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**Bayswater Power Station
Hunter River Low Pressure Pump Station
Augmentation
Part 3A Project Application**

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1. Introduction

Macquarie Generation is a state owned corporation that operates power stations within the New South Wales Hunter Valley. The Bayswater and Liddell power stations are located approximately 25 kilometres north west of Singleton and can meet approximately 40% of the state's electricity demand.

Water for the operation of Bayswater and Liddell Power Stations is sourced from the Hunter River under a licence from the Department of Natural Resources (DNR). The existing water licence entitles Macquarie Generation to 1,200 megalitres (ML) per day in recognition of the need to capture water from high flow river conditions to ensure sufficient water is available for the operation of both power stations. Water is pumped from a location on the Hunter River to the north of Jerrys Plains. From the Hunter River the water is pumped to either Plashett Dam, Lake Liddell or direct to Bayswater Power Station. All of the water extracted is used in accordance with Macquarie Generation's Water Licensing.

2. The Project

Macquarie Generation plans to augment the existing water supply scheme for Bayswater and Liddell Power Stations. The existing scheme, built in the late 1960s, is capable of extracting approximately 400 ML/day but this capacity declines under flood conditions due to blocking of intake screens and lack of access to attend to problems. Macquarie Generation requires an extraction capacity of 1200 ML/day from the Hunter River, especially during peak flow events. Water extracted will continue to be either pumped directly to Macquarie Generation's operating facilities or to Plashett Dam.

The proposed Low Pressure (LP) Pump Station Augmentation Project (the Project) involves a number of components including:

- New low-pressure pump station
- Rising main (above ground pipeline from Hunter River to Plashett Dam)
- Gravity main
- Water inlet structure at Plashett Dam

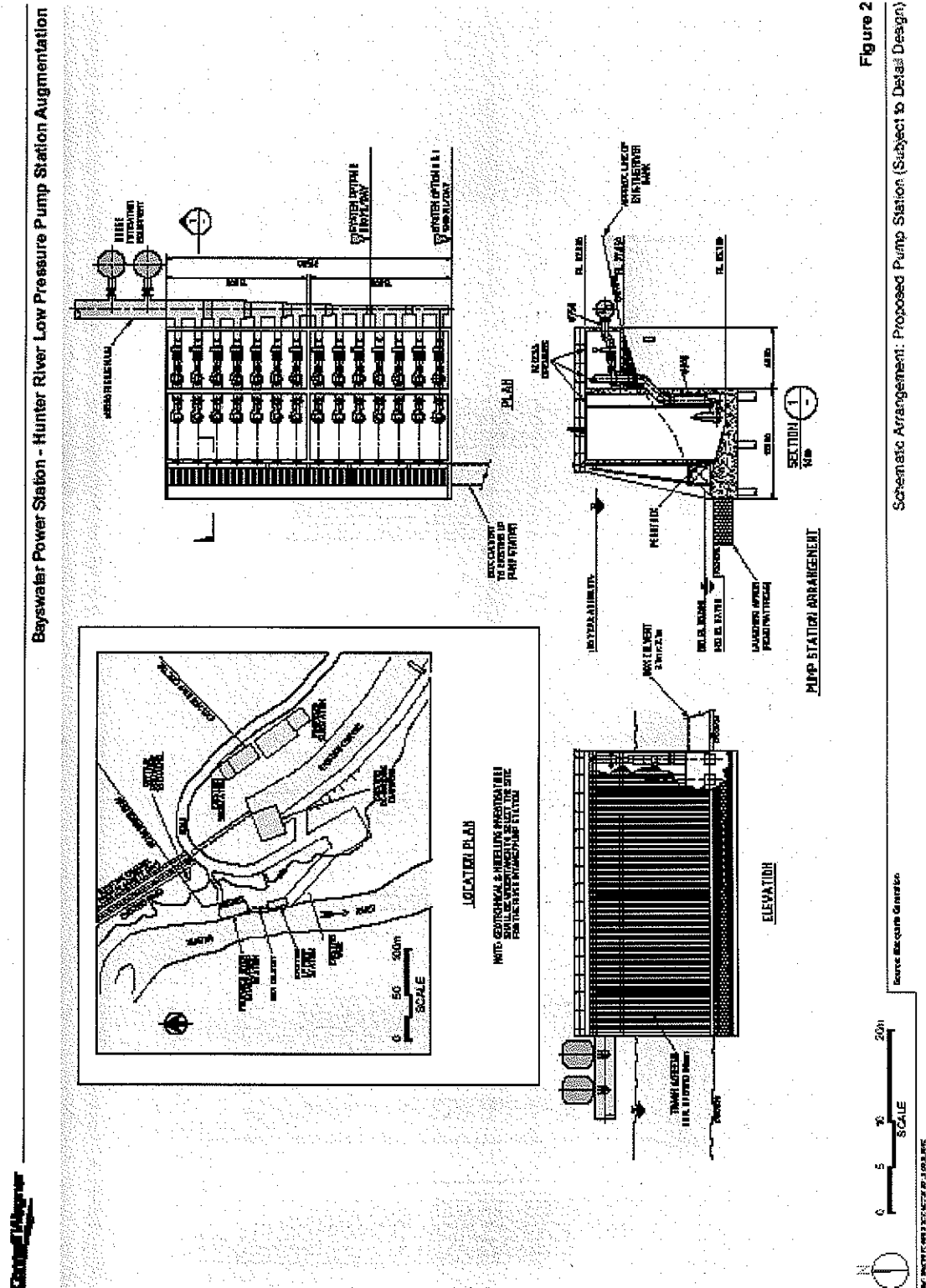
The capital cost of the proposal is estimated to be over \$35 million.

The proposed location of the pump station and pipeline is shown in Figure 1, while the proposed configuration of the pump station is illustrated schematically in Figure 2.

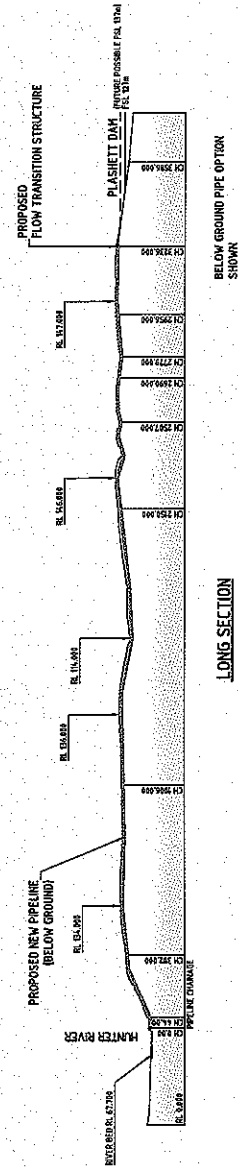
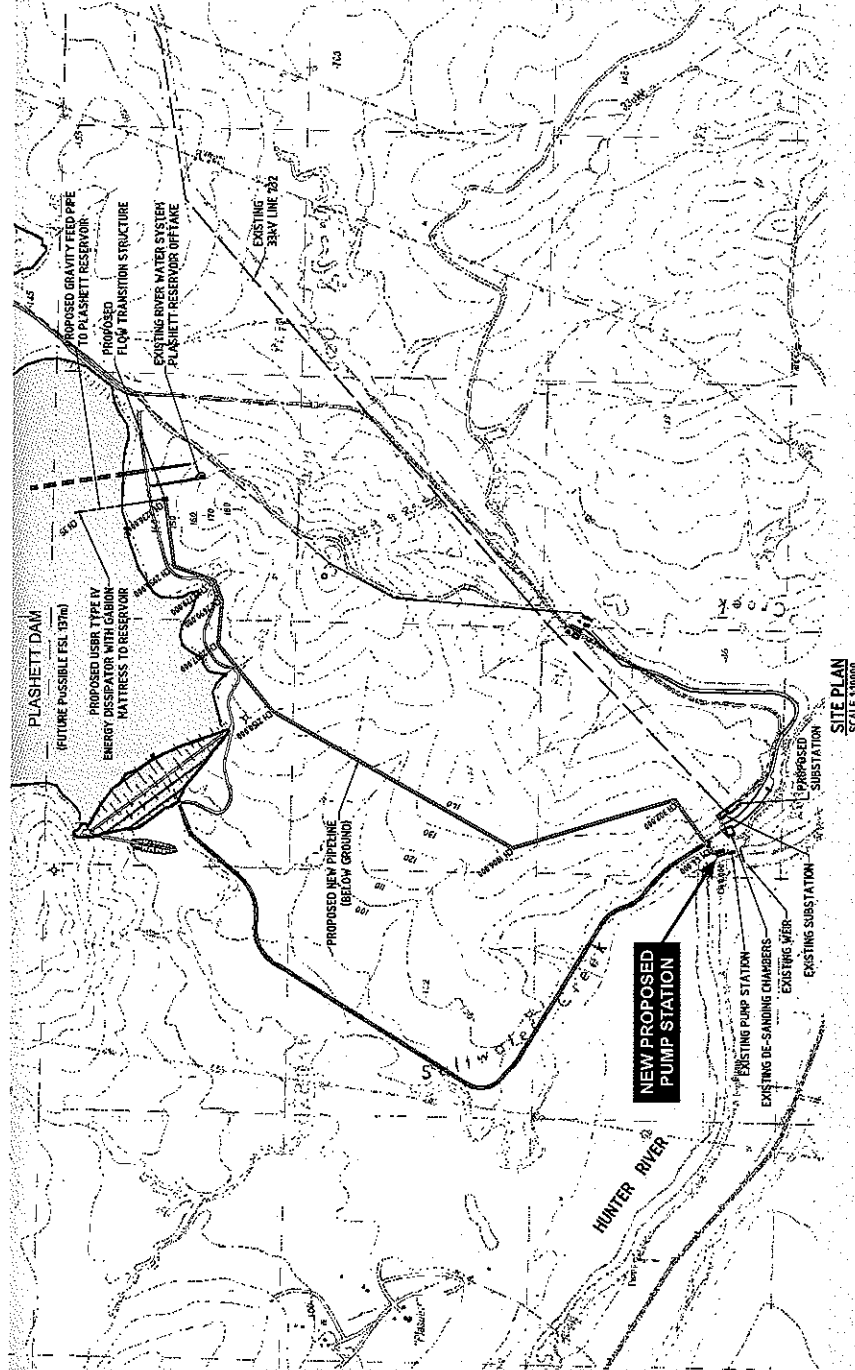
Indicative average workforce numbers at any time during construction of the project would be about 30 employees for the construction. Actual numbers would vary according to the contractor's equipment and construction techniques.

This Project relates only to securing the water supply for the current level of operation for Bayswater and Liddell Power Stations. The Project does not involve any change to the operation of the power stations in terms of their capacity to generate electricity or their generation requirements. There are no other proposed changes, implied or otherwise, to the operations or generating capacity of the power stations with respect to this Project.



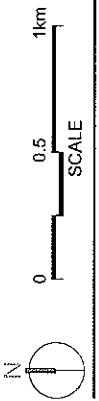


Bayswater Power Station - Hunter River Low Pressure Pump Station Augmentation



LEGEND

Proposed pipeline



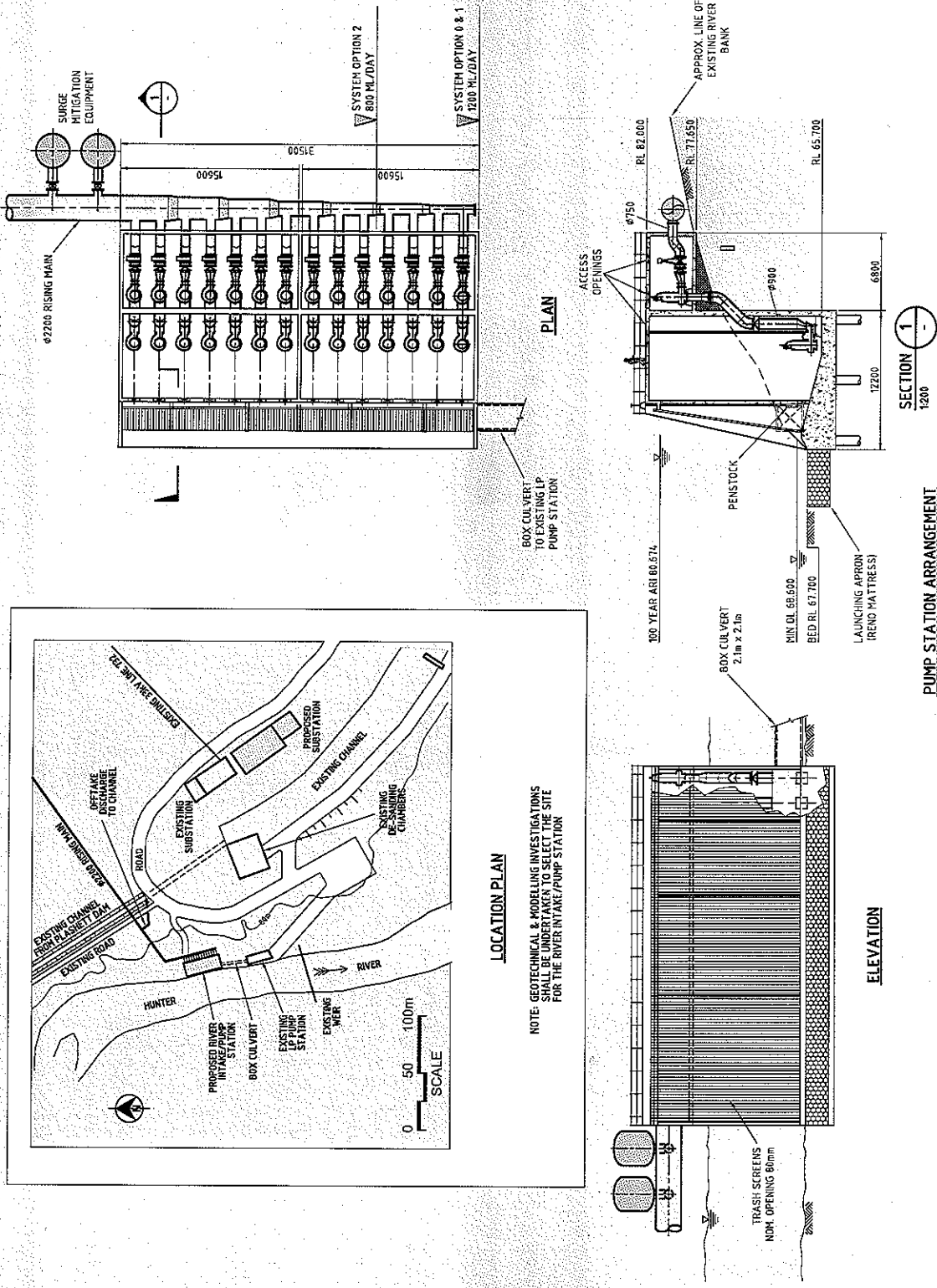
Source: Macquarie Generation

BAYS WATER POWER STATION 22257 06.01.08 08.00PC

Figure 1

Site Plan and Preferred Pipeline Option

Bayswater Power Station - Hunter River Low Pressure Pump Station Augmentation



Source: Macquarie Generation

3. Need and Justification for the Project

Macquarie Generation requires an extraction capacity of 1200 ML/day for water storage and operational requirements for the Bayswater and Liddell power stations. Macquarie Generation's access rules were modified following introduction of the Hunter River Water Sharing Plan in 2004. In addition, the existing pump station is unable to take advantage of high river flow and flood conditions to the extent allowed in Macquarie Generation's water licence, because of design deficiencies in the intake structure and trash racks, coupled with the lack of suitable access (for clearing of the trash racks and intake). Under the existing conditions of the water licence Macquarie Generation is entitled to extract 1,200 ML/day from the Hunter River, however the existing pump station is restricted to 400 ML/day.

4. The Site

All infrastructure required for the Project would be located on land owned by Macquarie Generation and zoned 1(a) (rural zone) under the provisions of Singleton Local Environment Plan (LEP) 1996. The land surrounding the existing pump station site on the Hunter River is predominantly cleared with some riparian vegetation fringing the river.

The land extending from the pump site to Plashett Dam where the proposed pipeline would be located generally consists of cleared grazing land with a relatively small area of native forest. This land is currently used for cattle grazing.

5. Statutory Controls and Approvals Process

5.1 Commonwealth Environmental Assessment Process

5.1.1 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) governs the Commonwealth Environmental Assessment process and provides protection for matters of National Environmental Significance (NES). Potential impacts associated with the development of the Project have been assessed against these matters of NES, and no negative adverse impacts have been identified. Referral under Section 68 of the EPBC Act to the Commonwealth Minister for the Environment and Heritage is therefore not necessary.

5.2 NSW Environmental Assessment Process

5.2.1 Part 3A of the Environmental Planning and Assessment Act 1979

Preliminary discussions with the NSW Department of Planning (DoP) have indicated that the Project will be assessed under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). An overview of the project approval process under Part 3A is illustrated in Figure 3.

The EP&A Act is supplemented by a number of Environmental Planning Instruments (EPI) including:

- State Environmental Planning Policies (SEPPs)
- Regional Environmental Plans (REPs)
- Local Environmental Plans (LEPs)
- Other planning policies and guidelines.

EPI's of relevance to the Project are discussed in the following sections.

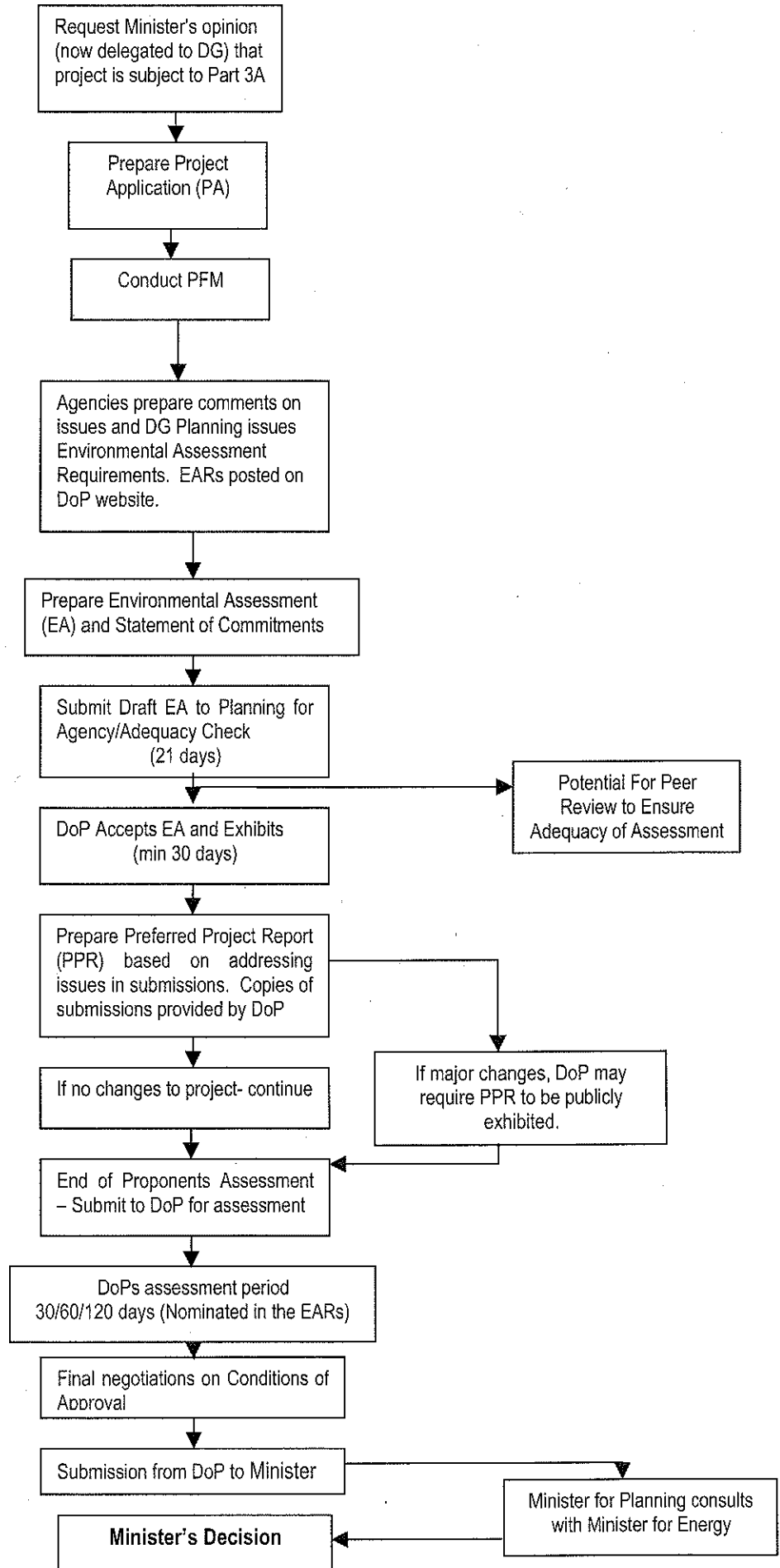
5.2.2 Singleton Local Environmental Plan 1996

Land affected by the Project is subject to the zoning controls administered by Singleton Council under the Singleton LEP 1996. As discussed above, the land is zoned 1(a) Rural under the LEP. The Council's objectives for the 1(a) Rural zone as listed under clause 16 of the LEP are:

- a) to protect and conserve agricultural land and to encourage continuing viable and sustainable agricultural land use,
- b) to promote the protection and preservation of natural ecological systems and processes,
- c) to allow mining where environmental impacts do not exceed acceptable limits and the land is satisfactorily rehabilitated after mining,
- d) to maintain the scenic amenity and landscape quality of the area,
- e) to provide for the proper and co-ordinated use of rivers and water catchment areas,
- f) to promote provision of roads that are compatible with the nature and intensity of development and the character of the area.

The Project's status under Part 3A of the EP&A Act means that the land use zoning and consent provisions of the LEP will have no statutory effect, as the Minister for Planning will be the consent authority for the purposes of the assessment under Part 3A. However, the zoning of the land remains relevant in so far as it reflects the underlying intent for the use of the land. In the circumstances, it is considered that this Proposal is not inconsistent with, and presents no potential conflict with the zone objectives as listed above. Further, Macquarie Generation's proposal is not considered to restrict or constrain the future use of the land for the purposes intended by Singleton Council in the 1(a) Rural zone.

Figure 3: Summary of Environmental Assessment Process – Part 3A



5.3 Other Licences and Statutory Approvals

Other statutory approvals that may be required or relevant to the Project include:

- The existing Water Management Licence, dated 11 December 2000 and administered by the Department of Natural Resources (the Project involves no change or proposed change to the conditions of this licence); and
- Environmental Protection Licence (EPL), which may be required under the *Protection of the Environment Operations Act 1997*, subject to consultation with the Department of Environment and Conservation.

Under Part 3A of the EP&A Act a number of the requirements for individual approvals under other NSW legislation are no longer required, as follows:

- *Heritage Act 1977* – approvals under Part 4 or excavation permits under section 139.
- *National Parks and Wildlife Act 1974* – permits under section 87 or consent under section 90.
- *Threatened Species Conservation Act 1995* – permits under sections 201, 205 or 219.
- *Fisheries Management Act 1994* and *Fisheries Management Amendment Act 1997*.
- *Native Vegetation Conservation Act 2003* – authorisation referred to in section 12 of the Act (or under any Act to be repealed by the Act) to clear native vegetation.
- *Water Management Act 2000* – water use approval under section 89, a water management approval under section 90 or an activity approval under section 91.
- *Rivers and Foreshores Improvement Act 1948* – permit under Part 3A.

The extent of any other associated approval requirements, in light of provisions under Part 3A of the EP&A Act, is currently being discussed with DoP.

6. Preliminary Environmental Assessment

A preliminary environmental assessment was undertaken to identify the key issues and highlight the need for relevant studies to be undertaken as part of the Environmental Assessment (EA) for the Project.

6.1 Key Issues

6.1.1 Terrestrial Ecology

A terrestrial flora and fauna survey has been undertaken for the site. The majority of the site has been substantially altered from a natural condition through previous land clearing with some remnant native vegetation remaining along the Hunter River and to the south of Plashett Dam. The vegetation fringing the river in the vicinity of the pump station while disturbed forms part of the endangered ecological community River Flat Eucalypt Forest listed under the Threatened Species Conservation Act 1995 (TSC Act). The remnant vegetation south of Plashett Dam consists of a woodland community. The majority of the proposed pipeline route passes through cleared land consisting of pasture and weed species.

The preliminary results of the fauna survey indicate that several common bird species were identified from the site as well as wombats and possums. During the site investigations a platypus was sighted upstream of the existing pump station. As part of the EA investigations a platypus expert will inspect the site and make recommendations with regards to protecting the habitat of this species. Potential impacts on terrestrial flora and fauna species and their habitats would be reduced through implementation of the following key mitigation measures:

- Retaining existing trees where possible to maintain current foraging and roosting areas for common fauna and connectivity of existing fauna movement corridors

- Rehabilitation and revegetation (representing ground cover, understorey and tree canopy) along the pipeline route following construction of the Project
- Preparation of a Vegetation Management Plan detailing restoration works, including weed management and re-establishment of native understorey species along the Hunter River.

6.1.2 Erosion and Sedimentation

Construction of the pump station and the pipeline has the potential to create erosion and sedimentation problems, which would impact on the Hunter River. In the vicinity of the proposed pump station location the banks of the Hunter River are generally soft and relatively steep. In operation there are no local water quality issues predicted to occur as a result of the Project.

A series of mitigation measures would be developed to minimise potential impacts related to erosion and sedimentation during the construction of the project. Such measures include:

- A Soil and Water Management Plan (SWMP) including an Erosion and Sediment Control Plan (ESCP) will be prepared which will describe detailed control measures and management strategies for potential erosion and sedimentation control during construction
- No spoil would be stored adjacent to existing waterways or drainage lines
- Sediment fences and other similar measures, such as control berms, would be constructed downstream of all disturbed areas to minimise the influx of sediment and other pollutants into local waterways
- Stability of reinstated creek banks will depend largely on the compaction of the backfill. A series of rehabilitation techniques may be employed to ensure the ongoing stability of the banks of the Hunter River. These techniques will be detailed in the construction contractor's rehabilitation plan.

6.1.3 Visual Impacts

The aspect of the Project with the greatest potential for visual impact is the pipeline from the pump station to Plashett Dam. The precise location of the pipeline is yet to be determined. However, if it is constructed above ground it is likely that a section of the pipeline may be visible from the township of Jerrys Plains.

The precise location of the new pump station is yet to be confirmed, however it would be located on the northern side of the river upstream (within 100m) of the existing pump station. The northern side of the river is characterised by a steep bank and moderate cover of trees and shrubs. Items of visual prominence include the existing pump station and transformer yard. The visual catchment of the proposed pump station site consists predominantly of grazing land and is traversed by a Main Road No. 213, the Golden Valley Way. A number of rural residences are also located within the visual catchment. When viewed from the Golden Valley Way, the bulk of the proposed pump station would be obscured by a rise in the landform to the south of the river.

The following mitigation measures are proposed:

- Construction of the pump station, control building and pipeline would be undertaken in a staged and timely manner to minimise impact on local visual amenity.
- The location of the pipeline route, pump station and control building will be chosen to minimise the extent of tree and shrub removal and to minimise destabilising the banks of the Hunter River.
- Following completion of the construction works the disturbed areas (ie. working width) would be rehabilitated with native and locally endemic species robust to local climatic conditions. It is anticipated that this will improve the visual amenity when compared with the pre-construction condition of the area. As part of the construction works where appropriate, undesirable species such as willows previously identified by the Department of Natural Resources shall be removed.

6.2 Non-key Issues

While the following factors are considered non-key issues, a Statement of Commitments to address their management would be included in the EA. The proposed mitigation measures outlined in respect of each of these issues are proposed as a draft Statement of Commitments.

6.2.1 Hydrology / Aquatic Ecology

The Project has been developed to augment the existing pumping capacity to enable high volume extraction under high river flow conditions. Macquarie Generation's existing water licence held with DNR details the flow conditions under which it is allowed to extract water from the river. In a high flow event, Macquarie Generation would not be permitted to pump water from the river for the first twelve hours to ensure that the river would continue to experience the flushing associated with major rainfall events.

During construction there is the potential for impacts on the aquatic environment. However, environmental management measures for erosion and sedimentation control would be employed to protect aquatic habitats. The operation of the Project would not result in any barriers to the movement of aquatic species within the Hunter River. The extraction of water is governed by the conditions of Macquarie Generation's water licence, which specifies the requirement for certain flow levels to be maintained downstream of the pump station. As the proposed water extraction would be in accordance with the existing licence, no hydrological investigations are proposed as part of the EA investigations.

6.2.2 Water Quality

There is the potential for water quality impacts during construction of the pump station and associated pipeline. The water quality of the Hunter River would be protected through the implementation of a range of erosion and sediment controls and other measures to protect against chemical spills from construction machinery. These measures would be detailed in the Project Environmental Management Plan (PEMP).

In operation there are no local water quality issues predicted to occur as a result of the pump station. As the water to be drawn from the river is not to be used for drinking or recreational purposes there would be no restriction on pumping if there was high turbidity or elevation of any other water quality parameters.

6.2.3 Air Quality

Potential air quality impacts are considered to be minor and restricted to the construction phase of the project. Vehicle and machinery emissions during construction may temporarily impact the local air quality. However, there are no heavily populated or sensitive areas within proximity of the proposed construction sites. In operation the Project would not have any impact on air quality.

The following measures would be implemented to mitigate potential impacts on local air quality during construction of the project.

- Provide 'all weather' surfaces on construction haul routes and establish and enforce appropriate vehicle speed limits
- All vehicle loads entering and departing construction areas to be covered
- Exposed stockpiles and unsealed construction areas would be sprayed with water from watering carts as appropriate, or stabilised with seeding and planting
- Vehicles and machinery would be regularly serviced and maintained to optimum working conditions to minimise potential emissions
- Works will cease when wind speeds exceed 10m/s and where dust generation cannot be effectively minimised, until adequate controls can be implemented or until such weather conditions abate.
- Vehicles will be confined to work areas to prevent any inadvertent encroachment or otherwise into exposed and stripped areas of ground

- All emission controls used on vehicles and construction equipment would comply with relevant DEC standards as provided under Section 124 of the Protection of the Environment Operations Act.

6.2.4 Noise and Vibration

The existing noise environment of the site would be typical of a rural area with the only notable potential noise source in the locality of the site being the Golden Highway. At the pump station the ambient noise levels are influenced by the river flowing over the weir and the humming of the operation of the existing pumps. The nearest noise sensitive receivers are located over a kilometre to the south and south west. The proposed pumping plant and equipment would not add significantly to the noise environment and would not be audible at the sensitive noise receivers to the south and south west.

Noise and vibration impacts would largely be restricted to the construction phase and be temporary in their nature. The absence of sensitive receivers in the vicinity of the pump station and pipeline locations indicates that noise and vibration is not likely to be a key issue during construction.

Consideration would be given to possible methods for mitigation of construction noise for potentially sensitive receivers:

- Notify the local community prior to the commencement of construction activities about timings, type of activities and hours of duration
- Equipment with low noise emission to be used, if required, wherever possible.
- A Construction Noise Management Plan would be prepared and implemented during the construction phase by the construction contractor
- Noise control in the vicinity of the Hunter River may be required during construction. Temporary noise controls, if required, would be detailed in the Noise Management Plan.

6.2.5 Indigenous Heritage

An indigenous heritage survey has been undertaken for the site. One isolated artefact (a stone flake) was found within the study area. It has been recommended that no further investigations (ie subsurface) are required due to the level of previous disturbance within the area.

The following mitigation measures would be adopted should items of archaeological or cultural significance be encountered during the construction work.

- Cease work immediately in the affected area so as to avoid any potential damage/disturbance to the artefact/relic of interest
- The construction contractor to notify the nominated Macquarie Generation Environment Officer immediately to arrange for a DEC officer to attend the site; and
- Appropriate 'rescue-record' measures would be implemented in accordance with appropriate guidelines under the National Parks and Wildlife Act 1974 and the advice received from DEC.

Furthermore, all site personnel would receive appropriate awareness training and briefings regarding their responsibilities under current NSW legislation prior to and during construction from a suitably qualified archaeologist in the event an archaeological artefact/relic is encountered.

6.2.6 Non-indigenous Heritage

No items considered likely to be of non-indigenous heritage significance were identified during the preliminary site investigations. A search of the relevant local and state government heritage registers would be undertaken as part of the EA investigations.

The primary mitigation measure proposed for the preservation of non-indigenous heritage items is avoidance. In addition, the following mitigation measures are proposed:

- Should any item be encountered during pipeline construction that is considered to be of heritage value, all work will cease immediately. The construction contractor's Environment Manager would be notified immediately who would then be responsible to make appropriate arrangements for a representative from the NSW Heritage Office or other suitably qualified person to be consulted.
- All site personnel would be made aware of the proximity of any identified non-indigenous heritage items.

6.2.7 Traffic and Access

Access to the site for construction activities would be from the New England Highway via the existing road network on the Bayswater Power Station site. Even during the peak construction period of the Project, the traffic volumes are not considered likely to cause any safety or road capacity issues due to the standard of the access roads and the isolated nature of the site. In operation the Project would generate only minimal traffic.

6.2.8 Geotech and Soils

The 1:250,000 Geological Map for Singleton indicates that the geology of the local area consists of quaternary alluvial deposits (gravel, sand, silt and clay) around the Hunter River and Singleton Coal Measure deposits (sandstone, shale, mudstone, conglomerate and coal seams) elsewhere. Isolated deposits of basalt may also occur within the general area.

Construction of the pump station would be likely to encounter alluvial soil deposits close to the river and residual soil/bedrock deposits further away from the river. Construction of the pipeline above ground also appears feasible. A range of issues will require further investigation during the EA stage including:

- Identification of transition from alluvial to residual deposits
- Identification of groundwater conditions
- Bank erosion, stability and protection
- Identification of erodible/unstable hillside conditions
- Identification of suitable bearing strata for pipeline structure
- Identification of potential variations in subgrade strength that may lead to differential movement between pipeline support structures.

6.2.9 Socio-economic

The Project aims to improve the security of water supply and hence Bayswater and Liddell Power Stations' electricity production during times of drought. This is in the interest of all electricity consumers of NSW.

6.2.10 Waste

The following measures would be implemented to mitigate potential impacts from waste generated during construction and operation of the Project.

- Preparation of a Resource and Waste Management Plan
- Handling, storage and transport of all hazardous materials and waste shall be in accordance with the National Code of Practice and the relevant Material Safety Data Sheets (MSDS) for the product
- Any wastes will be classified correctly in accordance with the Environmental Guidelines: Assessment, Classification & Management of Liquid and Non-liquid Wastes, produced by the EPA in July 1999 (the Waste Guidelines) to accurately identify management, transportation and disposal requirements.

7. Consultation

As part of the formal Part 3A process a planning focus meeting will be held for this Project. The following agencies will be invited to attend:

- Department of Planning
- Department of Environment & Conservation (DEC) - both NPWS and EPA
- Department of Primary Industries (DPI - Fisheries)
- Department of Natural Resources (DNR) - Water Management
- Singleton Council
- Hunter/Central Rivers Catchment Management Authority.

During the EA process, it is anticipated that some consultation will be undertaken with the local community of Jerrys Plains as well as any other groups/agencies identified in the EARs.

8. Conclusion

8.1 Environmental issues to be assessed in further detail

The preliminary environmental investigations presented in this report indicate the following issues would require detailed consideration as part of the environmental assessment:

- Terrestrial ecology
- Erosion and sedimentation
- Visual

It is proposed that these issues would form the focus of the environmental assessment. Macquarie Generation would prepare a draft Statement of Commitments to describe how these issues would be managed through the implementation of the Project.

8.2 Other Environmental Issues

The preliminary environmental investigations suggest that the following issues are unlikely to significantly affect the environment, and could be readily managed through the preparation and implementation of Construction Environmental Management Sub-plans by the construction contractor:

- Hydrology / Aquatic ecology
- Water quality
- Air quality
- Noise and vibration
- Indigenous heritage
- Non-indigenous heritage
- Traffic and access
- Geotech and soils
- Socio-economic
- Waste.