REPORT

Narromine 4A Solar Farm

Water Assessment

Submitted to:

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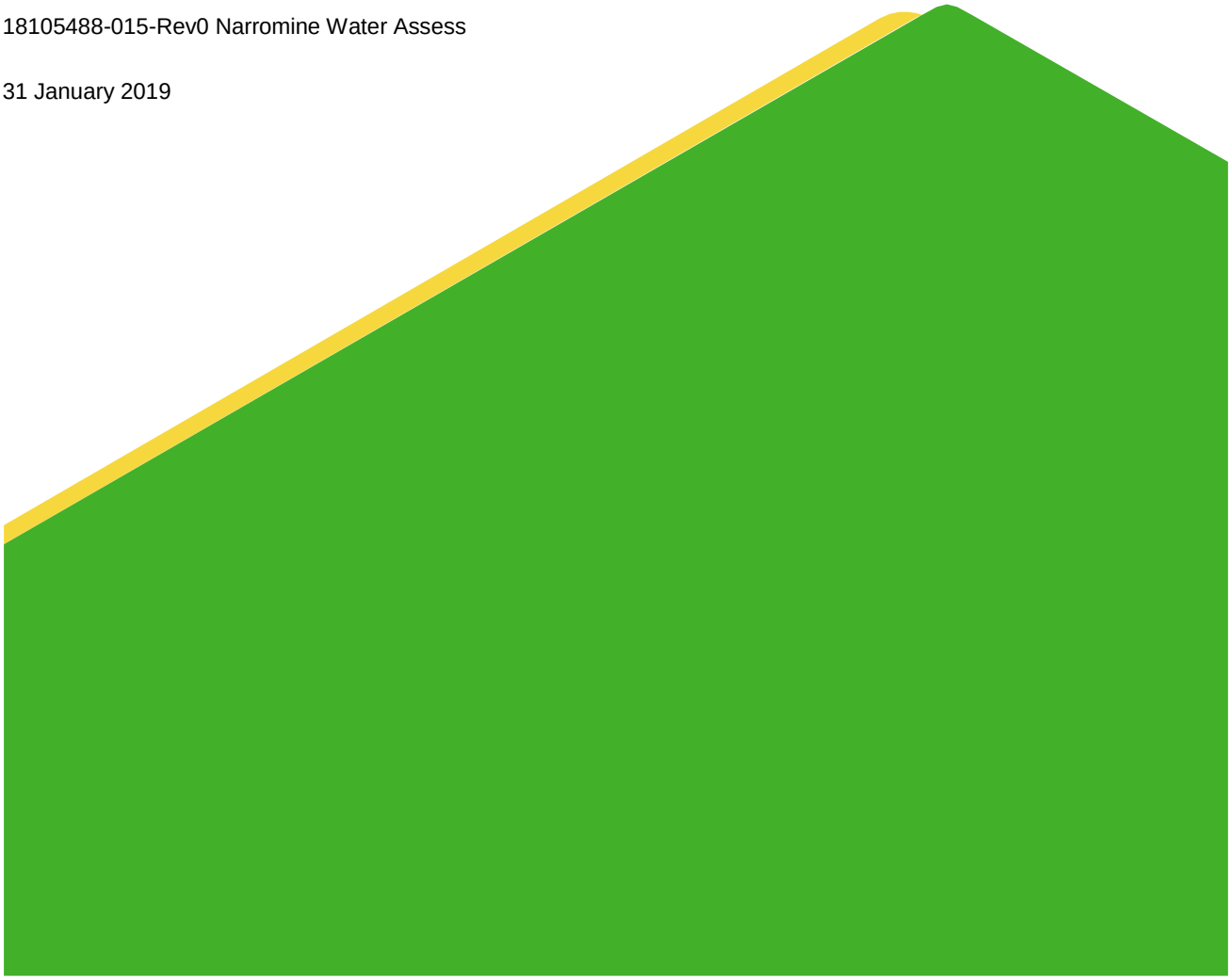
18105488-015-Rev0 Narromine Water Assess

31 January 2019



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1.0 INTRODUCTION

The proposed Narromine 4A Solar Farm is located at 6 Euromedah Road (Lots 41 & 46/DP752581) east of Narromine within the Narromine Shire Council area. ITP Renewables (Australia) Pty Ltd (ITP Renewables) propose to construct a 5 MW solar facility within the site that is currently used for agriculture.

This report, which provides a desktop flood assessment to support the Development Application for the project, includes a:

- Desktop review of local hydrology and catchment and water quality data.
- Desktop review of surface and groundwater quality data.
- Desktop review of the flood risk potential against the published references, Local Environmental Plan and Land-use Plan.
- Desktop impact assessment against New South Wales (NSW) policies and referenced industry standards for solar arrays.
- Desktop management assessment with mitigation measures recommended for construction and operation.

1.1 Limitations of Assessment

The assessment is based on publicly available information and data and does not include any additional hydrological and/or hydraulic modelling.

1.2 Important Information Relating to This Report

Your attention is drawn to the document titled - “Important Information Relating to this Report”, which is included in Appendix A of this report. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder Associates has under the contract between it and its client.

2.0 PROJECT DESCRIPTION

The proposed Narromine Solar Farm is located on Euromedah Road east of Narromine within the Narromine Shire Council (NSC) area. Figure 1 indicates the area of the proposed facility. ITP Renewables propose to construct a solar farm with a DC array capacity of 6.14 MW_{DC} and an AC output of 5 MW_{AC} on a site that is currently used for agriculture. Details are contained on the layout provided by ITP Renewables and attached in Appendix B.

There are to be 19,200 solar modules installed in 214 rows (each row being ~94 m long and ~4 m wide) running north to south. Each row of PV modules will rotate to track the sun across the sky from east to west each day. There is approximately 6 m spacing between each row. The hub height of each tracker is 2.0 m with the peak of the modules reaching a height of 3.7 m when the array is fully tilted to 60 degrees from horizontal.

The solar farm will also consist of two 2.5 MW inverter stations. These inverters are to be located within the array and are each mounted on a 20 ft skid. Each of these inverter stations incorporate the High/Medium voltage switchgear and transformers.

The mounting system will be constructed on piles that are driven into the ground. During construction, which is expected to take approximately 3 months, there is expected to be around 50 personnel on site working from 7 am – 4 pm Monday to Friday. Once operational the site will be unmanned with maintenance expected to be carried out quarterly by a crew of 2 – 3 people.

Figure 1: Proposed Narromine Solar Farm (indicated by black rectangle)[1]

[1] (Spatial Services, 2018)

3.0 CATCHMENT AND FLOOD HISTORY

The site is located east of Narromine and north of the Macquarie River. It does not fall within the Narromine Irrigation District area, which is predominantly to the west and south of Narromine.

The Narromine township and surrounding areas are prone to flooding by the Macquarie River. Four modelling studies have been undertaken since 1998 followed by a peer review, which ultimately resulted in the 2018 decision by the NSC to recommend the development of a levee aligned along the southern side of the Macquarie River.

In 2018, an independent peer review was delivered to address inconsistencies between the prior modelling studies, i.e. 1998 by Bewsher Consulting and those in 2006, 2009, 2012 and 2013 by Lyall & Associates. One of the key drivers was to assess the veracity of design flood levels derived in the various studies in order to recommend a definitive design flood level for Narromine for future flood planning and potential mitigation measures. The review found that:

- the general model configuration and adopted parameters are considered appropriate for establishing the design flood estimates
- the precautionary principle typically applies in floodplain management such that it may be prudent to apply some level of conservatism. Accordingly, the currently adopted 15.1 m is considered appropriate with potential for consideration of a level range[2] between 15 m -15.1 m.

Figure 2 indicates the extent of flooding associated with the 1% Annual Exceedance Probability (AEP)[3] event from the Macquarie River under the pre-levee scenario. This figure is sourced from NCC's 11 April 2018 Council Meeting Minutes but does not clearly attribute the original source, however it is mostly likely to be Lyall 2013.

The site of the proposed facility is shown to be on higher ground compared with areas closer to the river and the town more generally and outside the inundation zone for the 1% AEP flood. However, as the site is on the boundary of the model extent these results should be considered with caution. Additionally, Figure 2 does not indicate what, if any, impacts there are on this area should the levee on the southern side proceed.

NSC is expected to review its current floodplain risk management plan in 2019 following the December 2018 announcement of floodplain management grants by the NSW Office of Environment & Heritage. The update will include information from recent flood events. It may be prudent to engage early with NSC in order to advocate for updated model extents that would cover the site of the proposed facility and verify that it is not expected to be inundated by the 1% AEP flood.

[2] Local datum 0m at Narromine Bridge Gauge (Eumungerie Road) is equivalent to 224.01mAHD.

[3] A flood with a 1% AEP has a one in a hundred chance of being exceeded in any year.

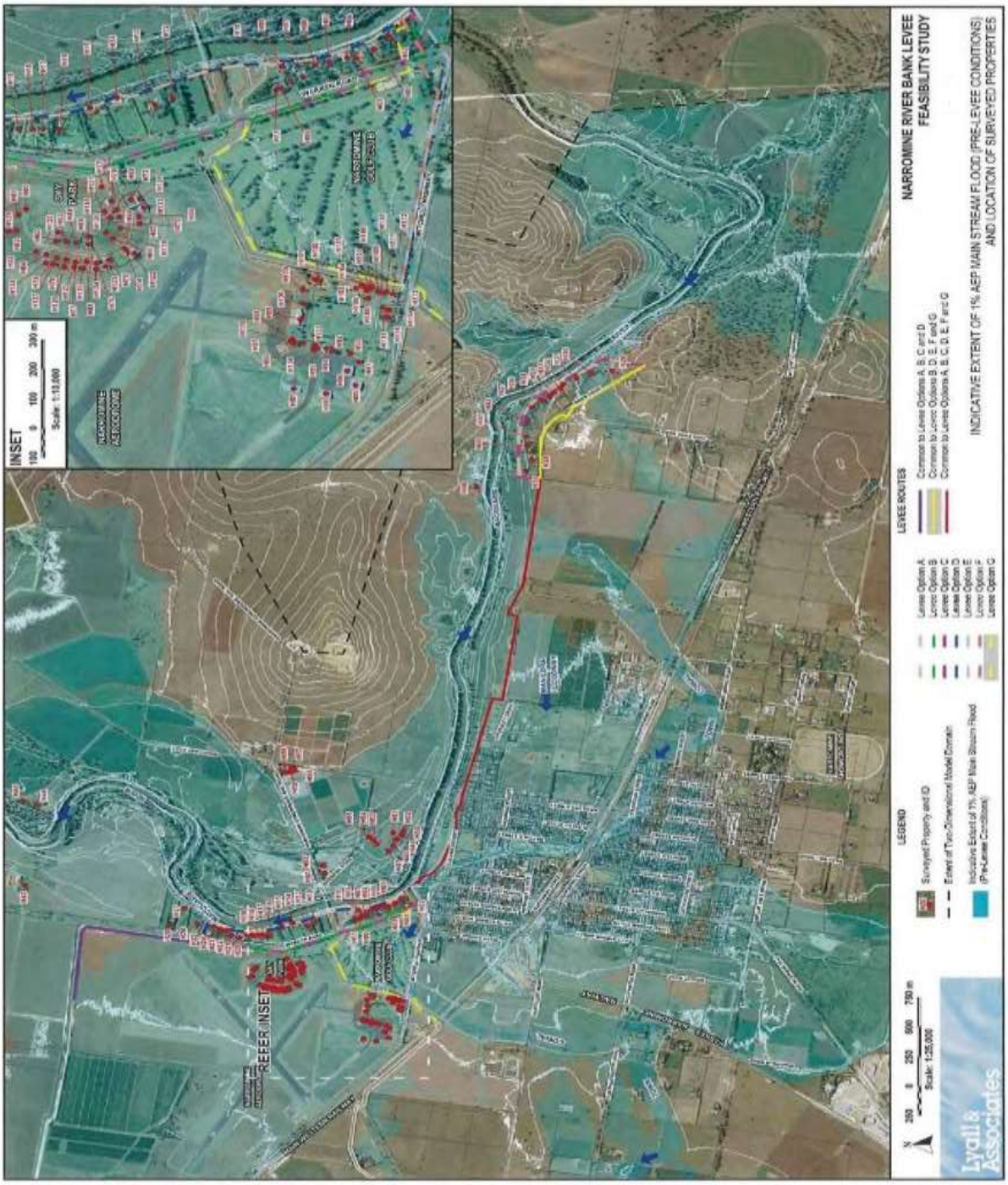

Figure 2: Indicative extent of Macquarie River 1%AEP flood (pre levee option)[4]

[4] Narromine Shire Council's minutes tabled 11th April 2018

4.0 LEGISLATIVE CONTEXT

NSW has a comprehensive legislative and policy framework for the management of floodplain risk and flood prone areas of the state with clear areas of responsibility as outlined below in Figure 3.

Figure 3: Floodplain Risk Management and Planning Process

4.1 Local Government Act 1993

This Act provides a legal framework for the NSW system of local government. The Floodplain Management Manual (NSW Government, 2005) was gazetted in 2005 as the manual relating to the development of flood-liable land and is the approved Section 733 manual for flood prone land. Section 733 exempts councils from liability in relation to flood prone land provided they have undertaken assessments substantially in accordance with the latest manual.

The manual supports the NSW Government's Flood Prone Land Policy by providing for the development of sustainable strategies for the management of floodplains specifically in relation to human occupation. It provides a framework for councils to implement the policy and a process for managing floodplain risk.

4.2 Environmental Planning and Assessment Act 1979

This Act is the basis to institute an environmental planning system and assessment arrangements for NSW. In 2017 there were major amendments passed with a view to improving the planning system through simpler processes, improved strategic planning and community participation in order to enable more balanced and transparent decision making. Clause 3.43 of the Act makes provision for the preparation of development control plans by relevant authorities (outlined further in Section 4.4.1).

4.3 Water Management Act 2000

This Act provides for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations. Water management principles intended to guide decision making under the Act in relation to floodplain management require the existing and future risk to human life and property arising from occupation of the floodplain to be minimised.

4.4 Narromine Local Environmental Plan 2011

The Narromine Local Environmental Plan 2011 (hereby referred to as the Plan) aims to ensure local environmental planning provisions for land in Narromine are in accordance with the relevant standard environmental planning instrument.

The Plan provides specific management requirements for flood planning and is applied to land at or below the flood planning level (1% AEP plus freeboard). It requires that development consent cannot be granted unless the proposed development is compatible with the flood hazard of the land, will not cause significant adverse impacts to other developments, the environment and the community and incorporates measures to manage risk to life. Flood planning maps refenced by the Plan (Appendix C) indicate the lower portion of the lot where the facility is proposed is considered part of the flood planning area.

Groundwater vulnerability mapping (also Appendix C) indicates the majority of the lot is considered vulnerable from depletion and contamination as a result of inappropriate development. The plan requires that development consent cannot be granted unless the proposed development will be:

- designed and managed to avoid significant environmental impact or
- designed and managed to minimise the impacts if such impact is unavoidable or
- managed to mitigate that impact if such impact is unable to be mitigated.

The Plan provides additional provisions for earthworks to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.

The Plan provides the prohibited and permitted types of development within the local area. Some types of development are also regulated by particular state environmental planning policies.

4.4.1 Narromine Development Control Plan

The Narromine Development Control Plan (DCP) provides guidance for developments and supports the statutory planning controls of the Narromine Local Environmental Plan 2011 (LEP). Chapter 6 of the Narromine Flood Policy outlines the approach the NSC will use to determine specific controls to be applied to proposed developments in flood prone areas. The policy applies to all land inundated by flood events up to the extreme flood, which has been defined as a flood which has a peak discharge of 3 times that of the 1% AEP flood event. The Flood Planning Level (FPL) depends upon the land use and may be restricted based upon the Flood Risk Precinct (FRP) in which the proposed development is to be located.

The extent of flooding on which the FRP boundaries are defined are considered approximate only and should be confirmed by site specific survey.

The DCP is based on the findings of the Narromine Flood Study 2006 and Narromine Floodplain Risk Management Study 2009. It is noted that NSC intends to update the floodplain risk management plan in 2019.

4.5 State Environmental Planning Policy (Infrastructure) 2007

Division 4 of the State Environmental Planning Policy (Infrastructure) 2007 relates to ‘Electricity generating works or solar energy systems’. The policy relates to the approval process for solar energy systems, with specific details being required for flood liable land, that is land susceptible to flooding by the probable maximum flood event. The policy states consultation with the relevant council is required if the proposal will alter flood patterns other than to a minor extent and their response must be taken into consideration.

4.6 Protection of Environment Operations (POEO) Act 1997

The POEO Act aims to protect, restore and enhance the quality of the environment in NSW, while still having regard to ecologically sustainable development.

With relevance to releases from the site, the Act aims to reduce risks to human health and to prevent degradation of the environment by promoting pollution prevention, the reduction in the use of materials, and the re-use, recovery or recycling of materials. The Act contains the requirements for the management of such discharges and also the offences that relate to pollution. Section 148 of the Act requires that any pollution incidents or those that threaten material harm to the environment must be notified to the relevant authority (e.g., NSW Environment Protection Authority).

4.7 Soil Conservation Act 1938

This Act makes provision for the conservation of soil resources and for the mitigation of erosion. The Act allows the Minister for Primary Industries[5] to issue soil conservation notices, declare areas to be sites of erosion hazard, proclaim works in catchment areas and outline specific regulations in regards to the Rural Assistance Act 1989.

Of general relevance to this project is the promotion of sustainable use and prevention of loss of soil resources from a site.

[5] Except Parts 2A, 3 and 4, and sections 15 and 30A in so far as they relate to Parts 2A, 3 and 4, jointly with the Minister for the Environment

5.0 AVAILABLE DATA

Climatic data and water quantity and quality monitoring information are available in the region as outlined in the following sections.

5.1 Rainfall

The Bureau of Meteorology (BOM) has operated three relatively long-term stations in the Narromine region, one of which, located in Dubbo, is currently operational. None of these are located within the local catchment of the site. However, the rainfall records are indicative of conditions that can be expected in the region.

Table 1 outlines the average annual, maximum annual, maximum daily and maximum monthly rainfall values for the selected rainfall stations, whose locations are shown in Figure 4. Mumble Peg and Alagalah St are both long term stations in Narromine, although both no longer operate. Consequently, the statistics derived from records for these stations are less influenced by outlier events than for stations with significantly shorter records. Airport, which is located in Dubbo (approximately 30 km from Narromine) and remains operational, has a shorter period of record reflected in differences in the statistics for this station compared to the other sites.

Table 1: Rainfall Stations

Station Number	Station Name	Period of Record	Rainfall (mm)			
			Average Annual	Highest Annual	Maximum Daily	Highest Monthly
051005	Narromine (Mumble Peg)	1881 - 2011	533.8	1313.1	209.6	408.2
051037	Narromine (Alagalah St)	1886 - 2013	526.8	1385.6	218.2	365.8
065070	Dubbo Airport AWS	1946 -	583.4	916.4	80.0	223.0

Average monthly values for the three rainfall stations are presented in Table 2. Comparing a particular monthly value for the three stations demonstrates the point made previously with regard to comparing statistics derived from longer and shorter term records. Median monthly values for March, June, September, November and December are significantly higher for Airport than for the Narromine stations, which is a direct consequence of the bias due to more recent higher periods of rainfall.

Table 2: Average Monthly Rainfall

Station Number	Rainfall (mm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
051005	59.0	50.5	44.8	39.8	42.8	44.3	38.8	39.6	37.3	45.4	47.1	47.2
051037	56.7	48.1	47.4	41.8	41.5	44.0	40.8	39.1	36.3	43.7	46.3	46.0
065070	56.6	41.5	60.6	32.7	39.9	50.5	41.3	35.3	42.8	47.5	60.6	62.4

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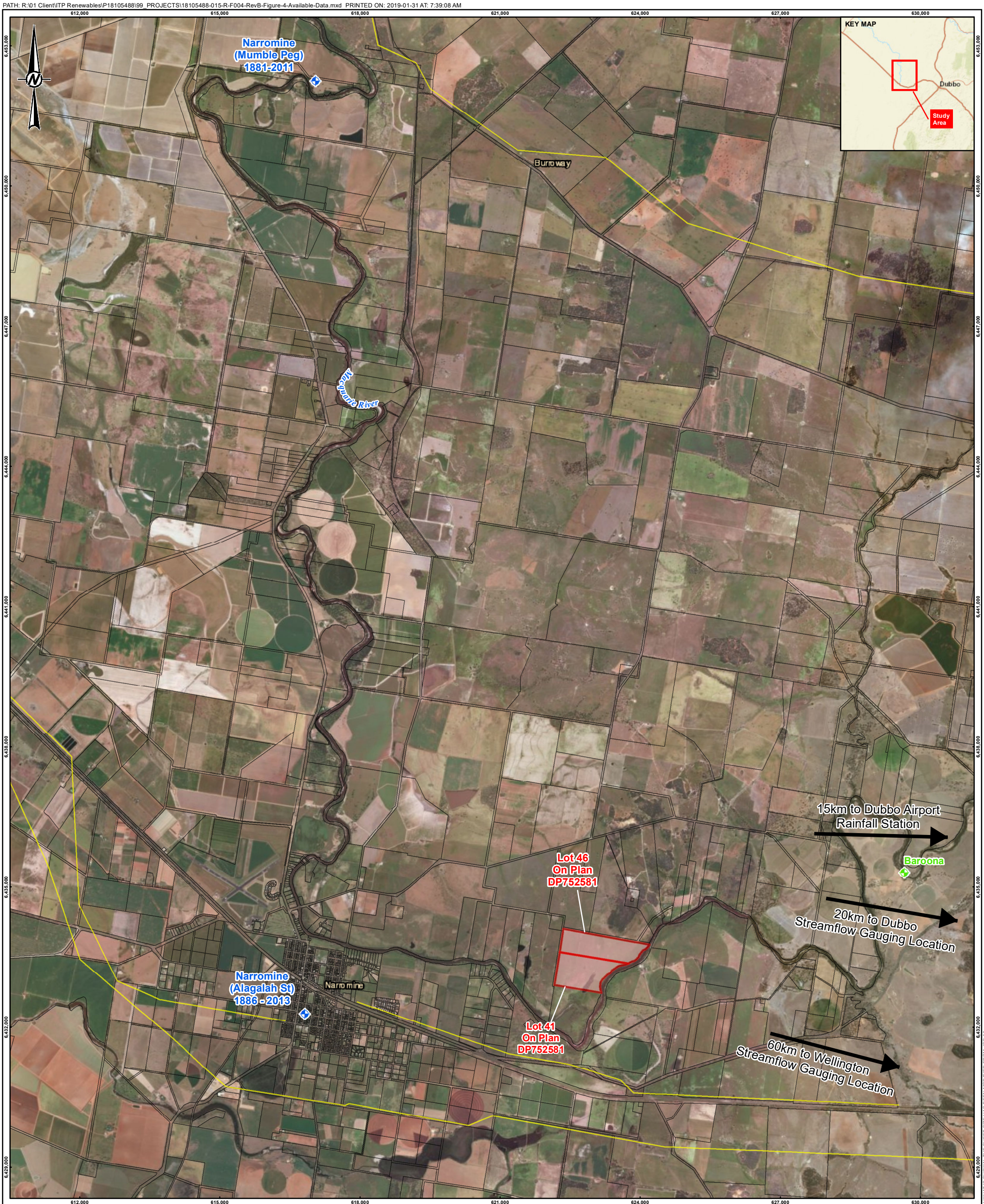

LEGEND

- Rainfall Stations
- Streamflow Locations
- Electricity Transmission Line
- Cadastre
- Lots/Plans of Interest

FOR DISCUSSION PURPOSES ONLY

DRAFT

0 1,000 2,000 3,000

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994

1:75,000 @A3 METRES

NOTE(S)

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

REFERENCE(S)

Electricity Transmission Lines, Cadastre: © State of NSW (Spatial Services - Department of Finance, Services and Innovation) 2018
Rainfall Stations: WaterNSW 2018

CLIENT
ITP RENEWABLES

PROJECT
NARROMINE - WATER ASSESSMENT

CONSULTANT
GOLDER

DD-MMM-YY	31-Jan-19
DESIGNED	HPB
PREPARED	BG
REVIEWED	SB
APPROVED	SB

TITLE
FIGURE 4 AVAILABLE DATA

PROJECT NO.	CONTROL	REV.	FIGURE
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25mm

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Flood producing weather systems across the region include inland troughs, cold fronts, and thunderstorms. Consequently, each rainfall event is a function of the prevailing meteorological conditions. Therefore, Narromine (Mumble Peg and (Alagalah St) provide useful information about expected seasonal rainfall in the area.

5.2 Streamflow

Streamflow records are available for various locations in the region from the Water NSW portal. A summary of the available records is presented in Table 3 with locations shown on Figure 4.

Table 3: Stream Gauging Stations

Station Number	Station Name	Available/Relevant Data	Comments
421001	Dubbo Weir Macquarie River	Flow, level	Macquarie River regional flooding
421003	Wellington Macquarie River	level	Macquarie River regional flooding
421127	Baroona Macquarie River	Flow, level, EC, temp	Macquarie River regional flooding

Generally, data from the available stream gauging stations do not provide specific information on local site flooding but are more useful in the context of assessing major regional flooding events, which may impact on site access or result in inundation of part of the lot. This information is publicly available from Water NSW Real-time data portal and could be incorporated into site management plans.

5.3 Groundwater

Within the Macquarie-Bogan catchment groundwater sources include:

- minor alluvial systems in the highlands
- fractured rock aquifers of the Lachlan Fold Belt
- porous rock aquifers associated with the Gunnedah Basin
- broad alluvial plains north and west of Narromine underlain by sedimentary Great Artesian Basin (GAB) aquifers.

The fractured rock, known as the Lachlan Fold Belt, covers the width of the Murray Darling Basin (MDB) in NSW and therefore extends beyond the Macquarie-Bogan catchment. This formation underlies the Bell Alluvium, Cudgegong Alluvium, portions of the Upper Macquarie Alluvium, the Coolaburragundy-Talbragar Alluvium and the Lower Macquarie Alluvium. In this area, it is considered to exhibit low to moderate connection with surface water. Much of the upper Macquarie catchment is underlain by fractured rock, which has a low water yield.

The Bell, Upper Macquarie and Lower Macquarie alluvial deposits form a continuous sequence of unconsolidated sediments, which generally allows for uninterrupted down valley flow as there is hydraulic connection across contiguous boundaries. A basement high exists between the Upper Macquarie Alluvium and the Lower Macquarie Alluvium, which restricts down valley flows.

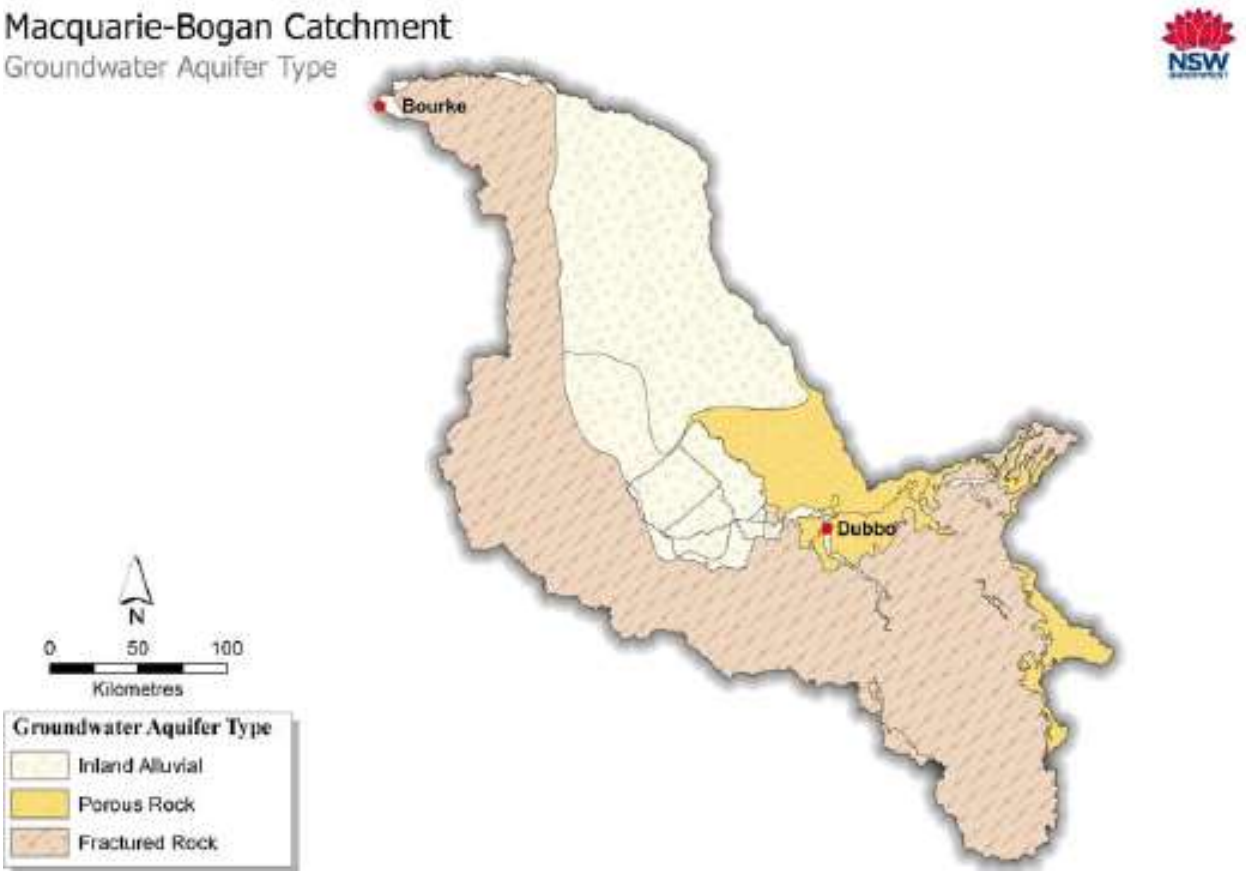

Figure 5: Macquarie-Bogan Catchment Groundwater Aquifer Type[6]

As indicated in Figure 5, the area to the east of Narromine is generally underlain by the alluvial groundwater unit with a small pocket being underlain by the fractured rock unit. It is not clear from this figure where the boundary of these units exists with reference to the site of the proposed facility. Figure 6 contains more detail in this location and when considered with Figure 7 confirms the site most likely crosses the boundary of these formations or is within a transition zone between the formations. Therefore, details of groundwater conditions are reported for both aquifer groups.

[6] Figure 10: Groundwater aquifer types of the Macquarie-Bogan catchment

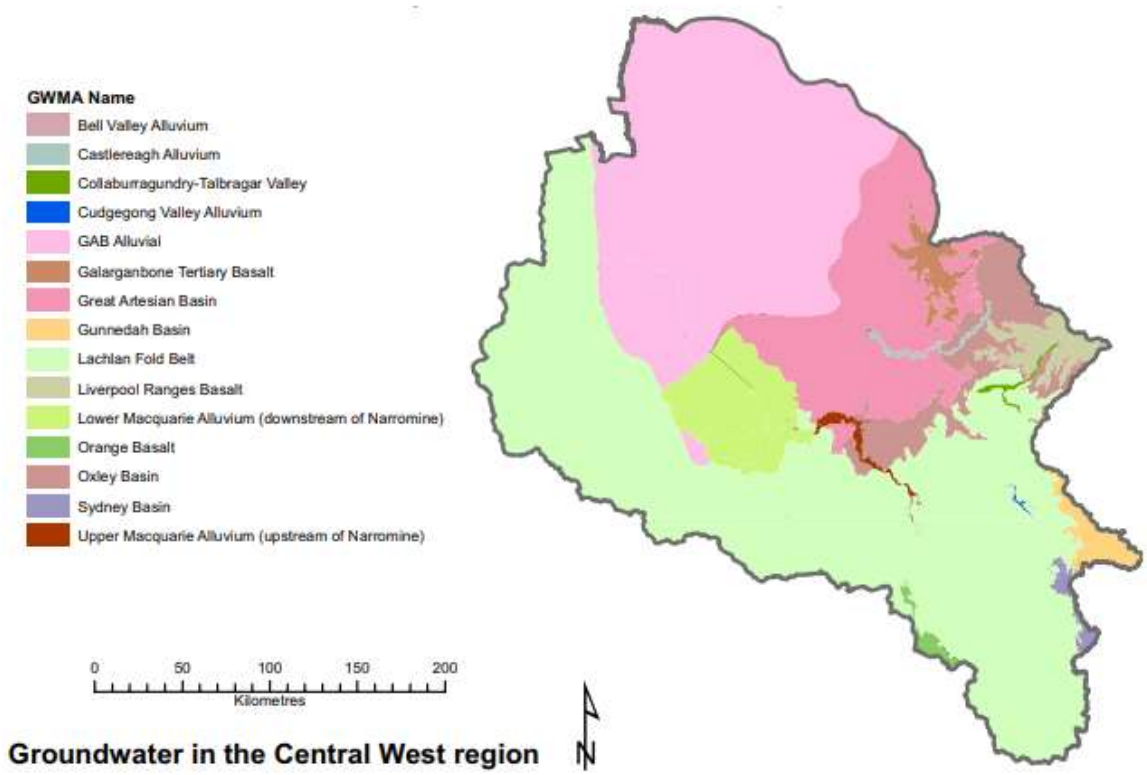

Figure 6: Groundwater Units[7]

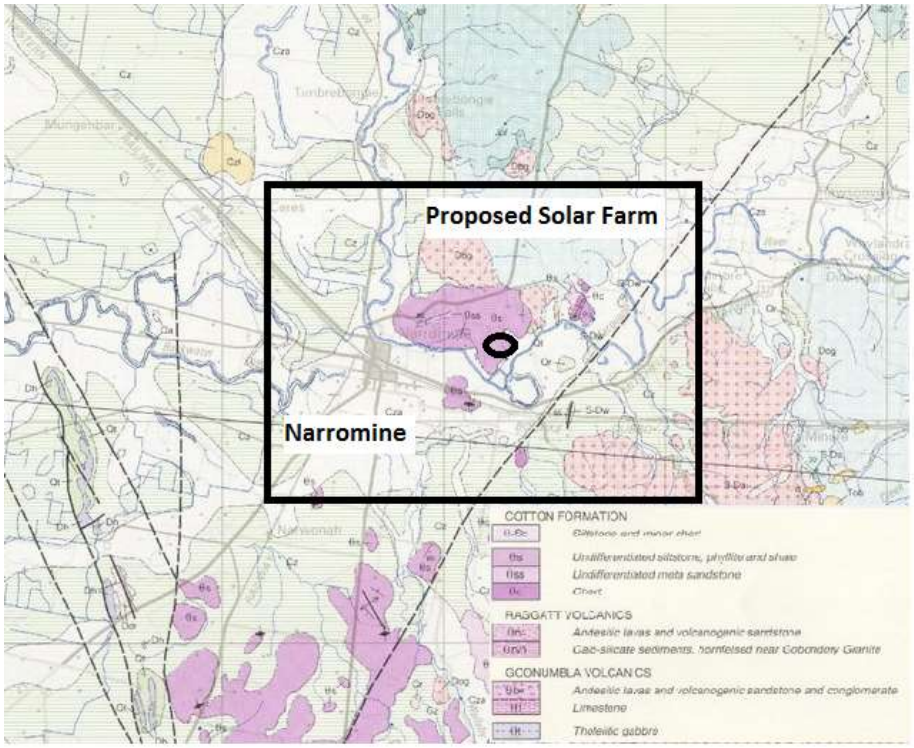

Figure 7: Narromine 1:250,000 Geological map excerpt

[7] DECCW, 2010

5.3.1 Lachlan Fold Belt

The Lachlan Fold Belt is one of nine sustainable diversion limit (SDL) units of the NSW MDB fractured rock and basalt group of groundwater sources (DPI, 2017). The permeability of the Lachlan Fold Belt is a function of the interconnection of fractures, joints, bedding planes, faults and cavities within the rock mass. Generally, groundwater flow replicates the topography, however, in fractured rock masses this is restricted and controlled by local fracture systems. The Lachlan Fold Belt is an extensive aquifer system with salinity generally increasing towards the west along with an increasingly arid climate.

Figure 8 illustrates the aquifer salinity while Figure 9 indicates typical representative water levels over the longer term. It is noted that water levels over the longer term within fractured rock will be spatially variable depending on local features that facilitate permeability.

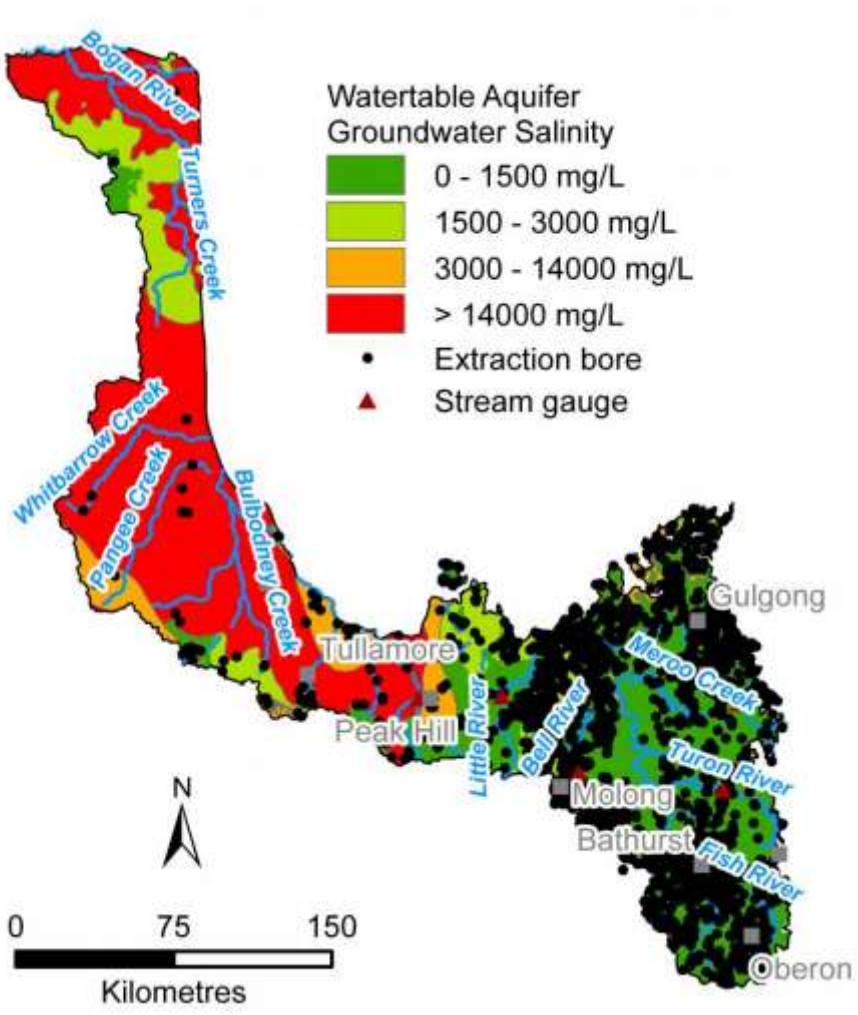

Figure 8: Lachlan Fold Belt: Macquarie Castlereagh SDL Report Card

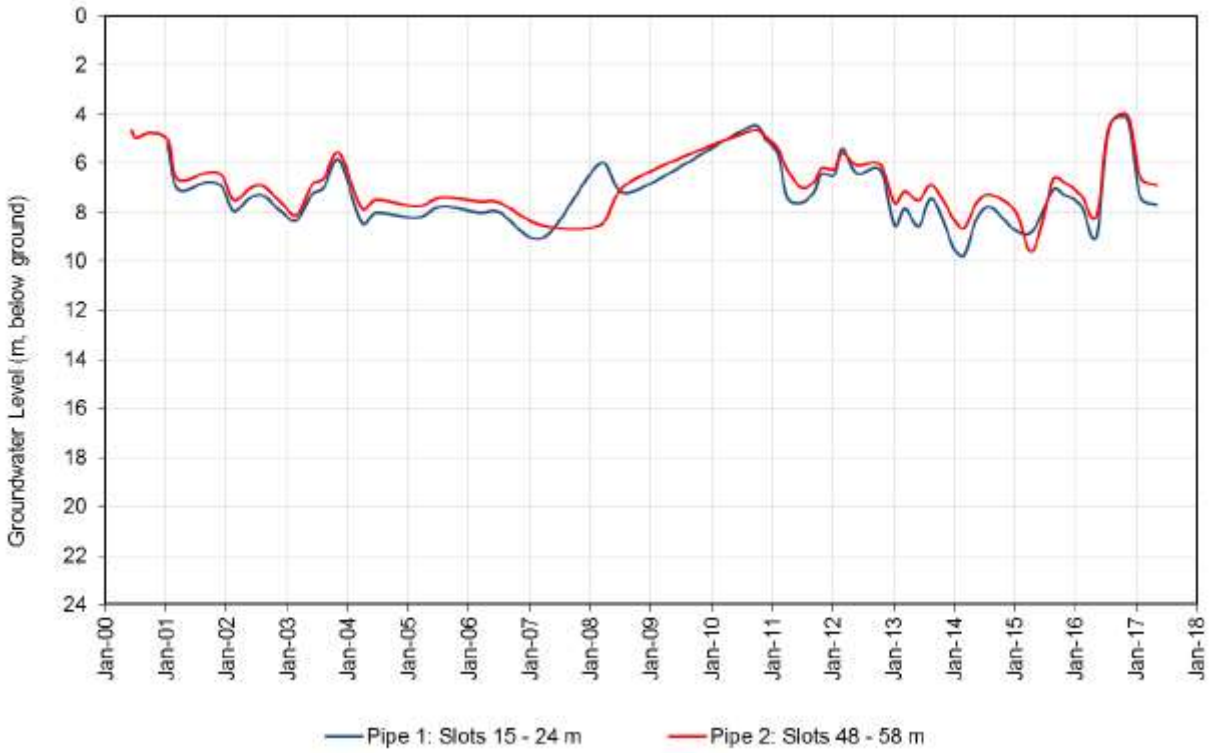

Figure 9: Lachlan Fold Belt Groundwater Level at GW096082

5.3.2 Lower Macquarie Alluvium

The Lower Macquarie Groundwater Sources are comprised of Cenozoic unconsolidated alluvial deposits and Mesozoic sedimentary rocks, which are part of the Great Artesian Basin geological sequence. The alluvial aquifers in the Lower Macquarie extend to depths of up to 160 m below ground level with the highest yielding aquifers being north-west of Narromine. There are three major alluvial hydrogeological formations – upper Narrabri, middle Gunnedah and lower Cubbaroo. Available records indicate groundwater levels rose between the early 1970s and mid -990s but have since declined as illustrated in Figure 10 and Figure 11. Water quality within the Lower Macquarie Alluvium varies spatially with good quality water found in the Narromine region. Alluvial aquifers are the main groundwater sources for town water supply and irrigation water in the Macquarie catchment.

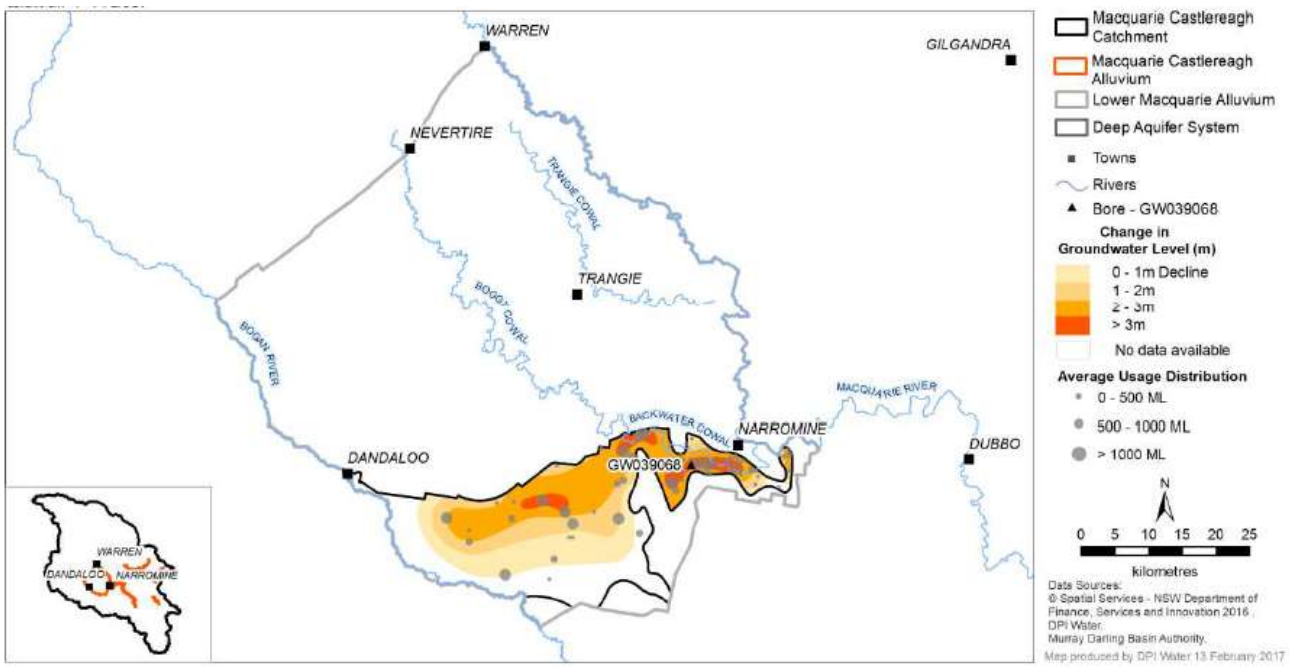

Figure 10: Change in Groundwater Levels in Deep Alluvial Aquifer System of Lower Macquarie over 10-year Period Between 2005/2006 and 2015/2016 Non-pumping Season

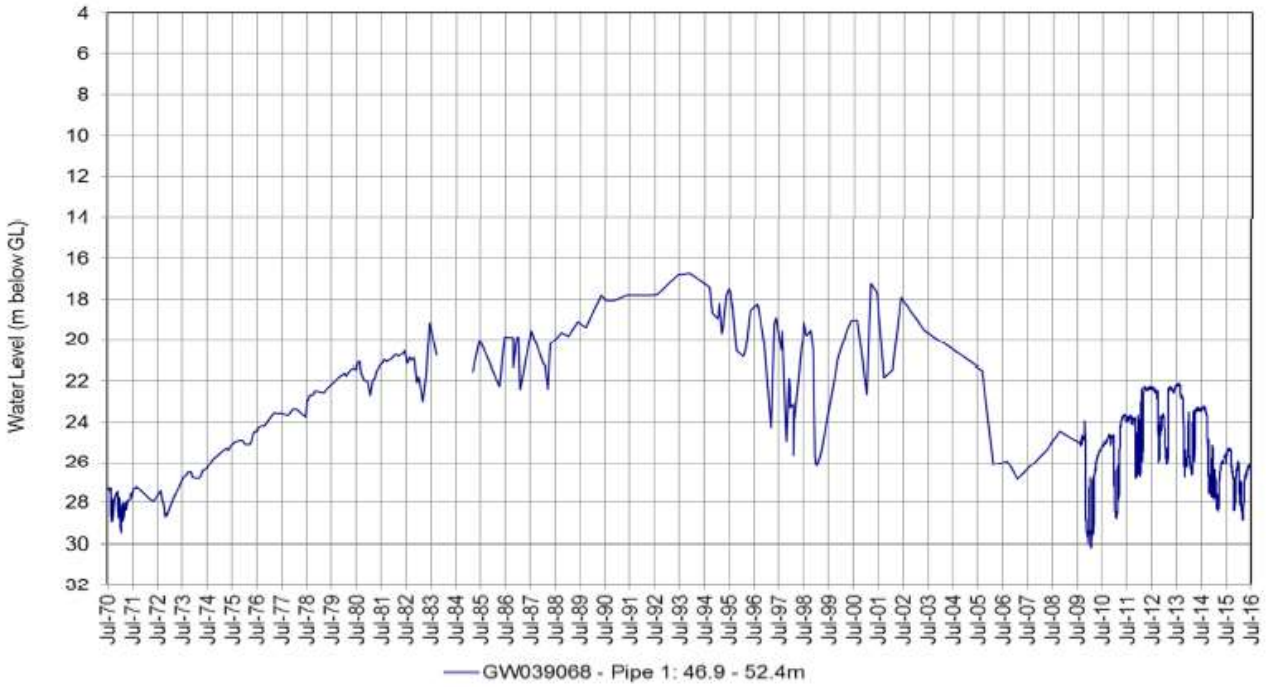

Figure 11: Long-term Groundwater Data Monitored at Bore Site GW039068

5.3.3 Groundwater Vulnerability

As mentioned in Section 4.4, development on the lot is impacted by the LEP's vulnerable groundwater requirements. However, the proposed solar farm will not extract groundwater and as the site is located on a hill it is expected that groundwater levels will be below the surface level.

6.0 POTENTIAL IMPACTS

Based on the current available information, potential adverse surface water-related impacts to the site include:

- Site accessibility and inundation
- Managing downstream actionable nuisance.

6.1 Groundwater

Although the site is located within an area listed as groundwater vulnerable in accordance with the LEP, proposed on site activity is not expected to materially contribute to any regional groundwater issues, particularly those associated with nearby irrigation districts.

6.2 Flooding

Flood planning maps refenced by the LEP indicate that the lower portion of the lot where the facility is proposed is considered part of the flood planning area. Although the proposed siting for the facility within the lot is shown to be outside the inundation zone for the 1% AEP flood event, this information should be considered with caution.

Additionally, regional flooding events may disrupt site activities and particularly access to the site during construction for the workforce and material suppliers. Consequently, it would be prudent to incorporate monitoring of relevant gauging sites (rainfall and streamflow) with appropriate mitigation and/or management measures incorporated into relevant project plans.

6.3 Water Quality

The project has the potential to alter existing catchment conditions within the site. The impervious area of solar facilities is typically only marginally increased owing to associated hardstand and building areas. However, the panels may impact the nature of vegetation coverage on the site, which has the potential to increase surface runoff and peak discharges. Increased flow concentration off the panels also has the potential to erode soil at the base of solar panels (Cook & McCuen, 2013).

Furthermore, as the site has been historically used for grazing there is little natural ground cover vegetation and there may be residual agricultural-associated pollutants. It is understood that the locality's predominant soil types, based on the Wyanga Hydrogeological Landscape (eSpade), include red chromosols which are considered to be moderately erosive. Consequently, there is the potential that site runoff will contain sediments resulting in increases in turbidity and other water quality parameters in downstream water ways. With the limited topographic relief of the site, these issues are considered manageable.

7.0 PROPOSED MITIGATION MEASURES

7.1 Site Accessibility and Inundation

The site accessibility and potential for inundation issues may be managed in the project's risk management register(s) given the regional nature of the flood events and the potential to impact whole of site works. It would be prudent to consider engaging with both the NSC and other local emergency management agencies in managing flood-related risks.

7.2 Downstream Actionable Nuisance

Impacts associated with erosion and sedimentation resulting from construction activities can be minimised by undertaking works in accordance with provisions of the NSW government's best practice sediment and erosion control series Managing Urban Stormwater: Soils and Construction.

Proposed mitigation measures associated with managing downstream actionable nuisance are outlined in Table 4'.

Table 4: Proposed Mitigation Measures

Stage	Measure	Activities/Approach
Design	Site drainage and water quality controls	Design Basis • Undertake hydrological assessment of the site's catchment in accordance with relevant methods outlined in Australian Rainfall and Runoff; • Determine sediment management targets and drainage control standards in accordance with Managing Urban Stormwater: Soils and Construction Vol 1 (Blue Book); • Develop a site erosion and sediment control plan in accordance with the Blue Book; • Develop site drainage design incorporating detention basins and sedimentation management structures where relevant. • Permanent site drainage should coincide with temporary arrangements where possible.
Construction and/or Demolition	Site drainage and water quality controls	General site works: • Catch drains to be located downslope of any proposed road works; • Install location appropriate sediment fences or other applicable control measures depending on whether the feature is upstream or downstream of a disturbed part of the site or will need to be trafficable; • All stormwater collection points need to have appropriate sedimentation and erosion controls; • Undertake ongoing inspections of stormwater facilities and water control measures to assess their effectiveness; • Vibration grids or wash bays at all construction exits • Level spreaders at locations where concentrated flow is discharged offsite to ensure sheet flow like conditions are maintained; • Flat land erosion control options include erosion control blankets, gravelling, mulching, soil binder, turfing and revegetation.

Stage	Measure	Activities/Approach
Construction and/or Demolition	Stormwater point source control	In the event of concrete works: • Do not undertake works if imminent chance of heavy rain; • Store rinsate[8] water, if applicable, separately to other water on site and dispose offsite as appropriate; • Block on site drains in the area of the works and remove any contaminated runoff. In the event that dewatering practices are required: • Elevate pump hose intakes for withdrawing water from excavations to minimise sediment pumping and direct hose to a containment area for settling of sediment prior to discharge of water; • Limit direct discharge off site (consistent with the design requirements for sediment pond discharge). Stormwater collected on site should be reused where possible. Controls should be inspected and maintained on a regular basis. All water released from sediment basins should be clear and, if not, be disposed off site by vehicle. Material and waste storage areas should be designed and operated to minimise interaction with surface waters. Vehicle washdown areas should be located away from water courses.

[8] A dilute solution of chemical resulting from washing the container and equipment with water, as defined by NSW EPA accessed 20 December 2018 https://www.epa.nsw.gov.au/licensing-and-regulation/licensing/environment-protection-licences/authorised-officers/glossary#r

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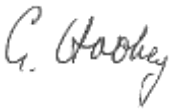
Signature Page

Golder Associates Pty Ltd

Suzanne Burow
Senior Water Resources Engineer



Greg Hookey
Principal Hydrologist

SB/GH/sb/ow

A.B.N. 64 006 107 857

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APPENDIX A

Important Information Relating to this Report

The document ("Report") to which this page is attached and which this page forms a part of, has been issued by Golder Associates Pty Ltd ("Golder") subject to the important limitations and other qualifications set out below.

This Report constitutes or is part of services ("Services") provided by Golder to its client ("Client") under and subject to a contract between Golder and its Client ("Contract"). The contents of this page are not intended to and do not alter Golder's obligations (including any limits on those obligations) to its Client under the Contract.

This Report is provided for use solely by Golder's Client and persons acting on the Client's behalf, such as its professional advisers. Golder is responsible only to its Client for this Report. Golder has no responsibility to any other person who relies or makes decisions based upon this Report or who makes any other use of this Report. Golder accepts no responsibility for any loss or damage suffered by any person other than its Client as a result of any reliance upon any part of this Report, decisions made based upon this Report or any other use of it.

This Report has been prepared in the context of the circumstances and purposes referred to in, or derived from, the Contract and Golder accepts no responsibility for use of the Report, in whole or in part, in any other context or circumstance or for any other purpose.

The scope of Golder's Services and the period of time they relate to are determined by the Contract and are subject to restrictions and limitations set out in the Contract. If a service or other work is not expressly referred to in this Report, do not assume that it has been provided or performed. If a matter is not addressed in this Report, do not assume that any determination has been made by Golder in regards to it.

At any location relevant to the Services conditions may exist which were not detected by Golder, in particular due to the specific scope of the investigation Golder has been engaged to undertake. Conditions can only be verified at the exact location of any tests undertaken. Variations in conditions may occur between tested locations and there may be conditions which have not been revealed by the investigation and which have not therefore been taken into account in this Report.

Golder accepts no responsibility for and makes no representation as to the accuracy or completeness of the information provided to it by or on behalf of the Client or sourced from any third party. Golder has assumed that such information is correct unless otherwise stated and no responsibility is accepted by Golder for incomplete or inaccurate data supplied by its Client or any other person for whom Golder is not responsible. Golder has not taken account of matters that may have existed when the Report was prepared but which were only later disclosed to Golder.

Having regard to the matters referred to in the previous paragraphs on this page in particular, carrying out the Services has allowed Golder to form no more than an opinion as to the actual conditions at any relevant location. That opinion is necessarily constrained by the extent of the information collected by Golder or otherwise made available to Golder. Further, the passage of time may affect the accuracy, applicability or usefulness of the opinions, assessments or other information in this Report. This Report is based upon the information and other circumstances that existed and were known to Golder when the Services were performed and this Report was prepared. Golder has not considered the effect of any possible future developments including physical changes to any relevant location or changes to any laws or regulations relevant to such location.

Where permitted by the Contract, Golder may have retained subconsultants affiliated with Golder to provide some or all of the Services. However, it is Golder which remains solely responsible for the Services and there is no legal recourse against any of Golder's affiliated companies or the employees, officers or directors of any of them.

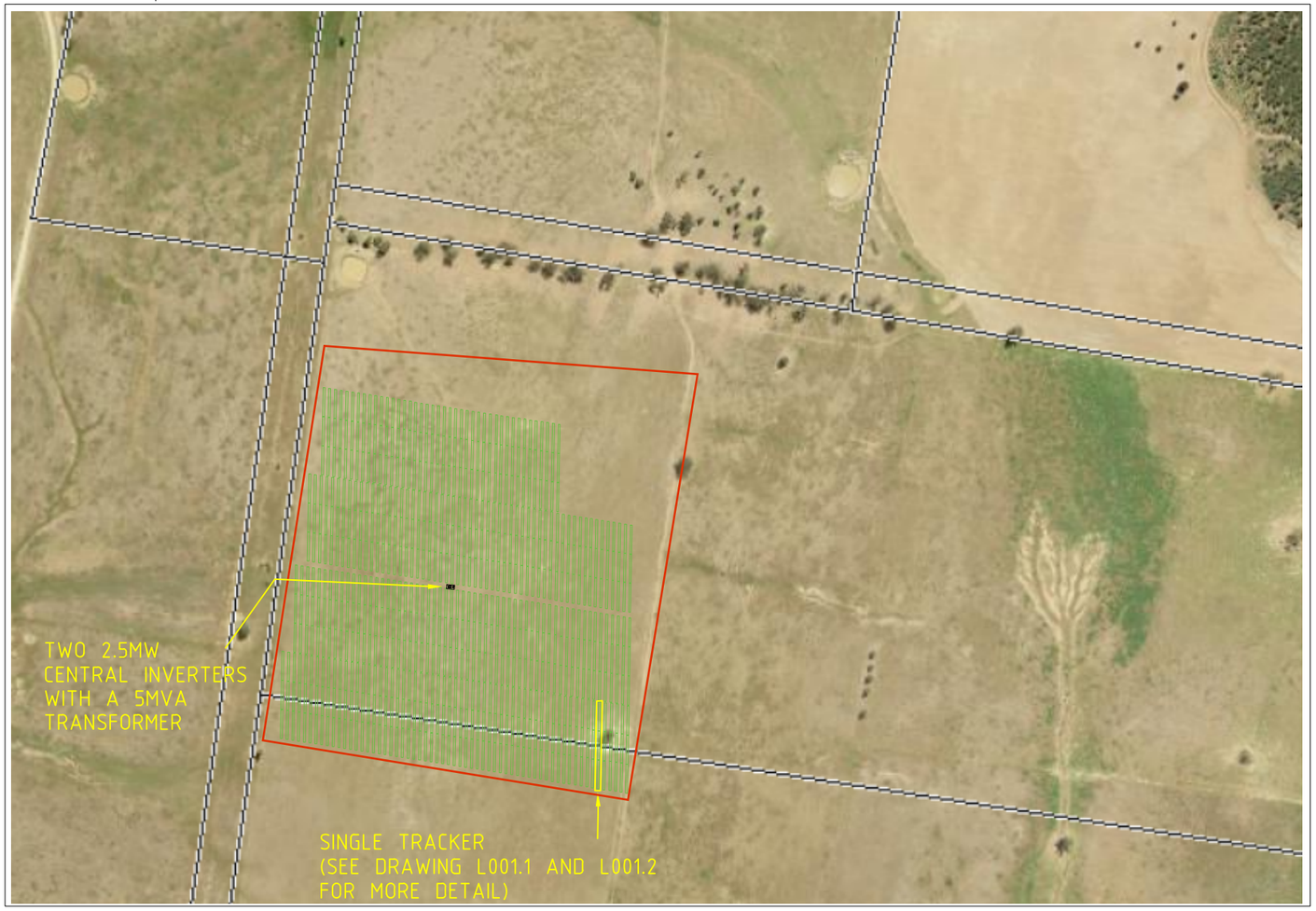
By date, or revision, the Report supersedes any prior report or other document issued by Golder dealing with any matter that is addressed in the Report.

Any uncertainty as to the extent to which this Report can be used or relied upon in any respect should be referred to Golder for clarification

APPENDIX B

Proposed Layout

L001. SITE LAYOUT



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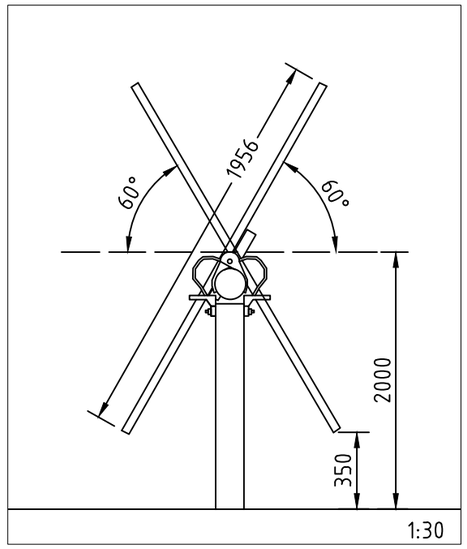
L001.1 TRACKER SECTION VIEW



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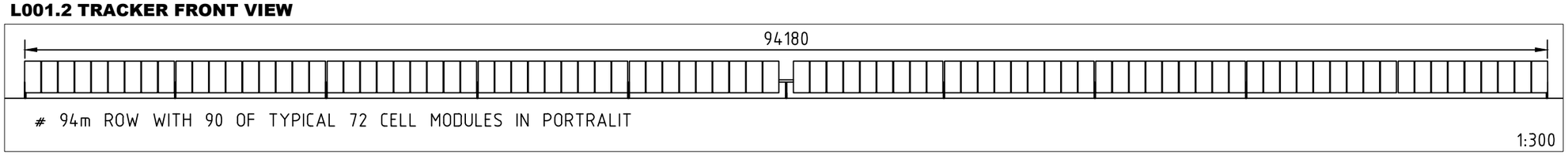
SYSTEM SPECIFICATIONS	
AC CAPACITY @ 25°C	5 MW ac
DC CAPACITY @ STC	6.14 MW dc
MODULE CAPACITY	320 Wp
INVERTER CAPACITY	2.5 MVA
PCS CAPACITY	5.0 MVA
DC/AC RATIO	1.2000
ROW SPACING	6 M
TILT ANGLE	±60°
AZIMUTH	0°
TOTAL MODULES	19,200
MODULES PER STRING	30
NUMBER OF STRINGS	640
NUMBER OF PCS	1
NUMBER OF INVERTERS - 2.5MW	2
NUMBER OF TRACKERS	214
PITCH	6 M

L001.2 TRACKER FRONT VIEW



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FOR INFORMATION

No.	Stage	Date
1	FOR INFORMATION	22/11/17
2	-	-/-/-
3	-	-/-/-
4	-	-/-/-
5	-	-/-/-
6	-	-/-/-

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O'connor, ACT 2602
Australia

Drawn by	WJ
Checked by	SD
Approved by	SF
Date by	4/6/18

DO NOT SCALE

Client –
Project – –
Scale –:–
Title SITE LAYOUT Narromine 4A
Original Size A3
Drawing No. : –
Rev: –

APPENDIX C

Narromine LEP Maps

Narromine Local Environmental Plan 2011

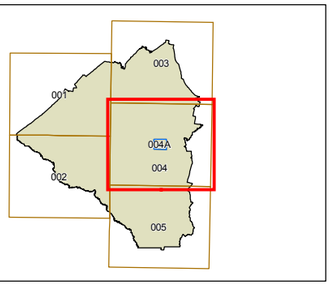
Flood Planning Map
Sheet FLD_004

Flood Planning Land

Flood Planning Area

Cadastre

Cadastre 14/12/2010 © Land and Property Information (LPI)



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Projection: GDA 1994
MGA Zone 56

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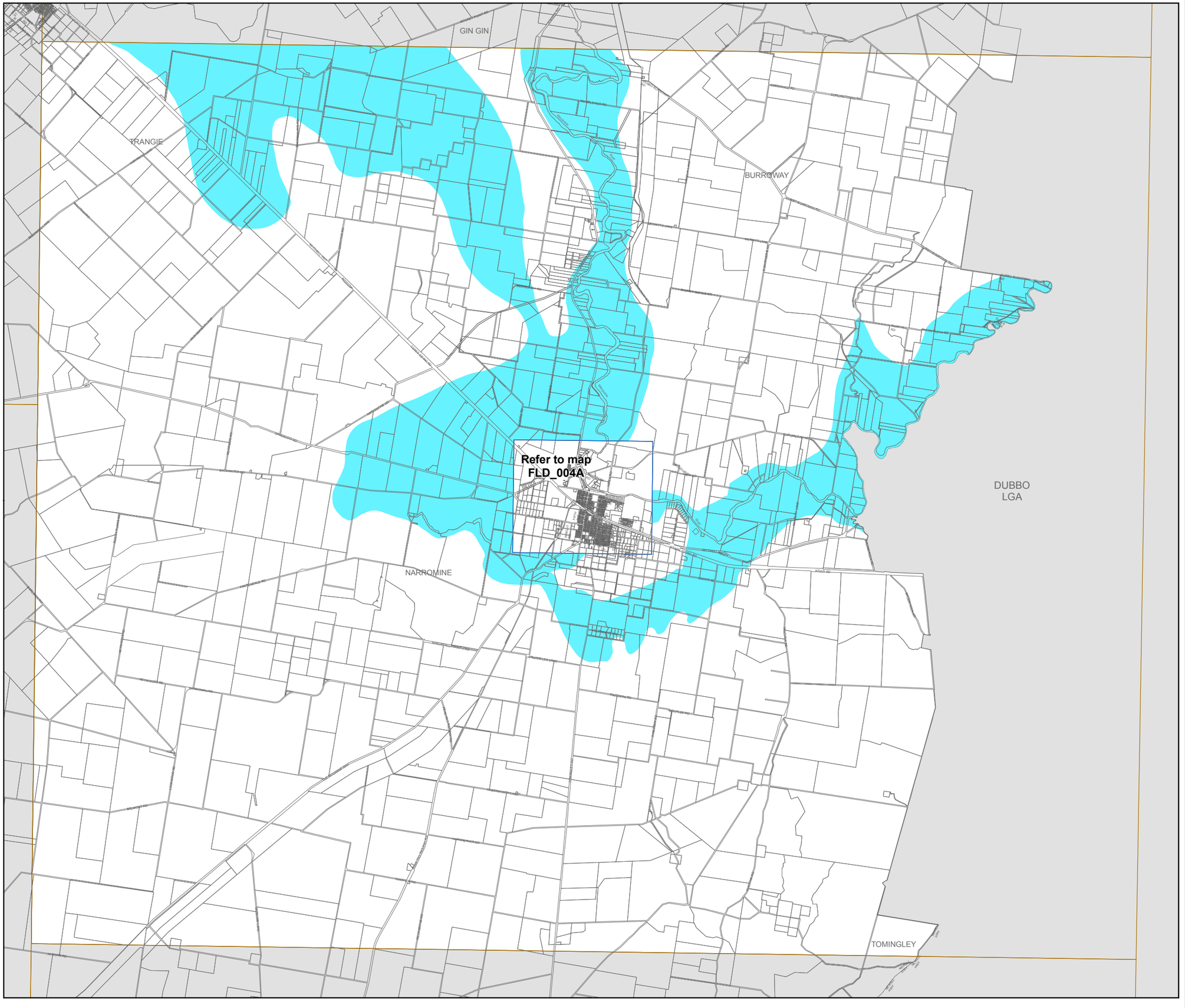


Narromine Local Environmental Plan 2011

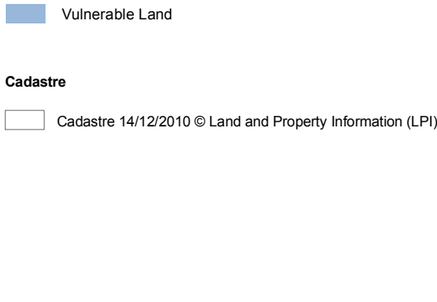
Groundwater Vulnerability Map
- Sheet GRV_004

Groundwater

Vulnerable Land

Cadastre

Cadastre 14/12/2010 © Land and Property Information (LPI)



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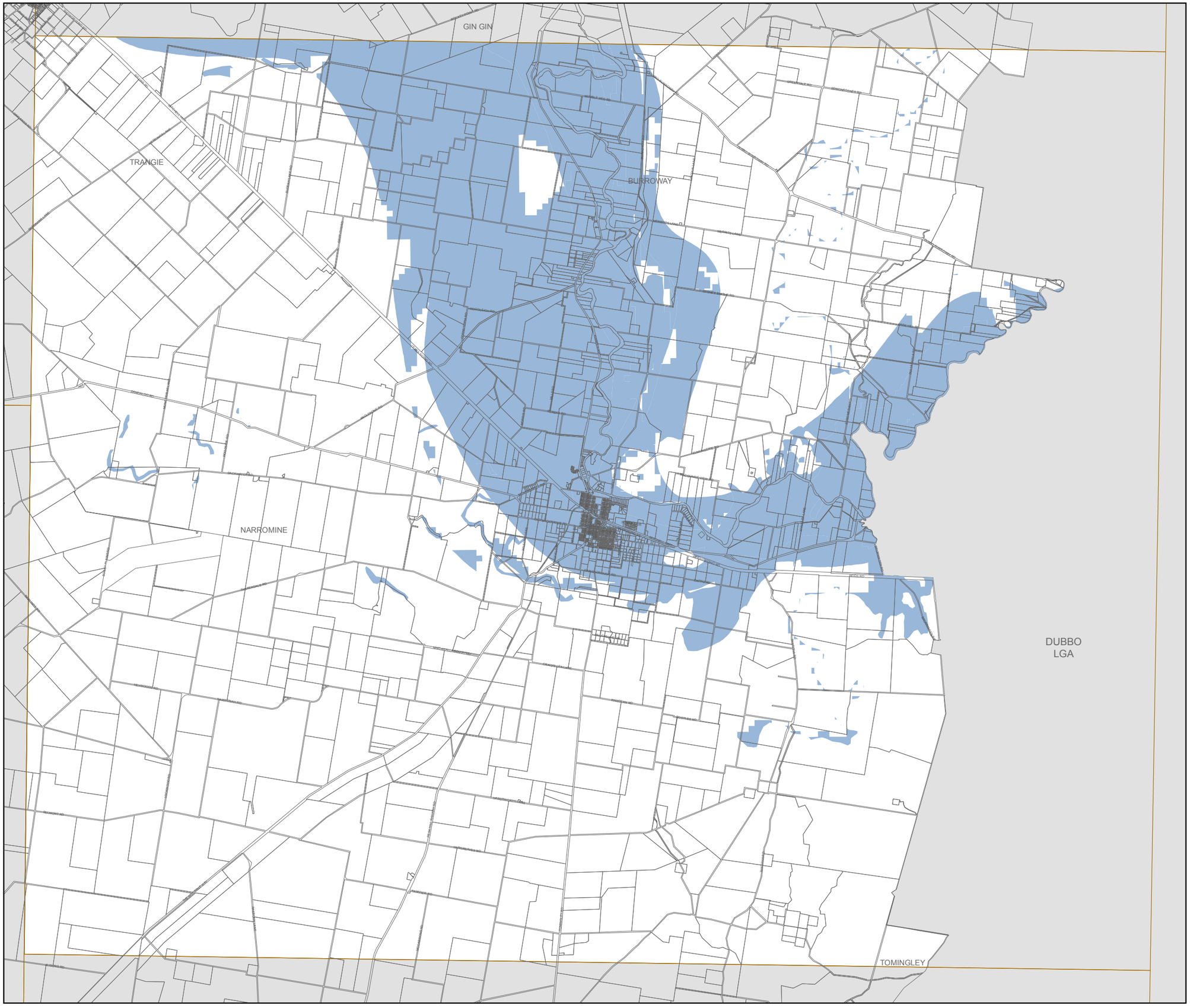

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