A comment on the HumeLink Submissions Report and revised Biodiversity Development Assessment Report – part 2: failure to avoid or mitigate biodiversity impacts

HumeLink Alliance Incorporated
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We appreciate the opportunity to comment further on Transgrid's HumeLink Submissions Report, May 2024,[1] and now also the revised Biodiversity Development Assessment Report (BDAR), June 2024.[2]

Transgrid's Submissions Report and revised BDAR, fail to address fundamental flaws in satisfying the Planning Secretary's Environmental Assessment Requirements (SEARs) in the HumeLink EIS. This comment by HumeLink Alliance focuses on the failure to identify undergrounding as a means of avoiding or mitigating biodiversity impacts.

1. Planning Secretary's Environmental Assessment Requirements (SEARs) for biodiversity

Under the heading of Key Issues, the SEARs for the HumeLink project states:

> *'In particular, the EIS must address the following specific matters:*
>
> ***· Biodiversity:***
>
> *- an assessment of the biodiversity impacts of the project, in accordance with the* ***NSW Biodiversity Conservation Act 2016****, , the* ***Biodiversity Assessment Method (BAM) 2020****, the* ***Guideline for applying the Biodiversity Assessment Method at severely burnt sites 2020*** *and documented in a* ***Biodiversity Development Assessment Report (BDAR)****;*
> *- the BDAR must document the* ***application of the avoid, minimise and offset framework*** *including assessing all direct, indirect and prescribed impacts in accordance with the BAM;'*

Also Transgrid has said:[3]

> *'The Department of Planning, Industry and Environment (DPIE) requires projects to avoid, minimize or offset environmental impacts and Transgrid is required to demonstrate that no other feasible options with lesser impact are available as part of the environmental planning approvals.'*

[1] https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-36656827%2120240716T213012.700%20GMT
[2] https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=RFI-71034708%2120240626T080312.087%20GMT.
[3] Transgrid, 2021, *Response to Kyeamba Concerned Landowners Group.*

2. Failure to assess alternative modes or technologies under the BAM 2020

The Biodiversity Assessment Method 2020 (BAM), specifically states that the development proposal should analyse alternative technologies that would avoid or minimise impacts on biodiversity values (screenshot below):[4]

7.1.1 Locate the proposal to avoid or minimise direct and indirect impacts on native vegetation, threatened species, threatened ecological communities and their habitat

……..

4. When selecting a proposal's location, all of the following should be analysed. Justification for the decisions in determining the final location must be based on consideration of:
   a. alternative modes or technologies that would avoid or minimise impacts on biodiversity values
   b. alternative routes that would avoid or minimise impacts on biodiversity values
   c. alternative locations that would avoid or minimise impacts on biodiversity values
   d. alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values.

However, the revised BDAR fails to do any analysis of alternative technologies or investigate whether alternative technologies would avoid or minimise impacts on biodiversity.[5]

When attempting to address this requirement, the BDAR merely states that GHD did a report on undergrounding without providing any analysis or the analysis of the GHD HumeLink undergrounding study[6] (see screenshot below). The BDAR therefore fails to satisfy the requirements of the BAM.

Project location	
An analysis of alternative modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	Alternative technologies were considered for the amended project. GHD (2022) investigated several transmission network options for HumeLink which use underground cables (undergrounding). Clearing methodologies would be tailored to reduce impacts where practicable. Opportunities for individually assessing hazard trees will be considered further during detailed design where required to minimise impacts (Table 14-1, B21).

Source: *HumeLink revised BDAR*, June 2024, p490.

3. Evidence that undergrounding avoids or mitigates biodiversity impacts

There is clear evidence in the GHD HumeLink undergrounding study that undergrounding transmission avoids and mitigates biodiversity impacts. However, this information is omitted from the BDAR.

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[4] https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/biodiversity-assessment-method-2020-200438.pdf , p29-30.

[5] https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=RFI-71034708%2120240626T080312.087%20GMT , p490.

[6] GHD (2022), *Concept Design and Cost Estimate, HumeLink Project – Underground*, Prepared for Transgrid, Dated 22 August 2022 https://www.transgrid.com.au/projects-innovation/humelink/underground-reports.

The GHD study states that undergrounding has "*low ongoing operation and maintenance impacts (e.g., vegetation clearing)*" and that overhead transmission has greater direct and indirect impacts to fauna *"due to collision with lines, habitat fragmentation or degradation due to ongoing maintenance of the easement*."[7] None of this information is included in the BDAR or EIS.

The GHD study also estimated the biodiversity offset costs of underground options, noting that biodiversity offset costs are directly proportional to biodiversity impacts. The cost was estimated based on the easement width (screenshot below).[8]

Biodiversity Offset and Land costs are calculated for the TCs, TLs, as well as the reactor stations, transition stations (UGOHs) and convertor stations. The base offset rates used are displayed below (as stated in the proposal) and scaled according to the circuit easement width and overall route vegetation cover.

- Biodiversity offset costs: $2,090,000 / km (70 m easement). (Scaled for the easement on each option)
- Land costs: $475,000 / km (70 m easement). (Scaled for the easement on each option)

Additional assumptions include:

- For TCs/TLs constructed in proximity to each other, no cost reduction has been applied.

Source: GHD, *Humelink undergrounding study*, August 2022, p55.

The biodiversity offset costs for an overhead line, with a 70 m easement, are stated by GHD to be $2.090 million/km. Therefore, for the 340 km[9] HumeLink route, biodiversity offset costs of the overhead line are $711 million.

The easement width of underground "Option 2A-1" in the GHD study is 17.2 m compared with 70 m for overhead (2 x 2.1 m + 3 m + 2 x 5 m = 17.2 m), see Figure 1 below.[10] The biodiversity offset costs reported for the underground GHD Option 2A-1 were $363 million, 50% less than the overhead option (see Appendix A).

This 50% reduction in biodiversity offset costs implies that the underground option has 50% less biodiversity impact than overhead transmission. With such an enormous difference in biodiversity impact known to exist between overhead and underground transmission, this should have been clearly stated in the BDAR and EIS so that decision-makers and the public are aware of this difference.

Note also that a 50% reduction in biodiversity offsets for underground transmission is likely an underestimate, and the true savings in biodiversity offset costs could be as much as 75% (i.e. 17.2 m is 75% narrower than a 70 m transmission easement).[11]

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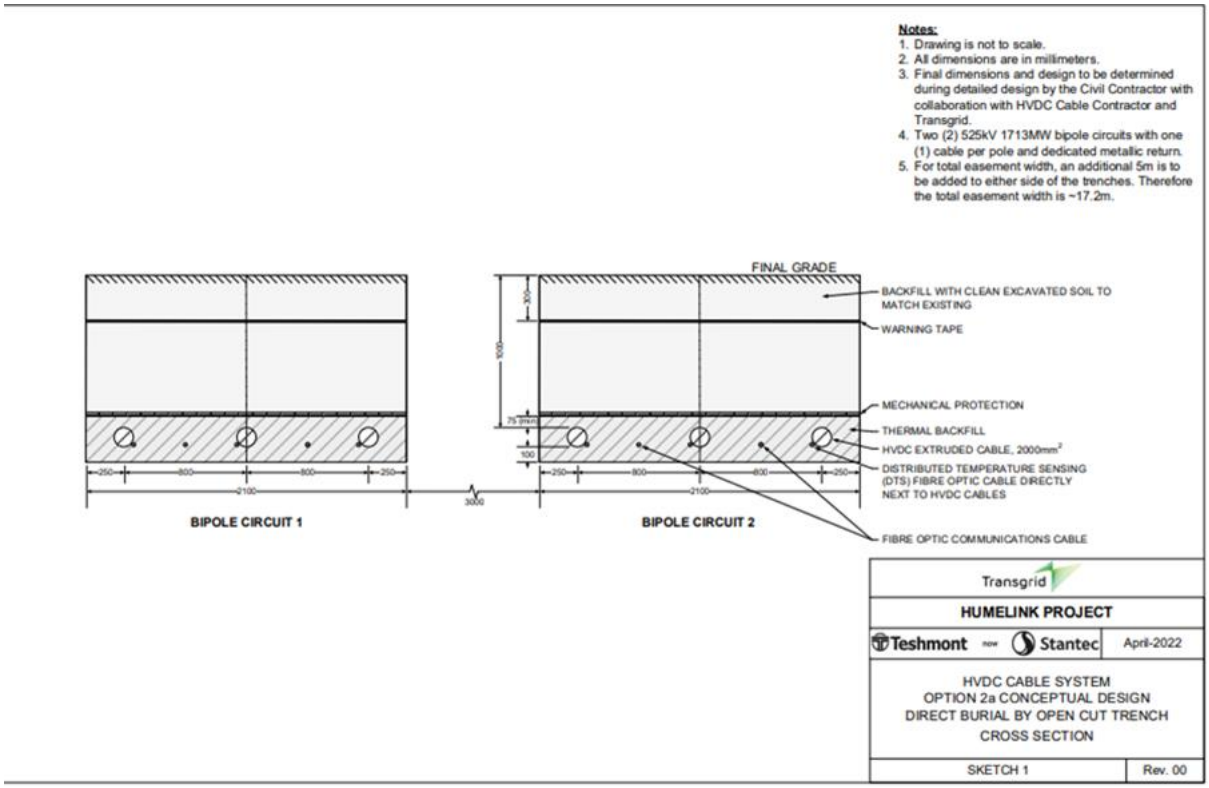
[7] GHD 2022, https://www.transgrid.com.au/projects-innovation/humelink/underground-reports, p74.
[8] GHD 2022, https://www.transgrid.com.au/projects-innovation/humelink/underground-reports, p55.
[9] 340km is the HumeLink route length in the GHD undergrounding study.
[10] GHD 2022, pdf p224. In addition to the widths in Figure 1, GHD allowed 5m either side of the trench.
[11] The biodiversity offset cost of GHD Option 2A-1 based on easement width is $175 million ($2.09 million/km x 17.2 m/70 m x 340 km = $175 million). However GHD (2022), Table 4.11: Option 2A-1 cost estimate, shows biodiversity offset costs of $363 million for underground GHD Option 2A-1, $188 million more than, the $175 million calculated value. It seems that the biodiversity offset costs calculated in Table 4.11 have applied the double circuit biodiversity cost to each single circuits TC1, TC2 and TC3, overestimating the biodiversity cost of GHD Option 2A-1 by around 100%.

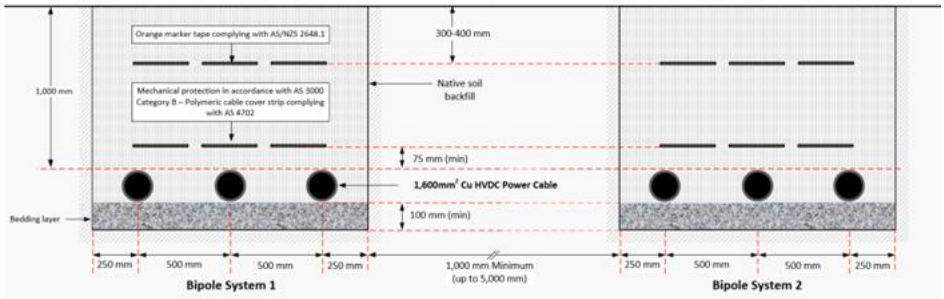
Figure 1: GHD Option 2A-1 HVDC cable system conceptual design



As well as the narrower easement width, it is also possible to horizontal directional drill for up to a kilometre with undergrounding, to avoid all biodiversity impacts in certain areas, for instance riparian zones, and so the biodiversity offset costs on the basis of easement width may well be an over estimation.

The undergrounding solution in the Amplitude Review[12], the 'Amplitude Modified Option 2A-1', has a minimum width of 4 m wide (2 x 1.5m + 1m = 4m), see Figure 5 below.

Figure 5 – Cable Trench Profile



[12] https://www.stophumelink.com.au/_files/ugd/805824_0e929837d10241e28e148cdfdaa30241.pdf

The easement width of 'Amplitude Modified Option 2A-1' at 4 m is 94% narrower than the overhead option at 70m. Therefore, the biodiversity costs can potentially be reduced 94% with undergrounding on the basis of easement width.

Amplitude used the 'same percentage' assumptions as applied by GHD in the GHD study to estimate biodiversity costs and estimated 'Amplitude Modified Option 2A-1' to have a biodiversity offset cost of $200 million, 70% less than the overhead option (see Appendix B).

4. Biodiversity offset strategy still inadequate

As noted in the EIS submission by former ecological consultant, Shana Nerenberg, the biodiversity offset strategy outlined in the BDAR provided no information on where the Humelink biodiversity offsets are located and what area of land they require. The amended BDAR provides no further information and still fails to provide a quote from the BCT confirming how much the biodiversity offsets will cost. Given the biodiversity offsets will necessarily occupy an area of land larger than the impact caused by Humelink, this lack of transparency is creating the same level of uncertainty and risk for the project as if the EIS was being prepared without knowing where in NSW the Humelink project will be located.

As Transgrid have not secured any offsets at this stage, there is no guarantee the biodiversity offsets will be available for Transgrid to purchase at the time they choose to purchase them. This is especially a problem for Plant Community Types (PCT) where 0% of the required credits are currently available or for PCTs in high demand.[13] Without an offset strategy than gives the location of the biodiversity offsets, there is no proof that the offsets exist or that the offsets are achievable. If the development is approved without knowing the location and details of the offsets, it is likely that the damage to the environment will occur before offsets are provided, opening the door to the offsets not being provided at all.

5. Concluding comments

The Amplitude Review of the GHD HumeLink undergrounding study establishes that undergrounding is a feasible option for the HumeLink project. With Snowy 2.0 significantly delayed and AEMO's optimal delivery timing of HumeLink being 2029-30, there is ample time to reassess the HumeLink project and adopt an underground solution.

Estimated biodiversity offset costs in the GHD study indicate that biodiversity offset costs would be 50% lower with an underground option than an overhead option, while the Amplitude Review of the GHD study found biodiversity offset costs of an underground option to be 70% lower.

Although the HumeLink BDAR acknowledges that the GHD (2022) undergrounding study was undertaken, it fails to disclose the major avoidance of biodiversity impacts with an underground option.

[13] See Table 16-2 (page 798) and Table 16-3 (page 799-800) of the amended BDAR

The environmental benefits of undergrounding are supported by environmental awards for other projects. Murraylink, for instance, which runs between Berri in South Australia and Red Cliff in Victoria, was the longest underground HVDC line in the world for some years, at 180km, and won the 2002 Case EARTH Award for Environmental Excellence for best practice and innovation in the environmental management of civil construction projects. Murraylink is renowned for only removing two trees along its 180km route.

The proposed Victorian 2200 MW offshore windfarm project, Star of the South, proposes to underground 75 km of transmission cables, and says:[14]

> '*While it's more costly to construct underground cables, we believe there are* ***many other benefits for the community, the landscape and the environment****.'*

The referral to the Environment Protection and Biodiversity Conservation Act (EPBC Act) states that the HumeLink project is significantly impacting matters of national environmental significance.

As a feasible alternative with a lesser impact, there are Commonwealth and State environmental legislative requirements for Transgrid to deliver the HumeLink project underground.

In addition to reduced loss of biodiversity, an underground option also has benefits of less risk of bushfires, more system security in severe weather, no loss of visual and noise amenity for landowners and communities, and less impacts on the productive efficiency of agriculture.

The SEARs state the EIS **must address** biodiversity environmental legislative requirements and assessment methods. The omission of consideration of undergrounding to avoid or mitigate biodiversity impacts of the project is a major failure of the HumeLink EIS and the revised BDAR. The HumeLink project as an overhead option is unnecessarily impacting matters of national environmental significance. Therefore, we urge you to deny planning approval for the HumeLink project as specified and uphold the requirements of the BAM for alternative technologies to be analysed.

[14] Star of the South, 2021, *Transmission fact sheet*.

Appendix A: Costs, including biodiversity costs, of GHD Option 2A-1[15]

Table 4.11 Option 2A-1 cost estimate

Case Scenario Capex Report		
Project	Hume Link - Underground Options Comparative Estimates	
Project Variant	2A-1	
Capex Total	$ 11,490,000,000	AUD
Transmission Line Capex	$ 7,717,000,000	AUD

Tranmission Cable	**TC1**	**TC2**	**TC3**		
Capital Cost				**Unit**	**Comments**
Subtotal	$ 4,431,000,000	$ 4,624,000,000	$ 2,431,000,000	AUD	All in costs (including offsets, convertor stations, reactor stations and UGOHs)
Installed Rate per km	$ 16,010,000	$ 15,790,000	$ 22,210,000	AUD/km	
Installed Cost per km/MW	$ 9,345	$ 9,216	$ 12,970	AUD/km/MW	
Subtotal	$ 3,143,000,000	$ 3,326,000,000	$ 1,248,000,000	AUD	Excludes offsets, convertor stations, reactor stations and UGOHs
Installed Rate per km	$ 11,350,000	$ 11,350,000	$ 11,410,000	AUD/km	
Installed Cost per km/MW	$ 6,628	$ 6,628	$ 6,659	AUD/km/MW	
Line Design				**Unit**	**Comments**
HVAC/HVDC	HVDC direct buried cable	HVDC direct buried cable	HVDC direct buried cable	-	
Voltage	525	525	525	kV	
Power/Rating	1,713	1,713	1,713	MW	
Circuit configuration	Bipole	Bipole	Bipole	-	
Location	NSW	NSW	NSW	-	
Country	Australia	Australia	Australia	-	
Length	277	293	109	km	
Number of Reactor Stations	0	0	0	-	
Number of Transition Stations	0	0	0	-	
Number of Converter Stations	2	2	2	-	
Cost Basis				**Unit**	**Comments**
Labour	$ 1,072,000,000	$ 1,134,000,000	$ 423,800,000	AUD	
Materials	$ 805,400,000	$ 852,300,000	$ 318,400,000	AUD	
Equipment	$ 686,600,000	$ 726,500,000	$ 271,500,000	AUD	
Engineering & PM	$ 211,300,000	$ 223,500,000	$ 83,520,000	AUD	
Pre-Construction	$ 175,700,000	$ 186,000,000	$ 69,480,000	AUD	
Distribs	$ 126,600,000	$ 134,000,000	$ 53,900,000	AUD	
Allowances	$ 65,220,000	$ 69,010,000	$ 27,770,000	AUD	
Additional Allowances				**Unit**	**Comments**
Biodiversity Offset Cost	$ 147,200,000	$ 155,400,000	$ 61,220,000	AUD	
Land Offset Costs	$ 33,450,000	$ 35,330,000	$ 13,910,000	AUD	
Reactor Stations	$ -	$ -	$ -	AUD	
Transition Stations	$ -	$ -	$ -	AUD	
Converter Stations	$ 1,107,000,000	$ 1,107,000,000	$ 1,107,000,000	AUD	
Footprints				**Unit**	**Comments**
Reactor Station	-	-	-	m2	Per station
Transition Station	-	-	-	m2	Per station
Converter Station	84,000	84,000	84,000	m2	Per station
Reactor Station	-	-	-	m2	Total footprint
Transition Station	-	-	-	m2	Total footprint
Converter Station	168,000	168,000	168,000	m2	Total footprint

[15] Source: GHD 2022, https://www.transgrid.com.au/projects-innovation/humelink/underground-reports, pdf page 60.

Appendix B: Costs, including biodiversity costs, of Amplitude Modified Option 2A-1[16]

Table 8 – HumeLink Option 2A-1 Cost Estimate

Line Design		Maragle to Bannaby	Gugaa to Bannaby	Maragle to Gugaa	Units
HVAC/HVDC		HVDC direct buried cable	HVDC direct buried cable	HVDC direct buried cable	
Circuit configuration		Bipole	Bipole	Bipole	
Voltage		525	525	525	*kV*
Power/Rating		1,285	1,285	1,285	*MW*
TR Value (K.m/W)		1.5	1.5	1.5	*K.m/W*
Soil Temp		25	25	25	*°C*
Cable Size		1,600	1,600	1,600	*mm^2*
Cable Cost /km		$770,000	$770,000	$770,000	*$AUD, 2023*
Route Length		277	293	109	*km*
Number of Converter Stations		2	2	2	
Capital Cost – Transmission Only					
Installed Rate per km of route		$6,239,000	$6,235,000	$6,293,000	*$AUD/km*
Installed Cost per km/MW		$5,000	$5,000	$5,000	*$AUD/km/MW*
Subtotal		**1,726,910,000**	**$1,826,921,000**	**$688,704,000**	***$AUD, 2023***
Capital Cost – Transmission, Converters and All Other					
Installed Rate per km of route		$10,007,000	$9,814,000	$15,296,000	*$AUD/km*
Installed Cost per km/MW		$8,000	$8,000	$12,000	*$AUD/km/MW*
Subtotal		**$2,769,910,000**	**$2,875,444,000**	**$1,673,888,000**	***$AUD***
Cost Basis					
Materials		$691,915,000	$732,391,000	$273,548,000	*$AUD, 2023*
Installation		$716,946,000	$758,018,000	$285,693,000	*$AUD, 2023*
Other		$318,049,000	$336,512,000	$129,463,000	*$AUD, 2023*
Engineering & PM	8%	$116,105,000	$122,791,000	$46,077,000	*$AUD, 2023*
Pre-Construction	7%	$96,543,000	$102,188,000	$38,331,000	*$AUD, 2023*
Distributions	5%	$69,564,000	$73,619,000	$29,736,000	*$AUD, 2023*
Allowances	3%	$35,837,000	$37,914,000	$15,320,000	*$AUD, 2023*
Additional Allowances					
Biodiversity Offset Cost	6%	$80,883,000	$85,377,000	$33,774,000	*$AUD, 2023*
Land Offset Costs	1%	$18,380,000	$19,410,000	$7,674,000	*$AUD, 2023*
Converter Stations		$943,737,000	$943,737,000	$943,737,000	*$AUD, 2023*
Total Transmission Cost:		**$7,319,242,000**			***$AUD, 2023***

[16] Source: https://www.stophumelink.com.au/_files/ugd/805824_0e929837d10241e28e148cdfdaa30241.pdf