areas to ensure integrity.

5.14 Standard procedures for the storage, handling, disposal and spill response for potentially hazardous waste materials will follow the Emergency Management Plan.

Section 6 – Land Use and Infrastructure

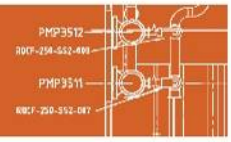
6.1 To offset the closure of the recreation area around the dam wall the Proponent will upgrade the existing boat ramps on the eastern and western arm of the Advancetown Lake. The facilities will include a sealed designated access track and ramp facility, sealed parking area, and also includes public toilet facilities. The western boat ramp upgrade will also include a memorial park in memory of the Guinea family, whose grave sites will be inundated by the proposed new FSL.

6.2 The Proponent has prepared a Recreational Master Plan for the Hinze Dam site. The objective of the Master Plan is to provide for long term recreation use that balances the requirements for protecting the water quality, while providing sustainable recreation opportunities for the community. This plan will be implemented as part of this project.

6.3 The existing café facility at the dam will cease operation prior to the construction phase commencing. The Proponent will implement the Recreational Master Plan that includes an interpretive centre, with similar kiosk and food outlet facilities as currently provided by the café.

6.4 In consultation with stakeholders the Proponent will identify sites for the relocation of both the Fleay's and Dreamworld koala food plantations which are impacted by the Project.

6.5 The access road across the top of the main dam embankment will be reinstated for pedestrian and cycling access upon completion of the construction works as part of the integrated park network.



6.6 Access across the top of the main dam embankment will be maintained for Maintenance and Emergency vehicles.

6.7 The Proponent will negotiate easements over any freehold properties adversely affected in the 1 in 100 year ARI flood associated with the Project. In the event that a voluntary easement cannot be reached, the easements will be obtained through compulsory acquisition under the provisions of the Acquisition of Land Act 1964.

6.8 The Proponent will continue negotiations with the State government in relation to offsetting the area of the Numinbah Forest Reserve inundated by the new FSL. In association with the State government a suitable vegetated site will be identified and made available as an offset. It is likely that this area will be sourced from the southern portion of Community Infrastructure Designation lot (Lot 4 SP164198), which is adjacent to the Numinbah Forest Reserve.

Section 7 – Surface Water Resources and Water Quality

7.1 During construction the Proponent will continue to operate the dam in accordance with current requirements of its Interim Resource Operations Licence. This will include the maintenance of the current level of environmental flow releases.

7.2 The Proponent will undertake construction of the dam upgrade using techniques to ensure water quality and security of water supply are maintained.

7.3 The construction program has been developed to ensure that the flood risk associated with the current dam configuration is not increased during construction.

7.4 A dam safety flood emergency plan will be implemented during construction to close up any exposed works area prior to flood waters reaching critical levels.

7.5 The flooding impacts created by the Project will be mitigated via infrastructure upgrades as detailed in Section 13 and the acquisition of easements as detailed in Section 6.

7.6 To protect the water quality in the dam and downstream of any construction areas, erosion and sediment control plans will be developed and implemented. The project will have a site water management system comprised of a series of sediment dams.

7.7 The Engineering Guidelines for Queensland for Soil Erosion and Sediment Control (IEAust 1996) will be applied.

7.8 Where activities will be undertaken on water, oil containment booms and oil spill recovery equipment will be available. Emergency response plans will be developed to manage any incidents

7.9 During construction a routine water quality monitoring program will be implemented within the dam and downstream waterways, measuring a range of physico-chemical parameters and bacterial analysis as appropriate.

7.10 Fixed site water quality loggers will be installed at the lower intake and downstream of the Dam wall, to monitor discharges into the Nerang River and at the lower intake tower, to ensure that water sourced by the Molendinar Water Treatment Plant is of a satisfactory quality.

7.11 During upgrade works on the upper intake tower a routine water quality monitoring program will be implemented.

7.12 All water quality sampling will be undertaken in accordance with the Water Quality Sampling Manual 3rd edition (EPA 1999). The frequency of monitoring and the range of parameters tested during flow and routine monitoring as described in the EIS will be reviewed after the first year of construction.

7.13 To ensure water quality in the lake is maintained the Proponent will implement a vegetation clearing and maintenance strategy as detailed in the EIS.

7.14 Upon completion of construction the Proponent will continue to monitor water quality in accordance with standard operational procedures.

7.15 Upon completion of construction the Proponent will operate the dam to achieve the outcomes specified in the Water Resource (Gold Coast) Plan 2006.

Section 8 – Groundwater

8.1 Ongoing groundwater monitoring will be undertaken in the immediate vicinity of the dam wall, spillway and saddle dams as part of geotechnical requirements for the Project.

Section 9 – Terrestrial Ecology

9.1 The Proponent will implement a compensatory habitat strategy to offset the unavoidable loss of 318 ha of mapped remnant vegetation to be cleared and/or flooded below the proposed FSL, to enable permanent inundation for the water storage. The objectives of the strategy will be twofold; (a) the

strategy will seek to comply with the intents of the Queensland Vegetation Management Act (1999) and associated Codes and Policies; and (b) the strategy will aim to provide tangible conservation and biodiversity benefits at the local and citywide scale, with an emphasis on threatened species conservation.

9.2 The Proponent will develop Translocation Plans (and associated management plans for translocation sites) for significant flora such as Spiny Gardenia, Onion Cedar, *Plectranthus nitidus* and Roughshelled Bush Nut. It is intended that suitable translocation sites be identified within the study area (above the proposed new FSL), and that propagated individuals of the target species be planted at several sites. These sites will be subject to active management to reduce threatening processes such as weed invasion and fire.

9.3 Collection of seeds and cuttings and propagation trials for significant flora known from the study area and the establishment of ex-situ populations of those species will be implemented. Pilot propagation and planting trials will be initiated as soon as practicable to determine the translocation potential of the target species.

9.4 Areas to be cleared will be clearly marked by tape, pegs and other means and will conform to the limits on design drawings. Particular attention will be paid to defining the boundaries of clearing were of concern regional ecosystems are present.

9.5 All vegetation clearance will be restricted to that necessary for the works.

9.6 A Weed Management Plan will be prepared for the Project in accordance with the EMP, detailing measures to prevent the movement of declared weeds to and from the construction site.

9.7 The Proponent will implement a plan for dealing with fauna during vegetation clearing and construction which will outline protocols for dealing with injured wildlife and other necessary actions relating to fauna. The plan will be based on the details contained in the EMPs.

Section 10 – Aquatic Ecology

10.1 Investigations into an upstream fish passage based on a trap and transfer system will be undertaken by the Proponent.

10.2 The Proponent will carry out additional fish research including fish distribution patterns and fish passage, to be utilized in the refinement of the design and operation of any trap and transfer system.

10.3 The potential to engineer more appropriate environmental flows for the Nerang River downstream of the dam while maintaining compliance with the Water Resource (Gold Coast) Plan 2006 will be investigated.

10.4 Further macroinvertebrate surveys will be undertaken during Spring 2007, enabling combined season models to be employed and hence giving a more robust picture of downstream ecosystem health.

10.5 Management of the aquatic weeds, including Cumbungi, Water Hyacinth and Salvinia will be undertaken by the Proponent immediately downstream of the dam.

10.6 Monitoring of methyl mercury concentrations in recreationally significant fish species will be completed annually prior to completion of the Project.

Section 11 – Air Quality

11.1 The risk of impacting on local air quality will be managed as set out in the EMPs

11.2 Dust deposition monitoring will be carried out in the vicinity of sensitive receptors adjacent to the construction site throughout the duration of construction.

11.3 Any dust complaint will be actively investigated expeditiously and the complainant will be consulted on the outcomes and proposed future actions.

11.4 The Proponent will maintain an inventory of greenhouse gas emissions for the Project once construction commences, report greenhouse emissions and progress on greenhouse mitigation measures as well as maintain membership of the Commonwealth Government Greenhouse Challenge Program.

Section 12 – Noise and Vibration

12.1 While there are no specific noise guidelines for the construction activities a noise level goal of LAeq 12 Hr 58 dB(A), consistent with the EPP (Noise) acoustic quality objective, has been developed for the project.

12.2 A Noise and Vibration Environmental Management Plan will be developed to minimise the noise levels emitted from the construction site.

12.3 Environmental noise compliance monitoring will be conducted on a 24 hour basis at two locations representative of the closest residential areas to the construction activities. Other sensitive receiver locations will be used on an ad hoc basis to monitor specific work activities or in response to a noise

complaint. These measured levels will be compared to the project noise goals and reasonable and feasible remedial actions will be implemented, as required.

12.4 To ensure that construction works do not cause adverse impacts on sensitive receivers the Proponent will undertake pre-construction condition surveys at potentially affected properties. Monitoring during initial blasting trials will be undertaken at key locations to ensure that any impacts are within or below acceptable limits.

12.5 As part of the Construction Communication Program a system of complaint reporting, investigation and response will be initiated allowing the local community the opportunity to provide feedback on noise and other environmental issues.

Section 13 – Transport and Roads

13.1 A Traffic Management Plan will be developed to manage the safety and performance of motorists and community (schools) during construction. This plan will be developed in consultation with the relevant authorities and local community stakeholders.

13.2 To reduce construction traffic in the Gilston and Advancetown areas the Proponent will operate a bus service for the construction work force between the construction site and key transport hubs on the Gold Coast.

13.3 Prior to construction commencing a safety audit of transport routes will be undertaken and works undertaken to ensure the safe passage of construction vehicles (e.g. raise overhead wires, local road widening etc).

13.4 An education program will be implemented for the workforce to raise and maintain awareness of issues safety and courtesy issues within the local community. Topics will include but not be limited to speed, fatigue, littering, noise, school zones etc.

13.5 As part of the Construction Communication Program a system of complaint reporting, investigation and response will be initiated allowing the local community the opportunity to provide feedback on traffic and safety issues.

13.6 A maintenance strategy will be developed in collaboration and agreement with Main Roads to address any accelerated pavement deterioration along transport routes as a result of the construction transport traffic.

13.7 The condition of the pavement along transport routes will be monitored continuously throughout the duration of the construction phase of the Project with any routine maintenance issues addressed as required. The

Alliance will continue to consult with the Department of Main Roads to establish maintenance requirements to address project impacts.

13.8 The stability and integrity of road embankment along Nerang-Murwillumbah Road (Main Roads road 201) and Gold Coast-Springbrook Road (Main Roads road 104) will be investigated. If required works will be undertaken to maintain the stability of these road embankments.

13.9 The Proponent will raise a section of the Gold Coast-Springbrook Road over a length of approximately 700 m starting approximately 250 m east of the Little Nerang Creek Bridge to provide 1 in 50 year ARI flood immunity. Access to adjacent properties will be upgraded to suit the proposed new road level. Utilities will be relocated to accommodate the new road formation.

13.10 The new road sections will be designed to the satisfaction of the Department of Main Roads.

13.11 The Proponent will upgrade the Pocket Road Bridge to provide an adequate level of service to the local community. GCCC and local residents will be consulted in relation to the level of service required.

13.12 Vehicular access will be provided across the dam wall and saddle dams for maintenance vehicles and Emergency Services vehicles. Access will also be provided to existing fire trails immediately east of the saddle dam.

13.13 As part of the recreation facilities upgrade access will be provided across the dam wall for pedestrians and cyclists as part of the integrated parkland.

Section 14 – Hazard Safety and Risk

14.1 During construction the Proponent will implement safety standards and occupational health standards that provide a basis for effective management of employee and public health and safety.

14.2 The Proponent will provide first aid and emergency rescue facilities and equipment during all phases of the Project. The Proponent will ensure that appropriately trained personnel will be on site throughout the life of the project to provide first aid and respond to on-site emergencies as required.

14.3 MSDS information will be obtained and communicated to all site personnel involved in the storage, handling, use and disposal of hazardous substances and materials.

14.4 The Proponent will liaise with local State Emergency Services and local paramedic and hospital services with respect to planning for Emergency response.

14.5 The Proponent will complete a Failure Impact Assessment Study according to ANCOLD guidelines.

14.6 Safety management systems will be developed for all operations in line with current guidelines as published by ANCOLD.

14.7 Emergency planning will be implemented in line with Queensland and Australian Emergency Planning Guidelines Codes of Practice.

14.8 Emergency Plan detailing each potential hazardous scenario on the site, including evacuation plans and emergency response will be documented prior to dam commissioning.

14.9 An updated Operations and Maintenance manual will be prepared for the dam.

Section 15 – Waste Management

15.1 The Proponent will develop a waste management plan for the site which will include monitoring and auditing.

15.2 The amount of wastes generated will be reduced where possible.

15.3 Wastes (other than natural earth, soil or rocks) will be collected in suitable skips or bins.

15.4 Reusing or recycling waste at an appropriate facility will be done where feasible.

15.5 Wastes will be disposed at an appropriate licensed landfill.

15.6 A licensed waste contractor will be used to transport wastes off site.

15.7 Any hazardous materials used on site will be recorded in a Hazardous Materials Register.

15.8 A waste management procedure will be developed, incorporating an approved waste tracking system for those wastes requiring tracking.

Section 16 – Socio Economic

16.1 During the approvals and construction phase of the Project the Proponent will continue ongoing communication with the local community and stakeholders regarding such things as the Project approval process, timelines, key Project milestones, regular construction updates, advice on blasting, transport issues and the results of EMP monitoring . This will be delivered by a site based dedicated communications team.

16.2 The Proponent will provide a complaints response system including promotion and provision of phone contact with construction management staff during hours of construction, and a follow up procedure which notifies complainants within 24 hours of the intended response to the issue raised.

16.3 The Proponent will upgrade its existing boat ramps on the eastern and western arm of the dam prior to the closure of the site for construction activities. This will maintain access to large areas of the dam during the construction phase for water based recreation activities.

16.4 To offset the inundation of the existing recreation facilities adjacent to the lake a new lakeside park will be constructed to the west of the spillway in the vicinity of the quarry.

16.5 The Proponent will replace the existing café with an interpretative/kiosk amenities building constructed on sustainable principles in the vicinity of the new lakeside park.

16.6 The recreation areas located below the dam wall will be rehabilitated and the facilities upgraded to include improved pedestrian and bike access through the construction of the new access road and pathways linking with the pedestrian and cycle connection through to the area to the east of the dam wall and the lakeside park and interpretive centre.

16.7 Pedestrian and bicycle access will be provided across both the dam wall and saddle dam as part of the integrated parkland concept.

16.8 Existing mountain bike trails affected by the construction and raised FSL will be re-established.

Section 17 – Cultural Heritage

17.1 The Proponent will prepare a Cultural Heritage Management Plan (CHMP) and meet the duty of care standards set by the Aboriginal Cultural Heritage Act 2003.

17.2 The Proponent will continue to engage with endorsed Aboriginal parties to develop the CHMP in order to manage the Aboriginal cultural heritage of the area in a culturally appropriate fashion in the context of the proposed development.

17.3 In order to minimise the risk of accidental damage to Aboriginal cultural heritage features the Proponent will incorporate cultural heritage awareness into worker induction programs.

17.4 The Guinea family gravesites will be relocated to an accessible location in a parkland setting. A plaque will be supplied commemorating the Guinea

family graves. This process will be carried out with full sensitivity to the nature of the activity and in close consultation with the Guinea family and other interested community members as well as relevant local and State Government agencies.

Section 18 – Visual Amenity

18.1 Existing vegetation will be retained on site and only removed where necessary. In particular, a buffer should remain between the clay borrow area and Duncan Road.

18.2 Waste generated during construction will be collected and stored neatly on the construction site and removed from site as soon as possible.

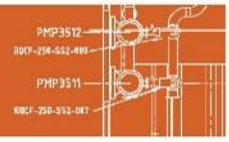
18.3 The Proponent will ensure that areas where vegetation is removed for construction activities that the areas are progressively rehabilitated to reduce visual impacts.

18.4 Dead/dying vegetation which becomes inundated and is visible from prominent viewing locations will be cleared.

18.5 Rehabilitation of the quarry and clay borrow area be completed as site works are completed. Rehabilitation will incorporate a selection of indigenous and fast growing plant species that are endemic to the site.

18.6 Lighting required for safety and security will be focussed on the areas required, with shields around the globes to limit extraneous light where practical. Lighting of the site will conform to Australian Standards.

Appendix 3: Additional materials



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Ph +61 7 3305 0470 Fax +61 7 3305 0499

The Coordinator-General
Hinze Dam Stage 3 Project
SEQ Water Grid
Department of Infrastructure
PO Box 15009
CITY EAST QLD 4002

Attention: Sonya Booth
12 September 2007

Dear Sonya

Hinze Dam Stage 3 Project – Fish Passage: Additional Information

In response to your request the Hinze Dam Alliance ('the Alliance') has prepared this letter to present additional information relating to the Alliance's commitments in relation to the delivery of fish passage as part of the Hinze Dam Stage 3 Project ('the Project').

Details of the investigations into the need for fish passage and the basis for the Alliance's position as it relates to fish passage was presented in Section 10 of the EIS. Following consultation with staff from the Department of Primary Industries and Fisheries (DPI&F) further information was prepared and presented in the EIS Supplementary Report. In particular Appendix E of the Supplementary Report contains the sections from the Preliminary Design Report that specifically relate to fish transfer.

This information, contained in the documentation described above, was presented to staff from DPI&F at a workshop held with Alliance staff on the 9 August 2007.

The Alliance team responsible for development of the project's fish passage strategy includes Dr John Harris and Brent Mefford, respected specialists in the fields of aquatic ecology and fish transfer. .

Dr John Harris has been a leader in the field of fish passage, including fish migrations and fishways technology, for over 20 years. He has been involved in the design of 30 new fishways in New South Wales and Queensland. He has played a leading role in a range of important fish-passage innovations including the development and testing of vertical-slot, rock-ramp, Denil and lock fishways specific to Australian conditions.

Dr Harris was at the forefront of key scientific and technical debates in Australia over the last 20 years that resulted in acceptance of the critical importance of fish passage in managing freshwater environments and freshwater fisheries.

Brent Mefford is Head of the Environmental Hydraulics and Fisheries Engineering Program for the United States Bureau of Reclamation (USBR). He has 25 years of experience in researching, designing and field monitoring of upstream and downstream fish passage and design of entrainment protection structures.

Brent's fish passage experience includes both salmonoid and non-salmonoid passage involving the design of technical fishways, nature-like rock fishways, hydraulic locks and mechanical lifts. Brent is also co-author of the "Reclamation Fish Protection at Water Diversions Manual" (USBR 2006) and the "Water Measurement Manual" (USBR 3rd edition 1997)

Copies of Dr Harris's and Brent's short Curricula Vitae are attached for your information.

The Alliance's recommendation to provide for fish passage on the Hinze Dam which currently has no fish passage device is for the provision of upstream fish transfer using a trap and haul facility. The Project has approved of the order of $4M for the design, development, construction and operation (during the construction period) of this facility.

The Alliance has previously recommended that downstream fish transfer facilities not be provided because:

- Studies undertaken in the course of the environmental impact assessment process demonstrate that downstream fish passage (in addition to that which will be provided via the dam's spillway) is not required to sustain the fish population dynamics in the Nerang River system
- The raised dam will not significantly modify the flow regime in the river below the dam
- Investigations indicate that low flow releases available from the dam are not sufficient to operate a downstream passage device successfully
- Additional releases are not within the parameters of the existing Water Resource (Gold Coast) Plan 2006 (WRP) and would compromise the additional water supply gained by the Project and enshrined within the *Water Amendment Regulation (No. 6) 2006*
- Investigations by the Alliance and the experience of Dr Harris and Brent indicate alternate methods (for downstream fish passage) involving the development of attraction flows within the impoundment (to simulate dam releases) have had limited success in dams of similar size in the United States of America and are expensive to construct and operate. Similar types of facilities in the USA have been found to be inefficient and costly to operate and are still largely considered experimental in nature many years after they were implemented.

The EIS identifies that downstream fish passage will occur when the dam spillway overtops. While it is recognised that injury to some fish will occur during travel over the spillway, the proposed Stage 3 upgrade of the spillway and downstream chute will reduce the fish mortality experienced in spill events when compared to the performance of the current Stage 2 configuration.

In addition to the commitments made in the EIS and Supplementary Report in relation to fish transfer, the Alliance is committed to undertaking a range of additional actions which will

contribute to the refinement and operation of a successful upstream fish transfer system and to enhance the understanding of the Nerang River fishery.

These additional commitments are summarized below and include:

- Ongoing liaison with DPI&F in relation to survey design, provision of data results and refinement of operations.
- Modification of the existing spillway chute and Stage 1 spillway to significantly reduce the number of fish caught in that area following a spillway overtopping event. Previously with the existing dam structure, large flow events have been followed by significant fish kills as fish have been unable to navigate through the spillway chute and continue downstream. This will be done via the provision of a slot in the Stage 1 spillway to allow fish to pass through the spillway system during and directly after the spill event when there is sufficient water downstream of the dam to support the fish biomass.
- Early construction of the upstream fish transfer system, by July 2009 to enable pilot operation, monitoring, and refinement of the facility by the Alliance for approximately 18 months prior to completion of the project in December 2010.
- Documentation of operation of the system detailed in a Fish Transfer Management Plan. This will be done in consultation with DPI&F.
- During the construction phase of the Project provision of an operational team that includes an aquatic ecologist of up to 0.5 Full Time Equivalent (FTE) for up to 2 years plus ongoing technical review by Alliance specialists, Dr John Harris and/or Brent Mefford.
- Ongoing surveys and analysis of the fish biomass in the vicinity of the transfer system, in the upstream and downstream reaches of Nerang River and at a control site in Mudgeeraba Creek. A total of up to 7 seasonal and/or event-based surveys are included in the Project's budget for the undertaking of survey work to provide better understanding of existing conditions and to inform ongoing optimisation of the transfer structure.
- Investigate the potential to engineer more appropriate environmental flow sequences utilizing existing outlet works and the release volumes supported by the WRP. Investigations will include the feasibility of pulsed environmental flows into the system to better simulate predevelopment flow processes. If appropriate these revised operating rules will be submitted to the Department of Natural Resources and Water (NRW) for inclusion in the Resource Operations Plan being developed as part of the WRP. The development of any modified environmental flows would be done in consultation with DPI&F and DNRW.

12 September 2007

The Hinze Dam Alliance is committed to developing a successful fish transfer system to introduce fish passage for the existing Hinze Dam as part of the Hinze Dam Stage 3 Project. The Alliance is further committed to consulting with DPI&F and other agencies throughout the project to optimise fish passage upstream via the fish transfer system and downstream during spillway overtopping events via improvements to the dam spillway chute.

If you have any questions in relation to this matter, please contact the Alliance's Manager for Environment and Approvals, Scott Abbey, on telephone 0419 189 466 or by email sabbey@hinzedamalliance.com.au.

Yours sincerely

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John Harris

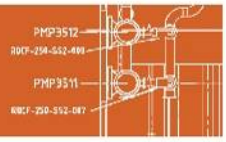
Aquatic Biology

Curriculum Vitae

Background	
Profile	Dr John Harris has a passionate interest and extensive experience in freshwater fishery issues. John has held numerous coveted research positions within this industry including leadership positions in the Australian Freshwater Fisherman's Assembly and the NSW Institute of Freshwater Anglers, an appointment to the NSW Government's Amateur Fishermen's Advisory Council and leader of the NSW Fisheries Research Institute and numerous other government sub-committees dealing with river health and fish-ecology issues. John provides various consulting roles in river health, fish passage and aquatic environmental research and management as well as undertaking significant research and development. He is also involved in voluntary work in aquatic ecology and fisheries issues with the Greater Taree City Council, especially the Cattai Wetlands Project, as well as with community fisheries groups. He is actively involved in a native vegetation propagation and regeneration program on the 100-acre property near Tinonee on the banks of the lower Manning River. John's areas of expertise include: The status of native freshwater fish and riverine environments • Assessing the ecological effects of river regulation, design and testing of environmental flow regimes • Experimental studies on the effects on fish of coldwater pollution from dam releases • Developing understanding of the migrations of freshwater fish, fishways technology, and ecological effects of barriers to migration • Developing better methods for river-health assessment, • Monitoring river ecosystem condition using fish community measurements and data from angling and commercial fisheries • Conservation of threatened fish species, especially trout cod, eastern cod Australian grayling and Macquarie perch • Ecological effects of alien pest species, especially carp
Qualifications	B.V.Sc., University of Sydney 1966, Ph.D., University of New South Wales 1984

Experience	

Experience	
Year to Year	**Hawkesbury River, NSW** **Ecological Fisheries** Dr Harris' initial appointment in NSW Fisheries was for ecological and fisheries work on the Hawkesbury River system. Particular issues included the effects of river regulation by dams and weirs, the impacts of sand and gravel mining, and management of freshwater and estuarine fisheries. Studies included community ecology in lowland and tidal reaches, bass larval recruitment and the roles of aquatic vegetation. Among other outcomes, the study prompted construction of four new fishways in the Nepean River. Subsequently a three-year study of the effects on the system of Sydney Water's activities was also planned and supervised by Dr Harris.
1989	**Cox River Study, NSW** The NSW Electricity Commission project involved planning for the new Mount Piper Power Station. The ecological impact of existing cooling-water discharges to the Coxs River from Wallerawang Power Station were assessed; involving the study of macro-invertebrates, water quality and fish. The study showed that the proposed expenditure of $11 million on a diversion pipeline from Wallerawang to Mount Piper was not justified in view of the multiple upstream disturbances of the Coxs River, including coalmines and washeries, sewage-treatment works and ash dams. Alternative remedial works were recommended.
Year to Year	**Fish Passage, NSW** Dr Harris has been a leader in the field of fish passage, including fish migrations and fishways technology, for over 20 years. He has been closely involved in the design of 30 new fishways in New South Wales and Queensland and has supervised graduate students and published internationally in this field. He has had leading roles in various important fish-passage innovations including the development and testing of vertical-slot, rock-ramp, Denil and lock fishways for Australian conditions. A novel airlift-pump fishway has being developed for testing. He has been a leader of the scientific and technical debates in Australia that resulted in acceptance of the critical importance of fish passage in managing freshwater environments and freshwater fisheries, with major government investments.
Year to Year	**Environmental Flows, NSW** Concerns over the effects of consumptive water use, particularly for irrigation, led to research on environmental flows. Dr Harris and his research group led many early investigations and discussions on this challenging topic. An important innovation was the development and application of the Expert Panel Assessment Method, a rapid, low-cost method for setting environmental flows using multi-disciplinary professional opinions. Expert Panels have since been used to determine flows in at least eight major river systems. His expertise in this field led to Dr Harris' significant role in the NSW Water Reforms.
Year to Year	**Coldwater Pollution, NSW** A brief survey of the Macquarie River showed that the impact of coldwater pollution from the thermally stratified Burrendong Dam extended over more than 300 kilometres down the river, with profound ecological implications. Dr Harris planned and supervised development of an experimental facility below the dam, using replicated stream channels with a novel heat exchanger to test the biological effects of cold water. Preliminary results showed growth suppression, avoidance behaviour and high mortality amongst young silver perch, as well as macroinvertebrate impacts. Dr Harris commissioned production of an important scoping report by CSIRO seeking engineering options for ameliorating coldwater



Brent Mefford

Fish Transfer System

Curriculum Vitae

Background	
Profile	Brent has twenty-nine years experience working for the U.S. Bureau of Reclamation's Water Resources Research Laboratory as a hydraulic research engineer and Head of the Environmental Hydraulics and Fisheries Engineering Program. He has extensive experience in hydraulic design, modeling and testing of hydraulic structures related to water storage, diversion and environmental compliance. Brent has twenty five years of experience in researching, designing and field monitoring of upstream and downstream fish passage and design of entrainment protection structures. His fish passage experience includes both salmonoid and non-salmonoid passage involving the design of technical fishways, nature-like rock fishways, hydraulic locks and mechanical lifts. Brent has author of over 75 published reports and professional papers in the field of hydraulics and is coauthor of Reclamation Fish Protection and Water Measurement Manuals. He holds three U.S. patents in the field of hydraulic structures engineering. Brent's areas of expertise include: • Study of hydraulic design • Fishway layout • Fishway design
Qualifications	B.S. Watershed Science, M.S. Civil Engineering, Colorado State University

Experience	
2002 - 2005	**Technical Fishways** **Fishway Design** Brent was responsible for fishway layout, fishway hydraulic design and baffle development on a number of projects including : • Grand Valley Diversion Dam, Colorado River • Link River Dam, Link River Oregon • Pyramid Lake Fishway, Truckee River, Nevada Brent researched and designed a new style of vertical slot fishway baffle that produces flow conditions better suited to the swimming and behavioural characteristics of non-salmonoids.
2003	**Burnett River Dam, QLD** **Hydraulic Design** Brent was involved in the Alliance design for the Burnett River Dam Project and was responsible for the concept development, layout and hydraulic design of the fish passage proposal. The proposed dam and storage reservoir provided challenges to fish passage due to large water surface fluctuations in the reservoir and tailwater. These challenges were overcome by proposing a fish lift with three release elevations coupled to sluices mounted to the upstream face of the dam. By sluicing fish and

Experience	
	pollution below dams.
Year to Year	**River Survey, NSW** In a major initiative, Dr Harris led the decision by the New South Wales Government and the CRC for Freshwater Ecology to invest substantial research resources in this extensive survey of the status of freshwater fish and riverine habitats in the State. The NSW Rivers Survey, which he planned and directed, addressed problems related to riverine environmental degradation, water-resource development, damaged catchments, declining fisheries resources and loss of biodiversity. The survey was intended to provide knowledge needed for better management and to show how rivers and their aquatic life were faring in the 1990's, using freshwater fish communities as indicators. The Rivers Survey studied the distribution, diversity and abundance of native fish and the alien fish species – especially carp – in New South Wales rivers; developed understanding of the ecological effects of river regulation; and tested a predictive model, the Index of Biotic Integrity (IBI), for monitoring river health through fish-community assessments. Five surveys were completed over three years at 80 (initially) then 92 riverine sites chosen in a modified-random survey design across the State. Quantitative data on fish communities were collected with five sampling methods, especially electrofishing, and habitat assessments were also recorded. Results of the survey provided much new information and were published in a major report. Many of the important conclusions have since influenced government policy, especially the decision to implement the NSW Water Reforms, to intensify efforts to halt the loss of aquatic biodiversity, and to manage the carp problem. The study showed that the State's rivers are degraded, especially in the Murray catchment, and many are in urgent need of rehabilitation.
2004	**Keepit Dam Study, NSW** **Researcher** In 2004, Dr Harris reported on ecological and fisheries implications and opportunities of upgrading Keepit Dam. The study was commissioned by NSW Fisheries in association with State Water and dealt with issues of fish passage, coldwater pollution, aquatic biodiversity, habitat values and fisheries.
2005	**Sustainable Rivers Audit** This major initiative of the Murray-Darling Basin Commission (MDBC) is using consistent, long-term monitoring to assess the condition of rivers throughout the basin. Three indicator themes, based on fish, macroinvertebrates and hydrology are currently assessed at the valley and river-zone scales in a six-year cycle. The Fish Theme incorporated several aspects of the IBI model developed for Australian use in the Rivers Survey. A pilot audit was completed on four rivers, one in each major State jurisdiction and the first full year of implementation was completed in 2005. Collaborative studies are continuing to evaluate new SRA themes based on floodplains, riparian vegetation and the physical form of rivers.

Experience	
	flow to the reservoir, only three pipe penetrations through the dam were required to pass fish over a wide range of reservoir elevation.
2000-2005	**Roughened Channel Fishways** **Fishway Hydraulic Design** Brent was responsible for fishway layout, fishway hydraulic design and study of weir hydraulic design for the following projects: • Derby Diversion Dam, Truckee River, Nevada • PNM Diversion Dam, San Juan River, New Mexico • Price-Stubb Diversion Dam, Colorado River • T & Y Diversion Dam, Tongue River, Montana As part of these projects Brent was responsible for testing and developing a standard design for roughened channel fishways that use boulders to control flow. This design can be used at slopes thereby reducing the fishway footprint and cost.
2000-2005	**Fish Friendly Pumps, California** **Researcher** Brent worked with other researchers conducting extensive fish passage survival testing of commercial screw pumps at the following facilities: • Red Bluff Diversion Dam, Experimental Pumping Plant, California • Tracy Fish Collection Facility, Sacramento River Delta, California Test results showed low injury and high survival of numerous delicate species through Hidrostal screw pumps and closed barrel Archimedes lifts. Studies resulted in these pumps and lifts being accepted by US fish agencies as 'fish friendly'.
2000-2005	**Fish Locks, Nevada** **Fishlock Layout and Hydraulic Design** Brent was responsible for the fishlock layout and hydraulic design of the Marble Bluff Dam, Truckee River, Nevada This remote unmanned sites required passage of large numbers of very different fish species past a 12m high dam with a 45-m-long uncontrolled concrete ogee crest spillway with gated sluiceway.

Appendix 4: Glossary

AMTD	Adopted Mean Thread Distance
ANCOLD	Australian National Committee on Large Dams
APFD	Annual proportional flow deviation
ARI	Average Recurrence Interval
CHMP	Cultural Heritage Management Plan
DES	Department of Emergency Services
DEWR	Department of Environment and Water Resources (Commonwealth)
DIP	Department of Infrastructure and Planning
DNRM	Department of Natural Resources and Water
DPI&F	Department of Primary Industries & Fisheries
DSD	Department of State Development
EFO	Environmental Flow Objective (from the WRP)
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP Act	*Environment Protection Act 1994*
EPA	*Environment Protection* Agency
EPBC Act (Commonwealth)	*Environment Protection and Biodiversity Conservation Act 1999*
EPP	Environment Protection Policy
EVR	Endangered, Vulnerable, Rare according to NCA
FSL	Full Supply Level
FTE	Full time equivalent
GCCC	Gold Coast City Council
HAD	Hinze Dam Alliance
IDAS	Integrated Development Application System
IPA	*Integrated Planning Act 1997*
LoS	Level of Service
ML	Megalitre, million litres
MR	Department of Main Roads
NCA	*Nature Conservation Act 1992*
NES	National Environmental Significance
QWC	Queensland Water Commission
REFs	Review of environmental factors
SDPWO Act	*State Development and Public Works Organisation Act 1971*
SEQIPP	South East Queensland Infrastructure Plan and Program 2007-2026
SKM	Sinclair Knight Merz
TAG	Technical Advisory Group
VMA	*Vegetation Management Act 1999*
WRP	Gold Coast Water Resource Plan 2006