Vales Point Solar Project

Sunset Power International Pty Ltd (Trading as Delta Electricity)

Preliminary Environmental Assessment

IA128100_2 | Final

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Project Manager:	Thomas Muddle
Author:	Thomas Muddle
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Jacobs Group (Australia) Pty Limited
ABN 37 001 024 095
710 Hunter Street
Newcastle West NSW 2302 Australia
PO Box 2147 Dangar NSW 2309 Australia
T +61 2 4979 2600
F +61 2 4979 2666
www.jacobs.com

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Contents

1. Introduction

Sunset Power International Pty Ltd (SPI) trading as Delta Electricity (Delta) are seeking to develop a large scale solar photovoltaic (PV) generation facility and associated infrastructure near the existing Vales Point Power Station in the local government areas (LGA) of Lake Macquarie and the Central Coast (formerly Wyong) (the project). The project will have a capital investment of greater than $30 million, accordingly the project is deemed a State significant development (SSD) under the *State Environmental Planning Policy (State and Regional Development) 2011*. As a SSD, an application for the project is required to be s ubmitted under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979.* The NSW Minister for Planning (or the Minister's delegate) is the consent authority.

Key components of the project are:

- Construction and operation of up to 45 megawatt (MW) capacity solar facility delivering an annual output of approximately 95 gigawatt hours (GWh);
- Installations of approximately 170,000 solar panel modules supported by either steel piles or concrete ballasted footings;
- Connection to the National Electricity Market via a short 33 kV transmission line;
- Approximately 100 jobs during an 18 month construction program; and
- Estimated 30 year design life with ongoing employment for up to five people.

The project is intended to have benefits including:

- Production of renewable energy, directly contributing to the State's renewable energy targets and the objectives of the NSW Government's Renewable Energy Action Plan (REAP);
- Creation of employment opportunities, including 100 full-time equivalents during construction and up to 5 during operations;
- Direct and indirect benefits to the local economy during the life of the project; and
- Increased energy security through valuable contributions to a more diverse energy mix.

The project is consistent with the objectives of the *NSW Renewable Energy Action Plan* and will contribute to achieving the Commonwealth Government's National Renewable Energy Target of 33,000 GWh of energy generated by renewable sources by 2020 (DoI DRE 2016).

1.1 Site and surrounds

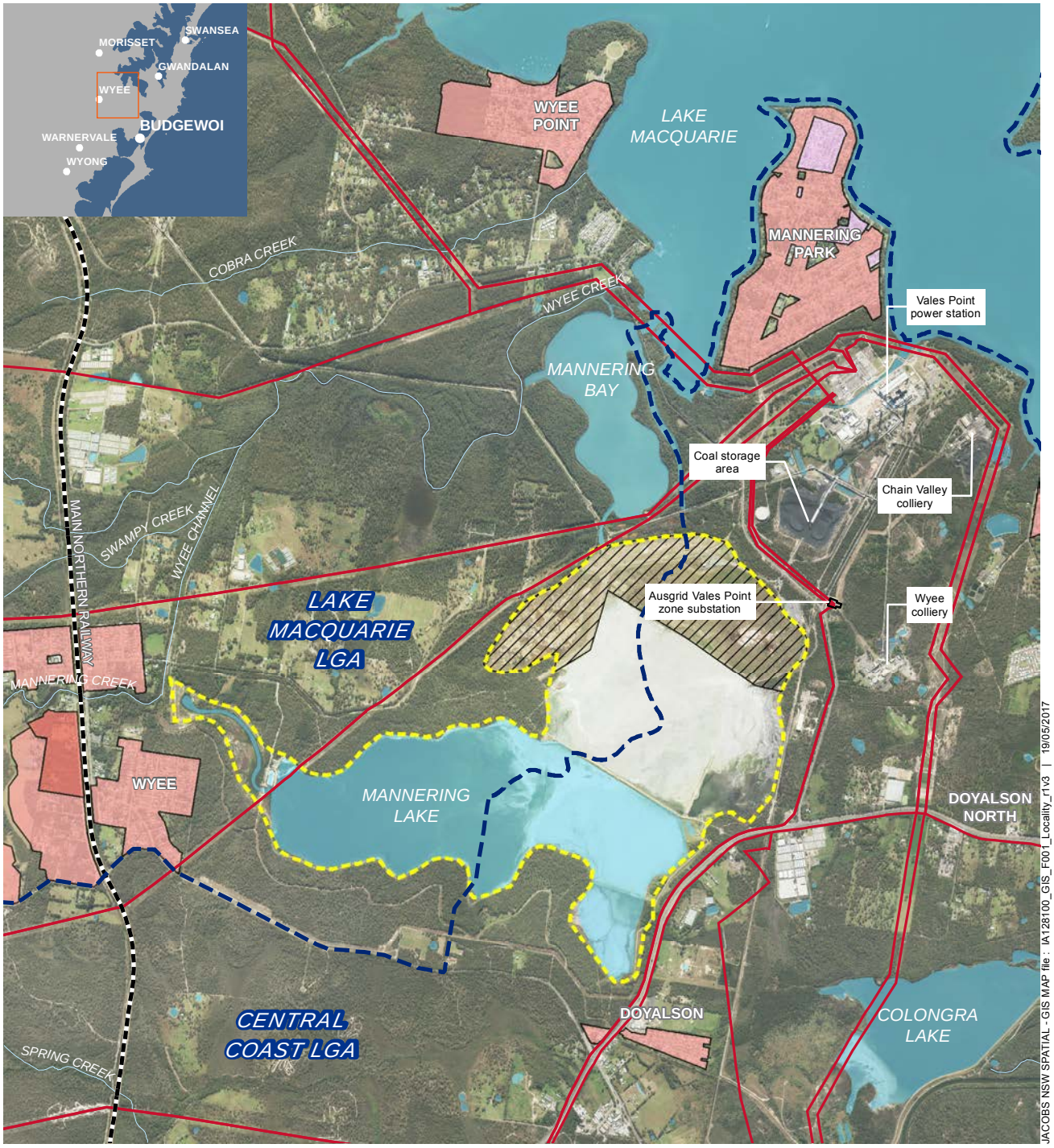
Delta proposes to develop the project on existing rehabilitated areas of the Vales Point Ash Dam (VPAD) associated with the operation of the Vales Point Power Station as shown in Figure 1. The ash dam extends across the LGA boundary of Lake Macquarie and Central Coast. The project site is entirely within the existing property boundary of the Vales Point Power Station. The proposed project would connect to either the existing Ausgrid substation located on the corner of Ruttleys Road and Construction Road to the north of the ash dam site or the Munmorah Sub-Transmission Substation (STS) to the east.

1.2 Applicant

SPI is an Australian owned company. SPI acquired the rights to operate the Vales Point Power Station in December 2015 during the NSW Government privatisation of State generation assets and continues to trade under the name Delta Electricity (Delta). Delta leases the land and assets from an unincorporated joint venture between Waratah Energy Pty Limited and Vales Point Investments Pty Limited as trustee for the Vales Point discretionary trust. Delta operates the Vales Point Power Station, a coal fired power station, with an installed capacity of around 1,320 megawatts and has extensive experience in the development, construction and operation of large scale electricity generation infrastructure.

1.3 Purpose of report

The purpose of the report is to provide a preliminary environmental assessment of the proposed development to support an application for Secretary's Environmental Assessment Requirements (SEARs).



Legend

- Ash dam
- Proposed solar development area
- Existing building
- Electricity transmission line
- LGA boundary
- Main North railway

Zone

- R1 General Residential
- R2 Low Density Residential
- R3 Medium Density Residential

Data sources

Delta Electricity 2015
Jacobs 2015
Ausimage 2014
LPI 2014

Figure 1 | Site location

2. Project Need

The need for the project has been considered in relation to State, regional and local strategic planning documents.

In September 2013, the NSW Government released the *NSW Renewable Energy Action Plan* to guide NSW's renewable energy development and to support the former national target of 20% renewable energy by 2020.The NSW Government's vision is for a secure, reliable, affordable and clean energy future for the state. The *NSW Renewable Energy Action Plan* positions the state to increase energy from renewable sources, at least cost to the energy customer and with maximum benefits to NSW.

The Action Plan strategy is to work closely with NSW communities and the renewable energy industry to increase renewable energy generation in NSW. The Plan details three goals and 24 actions to most efficiently grow renewable energy generation in NSW:

- Attract renewable energy investment and projects;
- Build community support for renewable energy; and
- Attract and grow expertise in renewable energy technology.

The proposed solar project would be aligned with the *Renewable Energy Action Plan* in that it involves renewable energy investment. Two significant and variable factors in the cost of solar development are the connection to the transmission network and cost of acquiring or leasing land. Being located in an energy generation area means there are many available connection options in close proximity to the site minimising the cost of transmission line development required. It would also use land that is owned by Delta and not currently supporting other industry or generating income. These two factors contribute to lowering the development costs and, as a result, energy cost to the customer.

The *NSW Government Submission to the Review of the Renewable Energy Target* (NSW Government, 2014) reconfirms the NSW Government's commitment to promoting energy security through diversity, particularly through increasing the supply of energy from renewable sources. It identifies that having a diversity of supply can help to protect energy customers from price sensitivity associated with fuel inputs, such as gas prices.

With the closure of Munmorah Power Station, significant local energy generation has been withdrawn from the area. The development of a solar project on the VPAD would contribute to offsetting this loss. The recently released regional plan for the Hunter includes an aim to diversify energy supply. Specifically, the *Hunter Regional Plan 2036-Implementation Plan 2016-2018* includes Direction 12 to diversify and grow the energy sector by promoting new opportunities arising from the closure of coal fired power stations that enable long term sustainable economic and employment growth in the region.

The *Central Coast Regional Plan* has the vision to create a region with a healthy natural environment, a flourishing economy, and well-connected communities. While not specified in a direction, the development of the solar project would contribute to the local economy through creation of jobs (particularly during construction) and local supply of renewable and low cost energy to support the goal of expanding local industry.

Lake Macquarie Council (LMCC) has adopted a 3% per annum Emission Reduction Target and adopted the *Lake Macquarie City Council Energy Resilience Plan* (Kinesis, 2012). This plan identifies a need for significant actions to achieve carbon neutrality and cumulatively save approximately 2,860,000 tonnes of CO2-e by 2050. These actions include renewable energy generation equivalent to approximately 600,000 MWh, consisting of 138,000 MWh of commercial scale PV, 24,000 MWh of commercial scale wind and the remaining renewable energy sourced from Greenpower outside the LGA. With a portion of the solar farm proposed to be located with LMCC LGA the energy generated would contribute to meeting this target. Central Coast Council does not have a comparable energy strategy or plan.

3. Planning Framework

3.1 Local Planning Instruments

The site is within the application area of both the *Lake Macquarie Local Environment Plan 2014* (LLEP 2014) and *Wyong Local Environmental Plan 2013* (WLEP 2013). The site is predominantly zoned SP2 Electricity Generation Works under both Local Environment Plans (LEPs).

The Objectives of the SP2 zone are:

- To provide for infrastructure and related uses;
- To prevent development that is not compatible with or that may detract from the provision of infrastructure;
- To recognise existing railway land and to enable future development for railway and associated purposes;
- To recognise major roads and to enable future development and expansion of major road networks and associated purposes; and
- To recognise existing land and to enable future development for utility undertakings and associated purposes.

The only development types permitted within the zone are roads and the purpose shown on the Land Zoning Map (in this case Energy Generation Works) including any development that is ordinarily incidental or ancillary to development for that purpose.

The Solar Project meets the definition of Energy Generation Works and as such is permissible with development consent.

A narrow strip of land within the Wyong LGA and along boundary is zoned W1 Natural Waterways. The objectives of this zone are:

- To protect the ecological and scenic values of natural waterways;
- To prevent development that would have an adverse effect on the natural values of waterways in this zone; and
- To provide for sustainable fishing industries and recreational fishing.

Energy Generation would be considered a prohibited land use under this zoning. Under section 89E of the EP&A Act development consent may be granted despite the development being partially prohibited by an environmental planning instrument. The W1 zoning is unlikely to be considered to remain an appropriate zoning of this land as the natural waterway to which the zone relates has been diverted and subsequently filled with ash in association with separate authorisations issued to Delta when it was owned by the NSW Government and acted as a Public Authority.

3.2 State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State and Regional Development) 2011 identifies that development for the purpose of electricity generating works using any energy source that has a capital investment value of more than $30 million as State Significant Development. The project would have a capital investment value of greater than $30 million and as such would be assessed as State significant development.

3.3 Environmental Planning and Assessment Act 1979

State Significant Development is assessed in accordance with Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) requiring the preparation of an Environmental Impact Statement (EIS) addressing the Secretary's Environmental Assessment Requirements (SEARs). The Minister of the Department of Planning and Environment is the consent authority for State significant development.

The following authorisations are not required for State significant development (and accordingly the provisions of any Act that prohibit an activity without such an authority do not apply):

- The concurrence under Part 3 of the *Coastal Protection Act 1979* of the Minister administering that Part of that Act;
- A permit under section 201, 205 or 219 of the *Fisheries Management Act 1994;*
- An approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977;*
- An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974;*
- An authorisation referred to in section 12 of the *Native Vegetation Act 2003* (or under any Act repealed by that Act) to clear native vegetation or State protected land;
- A bush fire safety authority under section 100B of the *Rural Fires Act 1997; and*
- A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000.*

The following authorisations cannot be refused if it is necessary for carrying out State significant development and is to be substantially consistent with the consent:

- An approval under section 15 of the *Mine Subsidence Compensation Act 1961*;
- An environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997* (for any of the purposes referred to in section 43 of that Act); and
- A consent under section 138 of the *Roads Act 1993*.

3.4 Other State legislation

3.4.1 Protection of the Environment Operations Act 1997

The principal legislation governing pollution and waste management in NSW is the *Protection of the Environment Operations Act 1997* (POEO Act). All scheduled activities as listed in Schedule 1 of the POEO Act require an Environmental Protection Licence (EPL) to be obtained prior to commencement of construction of the scheduled development work. While energy generation is generally a scheduled activity, generation of energy by solar is specifically excluded.

Delta Electricity holds a current EPL for the operation of the Vales Point Power Station including the VPAD (EPL761). The construction and operation of the Solar Project would need to be undertaken such that compliance with the EPL is not affected.

3.4.2 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) establishes mechanisms for:

- The management and protection of listed threatened species of native flora and fauna (excluding fish and marine vegetation);
- The listing of threatened species or key threatening processes;
- The development and implementation of recovery and threat abatement plans;
- The declaration of critical habitat;
- The consideration and assessment of threatened species impacts in development assessment process; and
- The management and regulation of actions that may damage critical or other habitat or otherwise significantly affect threatened species, populations and ecological communities.

The potential to impact threatened species, populations and ecological communities listed under the TSC Act is discussed in Section 6.6 of this report.

3.4.3 Water Management Act 2000

The *Water Management Act 2000* (WM Act) was introduced to provide a comprehensive singular piece of legislation to effectively manage and regulate access, and use of, the State's water resources. Chapter 3,

Part 3 of the WM Act requires that approval be granted for works that are classified as "controlled activities" within waterfront land defined as 40 metres from the bank of any river, lake, estuary or coastal waters of the state (Lake includes a wetland, a lagoon, a saltmarsh and any collection of still water, whether perennial or intermittent and whether natural or artificial). The VPAD is created from the application of a coal ash slurry into a man-made ash storage dam and the proposed project would occur on capped and rehabilitated sections of the filled ash-dam. A Controlled Activity Approval is not required for State Significant Development.

3.4.4 Mine Subsidence Compensation Act 1961

Section 15 of the *Mine Subsidence Compensation Act 1961* requires approval of the Mine Subsidence Board for the alteration or erection of improvements on land within a gazetted mine subsidence district. The site is within the Swansea North Entrance and West Lake mine subsidence districts.

3.4.5 Roads Act 1993

Under section 138 of the *Roads Act 1993* the consent of the roads authority is required to:

- Erect a structure or carry out a work in, on or over a public road, or
- Dig up or disturb the surface of a public road, or
- Remove or interfere with a structure, work or tree on a public road, or
- Pump water into a public road from any land adjoining the road, or
- Connect a road (whether public or private) to a classified road.

Subject to design and assessment of the project there may be a requirement for some site entry improvements and if so the consent of the road authority will be required.

3.4.6 Contaminated Land Management Act 1997

The *Contaminated Land Management Act 1997* (CLM Act) provides a regime for investigating and, where appropriate, remediating land affected by contamination which represents a significant risk of harm to human health or the environment. The CLM Act specifies responsibilities for managing contaminated land and the role of the EPA in investigation, remediation and management of contaminated sites.

It is noted that, while contaminated sites (including some closed landfills) in NSW are regulated under the CLM Act, active or recently closed landfills are managed through the landfill licensing process under the PoEO Act and the minimum standards in associated guidelines.

3.4.7 State Environmental Planning Policy 55

Under *State Environmental Planning Policy 55 -Remediation of Land* (SEPP 55) a consent authority must not consent to the carrying out of any development on land unless:

- It has considered whether the land is contaminated, and
- If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
- If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

The site has been subject to filling with ash and other forms of power station waste. The portion of the site where the project would be established has been capped and rehabilitated. While the EIS would need to consider contamination status, no additional approvals are required under the CLM Act.

3.5 Commonwealth legislation

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the primary Commonwealth legislation relating to the environment. Under Part 3 of the EPBC Act, approval from the Australian Minister for the Environment and Energy is required for an action that:

- has, will have, or is likely to have a significant impact on a matter of national environmental significance;
- is undertaken on Commonwealth land and has, will have, or is likely to have a significant impact on the environment;
- is undertaken outside Commonwealth land and has, will have or is likely to have a significant impact on the environment of Commonwealth land; and
- is undertaken by the Commonwealth and has, will have or is likely to have a significant impact on the environment.

Matters of national environmental significance (MNES) include:

- World heritage properties;
- National heritage places;
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed);
- Nationally threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas;
- The Great Barrier Reef Marine Park;
- Nuclear actions (including uranium mining); and
- A water resource, in relation to coal seam gas development and large coal mining development.

A search of the Australian Government Department of Environment and Energy's EP&BC Act Protected Matters Search Tool was undertaken for the site, within a 10 kilometre radius on 3 April 2017. The searches found:

- No World Heritage Properties;
- No National Heritage Places;
- No Wetland of International Importance;
- No Commonwealth Marine Areas;
- Two listed Threatened Ecological Communities (the endangered Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion and vulnerable Subtropical and Temperate Coastal Saltmarsh);
- 80 listed Threatened Species;
- 70 listed Migratory Species;
- No Commonwealth Listed Heritage places; and
- Three areas of Commonwealth Land (Australian Postal Commission, Australian Telecommunications Commission, Director of War Service Homes).

It is generally the responsibility of the proponent of a proposed development to determine whether the proposal, or action, has the potential to impact upon a MNES and constitute the need for a referral to the Commonwealth for determination. Further assessment of MNES, particularly threatened species and ecological communities and migratory species, will be undertaken during the EIS, in order to conclude whether a significant impact is, or is not, likely and whether a referral to the Commonwealth Department of Environment and Energy is required.

4. Description of Project

4.1 Overview

The Vales Point coal fired power station and Vales Point Ash Dam (VPAD) are located at the southern end of Lake Macquarie on the NSW Central Coast. The station is owned and operated by Sunset Power International (SPI) (trading as Delta Electricity, "Delta") and has an installed capacity of 1320 MW. The VPAD consists of a series of operational and closed landfill cells. The closed cells, or ponds, have been capped with soil and rehabilitated with grasses. The rehabilitated area is relatively flat and provides a substantial area for the construction of a utility scale solar field.

An initial solar capacity assessment has found that up to 45 MW of solar capacity could be supported on existing capped and rehabilitated areas – namely 81 hectares (Ha) of Ponds 1,2 and 3 of the VPAD. Such a development would have an expected annual output of approximately 95 GWh.

4.2 Project Location

The VPAD is located in the southern section of the Vales Point Power Station property. The proposed project will be sited on the rehabilitated areas of the VPAD situated west of the Pacific Highway with a northern boundary at Ruttleys Road. To the east of the site is Mannering Bay which is a natural water body that flows into Lake Macquarie. The southern boundary of the VPAD is Wyee Road, at Doyalson.

Both the *Lake Macquarie Local Environment Plan 2014* (LLEP 2014) and *Wyong Local Environmental Plan 2013* (WLEP 2013) apply to land within the project site. The site is predominantly zoned SP2 Electricity Generation Works under both Local Environment Plans (LEPs) as detailed in Section 2.1.

The nearest residential areas in relation to the VPAD are located at Mannering Park approximately 1 kilometres to the north, Doyalson North around 1.4 kilometres to the east, Wyee approximately 2.2 kilometres to the west and Doyalson 2.3 kilometres around to the south. A number of rural residential receivers are located in closer proximity to the site along Summerhayes Road, approximately 700 metres from the north western boundary of the VPAD.

4.3 Key Elements of the Project

4.3.1 Layout

The major components of the project include:

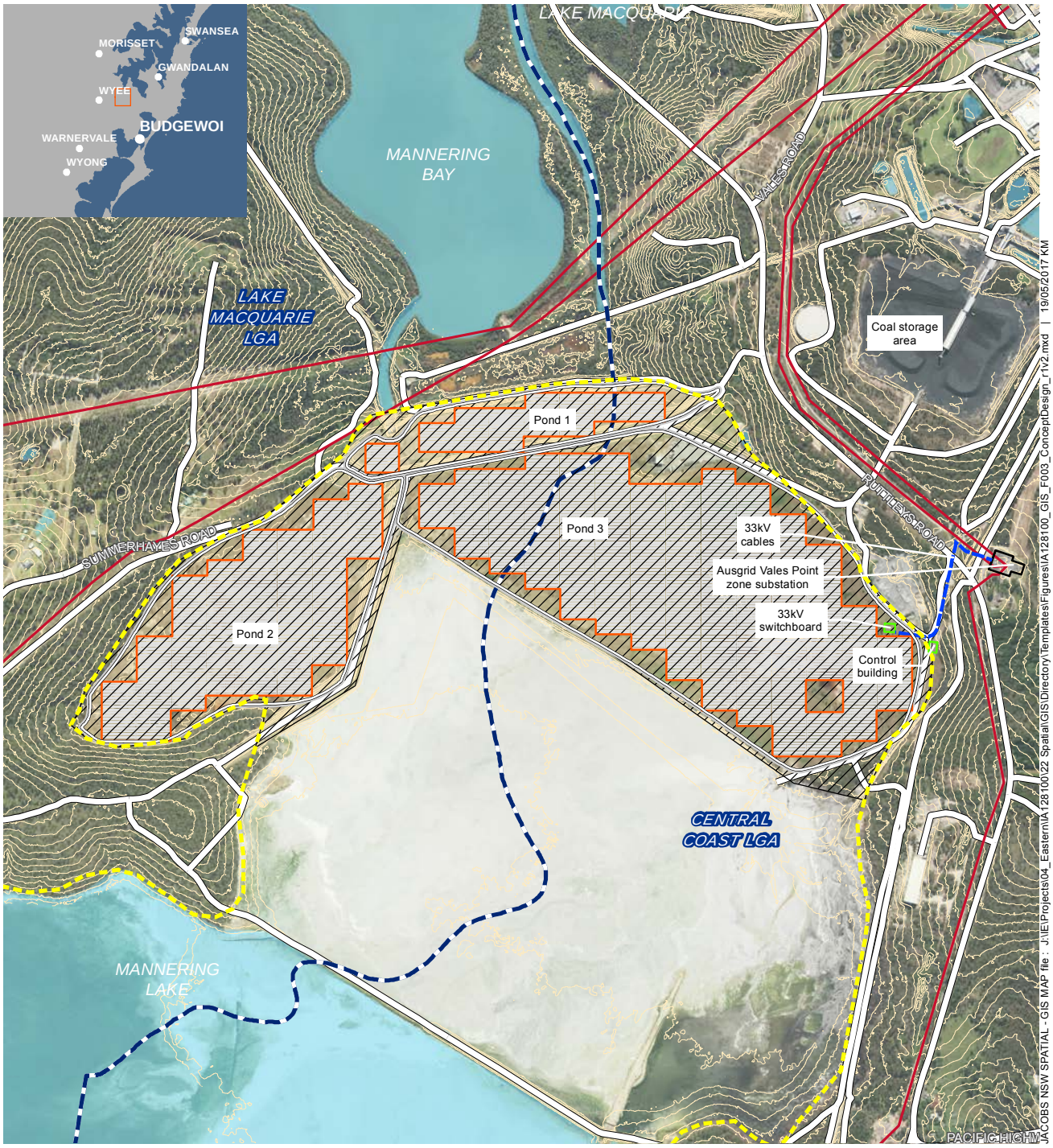
- Photovoltaic (PV) solar panels and supporting infrastructure;
- an electrical collection system and switchyard;
- internal access roads and drainage system; and
- network electrical connection infrastructure from the solar field to the Vales Point Zone Substation.

A site plan for the proposed solar field and electrical infrastructure is shown in Figure 2.

4.3.2 PV Solar Panels

The project will install PV solar modules (or panels) in a series of rows aligned to optimise the collection of solar energy at the site. The panels will utilise either fixed tilt or single axis tracking configurations. Tracking systems allow the mirrors to follow the sun in an east to west direction throughout the day to maximise solar energy collection. Tracking systems typically require a greater installation footprint and therefore reduce the capacity of the field in comparison to fixed panels of the same area.

The solar panels will be mounted on support structures consisting of either steel posts or ballasted footings. Ballasted footing mounts, such as concrete or steel, use that weight to secure the solar module in position and do not require ground penetration. The expected height of the panels is approximately 2 metres.



Legend

Concept design
PV access road
PV array area
33kV cables
Propsed building
Existing building
Pond
PV array
Ash dam
Proposed solar development area
Electricity transmission line
Contour (interval: 1m)

Data sources

Delta Electricity 2015
Jacobs 2015
Ausimage 2014
LPI 2014

Figure 2 | Vales Point ash dam solar farm 45MW concept design

It is anticipated that approximately 170,000 panels will be installed with the final module design to be determined by a detailed solar resource assessment and optimisation of the solar field layout, detailed geotechnical assessment of the subsurface, and the available grid capacity and network connection requirements.

4.3.3 Electrical collection system and switchyard

A system of DC to AC inverters and medium voltage step up transformers will be located throughout the arrays and join at a new 33kV switchyard. This station and switchgear will be connected to the network in the vicinity of the Vales Point Zone Substation via an overhead or underground 33kV line. Further detail on the connection configuration is provided in Section 3.3.5. A series of cable trenches will be required to be constructed for underground electrical conduits and cabling to connect the arrays to the inverters and transformers.

4.3.4 Site Infrastructure

A portion of the site will be utilised for internal roadways, access tracks and hardstand areas to allow access for construction activities and ongoing maintenance of the site. The current stormwater management practices for the VPAD are summarised in the Vales Point Ash Dam Management Plan (2015-20). Additional information regarding stormwater management for the proposed project is provided in Section 5.7.

4.3.5 Network Connection

Preliminary discussions have been held with the network operator (Ausgrid) regarding the network connection location. It is proposed that the project will connect to the network via a 33kV connection to the 743/744 33kV feeders that supply the Vales Point Zone substation from the Munmorah sub-transmission substation (STS). The 33kV connection point would likely in the vicinity of the Vales Point Zone Substation as shown in Figure 2. Connection would be possible at either at the zone substation or a pole connection directly to either 743/744 33kV feeder in the vicinity of the substation. An alternative 33kV connection could be made at the Munmorah Sub-Transmission Substation (STS) which is located adjacent to the decommissioned Munmorah Power Station site. For either option, the connection point would utilise existing easements, such as the coal conveyor and pipeline easement, where possible, to minimise the requirement for vegetation clearing.

Final design of the network connection infrastructure will be subject to the requirements of the network service provider (Ausgrid), outcomes of the grid connection studies, transmission line route selection and engineering, and any identified environmental and landholder constraints. Existing easements associated with the Vales Point Power Station will be utilised where available to minimise and assessment of the transmission route and network connection point will be completed as part of the EIS.

4.4 Construction

Project construction is expected to be completed over an 18 month program with a commencement date in 2018. Construction impacts are expected to be limited to short term noise and traffic impacts and disturbance within the project footprint.

4.5 Operation and decommissioning

Utility scale solar developments are largely passive with negligible ongoing off-site impacts expected to result from the proposed project. During decommissioning, all solar arrays (including the foundation posts and footings), site amenities and equipment, posts, cabling and fencing would be removed. All areas of soil disturbed during decommissioning would be rehabilitated in accordance relevant regulatory requirements with the aim of meeting the existing (pre-construction) land capability. Subsurface infrastructure will be decommissioned on the basis of removing as much equipment as possible while minimising the potential for disturbance and exposure of ash. All waste material generated during the decommissioning phase will be recycled where possible, or disposed at a licensed waste handling facility.

With an estimated 30 year design life and entirely reversible environmental impacts post decommissioning, the site would retain potential for alternative developments in the future as land use needs change.

5. Stakeholder Engagement

5.1 Consultation Undertaken to Date

5.1.1 Central Coast Council and Lake Macquarie City Council

Delta has met with both Central Coast Council (CCC) and Lake Macquarie City Council (LMCC) to introduce the Vales Point solar project and outline the potential for the site to accommodate a substantial solar development. The proposal received positive feedback and Delta will continue to develop an effective working relationship with both CCC and LMCC throughout the stakeholder engagement program and during the preparation of the EIS.

5.1.2 Vales Point Power Station Community Reference Group

Delta has also provided an overview of the Vales Point Ash Dam Solar Project proposal to the Vales Point Power Station Community Reference Group (Community and Regional Environment (CARE) Forum) at a meeting held in November 2016. The membership of the CARE Forum includes community representatives from the local Precinct Committees surrounding the power station. The proposal received positive feedback which is typical of the high level of support among communities for the development of renewable energy throughout NSW (OEH, 2015). Project updates are provided to the CARE Forum at regular meetings each quarter.

5.2 Proposed Consultation

Delta will engage with all key stakeholders during preparation of the EIS. Stakeholder groups, with an interest in the project are expected to include:

- NSW Department of Planning and Environment (DP&E);
- NSW Department of Industry – Division of Resources and Energy (DRE);
- NSW Roads and Maritime Services (RMS);
- NSW Office of Environment and Heritage (OEH);
- NSW Environment Protection Authority (EPA);
- Transport for NSW (TfNSW);
- Central Coast and Lake Macquarie Councils
- Local land owners, farm managers and nearby residents; and
- Aboriginal stakeholders.

Delta will develop a consultation plan for the EIS once SEARs are received and the outcomes of consultation will be included the EIS and relevant technical studies. The purpose of the consultation plan is to ensure ongoing and effective communication with key stakeholders and the community.

6. Preliminary Environmental Assessment

6.1 Issues identification

An initial review of environmental constraints and potential impacts of solar projects has been undertaken to identify the issues likely to require detailed consideration as part of the project design and EIS process:

Key issues to be addressed include:

- Geotechnical;
- Traffic;
- Noise and vibration;
- Biodiversity;
- Heritage;
- Stormwater and flooding;
- Air quality; and
- Visual amenity.

A preliminary assessment of each aspect is provided below identifying likely further assessment requirements.

6.2 Geotechnical

The VPAD and associated civil structures are located within the Mannering Colliery (formerly Wyee Colliery) mining lease area. As a result, the Ash Dam and some of its civil structures have been, and will continue to be, subject to mine subsidence. Further considerations of geotechnical and subsidence issues are required in the design process and will be detailed in the EIS.

6.3 Traffic

A traffic assessment was undertaken as part of the Review of Environmental Factors for capping and rehabilitation of VPAD (Parsons Brinckerhoff, 2010) to manage the soil deliveries to the site. This assessment found:

- Pacific Highway and Ruttleys Road currently have low daily traffic volumes (approximately 14,000 vehicles per day and 6,000 vehicles per day respectively) so have capacity to accommodate significant additional traffic without significant reductions in performance.
- By 2030 the Ruttleys Road/ash dam egress intersection would have a Level of Service F. The performance of this intersection would result in vehicles leaving the VPAD experiencing average delays of 220 seconds (4 minutes) while all other approaches at this intersection would have Level of Service C or better.

Updated traffic modelling and assessment of traffic impacts would be undertaken and detailed in the EIS.

6.4 Noise and Vibration

The nearest residential areas are located at Mannering Park 1km to the north, Doyalson North 1.4 km to the east, Wyee 2.2 km to the west and Doyalson 2.3 km to the south. A number of rural residential receptors are located in closer proximity to the VPAD. Existing noise sources in the area include vehicle noise from Ruttleys Road and the Pacific Highway, operation, capping and rehabilitation of the VPAD, ash recovery and recycling activities located within the VPAD boundary and ongoing operation of the Vales Point Power Station Mannering and Chain Valley Bay Underground Coal Mines.

Assessment of construction noise and vibration impacts would be included in the EIS including detailed consideration of construction noise impacts and mitigation measures. Solar projects do not have significant noise impacts during operation and as such detailed consideration of operational noise impacts is not proposed.

6.5 Stormwater and Flooding

6.5.1 Stormwater Control

The current stormwater management practices for the VPAD is summarised in the Vales Point Ash Dam Management Plan 2015-2020 and reproduced below.

> *"The current design and operation of the Ash Dam is for zero discharge from the storage area to the Wyee diversion channel, except in the case of extraordinary rainfall in the ash dam catchment area. This is achieved by storing stormwater runoff in Wyee Dam retention pond. The available stormwater storage capacity in Wyee Dam is managed by controlling the dam level with the Return Water System. This is accomplished by a blowdown offtake from the Return Water System, resulting in controlled discharge of excess water to Lake Macquarie via the Vales Point Outlet Canal.*
>
> *Clean stormwater runoff from the adjacent lands to the VPAD and from rehabilitated areas (Ponds 1, 2 & 3) is generally designed to flow away from the ash dam, to be discharged via culverts, spillways and weirs to Lake Macquarie".*

An assessment of stormwater management is required as part of the EIS to consider potential impacts of runoff during construction, operation and post-decommissioning of the project.

6.5.2 Flood Capacity

Delta undertakes ongoing review and revision of flood design level to ensure the VPAD meets current guidelines as set out by the NSW Dam Safety Committee. The current flooding status for VPAD is summarised in the Vales Point Ash Dam Management Plan 2015-2020 and reproduced below.

> *"A detailed flood study based on final estimated Probable Maximum Precipitation (PMP) values supplied by the Bureau of Meteorology was carried out in June 1998. A calibrated hydrological model (RORB) was used to estimate the inflow and outflow hydrographs for the storage. A range of storm durations were analysed for Annual Exceedance Probabilities (AEP) up to the Probable Maximum Flood (PMF).*
>
> *The results showed that the flood spillway can safely pass the PMF event without overtopping the dam wall. The maximum flood level was determined to be 17.7 m, which is 0.8 m below the Wyee Dam crest level of 18.5 m and 1.3 m below the crest of the dry ash embankment.*
>
> *Although the methodology for calculating extreme floods has been reviewed since this flood study was completed it is unlikely that there would be any significant change in the magnitude of the PMF, when calculated by the currently recommended methods. In any event, the excess spillway capacity will more than handle any increase in the design flood. Consequently, no additional flood studies to examine the PMF have been recommended at this stage".*

A review of flood planning would be undertaken to demonstrate that the proposed solar development would not be subject to flooding under future power station operation scenarios.

6.6 Biodiversity

The most recent assessment of the biodiversity status of the VPAD and it surrounds is summarised in the Vales Point Ash Dam Management Plan 2015-2020 and summarised below:

> *"The REMS mapping (Lower Hunter and Central Coast Environment Management Strategy 2000) shows four vegetation communities in the vicinity of the ash dam. Of these, two vegetation communities are dominant: Coastal Plains Scribbly Gum Woodland; and Coastal Plains Smooth-Barked Apple Woodland. These vegetation communities have been used to guide the recommended species for revegetation activities.*
>
> *High resolution mapping of Endangered Ecological Communities (EECs) listed under the NSW Threatened Species Conservation Act 1995 (TSC Act) occurring within the immediate vicinity of the ash dam was*

completed by Ecotone Ecological Consultants Pty Ltd (Ecotone) in 2010. The mapping indicates that two EECs, plus an EEC transitional community occur within 250 m of the ash dam.

These communities were surveyed by Eco Logical in 2011, to validate the extent of the EECs and to collect data on their composition, structure, soils and position in the landscape, to verify that they meet the NSW Scientific determinations (NSW Scientific Committee, 2004a; 2004b) for the respective EECs, as per correspondence with the OEH.

Swamp Oak Floodplain Forest EEC

This community was restricted to the northern section of the ash dam perimeter, adjacent to the ash dam wall. It was considered to be consistent with the NSW Scientific Committee Final Determination for Swamp Oak Floodplain Forest for the following reasons:

- *It was positioned on the floodplain of Mannering Bay, at approximately 20 m elevation or lower.*
- *The soils were humic grey brown sandy loam soil.*
- *The woodland vegetation contained several species listed in the determination, specifically Swamp Oak, Dianella caerulea (Blue Flax-Lily), Bordered Panic, Gahnia clarkei (Tall Saw-sedge) and Common Reed.*

Swamp Sclerophyll Forest EEC

This community was present in both the northern and southern sections of the ash dam perimeter. It was considered consistent with the NSW Scientific Committee Final Determination for the Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions EEC (2004b) for the following reasons:

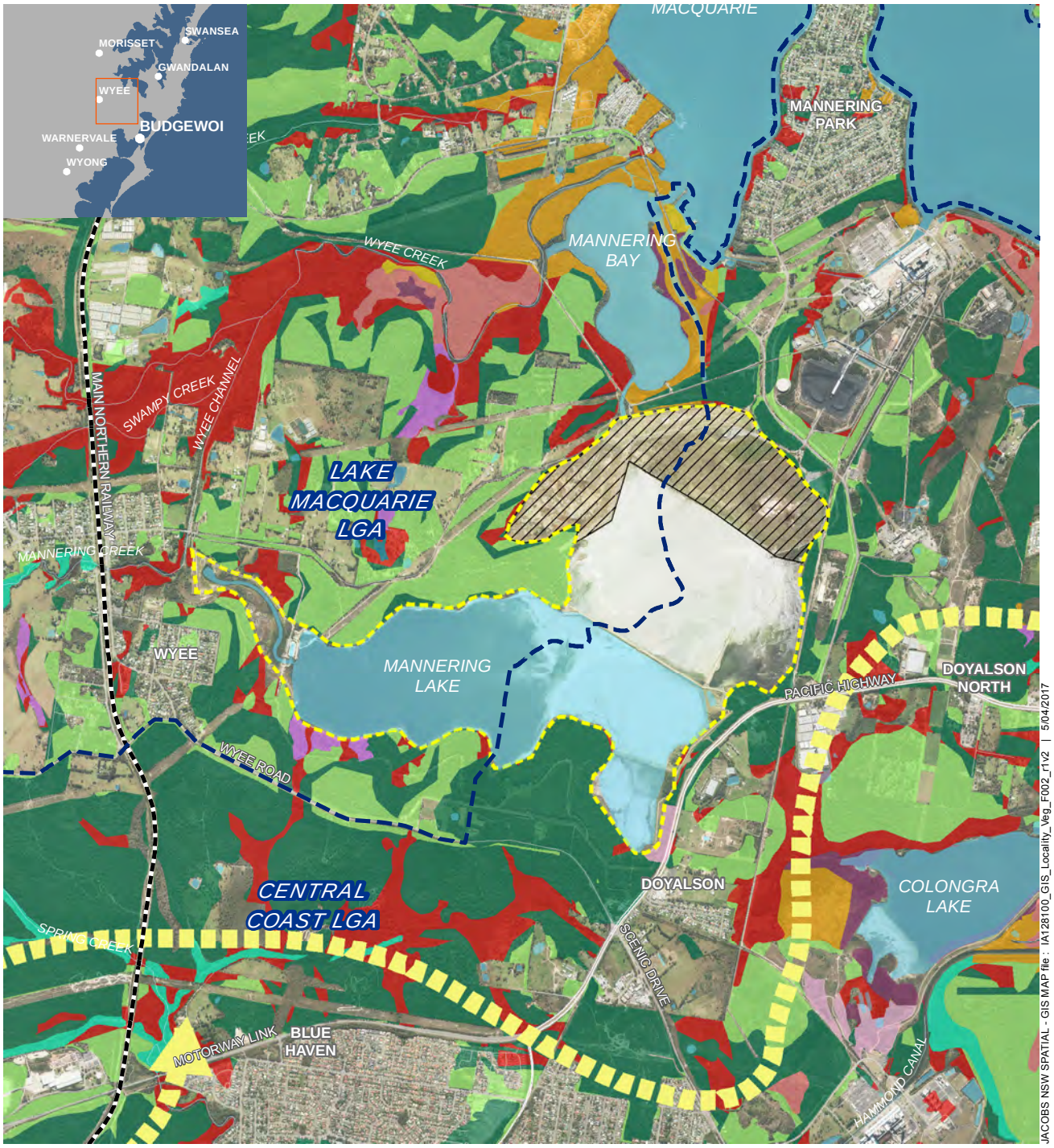
- *It was positioned on the floodplain of the Ash Dam, at approximately 20m elevation or lower.*
- *The soils were a humic grey brown clay loam sandy soil.*
- *The woodland vegetation contained several species listed in the determination, specifically Black Sheoak, Blue Flax-lily, Bordered Panic, Swamp Mahogany, Red-fruit Saw-sedge, Imperata cylindrical var. major (Blady Grass), Flax-leaved Paperbark, Broad-leaved Paperbark, M. sieberi, Parsonsia straminea (Common Silkpod) and Bracken.*

Threatened Species

Three species of threatened flora and five species of threatened fauna (TSC Act) were recorded in the immediate vicinity of the ash dam during surveys undertaken by Eco Logical in 2011. These species include:

- *Charmhaven Apple (Angophora inopina);*
- *Leafless Tongue Orchid (Cryptostylis hunteriana);*
- *Black-eyed Susan (Tetratheca juncea);*
- *Wallum Froglet (Crinia tinnula);*
- *Varied Sitella (Daphoenositta chrysoptera);*
- *Scarlet Robin (Petroica boodang);*
- *Squirrel Glider (Petaurus norfolcensi); and*
- *Koala (Phascolarctos cinereus).*

It is noted that the threatened species identified were predominantly found outside the project footprint. Vegetation communities surrounding the VPAD are illustrated in Figure 3.



Legend

- Ash dam
- Proposed solar development area
- Indicative green corridor
- LGA boundary
- Main North railway

Vegetation communities

- Coastal Plains Scribbly Gum Woodland
- Coastal Plains Smooth-barked Apple Woodland
- Freshwater Wetland Complex
- Mangrove-Estuarine Complex
- Melaleuca Scrub
- Redgum Rough Barked Apple Forest
- Riparian Melaleuca Swamp Woodland
- Swamp Mahogany - Paperbark Forest
- Swamp Mahogany- Paperbark Swamp Forest
- Swamp Oak Rushland Forest
- Wyong Paperbark Swamp Forest

Data sources

Jacobs 2016
Ausimage 2014
LPI 2014
DECCW

Figure 3 | Vegetation communities

As the project is proposed to be located within an existing disturbed landscape (although rehabilitated to some extent) there is little potential that the works would have a significant impact on biodiversity. The operational areas of the Vales Point Station and the VPAD are surrounded by areas identified as green corridor and habitat network and are bypassed by the major conservation links identified in the *North Wyong Structure Plan 2012* and more recently in the Central Coast and Hunter Regional Development Plans. The *Hunter Regional Development Plan* identifies the corridor as the Jilliby to Wallarah Peninsula Link and Inter-regional Landscape Break. This link recognises corridors previously identified in the *Lower Hunter Regional Strategy 2006-2031* and the *North Wyong Shire Structure Plan 2012.* It encompasses major new land release areas that accommodate urban and employment uses in the Hunter and Central Coast regions. The aim of conservation planning in this area is to identify and create habitat corridors and stepping stones to maintain connections between Jilliby State Conservation Area, Wallarah National Park and the Munmorah State Conservation Area.

The VPAD is not currently identified as a part of a green corridor or habitat network. The site is currently fenced for safety and security purposes and is devoid of large vegetation. The installation of a solar development is not likely to affect the functioning of the green corridor outside the VPAD footprint or significantly reduce biodiversity values within the development footprint.

6.7 Aboriginal cultural heritage

The VPAD Management Plan identifies aboriginal cultural heritage values in the vicinity of the site as follows:

> *"Based on a field inspection carried out on the Vales Point Power Station site in 1993, areas of Indigenous Cultural Heritage are known to exist. Although the existing ash dam is a heavily disturbed environment and no excavation works are proposed for the site, the conservation of cultural heritage sites should be incorporated into ongoing management of the ash dam areas. Most of the area surrounding the ash dam is considered to be of Moderate Heritage Significance (See Figure 7 and the Land Management Plan). Based on this, any significant development should be preceded by archaeological sample surveys".*

There is not considered to be any remaining cultural heritage significance within the footprint of the ash dam. Consideration of Aboriginal Cultural Heritage would be undertaken in relation to the construction the transmission line to the Electricity network.

6.8 Air Quality

The construction of the project is unlikely to have a significant impact on local air quality. A Construction Environmental Management Plan will be prepared to manage any air quality impacts during construction but this is not considered to represent a key project risk. During operations, air quality impacts are managed through the maintenance of adequate ground cover under panels.

6.9 Visual Amenity

The VPAD Management Plan identifies that the VPAD is generally well screened in close proximity from external views by a large vegetated buffer that surrounds it and by the favourable topography of the site. While the community is likely to be sensitive to any increased visibility of the site there is not considered to be any local or regionally significant scenic or visual values that would be impacted by the solar development.

In the absence of elevated viewing locations Solar projects on flat land generally present as low dark/black expanse within a thin band interspersed with inverter / transformer infrastructure. The short transmission line would be expected to be visible to the public as regardless of the connection point as it is likely to cross the road network. Given the amount of electricity infrastructure surrounding the VPAD a new transmission line is unlikely to change the visual character of the area.

A desktop assessment of potential visual receptors would be undertaken to confirm the need for detailed visual impact assessment. The preparation of a detailed visual impact assessment or photo montages is not proposed to be undertaken in association with the environmental impact statement.

7. Conclusion

Delta proposes to develop a large scale solar farm on land spanning the boundary of Lake Macquarie and the Central Coast local government areas, with the capacity to generate approximately 45 MW. The project would be assessed under Division 4.1, Part 4 of the EP&A Act and would be deemed State significant development.

This document provides a preliminary description of the solar farm, existing information on e nvironmental context and likely key issues. T his preliminary environmental assessment supports an application for the Secretary's Environmental Assessment Requirements (SEARs). Once obtained, Delta will prepare an Environmental Impact Statement to address the SEAR's to support a formal application for development consent.

References

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