Alternatives to the Proposal – Summary of Key Outcomes

A range of alternatives were considered as presented in this chapter. The distillate-fired gas turbines operating in open cycle mode as proposed are considered to be the only practical option when compared to alternatives such as hydro, wind, combined cycle gas turbines, reciprocating gas engines and coal fired generation for meeting the peak electricity demand and network and market support requirements described in **Chapter 2**.

The "do nothing" option was not considered by IPRA to be an option in light of the NSW Government Green Paper and the NEMMCO *SOO 2007* load growth forecasts for NSW as discussed in **Chapter 2**.

In addition to desktop studies and field investigations, extensive consultation has been undertaken with NSW regulatory agencies, in particular with officers from DOP, DECC and DOH in regard to environmental aspects of the proposal. The outcome of this consultation is the proposal presented in this Environmental Assessment.

Provided that the project is commercially viable, is consistent with State and Local Government policy and satisfies relevant Acts and prescribed Regulations (zoning, environmental, heritage etc), IPRA considers that the key "alternatives" parameters are associated with cost effective plant and site selection. These factors comprise:

(A) Plant selection, these being:

- proven plant technology and "buildability" using local industries and other resources;
- satisfying environmental and socio-economic community requirements;
- plant sizing to satisfy the range of market and network support scenarios envisaged;
- plant to be "dual-fuel capable" in the event that natural gas supplies become commercially available in the future;
- available fuel(s) and reliability of fuel supply;
- plant capability to meet power quality, responsiveness, reliability and security parameters;
- procurement lead times to meet project deliverability requirements; and
- whole-of-life operational and maintenance requirements.

(B) Site selection, these being:

- land availability and zoning;
- convenient network access for grid connection;
- potential environmental and other community impacts;
- proximity to a NEM high voltage transmission regional interconnector node;
- a reliable supply centre for distillate fuel;
- access to water for plant process uses; and
- other local resources and infrastructure such as communications, transport access, etc which impact upon construction and ongoing operation.

Chapter 3 Alternatives

Desktop studies were carried out to review plant characteristics best suited to providing both market and network support services at a commercially viable price. These very quickly centred on the plant type proposed in this application for the reasons set out **Section 3.1** below.

Given the large geographical area described by NEMMCO and TransGrid (refer **Chapter 2**, Sections 2.2.3 and 2.2.5) as being problematic under various high demand scenarios and the known constraint issues associated with the MurrayLink interconnector, IPRA focussed on the far western region of NSW for a suitable location for the peaking plant.

Desktop studies indicated that a potential optimal site would lie somewhere along the 220kV transmission line between Red Cliffs in Victoria and the TransGrid Switching Station at Buronga (see **Figure 3-1**). Field visits, which included a review of local resources and infrastructure, were conducted and the Buronga Peaking Power Plant Project site as proposed in this Environmental Assessment (see **Figure 1-1**) was determined to be optimal for the reasons set out in this Chapter.

The proposed Buronga Peaking Power Plant Project site is located on land immediately adjacent to the TransGrid switching station, approximately 10km northeast of Buronga, which would facilitate connection into the national electricity grid.

The proposed Development Site is located on Crown land presently forming part of a large pastoral lease - zoned Rural 1(a) - and IPRA has secured lease transfer arrangements with the leaseholder of this pastoral land which is controlled by the Western Lands Commissioner.

The Buronga Peaking Power Plant Project would be permissible with consent from the relevant authority within this Land Use Zone.

Subject to final plant selection, the Buronga facility would comprise three gas turbines fuelled by distillate, each of capacity up to 50MW and operating in open cycle. These three units would be capable of operating individually or in conjunction to produce a total output of up to 150MW. This multi-unit facility would provide a high level of reliable generation capacity embedded within the region. The gas turbine plant will be “dual fuel” capable - able to be converted to gas firing in the event that commercially viable natural gas supplies become available in the future.

NOx air emissions would be controlled through water injection as the most technically and cost efficient control mechanism to meet the required air emission standards for the operating regime envisaged. The modelling undertaken, using conservative “Worse Case” emission scenarios, demonstrates that other prescribed air emissions (including carbon monoxide, particulates, volatile organic compounds and so on) would comply with Regulatory limits.

Rainwater and stormwater captured on the developed area would be used on site as much as practicable. However, subject to detailed design investigations, it is intended that treated effluent from the Buronga Sewage Treatment Plant (STP) would be recycled for use at the site as the primary source of “raw water” for generation process and other water requirements. The facility would be a zero wastewater discharge site.

For comparison, **Plate 3-1** shows IPRA’s Snuggery facility - near Mount Gambier in the southeast of South Australia - which is located adjacent to the 132/33kV substation owned by ElectraNet, the local high voltage transmission operator. The proposed Buronga Peaking Power Plant would look somewhat similar to Snuggery, which also has three gas turbine units and provides system support in the southeast region of South Australia.

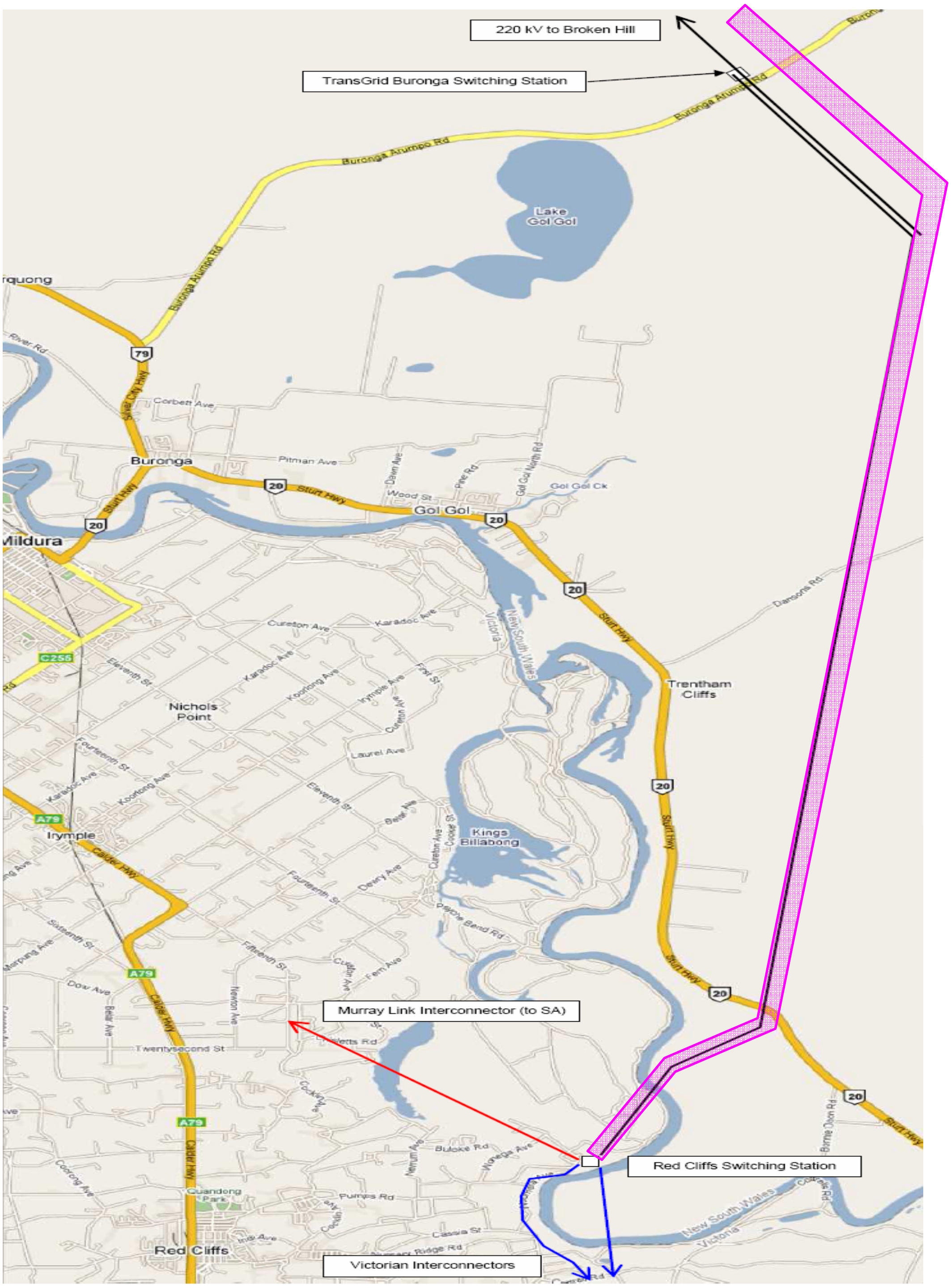

Figure 3-1 Area Investigated for Potential Peaking Plant Site (shown)

(Source: IPRA, 2008 using Google maps)

Plate 3-1 Snuggery Peaking Power Plant – South Australia

(Source: IPRA, 2008)

3.1 Plant Selection - Generation Technologies

The distillate-fired gas turbines operating in open cycle mode as proposed are considered to be the only practical option when compared to alternatives such as hydro, wind, combined cycle gas turbines, reciprocating gas engines and coal fired generation for meeting the peak electricity demand and network support criteria.

The essential characteristics of providing peaking power and network support reliably (to an acceptable level of electrical quality and physical security) include being able to provide cost efficient energy or ancillary services when that service is required (often at very short notice), where it is required and to the extent required.

3.1.1 Renewables

Hydro-electric power stations

In favourable geographic circumstances, such as the Snowy Scheme, hydro-electric power stations are able to provide peak load energy to the National Electricity Market. However, as there is no suitable river resource in the region nor is the terrain suited to alternative cost effective “pumped-storage” generation, this is not an option.

Wind and Solar

Notwithstanding higher unit cost profiles, generation from wind and solar power are simply not suitable for peak load power stations.

Wind fails the reliability and availability requirements because it is intermittent and uncontrollable - equally likely be unavailable as available when required and not necessarily of sufficient strength to generate to the level required. Wind turbines also suffer from the need to impose automatic “output de-rating” as a plant protection measure from the heat in peak summer periods.

Solar, while promising much in the future if more research is carried out on small scale lower cost applications, is not considered a reliable option for the facility role proposed. This is because the potential requirement for peaking power and network support can span 24-hours and wind or solar output is affected by adverse (inclement, overcast or dust) weather conditions.

Neither solar nor wind generators have significantly advanced storage technologies for later “release” of power when required to meet demand or provide other network support.

3.1.2 Gas Turbine Generators

Open Cycle Gas Turbines

Gas turbine power plant is referred to as operating in “open cycle” mode when no heat is recovered from the exhaust gas to drive a steam turbine to produce additional electricity output.

Modern open cycle gas turbines and aero-derivatives have a slightly better thermal efficiency than coal-fired power stations but with lower greenhouse gas emissions. The typical establishment time for the design, build and commissioning of open cycle gas turbine units is around one year, which is significantly less than for a coal fired power station.

Open cycle gas turbine units can be at full capacity within 10 minutes from cold start, compared to a minimum of eight hours for a coal-fired power station.

Given the relatively fast start-up times for these systems, open cycle gas turbine units are ideal for operations to meet short duration peak load demand and generally represent best practice technology for this use.

The capital cost per megawatt generated is less than that for combined cycle gas turbines or coal fired generators however operating costs are higher thereby making open cycle gas turbine units more cost effective only when operated for the short periods envisaged in a peaking role when higher prices generally pertain.

Combined Cycle Gas Turbines

Combined cycle gas turbine power stations consist of one or more open cycle gas turbine units coupled to a steam turbine. Steam is generated using the residual heat from the open cycle gas turbine units, which is then used to drive a steam turbine.

Combined cycle gas turbine units have the advantage of offering higher thermal efficiencies than open cycle gas turbine power stations and coal fired power stations. However, regardless of fuel type, they are more suited to intermediate or base load operations as they require longer start-up and shut down periods than open cycle gas turbine units and have a lower operating cost on a continual duty basis.

The opportunity to utilise combined cycle plant at Buronga is further limited by the need for considerably greater water resources as steam feedstock.

The peaking power and network support services to which the Buronga Peaking Power Plant Project are directed do not warrant the higher cost and greater water demand of combined cycle plant.

Compression Ignition Engines

Smaller size diesel generators and their more modern derivatives, gas generators (often called reciprocating gas engines or “RGE’s”) range in size up to 10MW. They have similar efficiencies to the open cycle gas turbines proposed, have relatively short design and commission period and have comparatively shorter start up and shut down time characteristics.

However, in IPRA’s view, these types of small generators are traditionally used for and more suited to the lower end “distributed energy” market, not for the intended larger scale peaking power and network support role. Also, IPRA considers that:

- depending upon the plant size chosen, it would require between 12 to 15 such units to provide the same level of services proposed in terms of reliability and security;
- the potential for 12 to 15 such units operating in unison to cause or cope with system instability; and
- the greater number of units would have comparatively greater whole-of-life operation and maintenance costs.

A further consideration for IPRA is that later conversion to natural gas firing (should natural gas become available) is more problematic for RGE plant than conversion of the gas turbines proposed.

3.1.3 Coal-Fired Power Stations

Building a coal-fired peaking power station at Buronga is not an option. If not already in operation, they typically require 8 hours to start up and therefore unable to respond to unforeseen load peaks.

Existing coal-fired power stations elsewhere in the State are a cost effective means of catering for base load demand and, if in operation, can contribute to meeting peak demand if not already running at full load.

Coal-fired power stations produce significantly greater greenhouse gas emissions and environmental impacts than the proposed Buronga Peaking Plant open cycle gas turbines.

3.2 Gas Turbine Options

The Buronga Peaking Power Plant Project is directed at meeting peak electricity demand and providing network and market support services.

This objective determines the type of gas turbine that can be used. The requirements are for a gas turbine that can be placed in service rapidly; can handle intermittent operation; can tolerate a high number of starts and stops; is reliable and from a longer term perspective, capable of conversion to natural gas-firing with distillate becoming a back-up fuel.

A number of manufacturers can provide generating plant that matches these requirements. The technology is well proven and has been used in similar service around the world for many years.

IPRA has opted to propose a facility comprising three smaller gas turbines rather than a single large unit with a correspondingly larger ground and aesthetic “footprint”. This multi-unit concept and dual fuel capability:

- optimises operational efficiency to meet the level of support services intended;
- increases reliability and security in the event of plant breakdown;
- minimises environmental (air emissions, noise etc) impacts commensurate with the number of units required to operate; and
- allows one generating unit to be taken out of service for maintenance (at a time of unlikely generation demand) while the other two units are available should market support services be required at an unforseen time.

3.3 Alternative Fuels

3.3.1 Natural Gas

IPRA has looked closely at utilizing natural gas as the preferred fuel for the proposed Buronga Peaking Power Plant however, at the present time, natural gas is not a viable option for the facility.

The site of the proposed plant lies some 13km northeast of the Victorian township of Mildura which has a small natural gas supply taken from Moomba to Adelaide Pipeline (MAP). Built circa 1997 to supply the relatively light industrial and domestic demand (in terms of gas pressure and quantity) in the Riverland and Mildura regions, this pipeline runs some 325km from Angaston (via Berri) in South Australia to Mildura, the final 138km from Berri being constructed of small diameter pipe (100mm).

IPRA has sought advice from the pipeline owner and understands that the pipeline is of insufficient capacity to supply a gas fired peaking plant of the size proposed for Buronga and that there are no plans in the foreseeable future to upgrade the existing pipeline and/or gas supply to Mildura. Such capital intensive upgrading is made commercially problematic by the intermittent and often "without notice" run profile for the proposed peaking power plant.

Therefore IPRA proposes to fuel the plant using distillate but configure the gas turbines such that they would be capable of conversion to burn natural gas in the event that sufficient gas supplies become commercially available in the future.

3.3.2 Distillate

IPRA proposes that the Buronga Peaking Power Plant would be fuelled by distillate fuel.

In reaching this decision, IPRA has looked very closely at the environmental impacts of distillate fuel and is confident that the use of distillate fuel will not present any adverse environmental or health outcomes as represented by Regulatory limits. Alternative fuels have been considered and rejected for the reasons identified in **Section 3.3.3** below.

It is clear from the consultation conducted and community and government stakeholder feedback received by IPRA that considerable concern would be directed at the potential environmental impacts resulting from the use of distillate.

It should be understood that, contrary to some perceptions in the broader community, gas turbine combustion technology fuelled by distillate is fundamentally different from the internal combustion technology generally associated with automotive diesel engines.

The difference between the two technologies is that the volume of air through a gas turbine is very large (~85m^3/sec) compared to an internal combustion engine (~7m^3/sec) and there is also a significantly higher difference in the turbine exhaust stack temperature (~500˚C compared to ~400˚C).

Consequently, the level of air emissions and resulting ground level concentrations of substances of concern (primarily particulates and volatile organic compounds) are significantly less from gas turbine technology than from internal combustion engines.

The differences between gas turbine and internal combustion engine technologies are recognised by the following:

- regulations under the Act[1] which impose much more stringent limits on gas turbine technology because such tighter limits are achievable; and
- the much lower levels of emissions for gas turbines compared to internal combustion engines (as documented in the National Pollutant Inventory [2]).

[1] *Protection of the Environment Operations (Clean Air) Regulation 2002 - Schedules 3 and 4* (NSW Clean Air Act)

[2] *National Pollution Inventory – Emission Estimation Technique Manuals* (COMMONWEALTH) *for Fossil Fuel Electric Power Generation Version 2.4* (March 2005) and *for Combustion Engines Version 2.3* (October 2003)

The specialist air emission reports attached to this Environmental Assessment demonstrate that, given the infrequent operations of the peaking power plant and the conservative nature of the air quality assessment, use of distillate fuel is considered to have negligible potential for adverse air quality impacts.

3.3.3 Alternative Fuels Considered

Given its limited experience in potential alternative fuels, IPRA sought extensive advice from plant suppliers in relation to their experience with alternative fuels in the plant being tendered for consideration.

Assuming consistent fuel quality control (which in itself is a critical issue), IPRA's primary concerns in regard to the use of alternative fuels are:

- proven plant operational history;
- proven plant performance;
- manufacturer's plant warranty;
- safety aspects associated with storage and use;
- readily availability insofar as continuous bulk delivery on 24 hours notice;
- plant capability for later conversion for gas firing; and
- cost.

IPRA's assessment of alternative fuels is summarised in **Table 3-1**. Costs are shown relative to distillate as a base case.

Table 3-1 Summary of Alternative Fuels

Fuel Type	Proven History	Proven Performance	Warranty	Seamless Transition	Safety	Availability	Cost
Biodiesel	Limited	Limited	NO	Unknown	OK	Problematic	>Higher
Naphtha	Limited	Limited	Limited	NO	Problematic	Problematic	>Higher
LNG	OK	OK	Limited	OK	Problematic	Problematic	>>Higher
LPG	NO	NO	NO	Unknown	Problematic	Problematic	>>Higher
Ethanol	NO	NO	NO	Unknown	Problematic	Problematic	>>>Higher
***Methane**	Limited	Limited	Limited	Unknown	Problematic	Problematic	>>>Higher
Distillate	YES	YES	YES	YES	OK	OK	(Base)

Source: IPRA, 2007

* Note that natural gas is predominantly (~85+%) methane and IPRA sought to canvass suppliers' operational experience with pure methane. IPRA notes that supply of pure methane would be very problematic.

Against these parameters, distillate best meets all of IPRA's primary concerns and, compared to distillate, all of the alternatives have significant shortcomings against one or more of the above considerations. In particular, IPRA would not accept a fuel for which the plant manufacturer would not provide a commercial warranty covering plant life, reliable operation and performance. Similarly, IPRA would not accept any fuel for which the manufacturer's plant did not have a proven history of reliable operation and performance.

Notwithstanding this, storage of highly flammable and/or explosive fuels (eg ethanol, LPG, LNG, naphtha) presents a significant safety and hazard issue in the event of accident or malicious damage.

Biodiesel is still in its infancy insofar as use in gas turbines and a number of plant manufacturers are now trialling their plant on this fuel. None is willing to offer warranties and obviously, there is only a limited track record to date for plant utilising this fuel.

3.4 Air Emission Control Options

IPRA has consulted with officers of the NSW DoP and DECC in regard to air emissions and controls. It was emphasised in these consultations that a proposal would need to consider the use of best available and most appropriate technology commensurate with commercial viability to meet and, where possible, better the prescribed emission limits stipulated in POEO Regulations[3] .

Further to compliance with the broad range of prescribed emissions, specific attention was directed at demonstrating Regulatory compliance with and best practice controls, firing distillate fuel, for:

- Nitrogen Oxide and Nitric Oxide emissions (NOx);
- particulate emissions (PM_{10}); and
- Volatile Organic Compounds emissions (VOC).

The specialist air emission reports attached to this Environmental Assessment (refer **Chapter 7** and **Appendix C**) establish that given the infrequent operating time of the peaking power plant and the conservative nature of the air quality assessment, the proposed plant is considered to have negligible potential for adverse air quality impacts.

3.4.1 NOx Emissions and Control

IPRA has considered the use of Selective Catalytic Reduction, Dry Low NOx and Water Injection (also referred to as Wet Low NOx) for NOx emissions and control on the proposed plant.

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) is a post combustion control, where ammonia is injected into the gas turbine exhaust stream to react with NOx in the presence of a catalyst. The products of this reaction are molecular nitrogen and water.

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[3] *Protection of the Environment Operations (Clean Air) Regulations*

The SCR process is best suited to combined cycle gas fuelled plant operating at base load mainly due to the temperature dependency of the catalytic NOx-ammonia reaction and the catalyst life. The reaction takes place over a limited temperature range of 315ºC - 400ºC and, above approximately 455ºC the catalyst is damaged, often irreversibly and so requires disposal and replacement.

Further to these technical constraints, other issues associated with the use of SCR include:

- exhaust emissions containing excess, un-reacted ammonia;
- increased storage and safe handling risks associated with ammonia; and
- safe disposal of spent catalysts which typically contain heavy metal oxides.

Small open cycle units (such as those proposed for Buronga) have exhaust temperatures in the range 400ºC - 500ºC making SCR an unacceptable option on a technical basis. Notwithstanding this, IPRA consider that the SCR would introduce broader unacceptable health and environmental concerns associated with the use of ammonia and heavy metal catalysts.

Dry Low NO_x and Wet Low NO_x

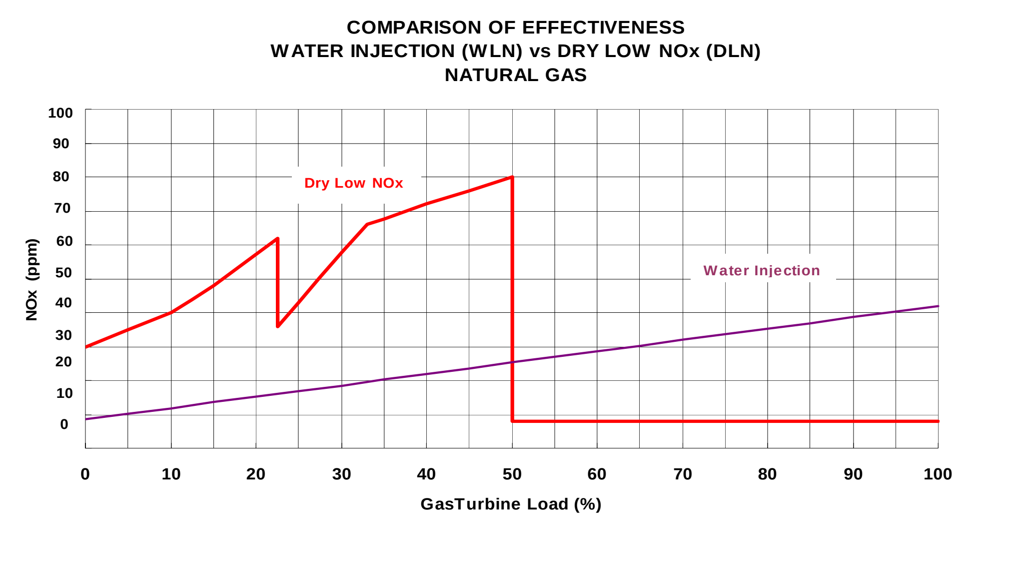
Dry Low NO_x (DLN), a more recent technology, consists of a physically longer combustion chamber such that air is introduced in a staged manner over the length of the chamber thereby reducing peak flame temperatures and hence reducing the production of NOx, which is a product of fuel combustion in air. DLN technology does not begin reducing NOx emissions until the gas turbine unit has reached around 50% output - for example, when a unit has reached 25MW of its peak 50MW load capability.

Wet Low NO_x (WLN) or water injection, an older technology also targeted at reducing NO_x emissions, consists of introducing a fine mist of water to similarly reduce flame temperatures. WLN achieves NOx reductions across the full load range of the gas turbine unit although it is noted that it is less effective than DLN at higher loads.

The fundamental difference between the two technologies is that, once in operation, the DLN technology would reduce NO_x levels to around one quarter of the WLN effectiveness at 100% load. Conversely, below 50% load, DLN technology has poorer performance than WLN as NOx levels may be some three to four times those emitted using WLN technology.

This comparison is illustrated in a simplified form in **Figure 3-2**.

Figure 3-2 Comparison of WLN vs DLN Effectiveness over Load Range



Source: IPRA 2007

Only one or the other type of low NOx technology can be fitted to plant of the size proposed by IPRA.

IPRA considers that it may be appropriate for plant intended to always run at between 50% to 100% load to be equipped with DLN technology, which is ideally suited for larger plant with that target operational regime.

However, IPRA intends that its plant be capable of serving a range of market and system purposes and the Buronga Peaking Power Plant would operate across the full load range of the gas turbine units, from full speed, no load (a “reactive power” mode) through to 100% load, for which WLN is the more appropriate NOx control technology.

For example, if IPRA installed a single 120MW or 150MW gas turbine and the circumstances called for generation of only 50MW (being 30-40% load for that turbine), a gas turbine fitted with DLN would produce significantly more NOx than a smaller unit equipped with WLN technology.

To ensure a prudent level of service availability and reliability, IPRA has opted to install smaller units and has therefore sought to balance its projected operational regime against potential NOx emissions and proposes to equip its gas turbines with WLN technology.

The plant would be equipped with turbine exhaust stack continuous NOx monitoring instrumentation and would comply with emission levels stipulated in the Environmental Protection Licence.

3.4.2 PM_{10} and VOC Emissions and Control

Oxidation catalyst technology has been used in some applications to control emissions of particulates and VOC. In order to address any suggestion that this technology may be applicable to the proposed plant, IPRA undertook an investigation of the applicability of this technology to gas turbine operation.

Oxidation catalyst technology has mainly been promoted by environmental agencies in the USA primarily to reduce CO emissions but also to reduce PM_{10} and VOC's.

IPRA's investigations concluded that oxidation catalyst technology may have application for internal combustion engines. However, due to the fundamental differences between internal combustion engines and gas turbine technologies as outlined in **Section 3.3.2** above, the cost and its effectiveness does not warrant its use on gas turbine technology. Industry supplied information available to IPRA suggests control technologies including oxidation catalysts applicable to this project would be approximately $10 million per turbine, thus rendering the project economically unfeasible.

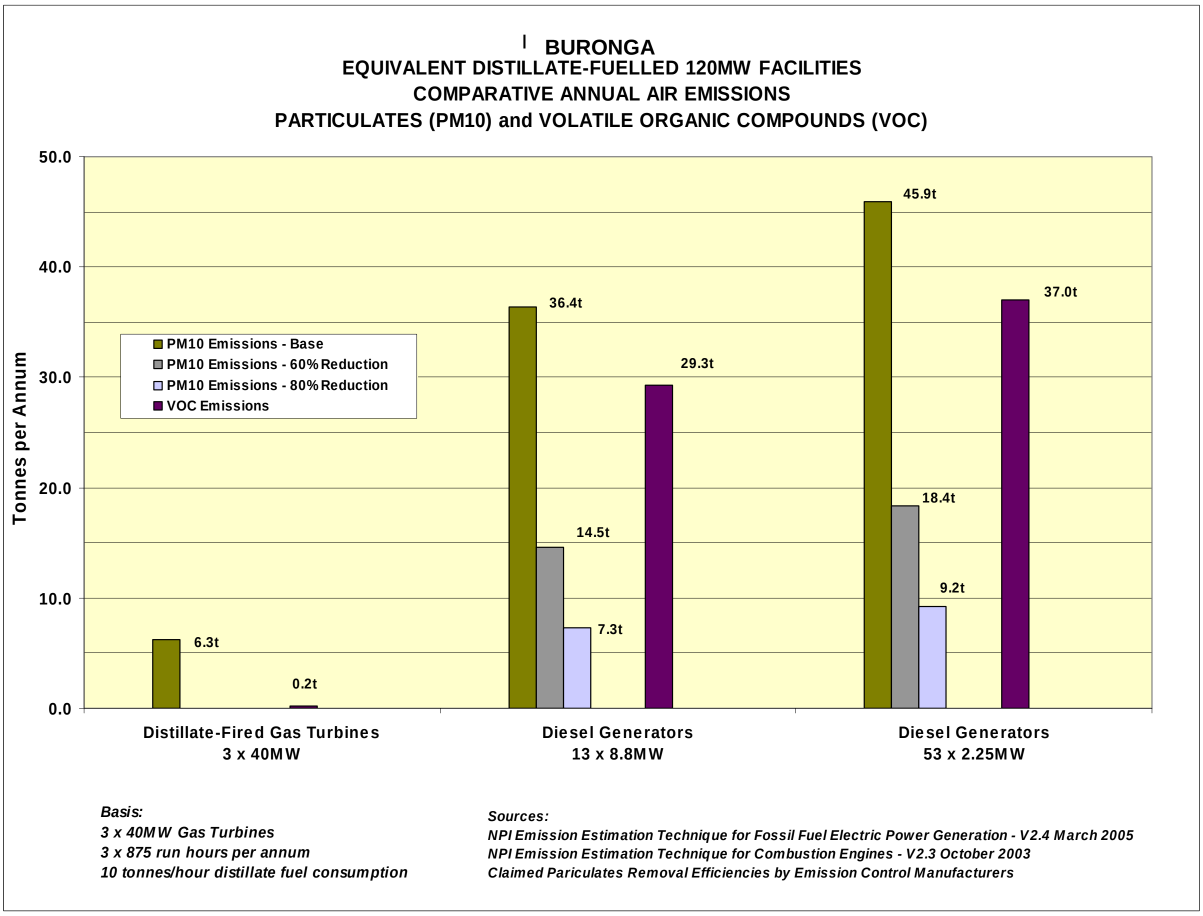
It is also noted that oxidation catalyst technology is not as effective if the plant is operated at part load, as is the scenario for the operation of the Buronga plant. The effectiveness of oxidation catalyst technology would also be limited by the inability to regulate turbine exhaust temperatures to the operating range of the catalyst (as would be technically feasible for a combined cycle plant operating at a high capacity factor).

In addition, comparative emission levels between gas turbine plant and internal combustion units or reciprocating gas engines of equivalent total capacity are illustrated in **Figure 3-3**. The PM_{10} emission improvements for internal combustion engines claimed by some emission technology suppliers still result in emission levels exceeding those from gas turbines.

The specialist studies and modelling appended to this Environmental Assessment demonstrate that PM_{10} and VOC emissions from the proposed Buronga facility would fall well within prescribed NSW limits.

Further discussion of Air Quality impacts is presented in **Chapter 7**.

Figure 3-3 Comparison of PM10 and VOC Emissions - Gas Turbines vs Reciprocating Gas Engines



Source IPRA 2007

3.5 Summary of Power Plant and Emissions Control

The proposed Buronga Peaking Power Plant would comprise three distillate-fired gas turbines.

IPRA has initiated tenders for gas turbine procurement and, whilst the specific gas turbines have yet to be finalised, all tendered plant is capable of meeting the specified technical performance parameters and would conform to relevant environmental regulations.

The gas turbine units under consideration range up to 50MW output capability.

Final plant selection would depend upon plant availability and "deliverability" - that is, plant suppliers guaranteeing off-shore manufacture schedules (in a period of high global demand) to meet IPRA's construction schedule and finalising other commercial issues.

NOx air emissions would be controlled through water injection being the most appropriate and cost efficient control mechanism to meet the required air emission standards.

Other air emissions would also meet or be well below prescribed emission limits without specific emission controls. Further, all gas turbine air intake ducts would be equipped with filter mediums which would also reduce particulate dispersal via the exhaust ducts.

3.6 Site Selection

The primary site selection parameters are described in the **Summary** prefacing this Chapter.

Clearly, a connection into a major transmission line is required to provide the NEM market and TransGrid support services at which this project is directed. Beside the obvious increased cost aspects, from IPRA's perspective the closer the connection to a high voltage facility the better, given the larger electrical losses and increased environmental impacts associated with longer transmission connection distances. Equally, issues of land availability and zoning, transport infrastructure, water and utilities services are also crucial.

Desktop studies indicated that a potential optimal site would lie somewhere along the 220kV transmission line between Red Cliffs in Victoria and Buronga (see **Figure 3-1**). Preferably, for ease of grid connection, the optimal location for the facility would be either:

- adjacent to the *SP AusNet* 220kV switchyard at Red Cliffs in Victoria; or
- adjacent to the TransGrid 220kV switching station at Buronga

Other locations along the Buronga - Red Cliffs "corridor" would only come under consideration if both of these preferred locations proved problematic for whatever reason.

Field visits included a review of local resources and infrastructure.

All potential sites along this corridor are effectively at the same elevation (approximately AHD50m) and therefore varying plant performance between sites was not a discriminatory factor.

IPRA undertook several field visits along the entire route and quickly determined that a location at or close to the Red Cliffs 220kV switchyard would prove impracticable given the limited land availability and proximity to residential areas.

The focus then turned to the potential site at Buronga (see **Figure 1-1**) which has proven to be optimal and as a consequence is the site proposed in this Environmental Assessment for the Buronga Peaking Power Plant.

3.7 The Preferred Site

The IPRA planning process sought to identify the most suitable site location for the identified economic, community, infrastructure and land availability criteria.

In the regional far west of NSW there is no economically viable access to natural gas and, for the reasons outlined above, this predicates the use of distillate as the fuel for the gas turbines.

The proposed Buronga Peaking Power Plant Project site is located on land immediately adjacent to the TransGrid 220kV switching station, approximately 10km northeast of Buronga, which would facilitate connection into the national electricity grid.

The Buronga location satisfies the requirements set out in **Chapter 2** insofar as providing market and transmission system support in the regional far west of NSW.

The location, immediately adjacent the TransGrid 220kV Buronga Switching Station, facilitates ready connection into the high voltage NEM transmission grid at a point that is recognised as important having been mooted as a possible point for an interconnector into South Australia. In discussions with TransGrid, IPRA has established that there are no fundamental barriers to a grid connection at the Buronga site.

The proposed Development Site is located on Crown land presently forming part of a large pastoral lease - zoned Rural 1(a) - and IPRA has secured lease transfer arrangements with the leaseholder of this pastoral land which is controlled by the Western Lands Commissioner. The Buronga Peaking Power Plant Project would be permissible with consent from the relevant authority within this Land Use Zone.

In discussions with the Wentworth Shire Council, whilst informal to date, council has no objection in principle to the proposed project and would rely upon the regulatory and planning processes to determine the merits or otherwise of IPRA's proposal.

Environmental and other studies included in this Environmental Assessment have demonstrated that there are no major impediments to the project proceeding provided that appropriate plans are in place to manage the issues identified.

The location is well served in its proximity to the regional centres of Buronga, Wentworth and Mildura together with associated services, transport and communications infrastructure.

3.8 Plant Footprint Considerations

The Buronga Peaking Power Plant site footprint would:

- require approximately 4 hectares of land;
- require vegetation clearing for access and plant layout, however wherever practical existing vegetation would be retained for visual screening;
- allow a minimum perimeter landscaping and vegetation on all perimeters except the south-western boundary which abuts the TransGrid switching station land;
- be laid out to meet relevant bushfire considerations and satisfy the recommendations of the hazard assessment presented elsewhere in this Environmental Assessment; and
- be laid out and designed to minimise visual impact.

3.9 Do Nothing Scenario

The "do nothing" option was not considered by IPRA to be an option in light of the NSW Government Green Paper and the NEMMCO SOO 2007 load growth forecasts for NSW as discussed in **Chapter 2**.

3.10 Conclusion

IPRA has appropriately considered all relevant localities, social and environmental impacts, plant options, fuel types and technologies in proposing that the Buronga Peaking Power Plant as presented in this Environmental Assessment is the most appropriate to satisfy the requirements identified in **Chapter 2.**