Submission from Coleambally Irrigation Co-operative Limited

Transgrid Project Energy Connect Electricity Transmission Lines and the Dinawan Substation

Environmental Impact Statement (EIS) for the NSW-Eastern Section of EnergyConnect with the NSW Department of Planning and Environment (DPE)

https://majorprojects.planningportal.nsw.gov.au/prweb/IAC/Cc0BJSdJ6OdBNUpuWBJD7zYCxcJRCjpn*/!STANDARD

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Background

Coleambally Irrigation Co-operative Limited are strongly in favour of Project Energy Connect and the Dinawan substation. This has the potential to add renewable energy production to the mix of economic, social and environmental productive activities for our region.

This submission is to add some extra local knowledge to assist the success of this development.

The background is that Coleambally Irrigation Co-operative Limited (CICL) is responsible for the maintenance and eventual replacement of the Road Bridges and Road Culverts that convey Irrigation and Drainage water under the public roads within the CICL Area of Operations.

CICL is also responsible for the drainage within the CICL Area of Operations. All of the roadside drainage and most of the rainfall runoff and overland water flows and local flood flows, within the CICL Area of Operations, make their way into the CICL drainage network and are conveyed to the Yanko Creek or the Billabong Creek. Of particular interest is that the Dinawan Sub Station in “Red Swamp” property to the east of Kidman Way is more or less in the headwaters of what becomes the Delta Creek.

With Regards to the Bridges and the Road Network

The CICL concern is that as well as an overweight truck or crane may cause a structure to collapse but also the budgeted remaining life of the bridge assets will be significantly reduced such that they may need to be replaced much sooner than our long term modelling and budgeting predicts. The members of CICL make an annual contribution to the CICL Sinking Fund to provide for the replacement of the assets when they reach the end of their economic life. CICL engage GHD to conduct a review of the adequacy of our Asset Replacement Sinking Fund every 5 years.

The Road Bridges over the three Drainage Channels, DC500, DC600 and DC800, near the proposed Transmission Alignment have inspected. These bridges are typical of the CICL bridges constructed in the 1960s.

DC500, 2 span concrete, Built 1962, IF138300

DC600, 2 span concrete, Built 1963, IF1774000

DC800, 2 span concrete, Built 1964, IF2507000

However all of the original bridges on the council road network that cross CICL Channels and Drains are also around 60 years old and only had an 80 to 100 year design life. Many of these structures are on the transport routes to be used in the construction of Project Energy Connect.

The bridges were constructed to the design loading applicable at the time of the Second World War which still applied at time of original construction of the assets of the Coleambally Irrigation Area by the NSW State government by their Water Conservation and Irrigation Commission, WC&IC.

With Regards to the Drainage Network.

All of the roadside drainage and most of the rainfall runoff and overland water flows and local flood flows make their way into the CICL drainage network and are conveyed to the Yanko Creek or the Billabong Creek. Of particular interest is that the Dinawan Switch station in “Red Swamp” property to the east of Kidman Way is more or less in the headwaters of what becomes Delta Creek.

There is a Black Box Depression on “Red Swamp” on the western side of DC800 that has a levee bank around it and an overflow inlet structure and a 1200mm concrete outlet pipe structure. This acts as a detention basin where drainage flows over say 500Megalitres/day can overtop into the detention basin. The levee bank is only made from the nearby soil. The crest of the levee bank is wide enough to drive a ute along, say 2.5m wide. Over time the cattle tend to walk of at the lowest spot the can see. It was topped up about 2012 with a road grader. It was never anticipated that there would be a major electrical substation a couple of kilometres down stream of the detention basin. 2016 CICL conducted a drone survey of the DC800 to identify any low spots in the banks of DC800 that could flood out onto adjoining grazing land. These identified low spots, mostly down towards the Yanco Creek, were topped up in 2017. We did not survey the levee bank as it had been recently topped up.

About every 10 years or so, the area receives heavy down pour of around 100mm in 24 hours. This can be either the tail end of a cyclone such as cyclone Yasi in February 2011, an “East Coast Rain Depression” or the tail end of a cyclone originating in the Indian Ocean that comes through central Australia.

Although the landscape looks flat, there are red soil rises and black soil depressions. In a big rain event the rainwater sheds off the red soil high ground and accumulates in the black soil depressions. These depressions can start flowing from the east generally towards the west following the natural gradient of the landscape.

The Transgrid Senior Surveyor, David Webb, who I met on Red Swamp has sent a LIDAR survey of the site for the Dinawan sub station and east to the Red Swamp detention basin area. The map I have seen of the proposed location of the Dinawan sub station appears to place it in a lower black soil area of “Red Swamp”.

Community Consultation Process Participation.

Kevin Kelly added a range of local knowledge comments to the original community consultation comments page at the following link;

https://www.transgrid.com.au/projects-innovation/energyconnect

This is the link to the Transgrid community consultation page, Update NSW Eastern Section relative to the siting of the Project Energy Connect infrastructure and construction access features.

On this early interactive map I had placed local information about CICL bridges and indicative condition status, Red Swamp detention depression and the Delta Creek headwaters flow lines from the Red Swamp to the west towards the Dinawan substation site.

Below is a listing of some of these comments.

West of Kidman Way

Four Corners road - CICL Access Bridge Pooginook -Wonga boundary. 12tonne Axle Group load limit.

Four corners road - CICL Road Bridge “Four Corners Rd over DC500”. Please contact CICL for Over Mass info.

Pooginook Rd - This is not a public road

CICL WCC “WONGA REGULATOR” uses Telstra network for remote communication.

CICL Farm 8005 WCC pump site

CICL Access Bridge “Wonga Front Drive” 14tonne Axle Group load limit.

CICL Access Bridge Wonga DC600. 12tonne Axle Group load limit

CICL Access Bridge Pooginook -Wonga boundary. 14tonne Axle Group load limit

West of Fernbank Road – South of Four corner Road, in corridor - CICL Access Bridge 12tonne Axle group load limit.

East of Fernbank Road – South of Four corner Road in corridor - Access bridge CICL - 12 tonne axle group loading

Dinawan Sub Station location – East of Kidman Way

CICL DC840

CICL DC800

CICL Access Bridge “DC800 Up Stream of Red Swamp”

Boundary bank of Red Swamp to contain flooding

CICL Drain and outlet structure from Red Swamp into Drainage Channel DC800

CICL Bridge over DC800 D/S of Red Swamp. Please ask for load limit. *Comment* CICL Bridge over DC800 down stream of Red Swamp was inspected 6June2021 and is in good condition. It will carry road legal loadings.

CICL Thurrowa Rd Road Bridge over Drainage Channel DC840. Please ask about load limits for construction equipment, particularly Cranes.

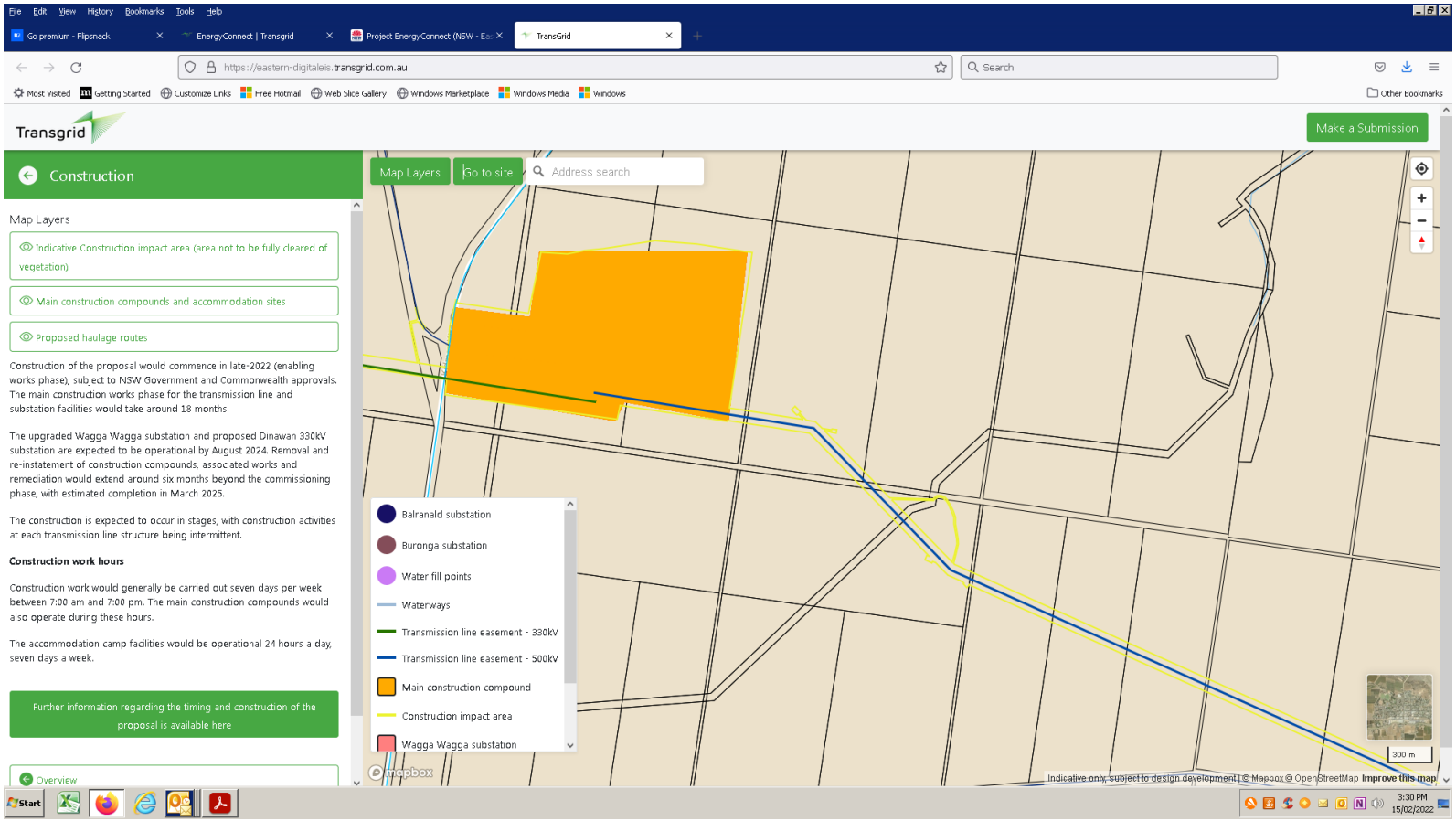
Overland Flood Flows in the Coleambally Irrigation Co-operative Area of Operations that may impact Transgrid Project Energy Connect Electricity Transmission Lines and the Dinawan Substation site.

We note in the EIS that there is extensive detailed reference to “Water courses”. Water courses on most maps are the Proclaimed Water courses as identified under various NSW State Legislation. Local experience in the very flat Riverine Plain is that following, either a wet winter or a heavy summer rain event, there is runoff from the higher red ground into the lower black soil depressions and gilgai country.

Looking at the Interactive EIS map located at

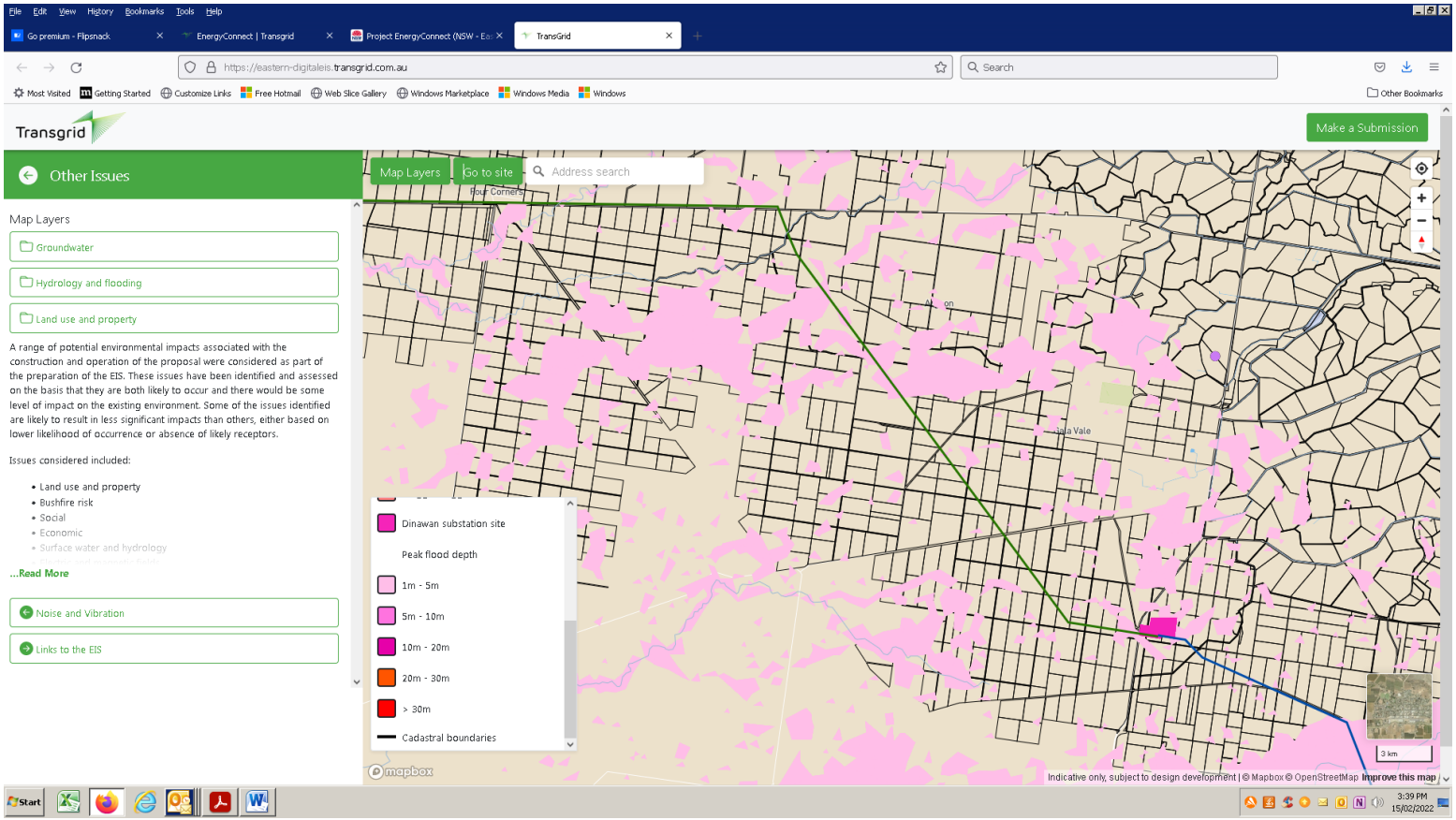
https://eastern-digitaleis.transgrid.com.au

we do not seem to see any reference to the local knowledge comments on the initial Transgrid community consultation page.



I have tried turning on the various “Map Layers” to try to find more details.

This Print Screen view above, only shows the boundaries of the easements and land owned by CICL. These are for the overland flood flow water management infrastructure that Coleambally Irrigation has in place to the east i.e. up Stream of the Dinawan Sub Station. This whole area is effectively the headwaters of the Delta Creek.



This Print Screen view above showing the “Peak Flooding Layer” shows the many depressions that fill up with water following overland flood flow after a big rain. A big rain could be 100mm in 48hours rain event. Water management infrastructure that Coleambally Irrigation has in place to the east i.e. up Stream of the Dinawan Sub Station mostly diverts, but definitely not all of, these overland flood flows into Drainage Channel DC800 and thence into the Yanco Creek to the south.

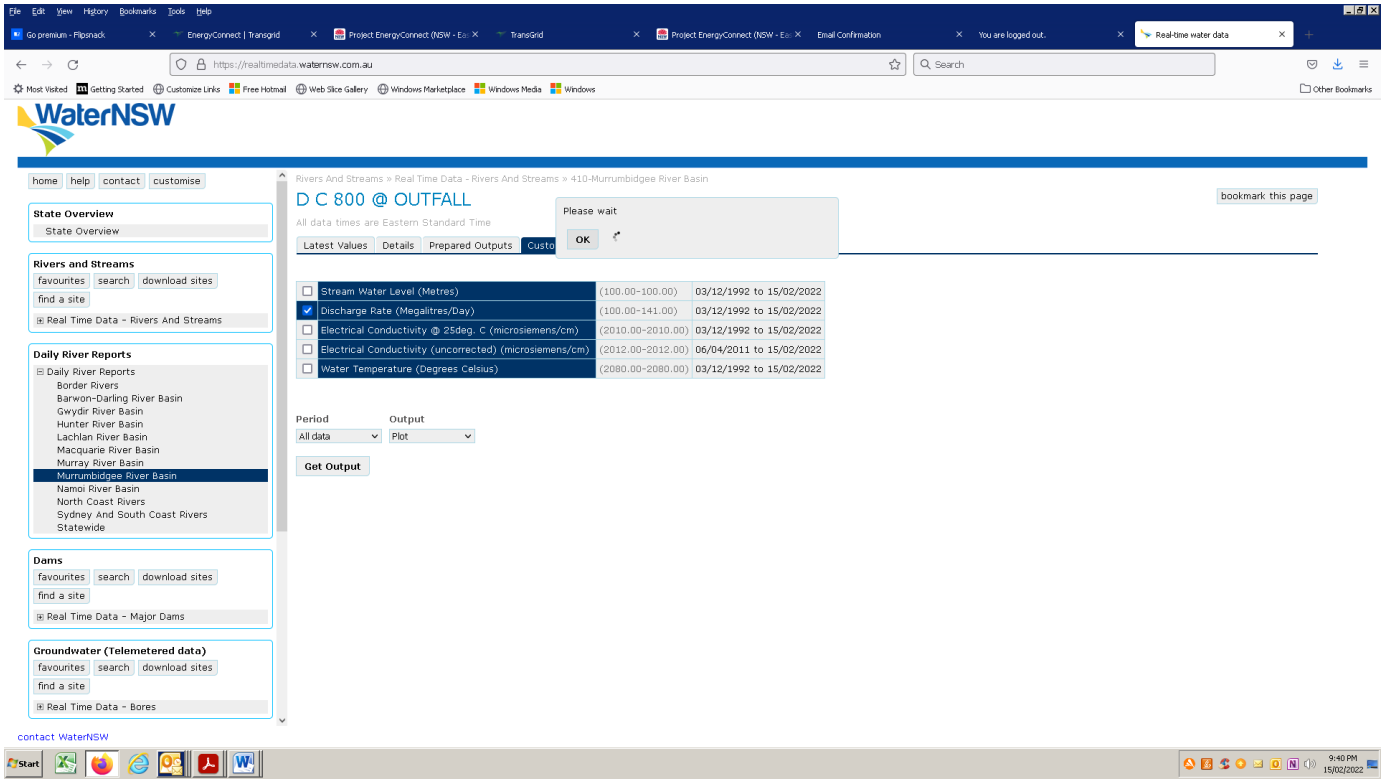
Flow information for the three Coleambally Irrigation Drains, DC500, DC600 and DC800

The EIS stated that there is no flow information available for the drainage system in the Coleambally Irrigation Area.

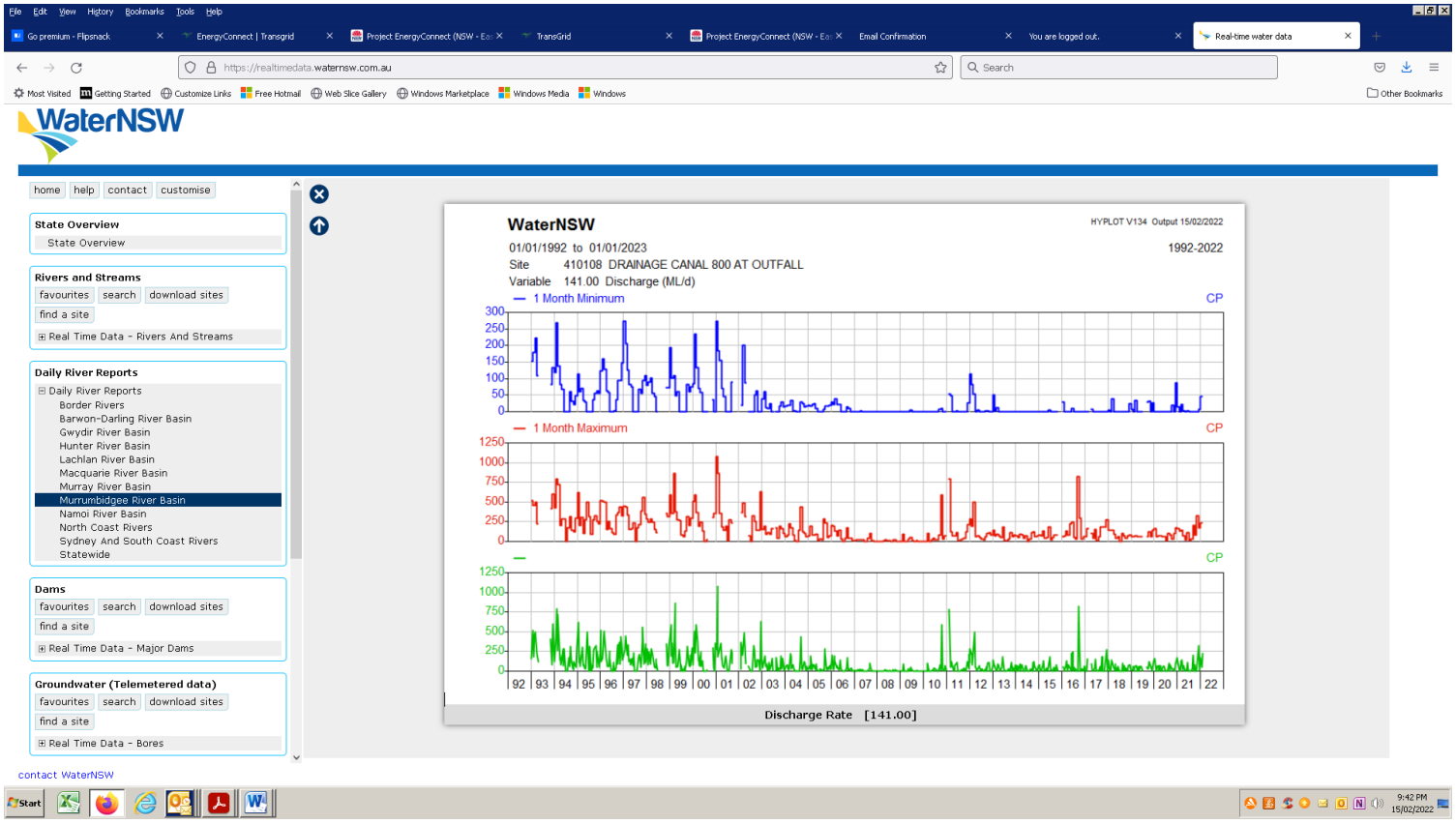
Flow information for the two bigger Coleambally Irrigation Drains, DC500 and DC800 that the project Energy Connect crosses over is readily available from the Water NSW Real Time Data website.

https://realtimedata.waternsw.com.au/

Select **Daily River Reports** then **Murrumbidgee River Basin** then scroll down to the measurement station e.g. **DC800 Outfall**.



Select **Custom Reports** to create the reports for the timespan of interest. This can be either graph plot or raw excel CSV data.



Monthly Max and Min flows in ML/Day from establishment of Hydrographic measurement station on 3Dec1992 to today.

On this print screen above, the lower green plot shows high flows in 1999, 2001, 2011 and most recently 2016.

Possible Solutions for Concerns with Electricity Transmission Lines in the Coleambally Irrigation Co-operative Area of Operations.

Pelican Strikes

The Pelicans breed up some where out west and turn up each autumn in time for rice draining and when we drain out the irrigation channels at the end of the irrigation season in May each year. As the pelicans fly they follow the water courses which are now our irrigation supply and drainage system. Unfortunately we do see a few pelicans each year that do not see the power lines that cross our channels and drains.

Solution. Coleambally Irrigation have been requesting that any new powerlines crossing our channels and drains have a visibility marker to try to reduce the pelican injuries and deaths. The round rotating red and white vane ball type, seem to be more effective than just flat flags.

Aerial Agricultural Pilots Strikes

I am concerned that there is a local history of for Aerial Agricultural pilots striking powerlines. In the Project Energy Connect alignment in this area there are three main uses of agricultural aircraft.

- Crop spraying.

Much of the aerial agriculture operations are done early in the morning when there is less wind. This can involve sun in the pilot's eyes. Normally this can all be pre-planned and utilise farm maps with all obstructions marked on the maps. Tragically there have been two crashes in this area where planes have hit power conductors.

North River Rd west of Carrathool spraying rice on Cobran Station about 25 years ago
North of Conargo 18 months ago a helicopter hit powerlines and the pilot also died.

- Plague locust spraying.

Last big plague it was mostly free-hand flying spraying where the ag pilot did the spotting of the bands of young hoppers and sprayed the biocontrol fungus as he found them. It was not possible to pre-plan the spray sites as the bands were on the move each day.

- Fire fighting using water bombing.

This is the aerial agriculture activity near powerlines that worries me the most. In Australia there is increased emphasis on use of aerial fire fighting to try to get on top of a fire quickly. Factors that increase risks include; reduced visibility due to smoke haze, the urgency of stopping the fire, working at sunset and into the dark, out-of-area pilots who may not be familiar with local landmarks and pressure to work longer than normal work days to just finish off the last bit of the fire outbreak.

Solution. Sorry, I do not know a cost effective simple solution for this concern.

Structural Stability of Guyed Towers.

In my experience, understanding the reliability of a structure requires understanding the “modes of failure” of the structure.

Another predictor of reliability is if one mode of failure occurs, what designed-in features prevent other related and/or consequential modes of failure that will occur.

For Example, if one tower was to fail and fall sideways, would this failure take a fair few other guyed towers with it?

Solution. Is there available a mode-of-failure analysis of the two tower types?

Designed Wind Loading

We have seen electricity transmission lines towers that were a twisted mess of steel after a high wind along O'Neil Rd to the north of the Coleambally Irrigation Area. The towers were redesigned and strengthened with extra cross stays and braces.

In this open flat Riverina Plain wind gusts can be say 100metres wide and very destructive. We see narrow strips of trees snapped off for a few kilometres long.

Solution. We need to know to what wind gust speed the proposed Guyed Towers have been designed compared to the existing tried and tested Lattice Towers.

Reliability of structures to fulfil all the functions required into the future.

The South Australian State Wide Blackout in September 2016 showed that there must be designed in resilience in our electricity grid network.

We are very pleased to see that Project Energy Connect is not only connecting electrons between each end of the interconnector, but also has the following grid stability functions;

- A.C. Frequency stabilisation
- It should provide Black Start capability for South Australia
- Reactive Power stabilisation
- Market price stabilisation
- Better utilisation of renewable energy.

Project Energy Connect is in marked contrast to the "innovative" Murray Link underground High Voltage DC connection between Red Cliffs in Victoria and Berri in South Australia. On paper Murray Link looked like a good technological solution to transfer electrical power between two extremities of the Australian east coast electricity grid. However it was useless to provide the above functions of grid stability during the South Australian State Wide Blackout in September 2016.

Solution. Learn from past mistakes so that they are not repeated. Listen to locals.

Just because “innovative” design is used in other places, does not make those innovative designs appropriate for our local situation.

Hope that this is of some help.

Please ask if you have any questions.

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You can not plough a paddock by turning it over in your head.

https://majorprojects.planningportal.nsw.gov.au/prweb/IAC/Cc0BJSdJ6OdBNUpuWBJD7zYCxcJRCjpn*/!STANDARD

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