



PROPOSED BIOGAS HARVESTING

and

ELECTRICITY GENERATING FACILITY

NARRABRI WEST NSW

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Executive Summary

In accordance with Part 4 of the *Environmental Planning and Assessment Act, 1979* and subsequent policy procedures of the Minister of Planning and Infrastructure this document is in support of an application for Director General Requirements (DGR's) for a proposed development as described below to be located at Narrabri West, New South Wales.

This document also aims to satisfy the requirements of the State Significant Development (SSD) regime as defined in Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011* for electricity generating works of a capital investment value greater than \$30 million. Note that this project may also qualify under the category of waste material management.

The proposed development is located at the location of an existing piggery, Inglegreen, west of Narrabri, New South Wales. Narrabri township is located in the north-west region of the State and is some 520 kms from Sydney.

The project would consist of the following main integrated components:

- A biogas collection and harvesting plant utilizing waste product from the piggery
- A electricity generating facility to use this biogas (mainly methane gas) to generate electricity to supply on-site piggery operations as well as supply to the electricity grid network via an on-site switching station
- Supplement the biogas with other natural gas in a range of forms to increase the output of the facility so to supply the growing electricity demand needs of the region, and
- A gas storage system consisting of an underground pipeline system and above ground storage tank.

The Proponent is Power Partners Generation Pty Ltd, a private company with head office in Victoria also with a New South Wales branch office. The shareholders and directors are experienced in many aspects of the national electricity market and the company has formed a strategic alliance with a national electricity retailer to support its positioning in the electricity market. The company specializes in renewable energy projects as well as gas generation developments.

All aspects of the proposal will be addressed by the Proponent, in particular a comprehensive range of environmental issues will be assessed in a full environmental assessment report prepared with the guidance from the Director General Requirements for the project.

Layout of Report and Background Notes

This supporting document includes the following information as required by the Department of Planning. The layout and contents of this document closely follows the requirements of the application pathway required by the Department and its contents are as below:

Section 1

The project site will be described by presenting a number of reproduced aerial photographs that will show the existing project location and the surrounding rural precincts. Also an indication of location of the township of Narrabri relative to the state of New South Wales will be shown. Relevant infrastructure features will be shown on the project site photograph.

Section 2

This section will give an overview of the proposed project development by identifying the key components of the biogas harvesting development and the establishment of a small scale electricity generating facility on the project site.

Section 3

Key strategic and environment planning instruments applicable to the project will be identified in this section. This will include those for the biogas harvesting project as well as the electricity generating plant.

Section 4

This section will aim to identify any expected adverse environmental impacts that the proposed development may cause. A preliminary risk assessment of likely impacts will be presented that will help guide a further assessment process.

Section 5

The justification for installing the biogas harvesting system to the existing piggery establishment and the new electricity generating facility will be discussed. The past, existing and likely future use of the project site will have a significant bearing on these considerations.

Section 6

Plans for community and stakeholder consultation will be presented. As limited consultation only has taken place to date, these are considered by both the proponent and the land owners as essential in engaging with the local community and so help to achieve the successful establishment of the proposed facilities.

Section 7

It is a requirement of State Environmental Planning Policy (State and Regional Development) 2011, schedule 1 to demonstrate the qualification of this proposed development to satisfy the threshold

requirements of the above policy. The Proponent believes that the proposed development qualifies as the capital value of the works exceeds the \$30million threshold applying to electricity generating facilities. Supporting documentation to verify this capital investment value can be supplied if necessary.

Background Notes

The proposed project is presented by a private development and consulting company, Power Partners Generation Pty Ltd (PPG) that has its head office in Melbourne, Victoria and a branch office in New South Wales.

The company was initially established some five years ago with a focus on developing renewable energy generation projects. In the past two years the company name and business direction changed to move the development more towards gas-fired generation projects and a trading and consulting capability. Both founding directors of Power Partners Generation Pty Ltd have extensive knowledge and experience in most aspects of the development, operation and trading of generation electricity capacity. In recent years they have gained considerable experience in the unique aspects of the use of gas (both conventional and coal seam gas) for the production of electricity through their work with a number of coal seam gas companies.

PPG is presently developing a number of electricity generator sites across the National Electricity Market to support a strategic alliance with a national electricity retailer and is investigating potential future sources of gas for use in electricity generation facilities to be developed by PPG. These development opportunities would be in the order of 30MW to 100MW capacity and require the generation facility to be located close to a suitable network transmission line.

Section 1: Site Details

The proposed project site consists of a main area that would contain the biogas harvesting facility as well as the electricity generators and associated ancillary equipment of approximately 6Ha in size and a smaller area 1 km to the north of this main area that would be the site of the switching station for connection into the existing Essential Energy network. This switching station area would be in the order of 2Ha in size. These two sites would be connected by a suitably sized overhead power-line in a similar location to the existing line connecting to the main network outside the property perimeter.

The project site is located wholly within a larger property that is described as Lot 7 in Deposited Plan 757086 in the Shire of Narrabri. This property is approximately 500Ha in size and is located about 9 kms west of the main Narrabri town-ship. This property is the site of the Inglegreen Piggery establishment that is owned and operated by the Inglegreen Pastoral Co. This piggery has been operating on this site for over 85 years and has been in the same family for that whole time. The Inglegreen brand is well known to many quality restaurants across the state and to regional butcheries, and as such the piggery business is able to offer ongoing support and opportunities to the local community of Narrabri. This intensive agricultural business operation brings many benefits from its ongoing investment in the operations at the piggery in the form of local employment and flow-on supply industry opportunities.

Narrabri is a major rural centre in the north-west region of New South Wales and is some 520kms from Sydney, and is well served by both road and rail links to both Brisbane and Sydney and also has an expanding airline connection to Brisbane, Sydney and Newcastle. The region is experiencing substantial growth due to increasing agricultural activities (cotton and grain production and recently the establishment of a large fertilizer production plant) and also due to the continued development of coal mining and coal seam gas extraction.

Electricity consumption is increasing due to growth in the region so it is timely that more local electricity generation is developed to support this local electricity load growth and help alleviate the need for further augmentation to the electricity supply network system from either Tamworth or Armidale electricity bulk supply points.

This project site is located in a rural environment west of Narrabri and east of Wee Waa and the surrounding properties are mainly used for cattle and livestock grazing. Within a 2km radius of the project site is an established homestead that is approximately 1.8km east and three other rural homesteads between 2 and 4 kms distance from the project site. The other main built establishments within the local area is the CSIRO Solar Observatory that is approximately 9Kms to the west and the Wilga Park Power Station that is approximately 6 Kms to the south-east. The local airport is located over 19kms to the east of the project site.

The existence of key infrastructure to enable this project to be successfully developed are considered to be an ongoing, reliable source of biogas from the piggery operations augmented by a supply of other gas in various forms such as coal seam gas, conventional gas or compressed natural gas so that the electricity generating facility can reach a viable capacity to achieve the project goals. Also essential to this project is the ability to connect the electricity generated by the facility to the electricity grid and so increase the benefits of the electricity generating process and the development as a whole. Whilst the

connection to the grid is required, it is also envisaged that some electricity produced from the biogas facility will be used onsite for the ongoing piggery operations.

Other key requirements of the project include sufficient land for the project that is clear of any environmental constraints as well as a buffer zone around the site to nearby neighbors. As the main project site is presently cleared and positioned close to the centre of the large property of the piggery, it is considered that these selection criteria are met. Road access to the project site is available from an existing public road network as well established on-site roads presently used for piggery operations.

The key environmental feature of the local region surrounding the project site is the Namoi River and its main local supply tributary, the Bohena Creek system. Other environmental features are the existing surrounding state forests, although some distance from the project site, and the flora and fauna species found within those forest areas.

The main channel of the Namoi River is some 6kms to the north of the project site and the Bohena Creek is some 5kms to the east. The local area landscape drains from the south towards the north into the Namoi River. As part of the Environmental assessment, the proponent would consider the relationship of the proposed project site with the existing topographic character of location including any likely and potential impacts on local and regional drainage features.

To further describe the proposed development location and site, a number of aerial photographs have been prepared. These are identified in the supporting Documentation section of this report.

Figure 1.1 is titled ‘Project Site Location’ and shows a layout of key infrastructure items. This figure also shows the relative location of the generating facility site (also called ‘gens site’) to the existing piggery establishment. Existing site roadways and Essential Energy 66kV network connection site is also shown.

Figure 1.2 sets out the proposed sites for the generation facility and switching station in terms of their GPS locations.

Figure 1.3 is an aerial photograph of the broader community showing such features as the location of nearby homesteads relative to the project site. The residential housing that is shown to the east of the photo is the outskirts of Narrabri West.

Section 2: Development Description

Proposed development is made up of a combination of major activities that will be outlined in this section. The combination and integration of these elements is considered to be necessary for the efficient and economic viability of the existing piggery operations and to provide the most benefits from the proposed development. The collection and harvesting of the biogas from the piggery waste would achieve a reduction in the environment impact of the existing piggery operations by utilizing the biogas in the generation of low emission electricity. The biogas would be supplemented by other sources of natural gas in the generation of low emission electricity. This electricity would be supplied directly to local agricultural and residential communities via the local electricity distribution network.

The key components of the proposed project are:

- Biogas capture, harvesting, storage and utilization;
- Establishment of a gas fired electricity generating facility operating as peaking plant; and
- Gas Supply and Storage System.

2.1 Biogas capture, harvesting, storage and utilization

The existing Inglegreen piggery presently has an 800 sow operation and treats its manure effectively in three anaerobic settling ponds on the property. It is proposed to cover these ponds with a floating cover arrangement made from high density polyethylene (HDPE) or poly propylene (PP) reinforced material. By installing these covers the gases from the settling ponds are prevented from escaping into the atmosphere as well as helping to alleviate any offensive odors coming from the waste treatment process. This method of collection of waste gas from piggery waste is used extensively in the New Zealand pork industry. A commonly used technique in using these types of covers is to cover the anaerobic ponds with the covers and secured around the pond perimeter either by burying in a trench or by anchoring to a concrete perimeter curb.

The gas that is captured under the cover is removed through a perforated pipe placed around the pond perimeter. The biogas would then be extracted by a low pressure suction exhaust fan and treated and stored in a gas storage system network consisting of onsite underground low pressure pipes ready for direct injection into a reciprocating gas engine that would in turn drive an electricity generator set. Some of this electricity produced from the biogas would be used onsite for the piggery operations and this would connect into the existing electricity supply system on site. Electricity not used onsite would be connected through the larger electricity production facility for connection into the nearby 66kV transmission line.

2.2 Establishment of a gas fired electricity generating facility operating as peaking plant

To supplement the biogas harvesting and on site electricity generating production scheme, it is also proposed to establish a larger commercial electricity generating facility on the site, with the proposed facility being capable of supplying up to 55MW generation capacity that would be dispatched to the electricity grid. This would match the likely capacity of the connecting 66kV transmission network of Essential Energy.

This electricity generating facility would consist of a small number of gas fired reciprocating engine gensets and one or more small gas fired turbine generators. The gas engines would be sized between 2 and 4 MW each and the gas turbines in the order of 15 to 20MW each. The exact arrangement of the generating portfolio will be determined at a later stage of this assessment process. For the necessary assessment purposes a “worse case” scenario will be assumed by modeling the effects of a number of configuration options.

A significant feature of the proposed operating arrangement of the electricity generating facility will be its “peaking” operating only. It is not anticipated at this stage that electricity generation will occur for more than 3 to 4 hours per day and will not operate during night-time periods between 10pm and 7am on any day (on Sundays before 8am). This decision has been taken in consideration of a number of factors such as the present electricity market conditions, the forecast need for over-night electricity

capacity, the growing presence of renewable generation sources (in particular wind generation) that would not be turned down in the overnight period and very importantly, in consideration of any likely impact the proposed project may have on the amenity of the local neighbors.

2.3 Gas Supply and Storage System

The gas for the electricity generating facility would be secured from a number of sources.

At the project site, the gas supply would be from the biogas produced by the piggery waste. Other sources of gas to supply the project would be:

- From gas supplied from other regions transported by a gas transmission pipeline yet to be constructed. A project has been approved for a major gas transmission pipeline connecting Wollumbilla in Queensland with Hexham near Newcastle. This particular pipeline runs to the east of Narrabri township and a connection to this pipeline could service the project facility,
- From local or regional coal seam gas fields,
- From local waste facilities that could be producing waste gas which is usually in the form of methane gas,
- From compressed natural gas transported to the project site in road tankers.
- A gas pipeline network to supply gas to the project site is not part of this proposed development.
- A gas storage system would be constructed on the property to allow the peaking operation of the generating facility. This system would consist of a underground gas pipeline system consisting of dual pipes and an above ground gas storage tank to store the supply of compressed natural gas (CNG). Also an above ground storage tank would be installed to store the CNG.

In regards to the pipeline system, it is proposed that one of the pipes would be of a low pressure rating to allow storage of biogas or other low pressure gas. The maximum pressure of this pipeline would be 1100kPa. The other pipeline would be rated at 8MPa (mid range pressure rating) for storage of gas received from gas transmission systems or from the CNG storage tank.

The pipeline system would be approximately 2.5km in length and located towards the southern end of the Inglegreen property.

Section 3: The Project Planning Regime

Planning and development in New South Wales is carried out under the *Environmental Planning and Assessment Act 1979* and *Environmental Planning and Assessment Regulation 2000*. Following the proclamation of the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act of 2011* the Minister for Planning and Infrastructure has delegated to the Planning Assessment Commission and to senior staff of the Department of Planning the power to determine a range of development applications made under the *Environmental Planning and Assessment Act 1979* including those made under the new State Significant Development (SSD) Assessment regime. As part of this new regime this document has been prepared to support the proposed development by way of accompanying an

application by the Proponent for Director General Requirements that would apply to a full Environmental Assessment of the application. Also this project application is considered to qualify for “state significant development” status in accordance with Division 4.1 of Part 4 of the Environmental Planning and Assessment Act as a type listed in Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011.

It is considered that a number of environmental planning instruments apply to this application.

- State Environment Planning Policy (State and Regional Development) 2011

The State and Regional Development SEPP identifies development:

- To which that State Significant Development assessment and approval process under Part 4 of the Act applies.
- State Significant Infrastructure and Critical State Significant Infrastructure
- Development that is specified in Schedule 1 or Schedule 2 is declared to be SSD due to the proposed development complies with Clause 20 of Schedule 1.
- The proposed development has a capital investment value of approximately \$58million and therefore should qualify to be a State Significant Development. The project is also considered to qualify as it deals with a project involved with ‘waste material’ handling.

State Environmental Planning Policy (Infrastructure) 2007

This instrument aims to facilitate the effective delivery of infrastructure projects across the state. Division 4 of this SEPP outlines provisions for electricity generating works being “a building or place used for the purpose of making or generating electricity”. Clause 34 allows for development for the purpose of electricity generating works carried out by any person with consent on any land in a prescribed rural, industrial or special use zone. The proposed electricity generating facility is located within a prescribed rural zone (Rural 1A) and is therefore considered permissible with consent under this SEPP.

Additionally, Clause 34 of this SEPP provides for the development of a “waste or resource management facility” on the project site with development consent.

State Environmental Planning Policy Number 33 - Hazardous and Offensive Development

This SEPP 33 requires developers and consent authorities to assess the hazards and risks associated with a proposed development before approval is given for construction and operation.

Pipelines Act 1967

Part 1 Section 5 of this Act identifies the requirements of the Act in respect of licencing requirements for gas pipelines. Section 5A identifies certain pipelines that are not required to be licences as "a pipeline of the prescribed class" meaning a pipeline of a length of less than 10 kilometres. The proposed gas storage pipeline will be less than 10km in length and wholly on the project property, and as such is proposed to be not licenced.

Other SEPPs

Other SEPPs that would be considered by the Environmental Assessment would include:

- State Environment Planning Policy Number 55 – remediation of land
- State Environmental Planning Policy (Rural Lands) 2008

Local Planning Instruments

The proposed development site is wholly located within Narrabri local government area and is subject to the various provisions of the Narrabri Local Environment Plan 1992. The development site is located upon land designated by this LEP as Zone 1A (General Rural). The proposed activity is permissible under the LEP and will require development consent. Any other requirements of the LEP will be considered in the full Environmental Assessment of the project.

Other Commonwealth and State Legislations that may be applied to the project

Protection of the Environment Operations Act 1997 (POEO Act)

The POEO Act established the procedures for issuing of licences for environmental protection of aspects such as waste, air, water and noise pollution control. The owner or occupier engaged in such scheduled activities would be required to hold an Environmental Protection Licence. In this instance the proponent would require such a licence for the project as electricity generation is a scheduled activity as defined in Schedule 1 in the POEO Act.

Roads Act 1993

This Act provides a statutory framework for the management of public roads within the State and is administered by the Roads and Maritime Services Department, Local Council or the Department of Lands. The Environmental Assessment will consider the application of this Act to the project.

Threatened Species Conservation Act 1995 (TSC Act)

This Act requires that assessments be completed for all endangered ecological communities, threatened populations and species listed under the TSC Act that would be directly or indirectly affected by the development.

A preliminary ecological assessment has been undertaken across the project area and beyond. The results of this assessment are summarized in Section 4. A full ecological impact assessment would be undertaken as part of the Environmental Assessment.

National Parks and Wildlife Act 1974 (NPW Act)

The NPW Act aims to protect native flora and fauna and the integrity of any aboriginal heritage items in the State. An indigenous heritage assessment would be undertaken as part of the environmental assessment process.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas and species, populations and communities and heritage items. The full environmental assessment would include an assessment on whether the project would fall within the prescription of this particular Act.

Native Title Act 1993

This Act administers processes relating to the recognition, protection and determination of native title and dealings with native title land. A full assessment of the application of this Act to the project development site will be made in the environmental assessment.

Section 4: Project Impact and Assessment

This section will identify the expected environmental impacts and suggest an approach to mitigate any adverse impact. The section will also identify the range of issues that will be considered during the full environmental assessment process in support of the project application.

Following a number of site inspections and discussions with the longtime landowners, it is considered that the most likely adverse impact on the project would be water drainage issues across the project property and site and also likely noise emissions from the generating facility. In regards to any likely impacts from the biogas collection and harvesting facility, it is considered that the major impact would be a reduction in noticeable odors from the existing piggery operations. Note that the emission of methane gas from the anaerobic ponds is not able to be directly noticed by surrounding residences due to the characteristics of the gas. The collection and harvesting techniques under consideration for the project are extensively utilized in New Zealand piggeries so the deployment of the technology should not present any constraining issues.

The past 12 months of infrequent but heavy rainfall in the local area of the project site has highlighted the need to address drainage issues across the project property. Whilst the project development site has been chosen with this issue in mind, a full assessment of drainage issues will be undertaken in the Environmental Assessment. As a result of an initial site inspection and review of drainage across the property and nearby land, it is considered that a technique of raising the generating site with suitable fill would be considered along with the elevation of individual items of plant equipment within the facility. An alternate to be considered in the Environmental Assessment would be to construct a levee bank around the perimeter of the generating site.

All potential environmental impacts associated with the proposed project will be identified and managed through the appropriate design process and implemented in accordance with a site environmental management plan.

4.1 Noise Assessment

The proposed electricity facility will use generator sets consisting of a mixture of gas fired reciprocating engines and gas fired turbines. Both of these types of generating sets (gen sets) can be supplied with drop over noise abatement hoods that would cover the essential noise emitting equipment such as gearbox, generator housing and cooling fans. Also in some instances gas turbine suppliers are also

offering similar hood arrangements for their smaller turbine sets. In addition to this particular approach, the Environmental Assessment will consider an alternative of enclosing the smaller reciprocating engine gen sets inside a single shed/hall building.

Typically, gen sets manufactures specify a noise level of 85dB at 1 metre distance from their operating machines. This can be modified with extra noise abatement equipment but with the nearest noise receptor over 1.5 km away from the project site it would be anticipated that noise emissions from the facility can comply with the necessary regulations. Also having a significant impact on noise compliance is the proposal by the Proponents to not operate the generating facility over night (after 10pm or before 7am or 8am Sundays). The noise assessment process will take into consideration many factors including a consideration of the local topography, background noise levels, meteorological influences as well as noise mitigation techniques deployed on the gen sets themselves.

The impact of the biogas collection equipment will be included in the noise assessments.

4.2 Land Use, Topography and Drainage Issues

The project site is located in the north western region of New South Wales. The nearest main township is Narrabri, which is approximately 10kms to the east of the project site. The current land use at the project location predominately an established intensive agricultural activity in the form of a piggery business. Livestock grazing is also undertaken on the property as a secondary activity to the piggery operations.

The project site drainage is dominated by surrounding low lands and flood plains associated with the tributaries of the Namoi River. The Bohena Creek is the dominate drainage line running from south to north to the east of the project site. It is a well defined, low sinuosity sand channel capable of accepting significant volumes of surface runoff from surrounding lands during periods of high rainfall and resultant surface flow. As part of the full Environmental Assessment, the relationship of the proposed development with the topographic character of the surrounding lands will be considered including any likely impacts on local or regional drainage features. Consideration will be given to establishing the 1/100 year flood level to enable the design of the project establishment to be appropriate during the project construction and operation. The electricity generating facility development would likely be required to construct a raised earth mound pad or an embankment levy around the perimeter of the electricity generating facility. Whatever the technique chosen, the Environmental Assessment report will ensure that the plant will remain fully safe and operable during periods of heavy rainfall and localized high surface water levels. The Environmental Assessment of the biogas utilization system would include appropriate measures designed into the construction and operation of the collection and harvesting system to cater for high surface water level that may arise.

4.3 Soils and Geology

The physical nature of the existing soils and subsurface geology will be determined during the detailed Environmental Assessment. Any previous investigations that have been carried out for the piggery establishment will be used where appropriate and will be considered in the design of the proposed project. During the construction phase of the project, appropriate control measures will also be identified for implementation so to reduce any potential adverse environmental impacts.

4.4 Air Quality and Greenhouse Gas Emissions

When operational the electricity generating facility will create a certain quantity of air emissions which is an unavoidable feature of such generation. All such gen sets emit the product of combustion through their exhaust stacks. The emissions typically include a range of gases such as oxygen, nitrogen, carbon dioxide, nitrogen oxide, sulphur dioxide and trace levels of carbon monoxide and these will be assessed as to any potential impact they may have on the surrounding environment. A key criteria for selection of the gensets to be installed would be the performance of the equipment in regards to air emissions. An appropriately detailed study will be carried out as part of the Environmental Assessment to model the dispersion of emissions from the generating facility.

The biogas collection and harvesting system is designed to reduce any existing odor emissions from the piggery site's anaerobic treatment process as well as capturing and harvesting of harmful methane gases for the utilization of these gases in electricity generation. The biogas collection and harvesting installation will be modeled to gauge the effectiveness of gas emission utilization from the anaerobic processes of the piggery. Any potential odor emissions from the operations of the electricity generation facility within the confines of the piggery establishment will be assessed but are not anticipated to impact on the amenity of the local neighborhood and accordingly it is not proposed to undertake detailed modeling of such potential odor emissions from the proposed project site.

An air quality assessment will be undertaken relating to the construction of the proposed development. The extent of any impact and potential mitigation measures would be identified during the assessment process.

An assessment of greenhouse gas emissions from both the biogas facility and electricity generating facility will be undertaken. It is anticipated that significant reductions in greenhouse gas emissions will result from the installation of the biogas harvesting facility. An assessment of greenhouse gas emissions from the electricity generating facility will be undertaken with the level of emissions from the project compared to the average emission intensity of electricity production in New South Wales.

4.5 Traffic and Transport

The proposed development site is located adjacent to the Narrabri to Wee Waa road. The internal access to the project site will be using existing roadways. An assessment of the potential traffic generated by the construction operation of the development would be carried out as part of the Environmental Assessment. Any appropriate mitigation measures will be incorporated into a site management plan once potential impacts are evaluated.

4.6 Visual and Landscape Assessment

The project site is located on an existing piggery operation with topographic features providing a physical and visual separation from rural homesteads in the area. Most of the property is screened by established large screens and the onsite infrastructure is only partially visible from public roads. A visual assessment of the final infrastructure proposed would be carried out as part of the environmental assessment. The extent of any visual impact on existing character and quality of the surrounding area together with potential mitigating measures will be addressed during the design phase and included in

the environment assessment report. It is anticipated that the additional infrastructure established by the development will blend into the existing piggery operations and infrastructure on the project land.

4.7 Water

The electricity gensets may require water during their operation for inlet air cooling during hot weather conditions. Where possible recycled water from the piggery operations will be used for this purpose or if this is not possible water requirements will be kept to a minimum. The biogas processing plant is not anticipated to require any additional water than that is presently used by the piggery operations.

During the construction and operation phases of the development, surface water runoff from the site may have the potential to impact on surrounding water bodies. Consultation will be carried out with all relevant authorities to ensure that the proposed development complies with any relevant guidelines and legislation.

4.8 Hazard and Risk Analysis

A quantitative risk assessment for the project would be conducted in accordance with the provisions of State Environmental Planning Policy 33- Hazardous and Offensive Development. A preliminary hazard analysis would be undertaken as part of the Environmental Assessment in accordance with the provisions of SEPP 33.

4.9 Heritage

The project site is located on land that has been previously cleared for agricultural purposes. Whilst the likelihood of it containing items of indigenous or non-indigenous heritage significance is considered to be low, a cultural heritage assessment will be undertaken for the proposed project site and immediate surrounds. A preliminary desk based survey utilizing the AHIMS website was conducted on 8th March 2012 with the results indicating that the project site and property is clear of any listed aboriginal heritage items. Documentation stating this position is included as Figure 4.1 in the back of this report.

In conjunction with the heritage assessment part of the Environmental Assessment, engagement and consultation with the Narrabri Local Aboriginal Lands Council will be undertaken.

4.10 Flora and Fauna

The proposed project development site has been extensively cleared over time for agricultural purposes and is surrounded by piggery establishment infrastructure. Preliminary data base investigations to date have found 128 species in the database within the surrounds of the project property. No species were found within the property boundaries. A map of these findings is shown in Figure 4.2 in back of this report. A full review of any potential flora and fauna issues will be undertaken in the Environment Assessment process

4.11 Waste Management

The biogas collection and harvesting process is not expected to increase the amount of waste material handled presently by the anaerobic treatment process of the piggery. A detailed evaluation will be undertaken in the environment assessment to substantiate any increase or not in waste material and its subsequent management.

The generating facility is not anticipated to generate significant quantities of waste during its operation due to the compact nature and sizing of the gensets used in the facility coupled with the anticipated infrequent operation of the plant. A full review and assessment will be undertaken of any waste management issues that are anticipated.

4.12 Social and Economic Issues

The development of the project is likely to have positive impacts on the existing social and economic aspects of the local community. Where it is possible, local goods and services will be utilized during the planning, construction and operational phases of the project. It is also likely that the establishment of the electricity generating facility will assist in meeting with the local electricity demand so helping to ensure lowest cost and reliable electricity supply is available locally.

Section 5: Project Justification

5.1 Project Site

The proposed development site was chosen for the following strategic reasons:

- An existing source of biogas from an operating piggery located on a property with a size of 500Ha in area
- The project site offers a range of existing infrastructure that would be available for the project implementation. This includes supply of sufficiently cleared land, access roadways within the property that is connected by public roads to main highways in and out of Narrabri. Any additional erected infrastructure resulting from construction of the proposal would blend in with the existing array of piggery buildings such as feeding silos and breeding houses.
- The proposed site is within a large property of 500 hectares and is essentially not visible from outside the property boundaries particularly from existing homesteads.
- A sparsely populated area such that within a radius of 2kms from the electricity generating site there is one existing homestead to be identified with three other homesteads greater than 2 kms away.
- The presence of existing electricity network infrastructure of a suitable capacity to allow the project to reach its full capacity.
- The existence of a large and developing natural gas source within the region and the subsequent connection of this gas to the eastern Australian gas transmission network.
- The project site is cleared of vegetation and a relatively small footprint (approximately 6 Ha) would be allocated for the generation plant and a smaller footprint (some 2 Ha) for the switching station.
- The local region is undergoing significant development and change and therefore would have available the necessary people with the skills needed to participate in the establishment and ongoing operation and maintenance of the plant.
- Due to increased regional development, the electricity demand is continuing to increase and this project will help support this increasing need without the necessity of constructing additional transmission networks into the region.

- The nearby homesteads should also notice a reduction in occasional odor from the piggery due to the installation of the collection and harvesting system associated with the anaerobic digestion process on the piggery site.
- The local, regional and national environment is also a beneficiary of this development by reducing greenhouse gas emissions from the established piggery.

The future viability of the family owned Inglegreen piggery should be enhanced by the development of the project which includes the use of the biogas to supply onsite electricity needs. By helping sustain the ongoing operation of the piggery this project would assist in supporting this business to continue to employ local residents and the engage a range of supporting suppliers to the business. The presence of this local piggery should be considered important to the ongoing agricultural sustainability of the region by its economic impact and support of the local community and hence reduce the overall reliance by the broader community of continuing to purchase increasing quantities of imported produce.

5.2 Alternative Locations Considered

A number of alternative locations were considered within the local area and region. None of the potential sites considered could provide the range of suitable opportunities that the nominated site would offer. The onsite ability to produce biogas exists only at the piggery and if the project design required that this waste gas was required to be transported to another location, the overall viability of the project would be questionable and could lead to design complications. The site chosen is also close to potential sources of natural gas supplies and is well served by established electricity and road networks. Also the proposed site is slightly elevated relative to surrounding land within and outside the property perimeter and as such is likely to be most suitable for the project site due to its capability to mitigate any drainage issues from local or regional rain events.

5.3 Justification of the Project

Justification to proceed with the proposed project is based on the following considerations:

- To reduce the emission of methane gases from the piggery waste system and so reduce the effects of greenhouse gas emissions. The Australian Government has introduced a suite of schemes aimed at encouraging the agricultural industry to reduce its carbon footprint and it is considered that this project will support this objective.
- To enable the existing piggery to remain commercially and environmentally sustainable by reducing waste produce gas emissions and odors and using this gas in the generation of electricity for onsite consumption. As this piggery is recognized as an intensive agricultural business that supports local employment and associated flow on industries it is considered beneficial to the local economy to provide opportunities for this business to continue and potentially expand its operations.
- To assist the local region to meet its increasing peak electricity needs. A review of Essential Energy's 2011 Electricity System Development Review indicates that summer demand in areas such as Wee Waa is rapidly outgrowing the ability to reliably supply summer peak demands. This situation is an indication of the overall regional needs particularly in meeting peak energy demand periods. The electricity output profile from this project specifically targets periods of highest demand.

- To assist the Proponents retail arm to manage the trading risk inherent in any electricity retail business portfolio. The effect of reducing such retail portfolio risk would help ensure the availability of more competitive supply agreement to customers.
- To assist other gas peaking plants in the national electricity grid to assist ensuring reliable and safe operation of the network that is impacted by the increasing capacity of intermittent generation from renewable type generating sources (in particular solar and wind generation). It is expected that over the next few decades the expected growth in electricity demand in peak periods will exceed existing reliable generator capacity in New South Wales. The Australian Energy Market Operator (AEMO) Electricity Statement of Opportunities Report for year 2011 indicates that electricity supply shortfalls are likely to occur during summer and winter peak demand periods in New South Wales within the next ten years, depending on actual rate of demand growth of consumption in the peak periods. The Australian Government Mandatory Renewable Energy target (20% renewable energy by 2020) whilst reducing overall concentration of greenhouse gas emissions from electricity generation does not address the supply needs in peak demand periods.

Section 6: Consultation

The Proponents of this proposed development recognize the importance of developing and undertaking an effective consultation program. One of the aims of such a program would be to identify any concerns of the local community regarding the project and to address these through a range of mitigation strategies such as project design, construction arrangements or operational protocols.

Also significant in the consultation process is the involvement of a range of government agencies and utilities, including:

- NSW Department of Planning and Infrastructure
- NSW Office of Water
- NSW Office of Environment and Heritage
- NSW Department of Trade and Investment, Regional Infrastructure and Services
- Narrabri Shire Council
- Essential Energy
- Preliminary consultation with Narrabri Shire Council has commenced.

Consultation will also be undertaken with other key stakeholders and community during the preparation of the Environmental Assessment including:

- Local aboriginal representatives from the Narrabri Local Aboriginal Land Council
- A range of commercial business groups including agricultural groups
- Local landholders and community.

Section 7: Project Capital Investment Value

It is proposed by the PPG that an established industry practice that presently applies to capital funding of electricity generation projects such as the construction of a gas fired power plant including either gas fired reciprocating engines or gas turbines be used as the guide to the capital investment cost of the proposed project. This approach would indicate that the costs to be in the order of \$1 million per MW installed including network connection costs.

This assertion can be supported by recent open cycle gas turbine developments proposed by electricity companies such as AGL, Origin and Snowy Hydro. Earlier developments of a smaller scale than those particular developments by Eastern Star Gas and Metgasco indicate a similar capital cost structure.

As the proposed size of this particular development is approximately 55MW installed, it can be assessed that the capital cost of the electricity generating facility alone is in the order of \$55 million. In addition to this proposed infrastructure, additional cost would be allocated for the installation of the gas storage system and biogas capture and harvesting system. These items would add an estimated extra \$3million to the total project cost, resulting in a total estimated project cost of \$58 million.

If a more detailed statement supporting these estimates is required then a statement from a reliable equipment supplier can be obtained.

Conclusion

This report has been prepared on behalf of Power Partners Generation Pty Ltd as a supporting document to their request for Director General Requirements for a proposed State Significant Development in accordance with requirements of Part 4 of the *Environmental and Assessment Act 1979*.

The project that Power Partners Generation Pty Ltd is proposing to establish is a biogas collection and harvesting facility combined with an electricity generating plant and its associated infrastructure, consisting of an electricity network connecting switching station as well as a gas storage system. This development is planned to be on the site of an existing piggery business west of Narrabri, NSW. The size of the electricity generating plant would be in the order of 55MW installed capacity. The biogas would be sourced from the anaerobic treatment works of the piggery and used in the electricity generating facility. This facility would operate as a peaking plant and only during daytime and evening time periods. Based on present electricity supply market conditions this would be approximately 3 to 4 hours per day only but would be capable of supplying electricity to the region in high demand periods

A number of key environmental issues have been raised in this report and these will be fully assessed by a comprehensive Environmental Assessment process that will also address the Director General Requirements for this project.

Supporting Documents

Section 1

- Figure 1.1 Project Site Layout
- Figure 1.2 Site Locations
- Figure 1.3 Aerial View of Project Site

Section 4

- Native Title Search
- Figure 4.1 Native Title Search
- NSW Flora and Fauna Search
- Figure 4.2 Flora and Fauna Search