

PRELIMINARY DECOMMISSIONING PLAN

NEWGEN POWER STATION

NEERABUP

December 2010



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Table 4.1 Key proposal characteristics

Table 5.1 Preliminary Register of Plant and Equipment

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1 Introduction

The NewGen Neerabup Power Station is an operating 330 MW gas-fired open cycle power station in the Neerabup Industrial Estate that provide electricity into the grid: the South West Interconnected System (SWIS).

Associated with the power station is a 30 km natural gas pipeline connecting to the Dampier to Bunbury Natural Gas Pipeline near Muchea and a 330 kV transmission line from the power station to the Western Power Neerabup terminal substation on Ziatas Road (Figure 1.1).

2 Company Information

The NewGen Neerabup Power Station was developed by ERM Power and is operated by ERM Power under an agreement with the owners, the NewGen Neerabup Partnership (ERM Power and the Infrastructure Capital Group).

ERM Power has successfully managed the feasibility and development of several gas-fired power station projects including; the Oakey Power Station (300 MW) and the Braemar Power Station (900 MW) in south-east Queensland, the Uranquinty Power Station (600 MW) in New South Wales and the NewGen Kwinana Power Station (320MW).

3 Need for the Project

The existing South-West Interconnected System (SWIS) supplies electricity to a large area from Perth in the west to Kalgoorlie in the east and from Kalbarri in the north to Albany in the south. This system incorporates transmission lines from a range of power stations and distribution lines to homes and businesses.

The population of south-west of WA has been growing rapidly in recent times. This growth together with a higher standard of living has resulted in an increasing demand for electricity that requires an increase in generating capacity, particularly at times of peak electricity use in the morning and evening.

The advent of the Wholesale Electricity Market allows independent operators to provide electricity generating capacity in accordance with processes set down by the Independent Market Operator. The NewGen Neerabup Power Station provides generating capacity for the SWIS during periods of high demand.



4 Project Information

4.1 Plant Information

Construction of the project commenced in February 2008 with commercial operation commencing in November 2009.

The power station comprises two 165MW open-cycle gas turbine (OCGT) units providing a nominal 330MW of generating capacity. The units are fitted with low NO_x burners to ensure air emissions are minimised. The power station functions as a peaking plant to provide additional capacity to the southwest electricity grid during periods of high demand.

The fuel source for the power station is natural gas. There is no diesel emergency fuel system. Power generation using natural gas has far lower atmospheric emissions than coal based power plants including less greenhouse gases, oxides of nitrogen and sulphur dioxide. Another advantage of gas-fired power stations is that the low emission natural gas fuel source can be piped directly to the site so that the power station can be located close to the centre of demand such as the metropolitan area. Thus, less energy is lost in the transmission of electricity than if the power station was located at the source of the fuel, as for coal-fired power stations.

OCGT units have a relatively fast start-up time typically less than fifteen minutes from start-up to full load compared to 24 hours for coal-fired units. Thus, OCGT units are ideal for operations to meet peak and high shoulder load demands as well as being complementary to intermittent generation such as wind and solar.

OCGT power stations require minimal supporting infrastructure which result in smaller footprint areas than many other power generation plants. The disturbance footprint for the NewGen Neerabup Power Station is approximately 10 hectares and the transmission line footprint of approximately 0.25 ha.

The key proposal characteristics are summarised in Table 4.1.

Table 4.1 Key Proposal Characteristics

Element	Details
Project purpose	330 MW gas fired power station and associated infrastructure
Project life	30 years
Power output	330 MW (nominal)
Power station footprint	Site of 10 ha was cleared farming land of which approximately 4 ha has infrastructure.
Pipeline footprint	Construction corridor around 30m wide over 30km length. Approximately 30 ha of native vegetation cleared and rehabilitated after construction.
Transmission line footprint	Approximately 400 m ² of native vegetation for construction of each of seven single-column power pole bases.
Fuel: Type Source Method of transport	Natural gas North West Shelf Dampier to Bunbury Natural Gas Pipeline and lateral to power station site
Major plant components	2x165 MW open cycle gas turbines fitted with low NOx burners
Plant operation	Intermittent operation to suit demand
Gas pipeline	Lateral pipeline of approximately 30km connects to Dampier to Bunbury Natural Gas Pipeline near Muchea
Transmission line	330 kV line to Western Power Neerabup terminal substation – approximately 2 km
Inputs: Natural gas ¹ Process water ¹	Approximately 11 PJ per year Approximately 65 ML per year from on-site bore
Outputs: Waste water Oxides of nitrogen Carbon dioxide ¹ Carbon monoxide Noise	No discharge of waste water <25 ppm @ 15% O ₂ Approximately 0.7 Mt CO _{2e} per annum <10 ppm @ 15% O ₂ Comply with <i>Environmental Protection (Noise) Regulations 1997</i> <30 dB(A) at nearest residential property <65 dB(A) at nearest industrial property

¹Will change with actual hours of operation

Abbreviations

CO_{2e} carbon dioxide equivalent
dB(A) decibels (A weighted)
GL gegalitres (10⁹ litres)
L litres
m metres
mg milligrams (10⁻³ grams)
ML megalitres
Mt megatonnes (10⁶ tonnes)

MW megawatts (10⁶ watts)
NOx oxides of nitrogen
PJ petajoules (10¹⁵ joules)
ppm parts per million
ppmv parts per million by volume
SWIS – South West Interconnected System
TJ terajoules (10¹² joules)

4.3 Land Description

The site for the power station is held in freehold by the station owners.

The site is located within the Neerabup Industrial Estate which is zoned industrial in the Metropolitan Region Scheme and designated as general industrial in Structure Plan No. 17 for the Neerabup Industrial Area. The site’s previous land use was for market gardening and hence it has been totally cleared of vegetation.



4.4 Environmental Approvals

NewGen has conducted a detailed environmental assessment on the relevant environmental factors for the power station project. The proposal for the Neerabup Power Station was referred to the EPA in August 2007. The proposal was formally assessed by the EPA and the report and recommendations on the project were released on 29 October 2007 in Bulletin 1268.

Ministerial approval for the project was issued on 8 January 2008 as Statement 000759.

5 Purpose of the Document

The Preliminary Decommissioning Plan has been prepared to satisfy the requirements of Ministerial condition 11, of Statement 000759. Condition 11 is set out below:

Prior to undertaking any ground-disturbing activities, the proponent shall prepare a Preliminary Decommissioning Plan for approval by the CEO, which describes the framework and strategies to ensure the site is suitable for future land uses, and provides:

1. *the rationale for the siting and design of the plant and infrastructure as relevant to environmental protection;*
2. *a conceptual description of the final landform at closure;*
3. *a plan for a care and maintenance phase; and*
4. *initial plans for the management of noxious materials.*

The broad aims of planning for decommissioning are:

- To protect the environment and public health and safety by using safe and responsible decommissioning practices;
- To reduce or eliminate adverse environmental effects post decommissioning; and
- To establish conditions to meet the pre-determined end landuse objectives.

5.1 Rationale for Site Selection

5.1.1 Power Station

Alternative locations were considered for the site of the gas-fired power station.

The Kwinana Industrial Area was investigated for potential sites however Western Power advised that there was no spare capacity in the network in that area for a new power station of this capacity to connect.

Other constraints considered for the location of the power station included:

- Distance from sensitive receptors such as residences;
- Clearing of native vegetation; and
- Compatible land uses.

Sites close to Western Power's Northern Terminal at Malaga and at Verve's Pinjar power station were also considered. There was no available land near the Northern Terminal. The Pinjar site was considered too environmentally sensitive to locate a new power station, as it



is located within the Gngangara Underground Water Pollution Control Area (Gngangara UWPCA) which has a priority 1 source protection classification and is nearly surrounded by undisturbed *Bush Forever* Site vegetation.

Western Power was in advanced planning for its new Neerabup terminal substation within the Gngangara pine plantation (Figure 1.1) and advised that locating the power station close to the terminal but at least one kilometre away would be supported. The terminal substation is a major interconnection point in the transmission network and is currently under construction. Electricity generated by the power station needs to be sent to the terminal for connection to the SWIS.

Being in close proximity to the substation will minimize the length of the high voltage (330 kV) transmission line that will transport electricity from the power station to the substation. A short line length is advantageous as the 330 kV transmission line structures are often regarded as being visually intrusive and also require a wide easement that restricts other uses. Proximity to the substation will also reduce energy losses from the transmission line during transport of the electricity to the substation.

The Neerabup Industrial Estate provided an excellent location for the power station, as the land was near the Neerabup Terminal, zoned industrial and was not a Priority One Water Reservation area. Detailed discussions were held with relevant Government stakeholders including LandCorp, City of Wanneroo and the Department of Industry and Resources to locate a suitable site for the power station development complying with planning requirements and taking into accounting future urban growth.

The site selected for the location of the power station is a cleared area of former market garden that is within the Neerabup Industrial Estate and approximately 2 km's from the Western Power terminal substation. The industrial estate provides a buffer to sensitive receptors especially to the south and the industrial land use zoning is compatible with electrical power generation purposes.

The design of the plant incorporates low NO_x burners to ensure air emissions are minimised and the air quality assessment has demonstrated that air emissions are well below the applicable standards and criteria. Also the design ensures noise emissions are reduced and noise monitoring has shown that noise emissions are compliant with the *Environmental Protection (Noise) Regulations* at the nearest noise sensitive receptors.

5.1.2 Gas Pipeline and Transmission Line

Natural gas is used as the source of fuel for the gas turbines at the power station. The source of the gas supply is the Dampier to Bunbury Natural Gas Pipeline (DBNGP).

The selection of the route for the gas pipeline from the DBNGP to the power station took into account a wide range of constraints including:

- Environmental impacts such as clearing of native vegetation, impact on wetlands and impact on fauna;
- Land tenure and use; and
- Constructability of the pipeline.

Five alternative alignments were examined during the route selection process:



- Neaves Road option, which connected to the DBNGP near Bullsbrook and runs along Neaves Road then along Pinjar Road to the power station site. This option was rejected owing to the extensive clearing of native vegetation required, presence of threatened ecological communities, narrow road reserve widths and proximity to urban development.
- Perry Road option, which utilised the existing DBNGP infrastructure corridor (pipeline and powerline easement) from north of Muchea to the Verve Energy Power Station and containing the Pinjar gas lateral pipeline as well as several transmission lines. After the Pinjar power station the route heads south along Perry Road and across to the NewGen power station site. The potential impact of this option on Lake Pinjar, a conservation category wetland, was considered too high.
- Road Reserve option, which utilises the same alignment as the Perry Road option from north of Muchea to the Pinjar Power Station then runs along Perry Road and to a road reserve down the length of Lake Pinjar and then across to the NewGen power station site. The potential impact of this option on Lake Pinjar, a conservation category wetland, was considered too high.
- ONC option, utilises the same alignment as the Perry Road option from north of Muchea to just west of the Pinjar power station, then traverses bushland along Water Road until it intersects with Cypress Road which it follows to Nisa Road. It then crosses into pine plantation and follows Nisa Road to Old Yanchep Road and then adjacent to Old Yanchep Road to the power station site. The potential impact of this option on *Bush Forever* sites was considered too high. This route also constrained future road planning options for Old Yanchep Road.
- Orchid Road option, utilises the same alignment as the Perry Road option from north of Muchea to just west of the Pinjar power station, then traverses bushland along Water Road until it intersects with Cypress Road which it follows to Tavira Road. It then crosses Old Yanchep Road and runs adjacent to a 50m corridor cleared in the pine plantation by Western Power in June 2007 for a 132kV transmission line. The route travels along Lisbon Road, Westco Road and Orchid Road to the power station site. Whilst the Western Power route has been cleared the pipeline would require its own clearing adjacent to this. The potential impact of this option on *Bush Forever* sites was considered too high and the route also placed constraints on future land use.

The route selected is known as the Old Yanchep Road option and is shown at Figure 1.1. The route utilises the same alignment as the Perry Road option from Muchea to just west of the Pinjar power station. It then crosses into the pine plantation and traverses through the pines adjacent to Cypress and Nisa Roads avoiding *Bush Forever* site 425 to cross and then parallel Old Yanchep still within the pine plantation. The route then crosses Old Yanchep Road heading east to skirt around *Bush Forever* site 293 and the conservation category wetland before crossing Old Yanchep Road once again into the pines and parallel to the road. It continues in the pines adjacent to Old Yanchep Road to the power station site. This route was the preferred alignment as it minimises environmental impacts by using areas that are already cleared or disturbed or are under pine plantation, avoids *Bush Forever* sites and conservation category wetlands and utilizes existing similar use easements.

A 330 kV transmission line connects the power station to the Western Power Neerabup terminal substation. The preferred route for the transmission line to minimise visual and environmental impact and line length is adjacent to Old Yanchep Road and then Spence Road to the substation (Figure 1.1). Alternative routes such as being located within the Pederick Road reserve or Old Yanchep Road reserve were rejected due to road planning



constraints and visual amenity impact. Traversing the area to the south of Old Yanchep Road was rejected as the vegetation in this Bush Forever site is relatively undisturbed when compared to the old rubbish tip site on the northern side of the road that forms part of the selected route.

5.2 Final Landform at Closure

The power station site is on cleared agricultural land within the Neerabup Industrial Estate in the City of Wanneroo.

Detailed strategies for decommissioning will be progressively developed and outlined in the final decommissioning plan for the site. Final land use and closure criteria will incorporate closure objectives as determined by the operators of the Neerabup Industrial Estate and the City of Wanneroo and will take into account applicable legislation at the time.

The final landform will be determined in consultation with the community and relevant stakeholders.

The site will be left in a state that does not compromise safety or the environment and takes into account proposed future land uses. At this stage it is envisaged that all plant and equipment will be removed from the site and recycled or disposed of according to legislative requirements at the time of decommissioning.

A complete register of plant and equipment to be decommissioned and removed will be developed as part of the final decommissioning plan. Table 5.1 provides a preliminary list of plant and equipment with proposed management actions.

Table 5.1: Preliminary Register of Plant and Equipment

Plant/Equipment	Proposed Management Action
Gas turbines	Removal for possible salvage
Emergency generator	Removal for possible salvage
Stack	Removal for possible salvage
Control room	Removal for possible salvage
Concrete footings	Removal and disposal at approved landfill
Transformers	Recycle where possible
Power lines and power poles	Removal for possible salvage
Cables and pipework	Recycle where possible
Hardstand areas and roads	Removal and disposal at approved landfill
Oily water separator	Removal and disposal at approved landfill
Raw water tank	Removal for possible salvage
Storage sheds	Removal for possible salvage
Raw water tank	Removal for possible salvage
Water treatment plant	Removal for possible salvage
Switchyard	Removal for possible salvage

5.3 Care and Maintenance Phase

In the event of unplanned or temporary closure the Neerabup power station will be placed on care and maintenance to ensure that equipment is maintained in good working order and the power station is able to be restarted without delay or environmental impact.

Care and maintenance will include the following actions:

- Procedures for the transition between the operational phase and care and maintenance;
- Ensuring the power station has a valid Environmental Protection Act licence during the care and maintenance phase which provides for test-firing during recommissioning and resultant emissions;
- Establishment of inspection and maintenance procedures for the power station equipment and infrastructure including inspection of waste collection sumps, evaporation ponds and chemical storage areas to ensure adequate containment; and
- Continued monitoring of groundwater quality via established bore network.

5.4 Noxious Materials Management

5.4.1 Solids

Visual inspection of the site will be carried out regularly for waste material that has been disposed of inappropriately. Waste collection will be monitored on a weekly basis. Waste tracking documentation (eg disposal of waste oil) will be monitored on a monthly basis.

The management strategy for solid waste will include the following elements:

- Segregation of waste into separate waste streams for recycling or disposal;
- Domestic and commercial waste will be periodically removed from site by a licensed contractor; and
- Sewage will be removed from site by a licensed contractor for further treatment.

5.4.2 Liquids

The following management strategies for liquid waste will be employed:

- Regular inspection of sewage treatment system; and
- Regular monitoring of the quality of wastewater to ensure it meets acceptance criteria.

5.4.3 Hydrocarbons

The following management strategies for hydrocarbon waste are employed:

- Segregation of hydrocarbon storage and use areas;
- Storage of hydrocarbons in accordance with the *Australian Standard for Storage and Handling of Flammable and Combustible Liquids (AS1940)*;
- Oil interceptor traps/separators remove hydrocarbons from entry into evaporation pond with collected hydrocarbons removed by an authorised contractor;
- Reuse and/or recycling of waste oil where possible; and
- Storage and subsequent collection of oily rags and used absorbent material for offsite disposal.



To minimise the generation of hydrocarbon waste and to manage cleanup and disposal the following practices are employed:

- Use of absorbent material to collect spillage;
- Use of spill capturing platforms for drum storage;
- Effective maintenance of all valves and piping systems to prevent the mixing of hydrocarbons with clean stormwater;
- Reuse and/or recycling of waste oil where possible; and
- Appropriate storage of waste hydrocarbons prior to collection.

5.5 Decommissioning Plan Review and Scheduling

The preliminary decommissioning plan developed for the Neerabup Power Station will be subject to internal review on a regular basis to ensure it remains relevant and contains adequate financial provision.

The final decommissioning plan will be prepared progressively but no later than 12 months prior to decommissioning of the power station. The preparation of the plan will involve the City of Wanneroo, the Department of Environment and Conservation, the Department of Mines and Petroleum and the Department of Commerce.

6. Bibliography

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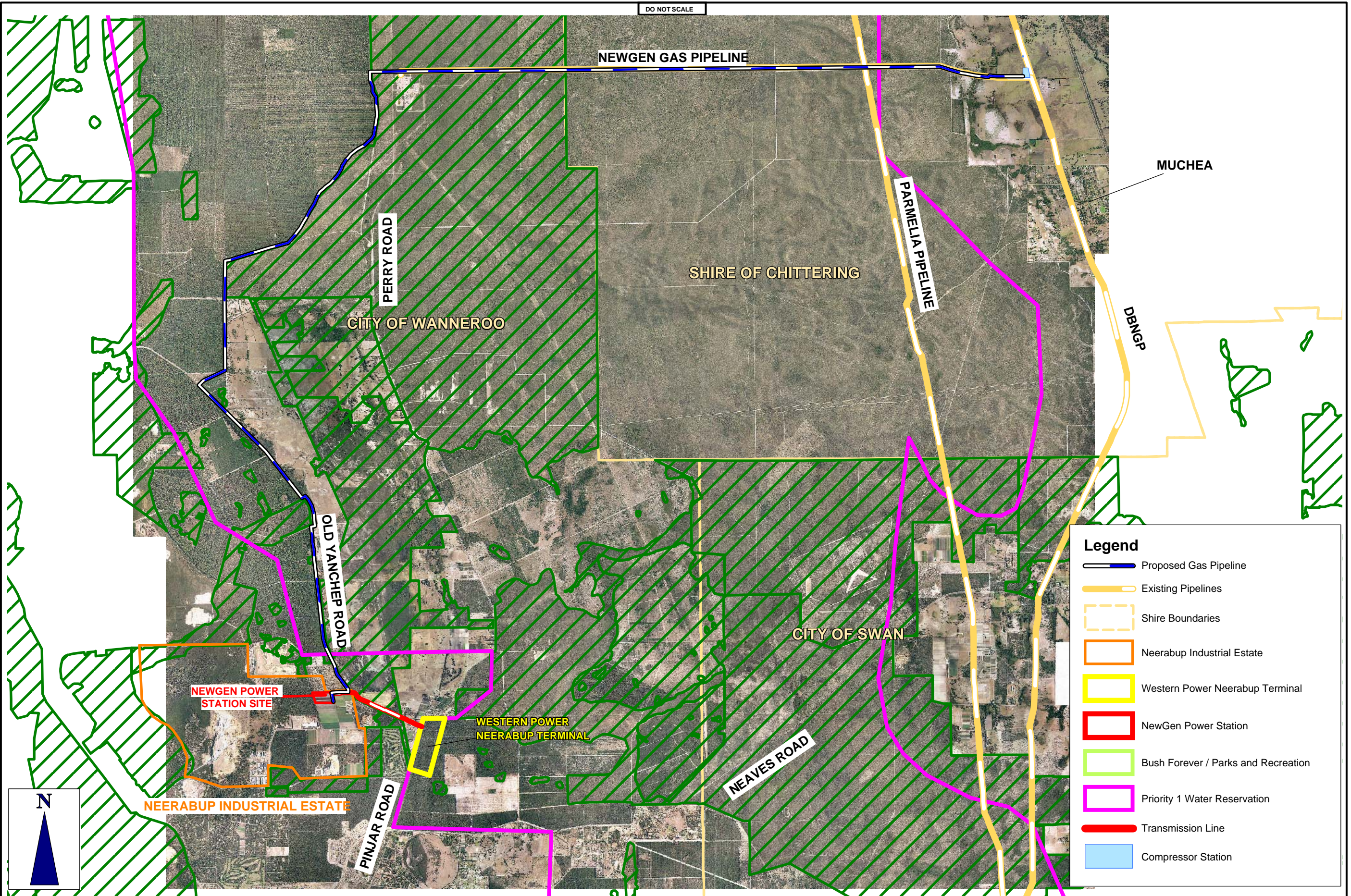
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Appendix A

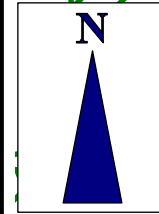
Figure 1.1

DO NOT SCALE



Legend

-  Proposed Gas Pipeline
-  Existing Pipelines
-  Shire Boundaries
-  Neerabup Industrial Estate
-  Western Power Neerabup Terminal
-  NewGen Power Station
-  Bush Forever / Parks and Recreation
-  Priority 1 Water Reservation
-  Transmission Line
-  Compressor Station



No.	Date	REVISION	C.G.	Drawn	Surv	Appl
0	30/11/10	PIPELINE ROUTE UPDATED, POWERSTATION UPDATED				



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NewGen Power 330 MW Gas-fired Power Station

Figure 1.1
NewGen Power 330 MW Gas-fired Power Station
Overview Plan

DATUM	GDA 94	DRAWING NUMBER	REV	SIZE	A3
ZONE	50	07197-001	0		