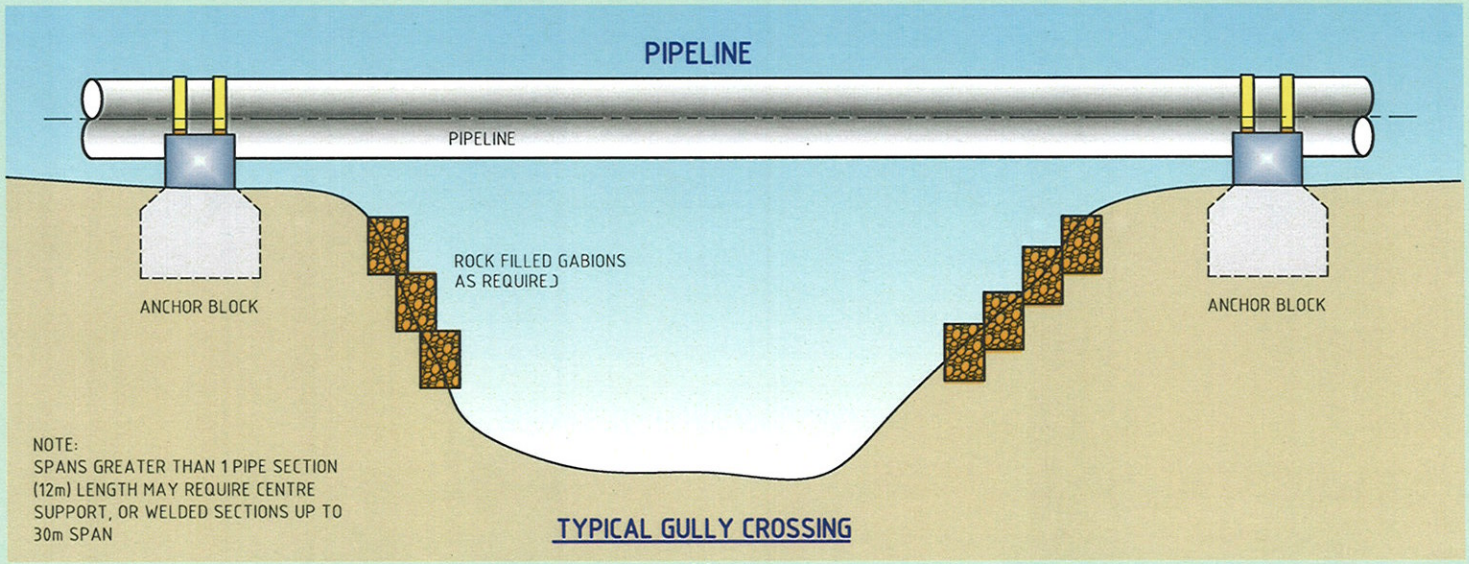


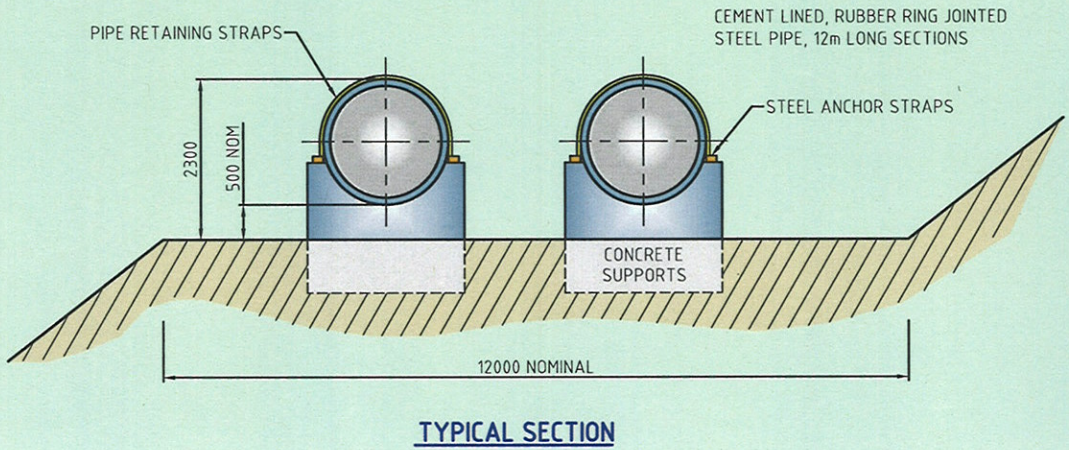
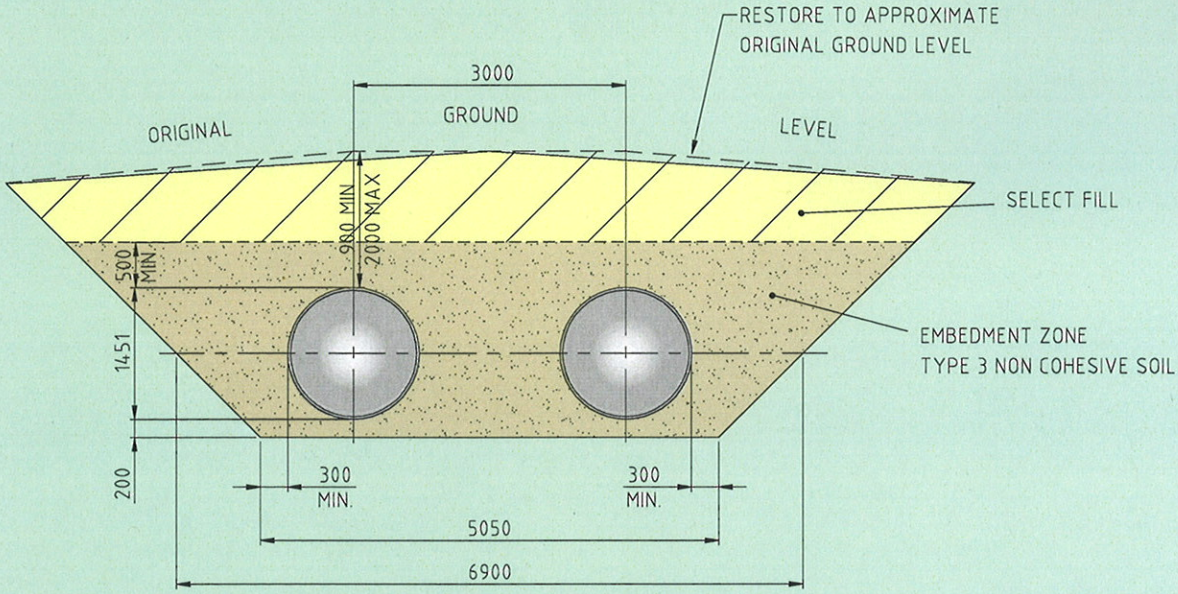
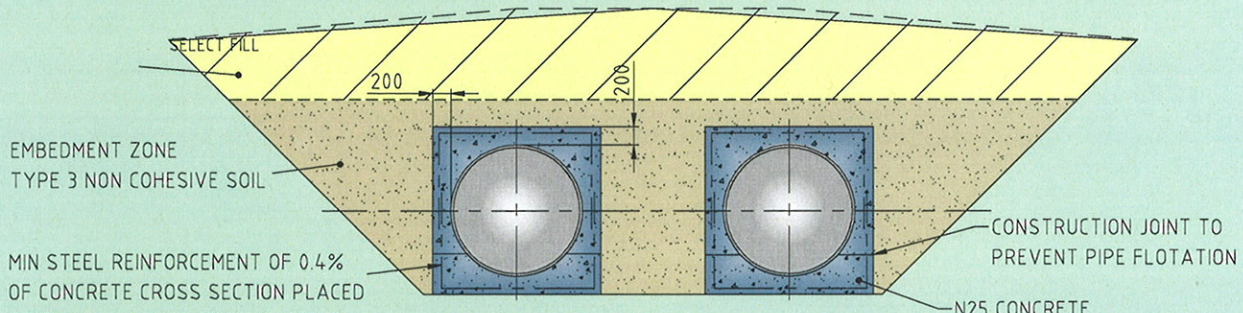


Figure 3.7

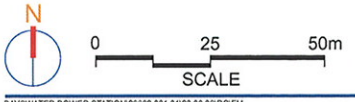
Typical Sections for Twin 1.8m Pipes



TYPICAL RISING MAIN SECTION
ADJACENT TO ACCESS ROAD
NTS



TYPICAL CONCRETE ENCASED
RISING MAIN SECTION
NTS

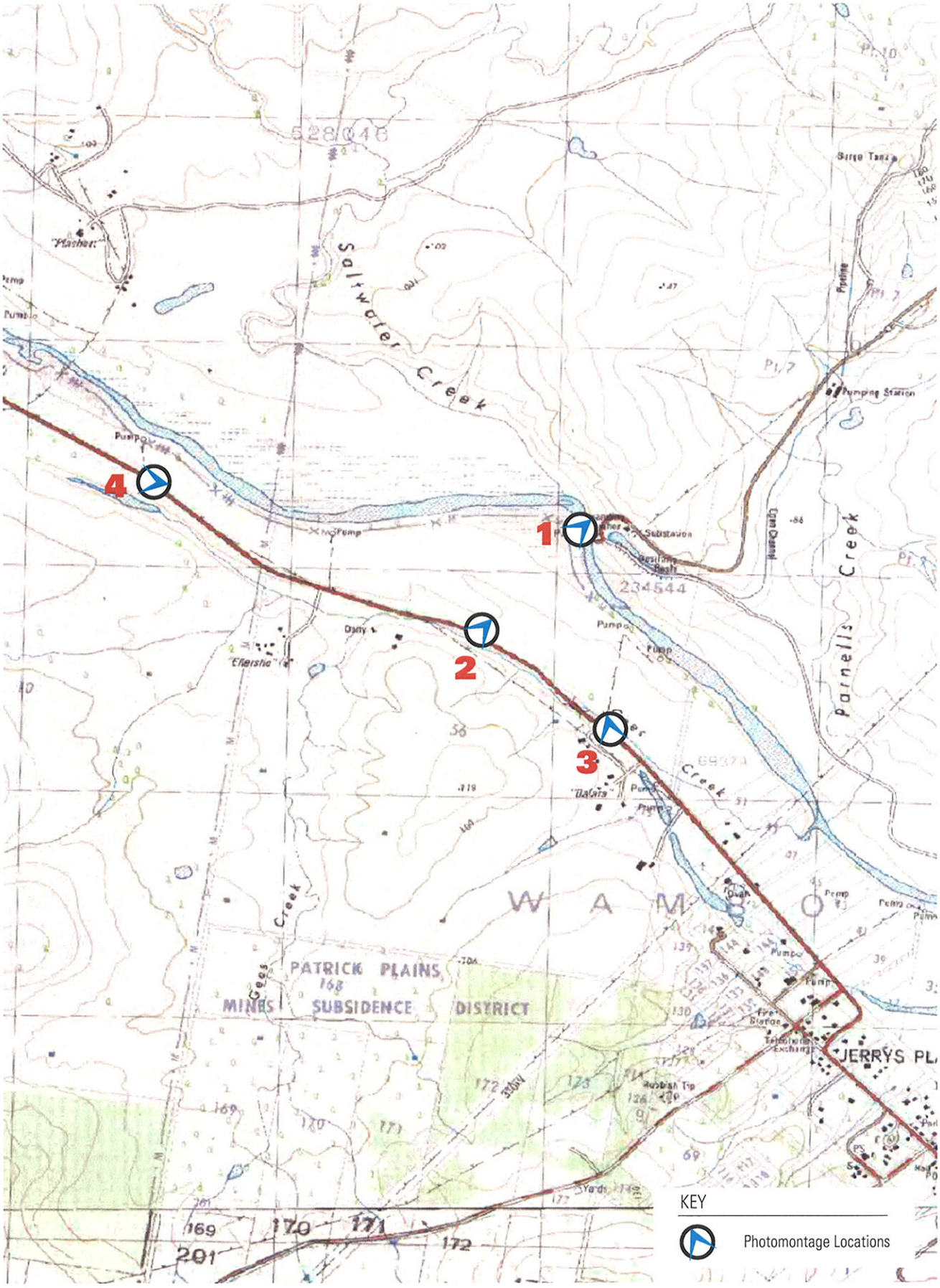


BAYSWATER POWER STATION\266\92.001.01\20.09.06\RC\FM

Source: Macquarie Generation

Figure

Delivery Pipeline and Associated Works



N

0 250 500m

SCALE

Source: Topoview 2006

BAYSWATER POWER STATION\26692.001.01\20.09.06\RCFM

Figure 1

Viewpoint Locations

Appendix B: Plates 1 to 4 showing view of Project from various vantage points

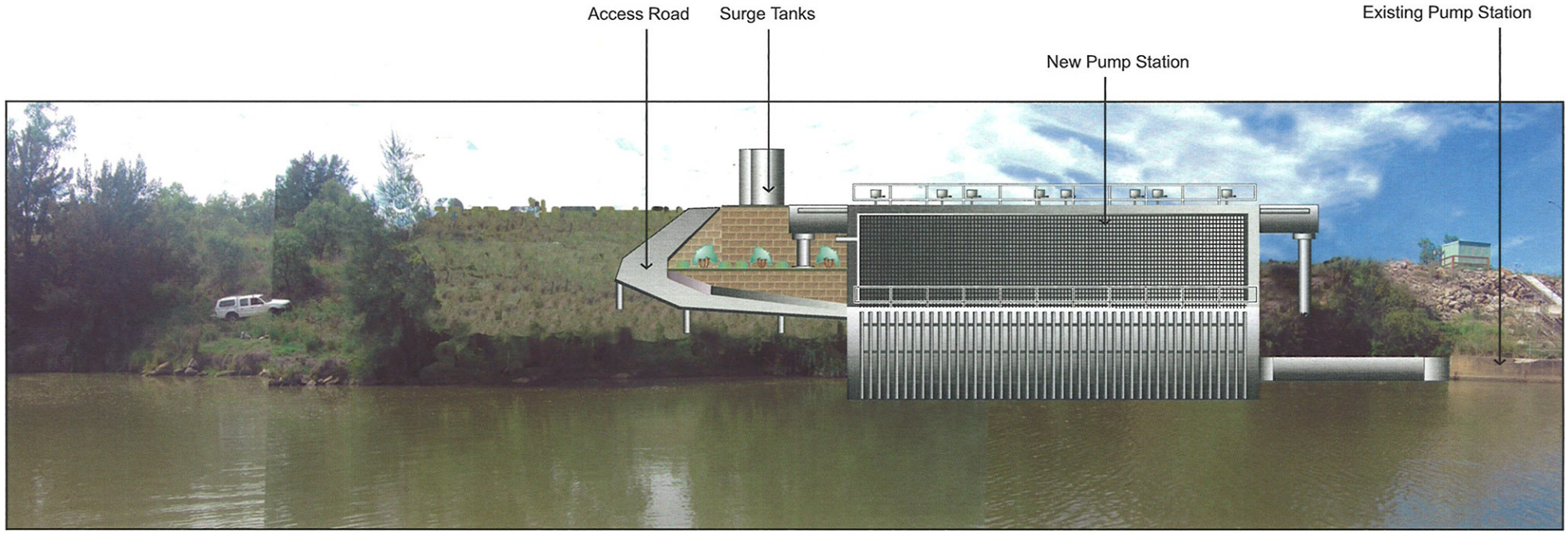


Plate 1

View across Hunter River

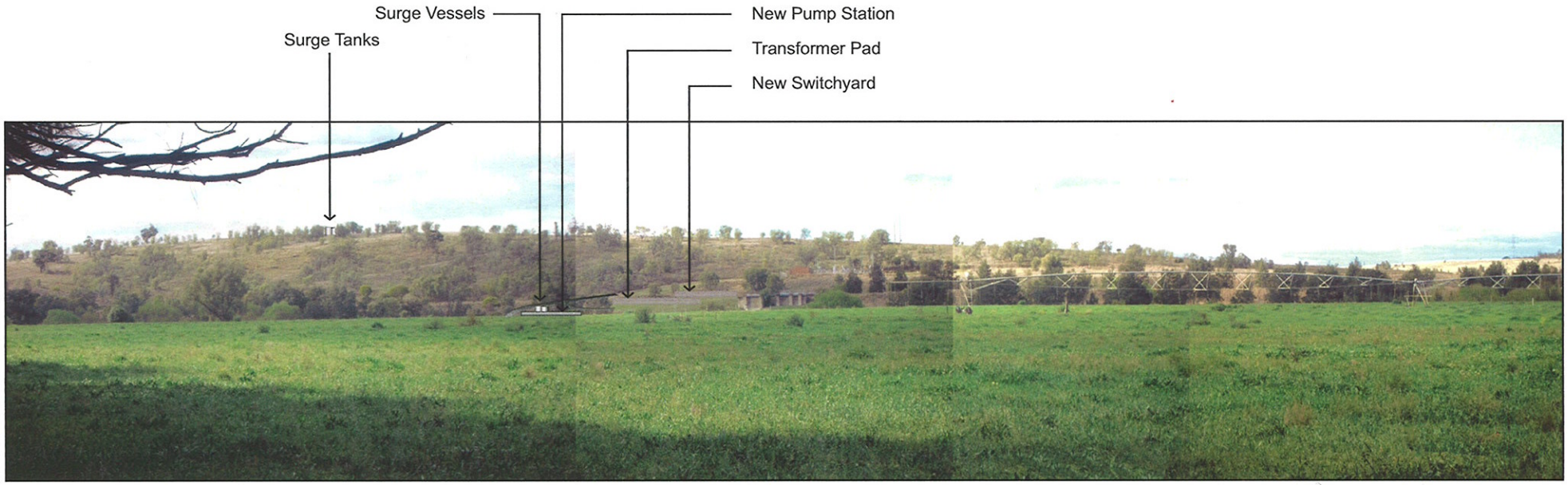


Plate 2

View to Pump Station from adjacent Golden Highway(About 2.1km NW of Jerrys Plains)

Plate 3

View from Golden Highway (About 1.7km NW of Jerrys Plains) near Gees Creek Crossing

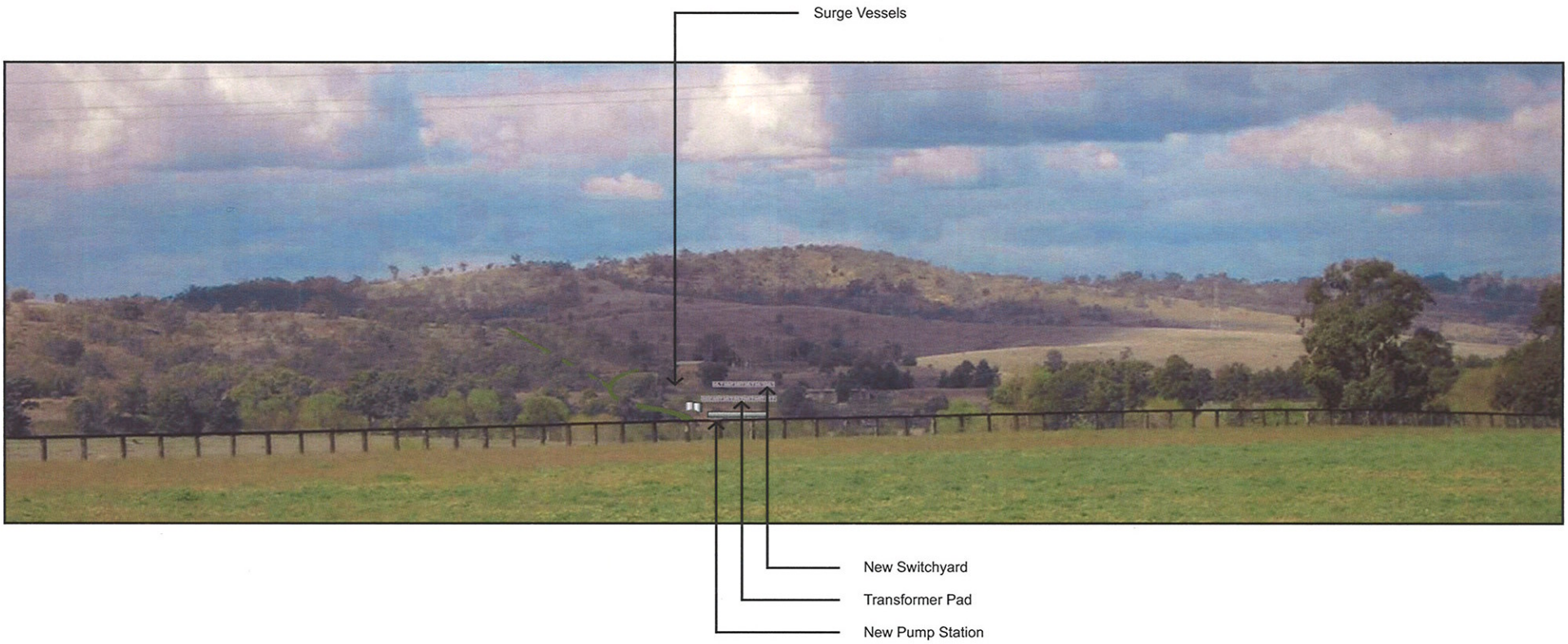


Plate 4

View to the East from Golden Highway (About 3.6km NW of Jerrys Plains)

Appendix C: Excerpt from Section 3 CEMP

The zone of the bank up to 10m (horizontal) from the water edge has been identified as the area with the highest probability for the existence of platypus burrows. All excavations in this area and up to 1m vertical distance below the bank surface will be subject to the following procedures and work methodologies (Section 3.1) to minimise any potential adverse affect on the local platypus population. Progress beyond 1 metre will be subject to the outcome of the specialist review of the first 1 metre of excavation (Section 3.2).

3.1 Initial Clearing and excavation to a nominal vertical depth of one metre

3.1.1 All clearing, sheet piling and initial excavations shall be supervised by a person experienced in habitat requirements and handling of platypuses and provided by Macquarie Generation (Platypus Biologist).
3.1.2 All excavation of the bank is to be carried out using excavators fitted with a batter or mud bucket (no toothed bucket to be used).
3.1.3 All excavations are to be made in slices of not more than 10 cm deep (100 mm), down to a nominal vertical depth of 1m and supervised by the Platypus Biologist (Section 2.1 above).
3.1.4 Pile excavated by auger, within the bank (for the sheet pile wall or for the bridge for road access to the new pump station) shall also be made in 10 cm (100 mm) slices under the supervision of the nominated Platypus biologist (Section 2.1).
3.1.5 Any areas of backfilling in the river and against the sheet pile will not be put in place until the adjacent river bank has been assessed by the Platypus biologist and declared clear of potential platypus habitat. This measure will ensure that the exit from any platypus burrows is not inadvertently blocked.
3.1.6 Prior to the sheet pile coffer dam construction, silt curtain will be placed in the river to contain any suspended sediment arising during initial site clearing. The area inside the silt fence will be reviewed regularly to ensure that no platypuses are trapped within the silt curtain.
3.1.7 Grasses and/or shrubs are to be removed before excavation of the bank begins.
3.1.8 Trees lining the edge of the stream are to be cut off near ground level and roots left in the bank.
3.1.9 The lowest terrace, immediately adjacent to the stream, is to be excavated to water level as above in slices of not more than 10 cm deep under supervision of the Platypus Biologist (Section 2.1). During this process, roots of trees left in the bank are to be carefully removed so that any burrows associated with them can be investigated by the Platypus Biologist (Section 2.1).
3.1.10 Any borrows detected within the excavation which proceed further up the bank, away from the stream, should be carefully exposed (by shovel and mattock if necessary) under supervision of the Platypus Biologist (Section 2.1).
3.1.11 Once the lower terrace (immediately adjacent to the stream) has been excavated to water level, careful excavation of the remainder of the site may not be considered necessary or could be modified, depending on the presence/absence/position of burrows located (see 3.2).
3.1.12 Where any trees outside the excavation site are removed, their roots must either be left in place or excavated carefully, so that any associated burrows can be investigated by the Platypus Biologist (Section 2.1). If roots are to remain, introduced species (e.g. willows) should be poisoned using bioactive herbicides and be replaced by appropriate plantings of species native to the area.

3.2 Clearing beyond the initial one metre zone (lower terrace zone adjacent to the stream)

The controls outlined in Section 3.1 will not be required for the excavation of the zone beyond one metre, provided that:

- no potential platypus burrows have been identified that extend into the zone beyond one metre, or
- any burrows extending into the zone beyond one metre have been investigated and the platypus removed by the nominated platypus biologist

Where the above conditions have not been satisfied, then the controls outlined under Section 3.1 will be continued until such time as the Platypus Biologist has assessed and declared the remaining area of excavation as free from potential platypus habitation

The nominated Platypus Biologist will carry out the following:

- Photograph and collect measurements of any burrows unearthed in the excavations
- Capture any adult platypuses found in the excavation area, record relevant biological
- information (e.g. sex, body measurements, breeding status) and release them upstream of the excavation area. For future reference and/or possible future monitoring studies, any platypuses caught should be marked with implanted PIT tags (microchips) and the details provided to NSW National Parks and Wildlife Service.
- No person other than the nominated Platypus biologist will attempt to catch or handle the platypus
- Make contact with an institution licensed to keep platypuses in captivity and having
- husbandry and veterinary facilities which would facilitate the possible successful rearing of any nest-dependent platypuses that may be found during the excavation (e.g. Taronga Zoo or Australian Reptile Park).
- Capture and safely transport any nest-dependent young to an appropriate carer institution (e.g. Taronga Zoo or Australian Reptile Park).
- Record observations of platypus activity in the pump pool in the mornings and evenings
- prior to and following daily excavation activities [provided there is sufficient daylight for observations to be carried out before daily site activities have begun or after they have ceased].

Appendix D: Excerpt from Section 2 CEMP

2.3 Erosion and Sedimentation Management Plan

The purpose of the Erosion and Sedimentation Management Plan is to outline measures that will be implemented to minimise erosion occurring on site and to intercept and retain sediment leaving the site during site preparation, construction and demolition works. An Erosion and Sedimentation Management Plan shall be included in all Contractor Specific CEMPs to address all earthworks under the respective contracts. The specific plans must comply with the following guidelines and documents:

- The Department of Planning's requirements in respect to the Erosion and Sedimentation Management Plan (Section 6.2 (a) of the Project Approval document found in Appendix A);
- The Hunter River Pump Station Augmentation Environmental Assessment;
- Landcom's "Managing Urban Stormwater- Soil and Construction",
- The Singleton Council's "Erosion and Sediment Control Development Control Plan";
- RTA's guidelines for the Control of Erosion and Sedimentation in Roadworks; and
- DIPNR Guideline for the "Preparation of Environmental Management Plans".

The Contractor's Erosion and Sedimentation Management Plan is required to be approved by Macquarie Generation or their representative and implemented prior to the commencement of works.

2.3.1 Soil Characteristics

The Contractor's Erosion and Sedimentation Management Plans must take into account the results of investigations into soils associated with the site, and in particular ensure that specific measures are in place for those areas on site which have been identified as being prone to erosion or deemed unstable in respect to the soils. Details of soil landscapes and geotechnical studies are outlined below.

2.3.1.1 Soil Landscapes

The project area consists of four soil landscapes, namely, Hunter, Brays Hill, Bayswater and Liddell soil landscapes. Figure 2.1 illustrates the location of the respective soil landscapes in relation to the pipeline, in addition to the type of erosion each soil landscape is predisposed to.

In preliminary studies conducted in the EA, it was found that the bank of the Hunter River, where the pumping station is to be located, is relatively soft and steep, making erosion and sedimentation a high risk if not managed properly. Permanently high watertable, seasonal waterlogging, flood hazard and foundation hazards are also characteristic of the Hunter landscape. The location of the pipeline discharge into Plashett Dam has also been identified as having potential for gully and sheet erosion, particularly along the drainage lines.

The Contractor will need to carefully consider erosion and sediment controls in both of these areas and include plans and mitigation measures in the Contractor Specific CEMPs.

2.3.1.2 Geotechnical testing

Geotechnical testing was conducted in April 2007, where excavation bores were drilled on land and over water. The results have been incorporated into the civil design structure as illustrated in the drawings issued for tender, CL004-Cl009 and ME020, found in Appendix B. This information will assist the contractors in drafting their erosion and sedimentation management plans.

2.3.2 Contractor Specific Erosion and Sedimentation Plans

The contractor is required to conduct all required site work to avoid erosion and sedimentation within the site, surrounding areas, watercourses and streams. Works which may result in soil disturbance, soil erosion and sedimentation could include earthworks for access tracks, foundations, excavations, trenching, changes to drainage, discharging from pipeline and stockpiles. Other activities may also have

the potential to cause erosion and sedimentation and need to be identified in the Contractor Specific Erosion and Sedimentation Plans.

The Contractor Specific Erosion and Sedimentation Management Plans for the site will be put into practice to:

- Divert clean water runoff away from the site without contamination from dirty water;
- Control sediment-laden runoff from areas within the site and divert them into sediment traps without contaminating any clean runoff on or moving through the site;
- Minimise disturbance of the site that may result in erosion due to the effects of wind and water action;
- Prevent erosion from disturbed areas on site and control sediment laden runoff from any such area;
- Revegetate disturbed areas; and
- Implement appropriate groundwater management measures for dewatering practices, based on the water quality.

The Contractor Specific Erosion and Sedimentation Management Plan must include details on proposed measures, design specifications for diversionary works, banks and sediment basins, erosion monitoring programs and rehabilitation and stabilisation measures. A visual representation illustrating the location and capacity of the erosion and sedimentation measures to be implemented should be included in the Erosion and Sedimentation Management Plan.

The detailed design of the pump station, pipeline and the associated access roads has incorporated erosion and sedimentation control measures, such as clean and dirty water drains and sediment basins, as illustrated in drawings CL004-CL009, ME020 and ST305 (Appendix B). These drawings will provide a framework for the Contractor Specific Erosion and Sedimentation Plans.

The erosion monitoring program to be included in the Contractor Specific CEMP must identify how the effectiveness of the erosion and sedimentation controls will be monitored, reviewed and updated. The monitoring program should include the components listed below, however, the contractor should not limit the program to that listed. The results of the inspections and monitoring conducted by the contractors will be included in the monthly reports to the Construction Manager.

The Contractor shall:

- Consult with an appropriately skilled engineer or soil scientist to:
  - Undertake inspections of temporary or permanent erosion and sedimentation devices
  - Ensure that appropriate controls are being implemented
  - Ensure the controls are being maintained in an efficient condition
  - Ensure the controls meet the planning and legislative requirements
- Visual inspections of disturbed areas for scouring;
- Regular inspections and maintenance on the control devices implemented;
- Visual inspection of the surrounding water courses for sedimentation;
- Monitoring turbidity of water courses; and
- Regular inspections of stockpiles and associated control devices.

Specific erosion, sediment and pollution control measures and practices were outlined in the EA and are listed below. However, the contractors should not limit controls to those listed.

- Where relevant, be consistent with the RTA guidelines for the control of Erosion and Sedimentation in roadworks;
- Construct a coffer dam around the river bank excavation to ensure that the construction area is kept dry and that the sediment from the construction site does not enter the river. This has been incorporated into the design and can be seen in drawing ME020 in Appendix B;
- Divert water pumped from the coffer dam to the existing canal to prevent sedimentation within the weir pool;
- The contractor will specify a strategy to minimise bare surfaces during construction to minimise soil erosion;
- No spoil to be stored adjacent to the waterways or drainage lines;
- Divert surface flows around areas of disturbed ground and soil stockpiles;
- Construct sediment fences and other similar measures such as control berms, downstream of all disturbed sites to minimise the influx of sediment and other pollutants into local waterways;
- Establish sandbags, linear silt fencing, or other suitable material between disturbed surfaces and aquatic or riparian habitats, to capture any sediment mobilised during wet weather;
- Maintain the silt fences until the site has been revegetated, stabilised and no longer prone to erosion;
- Inspect and maintain erosion and sediment control devices weekly and after rainfall events with any defects rectified promptly;
- Include a contingency plan for chemical, fuel and oil spills (Section 2.5);
- Employ rehabilitation techniques as necessary to ensure the ongoing stability of the banks of the Hunter River and drainage lines for the Saltwater Creek catchment; and
- Progressively rehabilitate exposed soils through the construction period.

All erosion and sediment control devices will be maintained in satisfactory working order until such time as the disturbed areas have been stabilised to the satisfaction of Macquarie Generation or their representative. All temporary control measures will be removed when revegetation has established on formerly disturbed areas and will be disposed of in a satisfactory manner.

Topsoil suitable for stripping and re-use in revegetation will be stockpiled. Stockpile sites will be clearly identified and selected to be away from traffic, drainage lines and watercourses. They will be managed to minimise erosion and loss of topsoil.

At the conclusion of construction, all temporary tracks and areas disturbed by construction work will be reinstated and revegetated (representing ground cover, understorey and tree canopy). The contractors will be required to prepare a Rehabilitation Plan as a component of the Contractor Specific CEMP, which is to be approved by Macquarie Generation (Section 2.4.4).