EnergyConnect (NSW – Western Section)

Response to DPIE Request for Information – 7 May 2021 and subsequent discussions

10 August 2021

This memorandum provides final responses to the Request For Information (RFI) aspects raised by Department Planning Industry and Environment (DPIE) on 7 May 2021 (Sections 1 - 8) and additionally on 21 May 2021 and 30 June 2021 (Section 9). Submission comments received from the Department's Biodiversity and Conservation Division (BCD) in May, June 2021 and subsequently are also addressed in Section 1.

1. Biodiversity

Formal comments on the Biodiversity Development Assessment Report (BDAR) have been provided by BCD on two occasions including the 6 May and 1 June 2021, with additional follow up clarification comments received on 10 and 15 June and subsequently. The consolidation of responses to comment periods are summarised under each RTS heading below noting the:

- blue text identifies the 6 May BCD comment
- grey text following provides the TransGrid response
- **bold greyed text identifies the additional 1 June, 15 June and any subsequent BCD comments on the item**
- grey text following provides the further TransGrid response.

It is noted that a revised BDAR was prepared and was provided on 21 May 2021 in response to the 6 May comments raised. A further revised BDAR is now submitted 10 August 2021 to include additional detail as identified below in response to the 1 June, 10 June, 15 June and any subsequent comments raised by BCD.

> RTS 1. Provide detail about the connectivity strategy referred to in Table 8.1. For instance, how many 'strategic locations' for the 20m connectivity corridors will be placed along the alignment.

Connectivity corridors would occur as a minimum at:

- key riparian crossings (Darling, Anabranch, Murray)
- areas of the alignment joining proposed Biodiversity Stewardship Agreement sites and or conservation reserve estate.

Exact locations would be based on the Connectivity Strategy which would be developed post approval and subject to review as part of the Biodiversity Management Plan review by BCD.

1 June additional BCD response:

BCD considers that any corridors near offset sites and conservation areas would be important and expects that corridors will be created in the far west mallee areas. Any areas of existing dense mallee / belah should be the focus for connectivity. The Connectivity Strategy should provide detailed mapping of connectivity areas.

Additional TransGrid response: This is noted and will be addressed in the connectivity strategy.

> RTS 2. Provide evidence that alternative routes across the Great Darling Anabranch have been considered.

Section 3.3.1 of the EIS (NSW – Western section) (Volume 1) outlines the approach to the identification and refinement of the proposal corridor. A hierarchy of constraints and opportunities was used to define and refine the preliminary and preferred alignment corridors.

With reference to the proposed RTS 2 option, the proposed alternative line in BCD submission crosses directly over a residential property (deemed a Tier 3 constraint) and thus the preferred option in this area was to push the alignment as far from the residence without encroaching on the next residence approximately 770 metres further to the north (refer Figure 17-2 in EIS Vol 1) and while remaining aligned to the east-west trending property boundary. No viable options further south of these sensitive receivers were considered due to proximity to similar sensitive residential receivers.

1 June additional BCD response: Resolved

Additional TransGrid response: Noted

> RTS 3. Submit revised final spatial data so BCD can determine if BAM assessed area is complete.

Final spatial data has been provided with the revised BDAR.

1 June additional BCD response: Additional data set required to be submitted.

15 June additional BCD response: Please check and provide the complete dataset.

Additional TransGrid response: Additional data set is submitted and has been confirmed with BCD '*the version dated 11 June 2021* as being suitable with no further information required to be submitted.

RTS 4. Demonstrate that all disturbance has been thoroughly assessed in the BDAR, and where required is reflected in credit calculations

The revised BDAR contains updated approaches as discussed with BCD and it is on this basis that the impacts and updated BAM calculations are provided.

1 June additional BCD response: Additional data set required to be submitted. The approach to partial impact assessment reflects the outcomes of discussions between the Department, WSP and TransGrid.

Additional TransGrid response: Additional data set is submitted and has been confirmed with BCD as being suitable with no further information required to be submitted. Noted in relation to the partial impact assessment approach.

> RTS 5. BDAR to include revised assessment and mitigation measures for uncertain avifauna impacts

The revised assessment and mitigation measures for uncertain avifauna impacts are included in the revised BDAR.

1 June additional BCD response: Resolved. The approach to assessment and mitigation measures for uncertain avifauna impacts reflects the outcomes of discussions between the Department, WSP and TransGrid.

Additional TransGrid response: Noted

> RTS 6. The BDAR is to specify the techniques and equipment for operational maintenance activities that are to be included in the TransGrid Maintenance Guide (see 'additional comments' below).

The conditions of approval will require that the project is carried out in accordance with the EIS and as amended in response to the submissions received. The operational phase vegetation maintenance commitments in the Amendment Report (refer to Section 5.4.1 of the updated proposal description (operation) in Appendix A to the report) and the Biodiversity Development Assessment Report (refer to Section 10.3) will therefore become an environmental performance outcome that TransGrid must achieve. Mitigation measure B19 has been updated to capture this commitment (refer to Appendix G of this document).

It is not possible at this time, however, to confirm or commit to specific techniques and equipment that would be used to carry out the vegetation maintenance along the easement for EnergyConnect (Western Section) to achieve the required outcomes. Different techniques and equipment might be appropriate based on location-specific features such as the vegetation present, local topography and ground conditions. The selection of the vegetation maintenance techniques and equipment will be subject to an assessment process that considers the required outcomes, available methods and equipment, logistics and potential safety risks (as a minimum). This assessment process would occur prior to the commencement of any vegetation maintenance activities during the operational phase of the project. While the exact methods that will be adopted are currently unknown, the methods adopted will ensure that the vegetation maintenance outcomes that TransGrid has committed to are achieved.

1 June additional BCD response:

BCD considers that all potential impacts should be properly described. The operation/maintenance issues for this project are not new to TransGrid so they should be able to prepare their 'vegetation management protocols' based on experience with previous projects. TransGrid must be able to guarantee that the specific outcomes for vegetation integrity are achievable with current techniques and equipment.

For example, it may be that removal of individual trees by chainsaw is the only way to minimise soil disturbance to achieve those outcomes. But it is possible that removal of trees by hand (chainsaw) would be assessed as not safe or feasible, so the objective may not be achievable. There should be a contingency for this scenario.

Any additional impacts would need to be assessed and may generate an additional credit obligation.

15 June additional BCD response:

We expect to see specific mitigation actions in the revised BDAR to give DPIE confidence that the post-approval plans will result in no impact to areas that have not been offset.

For example, "exclusion zones will be established around all areas of retained vegetation and fauna habitat. These areas will be fenced using appropriate fencing materials and designated and signed as 'No-go Zones' or 'Environmentally Sensitive Areas' (or similar)."

Measure B14 (or equivalent in the current revision) should be updated to include: "Training will be provided to all project personnel, including relevant sub-contractors, on biodiversity management practices and the requirements from this plan through inductions, toolbox talks and targeted training". Timing: Pre-construction, construction and operational maintenance

Additional TransGrid response: The revised BDAR incorporates clear commitments in relation to exclusion zones for vegetation that does not need to be cleared during construction or maintained during operation.

Mitigation measure B13 (construction phase) commits that biodiversity exclusion zones will be physically marked and demarcated, and included on sensitive area maps, prior to clearing.

Mitigation measure B14 has been updated to commit that training on biodiversity management practices and the requirements for the project will be provided to all relevant project personnel, including relevant sub-contractors, through inductions, toolbox talks and targeted training.

Mitigation measure B19 (operational phase) has been updated to:

- confirm TransGrid's commitment to maintain vegetation in accordance with commitments in the EIS, as amended in the Amendment Report,
- develop and implement vegetation maintenance protocols that identify and consider biodiversity exclusion zones identified during the construction and other vegetation that does not need to be maintained during operation; and
- provide training to relevant TransGrid operational personnel and vegetation maintenance contractors regarding the vegetation maintenance protocols.

> RTS 7. Confirm that "clearance of vegetation within the corridor would be undertaken in accordance with TransGrid maintenance guides", refers to the new maintenance 'guide' that will be prepared for EnergyConnect (West).

TransGrid will maintain vegetation for EnergyConnect (Western Section) in accordance with project commitments (refer to Section 5.4 of the updated proposal description (operation) in Appendix A to the Amendment Report and also Section 10.3 in the BDAR). TransGrid will develop vegetation maintenance protocols for the project accordingly. This might include updating existing TransGrid maintenance procedures/guides or creating new bespoke maintenance procedures/guides specifically for EnergyConnect (Western Section). TransGrid will make a decision regarding exactly how these requirements will be captured in maintenance system for the project prior to the commencement of operation of the infrastructure. Regardless, the new or updated vegetation maintenance procedures/guides will be implemented for the project to ensure that the vegetation maintenance outcomes that TransGrid has committed to in the EIS (as amended in response to the submissions received) are achieved. Mitigation measure B19 has been revised to capture this commitment (refer to Appendix G of this document).

1 June additional BCD response: See RTS 6 - TransGrid has not provided an assessment of the feasibility of achieving the stated outcomes, by demonstrating that they are achievable with current techniques and safety standards.

15 June additional BCD response: TransGrid are to confirm (with DPIE Planning & Assessment) the mechanism for calculating and acquitting the impact of any post-approval impacts, specifically if clearing or disturbance is detected in the no-impact zone during operation or maintenance.

Additional TransGrid response: TransGrid has committed to maintain vegetation for EnergyConnect (NSW – Western Section) in accordance with project commitments and has updated project commitments in Appendix G accordingly. Furthermore, TransGrid has included a commitment to undertake a BAM-C calculation on the project's final project disturbance post construction and a commitment to meet any additional credit liability identified (refer to updated REMM15 in Appendix G).

> RTS 8. Revisions to the BDAR and provision of supporting data:

8.1: a. In Tables 3.9 to 3.13:

- List each Vegetation Zone according to identifiers in the five BAM-C cases.
- List plots that have been sampled (spatially) within each zone.
- Clearly identify the plots from outside that zone that were used to generate a VI score.

This is completed in the revised BDAR.

b. In Tables 5.1 to 5.5: - List each Vegetation Zone according to identifiers in the five BAM-C cases.

This is completed.

8.2. Summarise area of each subregion in Table 4.1 and include a simple subregion map.

This is completed.

8.3. Provide spatial data and submit finalised BAM-C cases for review.

This is completed.

1 June additional BCD response: This is completed in the revised BDAR. Additional updates to Tables 5.1 to 5.5 and 9.1 to 9.6 are requested however to ensure matching of Tables 3.9 to 3.13 and identification of vegetation zones as they are numbered in the BAM-C.

10 June additional BCD response: Tables in the memo (PS117658-ECO-MEM-001.pdf) are considerably easier to interpret and have identifiers that correspond with the BAM calculator. Thankyou.

Additional TransGrid response: Revisions to tables have been undertaken and confirmed with BCD for adequacy. The agreed revised table detail is now contained in the latest BDAR revision.

> RTS 9. All data sets to be provided to verify BDAR explanation of survey methods

This is completed.

1 June additional BCD response:

This issue has been resolved by re-classifying vegetation as moderate-good condition. The specific datasets referred to in our EIS response (Issue 9) are not mentioned in the revised BDAR.

However, not all species polygons developed for the assessment (and mentioned in Table 6.6 and Section 6.2.2) have been included with the final data submission (see RTS 3 recommendation B).

Additional TransGrid response: Revisions to datasets and attributes have been undertaken and checked with BCD. BCD have confirmed '*The dataset attributes relating to vegetation zones appear to be complete in the version dated 11 June 2021*' The agreed revised table detail is now contained in the latest BDAR revision.

> RTS 10. Provide details about proposed rehabilitation of construction and accommodation camp areas (noting the requirement under BCD Issue 2, RTS 4 regarding the assessment of any disturbance)

As per Section 6.6.7 (Demobilisation) in Appendix B (Updated proposal description (construction)) to the Amendment Report, disturbed "*areas would be restored back to their previous natural conditions as far as possible*". As indicated in Table 7-1 (Outline to CEMP sub-plans) of the Submission Report, "*rehabilitation strategies including progressive rehabilitation, and measures for the management and maintenance of rehabilitated areas (including duration)*" will be included in the Biodiversity Management CEMP Sub-Plan. General information about the likely rehabilitation is provided below.

The rehabilitation of areas subject to full disturbance (Disturbance Area A) (i.e. construction compounds, accommodation camps etc) would occur in consultation of the affected landholder and in accordance with associated land access agreements. Rehabilitation details would, therefore, vary from site to site. TransGrid notes that biodiversity offset credit liability calculations for areas subject to full disturbance assume that no native vegetation of conservation significance remains or is re-established on site.

In Disturbance area A (centreline clearing) root systems, topsoil and ground materials etc would be left in place. These areas would be generally left to regenerate naturally from root systems and any existing seed bank present. It is noted that these areas would form part of the inner maintenance area of the easement as indicated in Figure 5-9 and Figure 5-10 in Appendix A (Updated proposal description (operation)) to the Amendment Report. These areas would therefore be subject to future vegetation maintenance as required.

In Disturbance area B, a significant amount vegetation would be left in-situ. These areas would not be subject to rehabilitation.

1 June additional BCD response: BCD notes that is 'general information about the likely rehabilitation'. Any additional impacts would need to be assessed and may generate an additional credit obligation.

Additional TransGrid response: Noted

> RTS 11. The applicant be required to finalise and confirm the credit obligation for this project.

This is completed, to the greatest degree possible, given that the proposal footprint can only be indicative at this stage.

It is confirmed that the following replaces Amendment Report text in Section 6.2.4 and is consistent with the Revised BDAR. The proposal offset obligation has been calculated to require the following biodiversity credits:

- 10,715 ecosystem credits
- 1,562 species credits (1,284 of these are additional credits for indirect impacts).

1 June additional BCD response: BCD takes this to be the final minimum credit requirement.

Additional TransGrid response: Noted

> RTS 12. As a delayed offset obligation is being proposed, the applicant be required to provide further detail to demonstrate that the credit obligation (ecosystem and species credits) can be met for EnergyConnect (West).
>
> This should include evidence that:
>
> a) the biodiversity stewardship sites proposed in an initial memo (WSP 19 Oct 2020) are likely to yield the BOS credits necessary to retire the BOS credit obligation, and/or
>
> b) the potential exists to retire the obligation by purchasing BOS credits available in the market now, including how the variation and trading rules might be applied, and/or
>
> c) the applicant is able to meet the full obligation BOS credit obligation by paying into the BC Fund, and/or
>
> d) any other measures proposed will meet the Biodiversity Offset Scheme requirements, and
>
> e) that construction phases will result in the BOS credit obligation being incurred gradually, and how retirement of that obligation may be staged.

This has been completed, refer to Section 12.7 of the revised BDAR.

1 June additional BCD response: TransGrid to provide a Biodiversity Offset Strategy that clearly demonstrates how the credit obligation for EnergyConnect (West) will be met, addressing specific details required by BCD in their submission.

Additional TransGrid response: A revised BOS is provided in Section 12.7 of the revised BDAR. This includes further details on the estimated credits generated from the proposed BSAs based on available information to date, a commitment to meet the projects entire offset liability through one or more of the proposed offset strategies outlined in items a-d above and proposed staging of the establishment and retirement of credit liabilities against the currently estimated staging of the projects disturbance and approval. An indicative program of the BOS staging is provided below in Table 1.1.

This program provides an opportunity for the identification and Biodiversity Stewardship Agreement (BSA) establishment within Biodiversity Conservation Trust (BCT) establishment timeframes and sufficient ability to deliver on consolidated regionally significant conservation outcomes rather than series of smaller isolated BSAs.

As stated in Section 12.7 of the BDAR, TransGrid commits to meeting and retiring the total quantum of its credit liability in accordance with the BAM. Accordingly, TransGrid has included the following additional mitigation measure (B20) in the Final BDAR and the project's revised mitigation measure (refer to Appendix G of this document):

> *TransGrid will retire the total quantum of the project's biodiversity offset credit liability confirmed in accordance with the Biodiversity Assessment Method. TransGrid will develop a Biodiversity Offset Package that identifies measures to address the project's offset obligations and the timing and responsibility for implementation. Before commencing any project activities that impact biodiversity values, TransGrid will:*
>
> - *confirm the Biodiversity Offset Package with the Department of Planning, Industry and Environment, and*
> - *provide security to the Minister for Planning and Public Spaces for a Biodiversity Conservation Fund payment to cover any outstanding offset credit liability if the package is not implemented.*

Table 1.1 – Indicative program of the BOS staging

TIMING (YEAR)			2021		2022				2023			
Project Phase	**Project Stage**		**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**
Target approval and disturbance commencement	**EnergyConnect (NSW - Western Section)**		10,715									
Proposed BSA establishment	**Big Bend BSA**											
	Tareena BSA											
	Additional EnergyConnect (NSW – Western Section) BSA											
Credit Relinquishment	**Ecosystem Credits**	**BSA**					6,055 (Liability for PEC West from Western BSA)					4,066 (Residual PEC West liability)
		BCF										
	Species Credits	**BCF for Indirect**	1,284									
		BSA and or BCF Direct										278

KEY			
	Target Project Approval and Credit Liability estimate		BSA establishment
	Project disturbance commence		Credit relinquishment

> RTS 13. Conclusions about impacts on each threatened species be summarised in the MNES section of the BDAR.

This has been completed, refer to Section 9.9 of the revised BDAR.

1 June additional BCD response: Resolved.

Additional TransGrid response: Noted

> RTS 14. Remove non-binding terms from the BDAR

The use of the terms “where possible” and “where practicable” are considered to be appropriate, given the detailed design and construction methodology have not been finalised and that in certain circumstances it may not always be possible to implement the guidance contained in the BDAR. For example, the BDAR states that habitat features will be retained where possible, however this will be under the guidance of the suitably qualified ecologist and in some instances habitat features will not be able to be retained. TransGrid notes also the commitment (in mitigation measure B1) to avoid impacts to matters of biodiversity conservation significance to the greatest extent practicable during finalisation of the detailed design and construction methodology. Such statements indicate TransGrid’s commitment to impact minimisation. The terms used are appropriate given the scale and complexity of the proposal.

1 June additional BCD response: BCD considers that all impacts need to be properly described. Any additional impacts would need to be assessed and may generate an additional credit obligation.

Additional TransGrid response: Noted

> RTS 15. Amend the following actions in Table 11.1 as follows:
>
> *Action B1: This action lacks detail. For effective avoidance of impacts to threatened species or their habitat, the BDAR could specify that maps and spatial data (species polygons for species credit species) and buffered threatened species locations will be provided to the detailed design team and included in the CEMP.*
>
> *Action B2 (and Section 11.3.1, page 258): No clearing is to be undertaken outside the approved development footprint. Impacts to biodiversity that are not included in the BDAR must be assessed according to the BAM, by an accredited assessor.*
>
> *Action B18: The threatened biodiversity unexpected finds protocol should include reporting to BCD, submission of records to BioNet, and inclusion of the location on relevant CEMP and OEMP maps.*

This has been completed, refer to Table 11.1 of the revised BDAR.

1 June additional BCD response: Resolved

Additional TransGrid response: Noted

2. Noise

> **Provide a consolidated table of construction noise impacts for the residential receivers predicted to experience noise levels above the noise management levels during standard construction hours specified by the *Interim Construction Noise Guideline* (DECCW 2009). For each potentially impacted residence include:**
>
> – receiver identification (ID) number;
> – distance to transmission line corridor;
> – predicted noise level range based on proximity to works (best case and worst case); and
> – duration of impact for each construction stage.

Consolidated table

The residential receivers predicted to experience noise levels above the noise management levels (NML) during standard construction hours specified by the *Interim Construction Noise Guideline* (ICNG) (DECCW 2009) are detailed below.

The residential receivers with potential exceedances are identified for the transmission line construction works and the Wentworth compound and accommodation camp – enabling works (site establishment activity) only as these are the only activities which are identified to potentially exceed NMLs.

Construction works associated with the following activities do not have exceedances predicted at residential receivers:

- Buronga substation upgrade and expansion,
- the establishment and operations of the Buronga compound and accommodation camp
- the establishment and operations of the Anabranch South compound
- operation of the Wentworth compound and accommodation camp.

Tables 2.1 and 2.2 relate to the transmission line construction works. Table 2.1 identifies the potential noise level (up to maximum value range) and Table 2.2 presents the impacts based on the potential exceedance of the ICNG NML. Table 2.3 relates to the impacts from the Wentworth compound and accommodation camp works.

It is noted that in relation to the transmission line construction works that there are some clarifications since the noise technical paper was produced as follows:

- R647 and R3627 that were identified previously as potential residential receivers have been confirmed as being of industrial land use and therefore no longer considered in this assessment.
- Through further review of noise assessment, an error has been identified in the Technical Paper 8, Table 8.1 and 8.2 relating to affected distances for the TL – Earthworks and Civil Construction Works and Site Establishment and Access Tracks scenarios. With this error rectified, an additional receiver R3385 has been identified as exceeding the NML during transmission line works during standard hours for these scenarios, based on worst case scenario.

Table 2.1 – Potentially impacted residential receivers based on predicted noise levels for transmission line works by construction phase activity – worst case

Receiver identification (ID) number	Distance to transmission line corridor (m)	ICNG NML $L_{eq,15min}$	Predicted noise level based on construction phase activity and proximity to works – worst case dBA, $L_{eq,15min}$ (Values are up to ranges)							
			Enabling works	Site establishment and access tracks	Earthworks and Civil Construction Works	Tower Erection	Tower Assembly	Tower Stringing	Commissioning / Energisation	Demobilisation and rehabilitation
Indicative duration (weeks) Note 1			~2	~3	~4	~1	~3	~3	Occasional days over 4 month period	Up to 1 week
R1489	210	45	53	63	65	57	56	57	49	57
R2023	280	45	49	59	61	53	52	53	45	53
R2022	130	45	59	69	71	63	62	63	55	63
R3385	720	45	36	46	48	40	39	40	32	40
R1965	620	45	38	48	50	42	41	42	34	42

(1) Indicative timelines based on associated activities identified in Figure 6.2 Appendix B Revised proposal description of the Amendment Report (2021).

Table 2.2 – Summary of exceedances of ICNG Standard Hours NMLs for transmission line works by construction phase activity – worst case

Receiver identification (ID) number	Distance to transmission line corridor boundary (m)	ICNG NML $L_{eq,15\ min}$	Predicted exceedance range by construction phase activity – worst case, dBA, $L_{eq,15min}$ (Values are up to ranges)							
			Enabling works	Site establishment and access tracks	Earthworks and Civil Construction Works	Tower Erection	Tower Assembly	Tower Stringing	Commissioning / Energisation	Demobilisation and rehabilitation
Indicative Duration (weeks) Note 1			~2	~3	~4	~1	~3	~3	Occasional days over 4 month period	Up to 1 week
R1489	210	45	8	18	20	12	11	12	4	12
R2023	280	45	4	14	16	8	7	8	-	8
R2022	130	45	14	24	26	18	17	18	10	18
R3385	720	45	-	1	3	-	-	-	-	-
R1965	620	45	-	3	5	-	-	-	-	-

(1) Indicative timelines based on associated activities identified in Figure 6.2 Appendix B_Revised proposal description of the Amendment Report (2021).

Table 2.3 Predicted noise levels and exceedance range against ICNG Standard Hours NMLs for Wentworth construction compound and camp - enabling works activity

Receiver ID	Approximate distance to site boundary (Metres)	ICNG NML, $L_{eq\ 15\ min}$ dBA	Predicted noise level for enabling works – site establishment activity, $L_{eq\ 15\ min}$ dBA	Predicted range of exceedance to the ICNG NML, dBA (up to value)
Indicative duration of activity (weeks)		~8		
R3144 (Residence)	680	45	46	1
R3144 (Fort Courage Caravan Park)	570	45	48	3
R14914 Lot 2 DP623782 1600 Tooperoopna Road Rufus	570	45	48	3

Activity durations

Construction at each transmission line structure would be intermittent and construction activities would not occur for the full duration for each phase of construction as expressed in the indicative program of Figure 6-1 of the Appendix B_Revised proposal description of the Amendment Report (2021).

Figure 6-2 from Appendix B_Revised proposal description of the Amendment Report (2021) (included below) presents an indicative duration of construction activities associated with the transmission line structures. These indicative durations have been noted in Tables 2.1 and 2.2. Activities are not predicted to be continuous and break (non-activity) periods are expected in between each phase of works. The identified durations could vary and breaks between activities may be shorter which may lead to longer inactive periods in subsequent stages of construction at an individual transmission line structure. Durations of any particular construction activity, and respite periods, can vary for a number of reasons including (but not limited to), resource and engineering constraints, works sequencing and location.

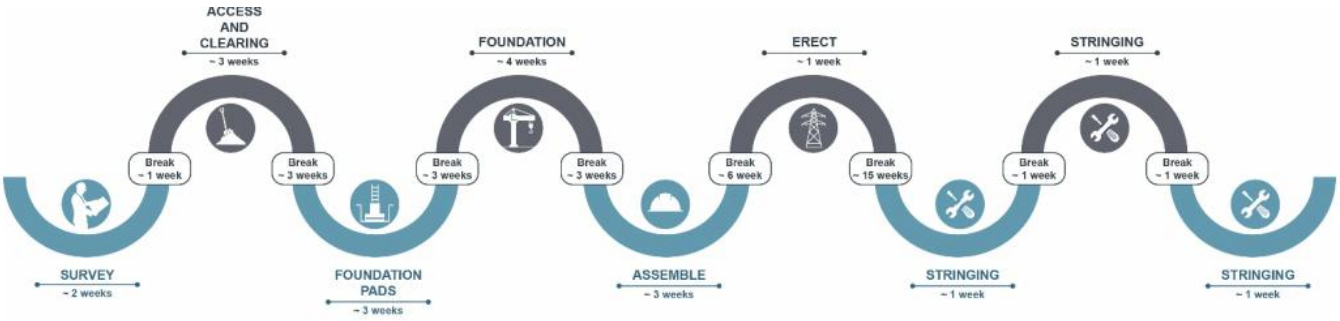

Figure 6-2 Indicative duration of construction activities at transmission line structures

Discussion

As discussed in Section 5.2.2.1 of Technical paper 8, the noise levels along the transmission line corridor and from Wentworth compound and camp enabling works activities have been modelled assuming all construction activities occur simultaneously and associated items of plant are in use concurrently. In the case of the potentially noisiest activity (Earthworks and Civil Construction Works), this means that 26 individual items of noisy plant are assumed to be operating concurrently at every location, regardless of the specific activity being carried out at that location (refer to Appendix B in Technical paper 8 – Noise and vibration impact assessment). The worst-case cumulative sound power levels assumed in the construction noise assessment are, therefore, highly conservative. For this construction phase activity, this approach leads to worst case cumulative sound power levels up to 7 decibels higher the worst-case noise level possible from the noisiest item of plant (excavator within hammer). The reality is that in any one location, there is only likely to be around 4 to 5 items of noisy plant operating concurrently.

When more realistic groupings of plant are considered, based on the sub-activities that make up this construction phase activity, worst case cumulative sound power levels could be 10 to 12 decibels less than the cumulative worst case noise level assumed for the construction noise impact assessment. In such instances, many of the receivers identified in Table 2.2 would not experience exceedances of NMLs during standard construction hours at all.

Also, the potential results are presented as a range (up to maximum possible dBA exceedance) based on the closest possible proximity of works to sensitive residential receivers (at the closest edge of the transmission line corridor or work site to the residential receiver).

The works are generally expected to occur at further away distances from the receiver (not everything and the transmission line corridor edge or Wentworth site edge) which would then reduce the expected levels. Further the intensity of equipment usage would also be expected to fluctuate and potentially result in reductions to predicted exceedances.

Technical paper 8 also discusses requirements of Construction Noise and Vibration Management Plan to be prepared by the contractor as well as implementation of appropriate mitigation measures to manage the likely impact. When implemented, these are expected to reduce the construction noise impact further.

As identified in the activity durations discussion above the works which have the potential to impact residential receivers with noise levels greater than NMLs would be intermittent and short term in nature.

> **Provide a consolidated table of operational noise impacts (corona discharge effect) for residential receivers predicted to experience noise levels above the project noise trigger levels specified by the *Noise Policy for Industry* (EPA 2017). For each potentially impacted residence include:**
>
> – receiver ID number;
> – distance to transmission line corridor; and
> – predicted noise level range based on proximity to transmission line (best case and worst case).

A consolidated table of operational noise impacts (corona discharge effect) for residential receivers predicted to experience noise levels above the project noise trigger levels specified by the *Noise Policy for Industry* (EPA 2017) is provided as Table 2.5.

In relation to the best case and worst case scenarios these are based on the potential proximity of the noise source (transmission lines) to the residential receiver based on the following:

> *Best case scenario* – the best case/longest buffer distance is determined by measuring the perpendicular distance between the building and the furthest boundary of the transmission line corridor, minus 40 metres to account for the easement.
> *Worst case scenario* – the worst case/shortest buffer distance is determined by measuring the perpendicular distance between the building and the nearest boundary of the transmission line corridor, plus 40 metres to account for the easement

This assessment is conducted for two possible operational characteristics of the transmission lines as identified in Table 2.4 (as included as Table 6.13 of Technical paper 8 of the EIS).

Table 2.4 Transmission lines operational characteristics (where relevant to noise emissions)

Scenario	Audible noise risk zone - distance from 330kV Transmission line centreline (metres)
Base case, wet weather	442
Base case plus 1% increase in SVG, wet weather	548
Base case, fair weather	<40 (i.e. within the easement designated for the transmission lines and towers)

Table 2.5 identifies results for potential impacts from the base case, wet weather and base case plus 1% increase in SVG, wet weather scenarios only as the base case fair weather scenario is predicted to not have impacts on any residential receiver.

Table 2.5 Operational noise impacts for residential receivers predicted to experience noise levels above the project noise trigger levels specified by the Noise Policy for Industry (EPA 2017) for the 330kV transmission line

ADDRESS/ LOT OF IDENTIFIED RECEIVER (type)	RECEIVER ID	APPROXIMATE DISTANCE TO POSSIBLE TRANSMISSION LINE CENTRELINES[1]		ESTIMATED SOUND PRESSURE LEVELS (Level of exceedance against 35 dB LAeq 15min PNTL - dB)			
				Base case (compliant at 442 m)		Base case +1% SVG (compliant at 548 m)	
		Worst case (metres)	Best case (metres)	Worst case	Best case	Worst case	Best case
'Dunvegan' homestead complex 2042 Low Darling Road Wentworth, Lot 3 DP1189519 (residential dwellings)	R1489 R2023	250 320	370 440	39 (4) 37 (2)	36 (1) 35 (0)	41 (6) 39 (4)	38 (3) 37 (2)
Low Darling Road Wentworth, Lot 2 DP1189519 (shed with accommodation)	R2022	170	290	41 (6)	38 (3)	43 (8)	40 (5)

(1) Distances have been reviewed and revised to address previous discrepancy in measurements and best case and worst case distances provided to represent the furthest and closest potential distances, respectively. This has resulted in reductions to some of the potential exceedances.

It is not deemed feasible or reasonable to achieve noise reductions through a change in conductor design or via noise barriers. As such, any noise mitigation would be in the form of receiver-based treatments.

The requirement for at-receiver treatments at legal dwellings would be confirmed during detailed design when the final location of the transmission line centreline is confirmed. As such, there is an opportunity that the residual noise impact may reduce from the assessed worst-case conditions.

AS/NZS 2107:2016 Acoustics—Recommended design sound levels and reverberation times for building interiors indicates a recommended internal design target for sleeping areas in residential buildings in rural areas of 25 to 30 dBA L_{eq}. Based on an outdoor noise level of 43 dBA L_{eq} during the worst-case scenario, an overall noise reduction of up to 13 to 18 dB is required to be achieved through the building envelope to meet the appropriate internal noise target in sleeping areas. The following noise reductions can be typically expected to be achieved under the following scenarios:

> Reduction of 5 to 10 dB by a building façade with an open window or door that is not greater than 20 per cent of the overall wall area
> Reduction that is equal or greater than 20 dB through a closed and well-sealed building envelope of standard timber-framed construction with external and internal cladding.

Based on a preliminary survey conducted of the identified dwellings, it is likely that a standard closed / well sealed timber-frame structure would achieve the required 18 dB reduction. However, as per standard practice, building condition surveys would be required to confirm if internal noise levels are achieved based on the current condition or if additional treatment is required. If treatment is required, effective treatment would likely consist of the sealing of sound insulation weaknesses in the structure, and/or provision of alternative means of air ventilation (should compliance require doors and windows to remain closed). This may require the provision of active ventilation systems. This commitment is captured in environmental mitigation measure NV2.

TransGrid notes that wet weather conditions or mists must be present to cause the corona discharge effect required to generate the worst-case impacts predicted in the assessment. The required conditions occur infrequently throughout the year and generally persist only for short durations.

Further detail is available in Appendix A.

3. Visual

3.1 Provide a consolidated table of visual impact ratings for residential receivers that are predicted experience visual impacts, include:

- receiver ID number;
- distance to transmission line corridor or other project works; and
- visual impact rating.

A consolidated table of visual impact ratings for residential receivers that are predicted to experience visual impacts from permanent project infrastructure components is provided as Table 3.1. An accompanying memorandum explaining the assessment methodology used to determine these impacts is included as Appendix B to this memorandum.

The potential impacts are only associated with transmission line components of the project. Each of these receivers are greater than 35 km away (and up to 100 km) from the Buronga substation facility and would therefore have no visual impacts from this project component.

Table 3.1 Consolidated table of visual impact ratings for residential receivers that are predicted to experience visual impacts

Receiver ID	Address	Receiver type	Approximate distance to transmission line corridor boundary (Metres)	Visual impact rating[1]
R1967	'Regunyah' homestead complex, north of Renmark Road Pine Camp, NSW	Residential Dwelling	1,015	Low
R1968		Residential Dwelling	1,080	
R3385	'Wilton' homestead, 3080 Anabranch Mail Road	Residential Dwelling	720	Low
R1489	'Dunvegan' Homestead complex at 2042 Low Darling Road, Wentworth, NSW	Residential Dwelling	210	Moderate to High
R2023		Residential Dwelling	280	
R2022	Low Darling Road, Wentworth, NSW	Residential Dwelling (Shed with accommodation)	130	Moderate to High
R1965	Wentworth, NSW 2648	Residential Dwelling (Shed with accommodation)	620	Low

Note 1 - To respond to this RFI, an impact rating of visual impact has been determined. A range has been included for each property, as the final positioning of project elements may increase or decrease the visibility of the proposal elements, their scale and compatibility with the existing view.

4. Location of residential receivers

> **Provide updated version of Table 4.1 of Technical Paper 8 Noise and vibration impact assessment, to include receiver distance to all infrastructure (transmission line corridor, accommodation camps, construction compounds, water supply points), receiver ID numbers and distance to infrastructure.**

A revised receiver table is provided below as Table 4.1. The table is revised to include all sensitive receivers along the project site. Receivers are included within a general 2 km buffer from the project site, noting a few additional receivers are included from further distance which have been assessed within the landscape and visual impact assessment as having a potential view of the proposal.

It is noted that when a receiver is greater than approximately 1.5 km from a potential project site component the distance has been noted simply as >1.5 km distance. This is as a result of there being no noise and vibration or visual impacts predicted from the works at this distance range or greater.

Table 4.1 Sensitive receivers along the project site

Receiver ID	Address	Receiver type	Approximate distance to transmission line corridor boundary (Metres)	Approximate distance to compound / accommodation camp facilities	Approximate distance to water supply points	Approximate distance to Buronga substation
R1967	'Regunyah' homestead complex, north of Renmark Road Pine Camp, NSW 2648	Residential Dwelling	1,015	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R1968		Residential Dwelling	1,080			
R3346	Noola' homestead, south of Renmark Road	Residential Dwelling	>1.5km	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R3341	'Talgarry' homestead, east of Rufus Road	Residential Dwelling	<1.5km	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R3385	'Wilton' homestead, 3080 Anabranch Mail Road	Residential Dwelling	720	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R2035	'Glen Esk' homestead Anabranch South, NSW 2648	Residential Dwelling	1,065	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R1548	Anabranch South, NSW 2648	Residential Dwelling	1,130	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R1489	'Dunvegan' Homestead complex at 2042 Low Darling Road, Wentworth, NSW	Residential Dwelling	210	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km

Receiver ID	Address	Receiver type	Approximate distance to transmission line corridor boundary (Metres)	Approximate distance to compound / accommodation camp facilities	Approximate distance to water supply points	Approximate distance to Buronga substation
R2023	'Dunvegan' Homestead complex at 2042 Low Darling Road, Wentworth, NSW	Residential Dwelling	280	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R2022	Low Darling Road, Wentworth, NSW	Residential Dwelling (shed with accommodation)	130	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R1965	Wentworth, NSW 2648	Residential Dwelling	620	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R3400	'Sturts Billabong' homestead on Low Darling Road	Residential Dwelling	<1.5km	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R3627	Lot 1 DP1180587, Ellerslie substation Pooncarie Road	Utility facility	165	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R2026	694 Arumpo Road	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km (2,070m)
R2027	Opp 694 Arumpo Road	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km (2,340m)
R2028	16A Drovers Drive, Mallee	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R2029	16B Drovers Drive, Mallee	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R986	Trentham cliffs, NSW 2738	Industry facility	1,400	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km

Receiver ID	Address	Receiver type	Approximate distance to transmission line corridor boundary (Metres)	Approximate distance to compound / accommodation camp facilities	Approximate distance to water supply points	Approximate distance to Buronga substation
R980	88 Alfred Elms Road	Residential Dwelling	1,010	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R979	87 Alfred Elms Road	Residential Dwelling	1,105	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R963	59 Chanters Lane	Industry facility	1,150	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R960, R961	Trentham Cliffs, NSW 2738	Residential Dwelling	1,100	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R959	6187 Sturt Highway	Residential Dwelling	1,185	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R958	Monak, NSW 2738	Residential Dwelling	1,140	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R957	Monak, NSW 2738	Residential Dwelling	1,110	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R956	Monak, NSW 2738	Residential Dwelling	1,370	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R647	Trentham cliffs, NSW 2738	Industry facility – Sheds	380	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R3433	59 Chanters Lane	Residential Dwelling	1,150	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R2103	Ellerslie, NSW 2648	Education facility	>1.5km	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R2033	‘Allanvale’ homestead	Residential Dwelling	>1.5km	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km

Receiver ID	Address	Receiver type	Approximate distance to transmission line corridor boundary (Metres)	Approximate distance to compound / accommodation camp facilities	Approximate distance to water supply points	Approximate distance to Buronga substation
R1411	'Warriwillah' homestead, Ellerslie Road	Residential Dwelling	>1.5km	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R13972	240B Ellerslie Road	Education facility	1,550	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R13650	248A Ellerslie Road	Community facility	1,450	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km
R3144	Residence and Fort Courage Caravan Park, 1703 Old Renmark Rd, Wentworth	Residential Dwelling	>1.5km from transmission line corridor	680 m (Residence) and 570 m (Caravan Park) to the Wentworth main construction compound and accommodation >1.5km from other compounds and camps	320 m (Wentworth main construction compound and accommodation camp water supply location) >1.5km from other water supply points	>1.5km
R14914	1600 Tooperoopna Road, Rufus (Lot 2, DP623782)	Residential Dwelling	>1.5km from transmission line corridor	570 m to the Wentworth main construction compound and accommodation >1.5km from other compounds and camps	270 m (Wentworth main construction compound and accommodation camp water supply location) >1.5km from other water supply points	>1.5km
Including: R3432, R962, R963, R967, R978-980	Numerous residences to the east of the Sturt Highway, on the outskirts of Trentham Cliffs	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	>1.5km from all water supply points	>1.5km

Receiver ID	Address	Receiver type	Approximate distance to transmission line corridor boundary (Metres)	Approximate distance to compound / accommodation camp facilities	Approximate distance to water supply points	Approximate distance to Buronga substation
-	42 Arthur Street, Wentworth (Wentworth residential area surrounds this receiver)	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	6 m (Beverley Street, Wentworth water supply point) <1.5km from other water supply points	>1.5km
-	82 Allombo Road (Corner Channel Road) Coomealla	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	255 m (Fletchers Lake Drive, Dareton water supply point) >1.5km from other water supply points	>1.5km
-	48 River Drive, Buronga (Buronga residential area surrounds this receiver)	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	50 m (River Drive Buronga water supply point) <1.5km from other water supply points	>1.5km
-	690 Pomona Road, Pomona	Residential Dwelling	>1.5km from transmission line corridor	>1.5km from all camps and compound sites	10 m (690 Pomona Road, Pomona water supply point) >1.5km from other water supply points	>1.5km

> **The Department notes that distance between residential receivers and project works presented in Table 4.1 of the Noise and vibration impact assessment is inconsistent with section 5 (page 62-63) of the Landscape and visual impact assessment and section 13.5.4 of the EIS. Review and confirm distances.**

The distances in the Table 4.1 the Noise and vibration impact assessment were measured based on approximate distance from the receiver to the boundary of the transmission line corridor. The Landscape and visual impact assessment and associated summary text in 13.5.4 of the EIS was based on measurements to an indicative transmission line alignment (approximate centreline) within the transmission line corridor. This indicative alignment was based on the indicative disturbance area and was used in the landscape and visual impact assessment in the preparation of photomontages. The revised table included in section 3 above has clarified the distances and now matches the noise and vibration impact assessment table distances.

Based on the revision of distances for the landscape and visual impact assessment, and in consideration of the amendment report assessment findings, the text in section 13.5.4 should be per the text below. Noting previously a property about 500 metres east of the proposal in the vicinity of the Sturt Highway within the Arable landscapes on the Murray River plain landscape character area was identified as having potential visual impacts. It has now been confirmed with the landholder that the structure at this location is a shed and not a private residence.

13.5.4 Impacts on views from private properties

Distances to closest private properties from the transmission line corridor range from around five kilometres to 130 metres. Impacts would depend on the distance to the transmission line corridor, as well as presence of vegetation or intervening terrain.

There are a number of private properties where there is a potential visual impact, including 'Regunyah', within the Lake Victoria Cultural Landscape and semi-arid plains character area; 'Wilton' and 'Dunvegan' and two surrounding properties each with sheds with accommodation in the Mallee shrubland and rural landscape. In the vicinity of residences such as these, mitigation measures (such as maximising the spacing of transmission line structures, or screening) would reduce the extent of visual change and reduce the potential visual impact.

5. Traffic and transport

5.1 Provide a schedule of all proposed road works and upgrades, including site access point requirements

The proposal does not propose to construct new roads or upgrade existing roads.

New temporary access points would be required, which would require the construction of new connections or an upgrade of an existing access point. The schedule of required access points is provided in Table 5.1. In most instances, access for transmission towers construction areas would cater for low vehicle movements.

The type of access point has been determined with consideration to the type of road that is being impacted (e.g. minor paved road, major road or highway or gravel road). Sealed access points would be provided where the access point connects to a sealed road.

As provided in mitigation measure TA1, the design of the site access/egress points would be agreed with the relevant roads authority and would be designed in accordance with the Traffic Control at Worksites, Austroads Guide to Road Design and Austroads Guide to Traffic Management, and approved by the relevant roads authority.

The final location for the access points would be confirmed during detailed design, and would align with the location of the proposed transmission towers.

Table 5.1 Indicative access point schedule

Road	Proposal feature	Relevant road authority	Type of access point	Indicative number of access points
South Australian border to Buronga substation				
Renmark Road	Transmission towers	Council	New access off a gravel road with minimal temporary works required.	79
Nulla Road	Transmission tower	Council	New access off a gravel road with minimal temporary works required	1
Annabranch Mail Road	Transmission towers	Council	New access off a gravel road with minimal temporary works required	3
Silver City Highway	Transmission towers	Council / TfNSW	Upgrade of existing access points.	2
Silver City Highway	Anabranch South main construction compound	Council / TfNSW	A new access point to a major road/highway.	1
High Darling Rd	Transmission towers	Council	Upgrade to existing access points off a gravel road.	2
Lower Darling Rd	Transmission towers	Council	New access point off a minor paved road.	1
Lower Darling Rd	Transmission towers	Council	An upgrade to an existing access point on a minor paved road.	1
Wentworth Pooncarie Rd	Transmission towers	Council	An upgrade to an existing access point on a minor paved road.	1
Wentworth Pooncarie Rd	Transmission towers	Council	New access point off a minor paved road.	1
Renmark Rd	Wentworth Camp	Council / TfNSW	New access point off a minor paved road.	1
Arumpo Rd	Buronga Substation/Camp	Council / TfNSW	An upgrade to an existing access point on a minor paved road.	1
Buronga substation to Victorian border				
Arumpo Rd	Transmission tower	Council / TfNSW	An upgrade to an existing access point on a minor paved road.	1
Dansons Rd	Transmission tower	Council	New access off a gravel road with minimal temporary works required.	1
Sturt Hwy	Transmission tower	Council / TfNSW	A new access point to a major road/highway.	1

Road	Proposal feature	Relevant road authority	Type of access point	Indicative number of access points
Sturt Hwy	Transmission towers	Council / TfNSW	An upgrade to an access point on a major road/highway.	1
Woomera Ave	Transmission towers	Council	An upgrade to an existing access point on a minor paved road.	1

5.2 Confirm that all ground disturbance associated with road and site access upgrades has been assessed.

The impacts of the ground disturbance associated with the site access requirements (as detailed above) have been assessed within the study area including the potential biodiversity impacts.

Some further assessment for heritage will be required where the access tracks extend outside the surveyed area, the requirements for the further assessment is detailed in mitigation measure AH3. In many cases access tracks that extend into these areas are following existing access tracks and disturbance to these areas due to proposal activities is low.

5.3 Provide the indicative number of oversize and overmass vehicles required during construction.

It has been confirmed through consultation with DPIE that Section 2.9.3 of the Amendment Report provided the required level of detail and no further information is needed in response to this item.

However, it is clarified that the vehicle numbers provided in Table 2-5 of the Amendment Report, only the following deliveries would be via oversized and overmass vehicles: 200 MVA 330/220 kV power transformers, 200 MVA 330kV phase shifting transformers, sychronous condenser and 60 MV 330kV shunt reactors. This equates to less than 20 vehicles. The other equipment being delivered would be via containerised transport. The final number and schedule of these movements would be confirmed during detailed design.

6. Figure updates

6.1 Project site and project figures

> **Revise maps and figures to include a defined 'project site' that encompasses all works associated with construction and operation of the project,**

> **Provide updated Figures 1.2, 17.1 from the EIS and Figure 6.3 series and Figure 6.8 from Appendix B - Revised Proposal Description – construction of the Amendment Report.**

A project site which includes all project features has been defined for inclusion on figures.

Appendix C to this memorandum provides the revised figures 1.2, 17.1 from the EIS and Figure 6.3 series and Figure 6.8 from *Appendix B - Revised Proposal Description – construction* of the Amendment Report.

Further updates have also now been included in line with section 9.3 comments.

7. Potential Archaeological Deposits

7.1 Further information on the nature of the Potential Archaeological Deposits.

Additional information on the Potential Archaeological Deposits (PAD) identified in the ACHAR has been prepared and is documented in Appendix D to this memorandum.

The additional information responds to the request from DPIE for a consolidated table that:

> links each PAD to the relevant isolated finds;

> states the significance of the isolated finds; and

> provides the indicative significance for the PAD sites based on significance of isolated finds and other landscape features.

8. General

8.1 Specify indicative location and number of smaller ancillary facilities (laydown and staging areas) required during construction of the transmission line.

Section 6.5 of the EIS (and *Appendix B* of the associated Amendment Report), identified that the disturbance area would encompass all disturbance required for the construction of the transmission line and any ancillary infrastructure such as brake and winch sites. It is not anticipated that any smaller ancillary facilities for laydown and staging areas will be required as all activities associated with the construction of each tower, including laydown and staging, would occur within the construction footprint for that tower.

9. Additional queries from 21 May and 30 June 2021

9.1 Transport

9.1.1 General comments on traffic and transport request

Figure 6.8 has been revised to identify the primary, secondary and water access supply routes that would be used by construction vehicles between work areas and the main construction compounds and accommodation camps. The revised figure is provided as part of Appendix C to this memorandum.

Appendix E provides a tabular presentation of the roads along the nominate routes, the road condition, the relevant roads authority, the daily construction traffic volume (typical and peak by vehicle type) and the expected duration of use. In relation to oversized and overmass vehicles, less than 20 vehicles would be classified as an oversized and overmass vehicle and are factored into the heavy vehicle movement numbers provided in Appendix E. The final number and schedule of these movements would be confirmed during detailed design but it is likely that the movements would be spread throughout the construction duration for logistical reasons.

Secondary access routes would provide intermediate access to the transmission line corridor and would only be required for a short duration of the full construction program (for periods of less than one year). These routes are required to ensure the efficient movement of construction equipment and materials via the public road network to sections of the transmission line corridor where:

> Primary access routes are considerably distanced from certain sections of the corridor, and/or

> Where key waterways prevent access across the corridor.

For example, the use of Anabranch Mail Road and Milpara Road would provide access to sections of the construction corridor to the west of the Great Darling Anabranch that would otherwise need to be accessed via the Renmark Road.

Water supply access routes would provide connection between the water supply points nominated in the Amendment Report and the secondary or primary access routes.

Peak construction traffic volumes along the secondary routes would only occur during discrete sets of work associated with access road construction and earthwork activities. Any peak movements would therefore only occur for a short duration.

Of the secondary and water access routes, the highest volume of movements per day would be 160 vehicle movements per day (or 16 vehicle movements in a peak hour), of which 50 movements would consist of light vehicles. Comparing this to the desired theoretical threshold (being 600 vehicles per hour per traffic lane) for a Level of Service C, this volume would equate to around three per cent of the carrying capacity of the road. Therefore, the effect of traffic generated from construction on the secondary access route roads are expected to be minimal and would maintain desirable road flow conditions. Using available traffic volumes for other roads in the study area as a reference (which has been observed at around 33 vehicle movements per hour on a regional road), it is unlikely that the proposal would cumulatively impact the performance of the road network.

Mitigation measure TA2 requires the completion of pre-condition surveys for roads used by construction vehicles, and to include mechanisms to repair damage to the road network caused by construction vehicles. To maintain safe conditions, regular inspections would be carried out in consultation with the relevant roads authority to monitor the condition of these roads. Any identified issues attributable to project-related use would be rectified to maintain road safety. Mitigation measure TA2 has been amended to require this regular inspection at a frequency to be determined in consultation with the relevant roads authority (refer to Appendix G of this document).

TransGrid has notified the residents along each proposed secondary and water supply route of the intention to use the roads to support construction. The notifications were issued via letter box drop between 17 and 22 June 2021. The notification included contact details for the TransGrid project team if the residents required additional information or wish to discuss the proposal.

Further assessment on the secondary access routes and water supply routes is provided in Appendix E.

9.1.2 Vehicle numbers query

> **For the primary access route, the vehicle numbers in Table 2-4 and Table 6-25 of the Amendment Report are slightly inconsistent. Please check numbers and ensure the above table includes the peak and average vehicle movements for Buronga, Wentworth and Anabranch South**

The vehicle numbers provided in in Table 2-4 and Table 6-25 of the Amendment Report are correct based on the indicative vehicle movement proposed based on the current construction methodology. With respect to both indicative peak vehicle movements, both tables provide consistent totals for light and heavy as being around 500 vehicles and 400 vehicles respectively.

With respect to the breakdown of the movements per site, the following is noted:

- 100 light vehicles identified in the 300 for transmission line works (Table 2-4) have been assumed as being generated from the Buronga camp (Table 6-25). The remaining 200 vehicles associated with the transmission line works would therefore occur from the Anabranch South (around 50 vehicles) and Wentworth (around 150) providing the overall total of around 500 vehicles
- 20 heavy vehicles identified in the 200 for transmission line works (Table 2-4) have been assumed as being generated from the Buronga camp (Table 6-25). The remaining 180 vehicles associated with the transmission line works would therefore occur from the Anabranch South (around 40 vehicles) and Wentworth (around 140) providing the overall total of around 400 vehicles.

9.1.3 New site access points

> **Specify the site access design requirements for the construction compounds/accommodation camps. The EIS indicates that BAR/BAL and acceleration/deceleration lanes would be required. Ensure site access design requirements are consistent with TfNSW advice.**
> **Identify any further upgrades or site access point design requirements resulting from the assessment of the secondary access routes.**

Design detail for the construction compounds/accommodation camps is not available at this stage in the project and would be developed post approval. As provided in mitigation measure TA1, the design of the site access/egress points would be agreed with the relevant roads authority and would be designed in accordance with the Traffic Control at Worksites, Austroads Guide to Road Design and Austroads Guide to Traffic Management, and approved by the relevant roads authority.

It is envisioned that the construction contractor would require the use of the secondary routes at times during construction. However, as the detailed construction methodology has not yet been developed, specific details of any required upgrades or site access point designs, in relation to the secondary routes, are not known. These would be confirmed post-approval. All site access points would be designed and installed in accordance with project commitments in mitigation TA1.

9.1.4 Secondary route intersection upgrades

No intersections upgrades are proposed at this stage for the secondary access routes.

Where the secondary access routes intersect other paved roads, the intersections are already sufficient to accommodate the additional traffic associated with project-related activities. No changes to pavement and/or existing line marking are proposed.

Where the secondary access routes intersect unsealed/unpaved roads, the unsealed/unpaved surfaces would be inspected. Where required, minor rectification works would occur to address any existing dilapidation to promote safe use. This might include filling potholes, surface rolling and potentially grading of the unsealed surfaces. No upgrades to the associated paved road surfaces and existing line-marking are, however, proposed.

9.2 Noise

9.2.1 Transmission line – construction noise

> Explain why there are additional residential receivers expected to experience noise levels above the NML for standard hours during (Ref Table 8.2 of Noise Assessment).

Section 2 is revised to include the results for standard hours. The previous table incorrectly provided impacted receivers for the incorrect time period. This has reconfirmed a reduced number of impacted receivers.

9.2.2 Road noise - secondary access route

> Include an assessment of road noise along the secondary access routes

Existing traffic volumes on the secondary and water supply routes are not available, and an quantitative estimation of noise level increases due to project-related traffic is not possible at this stage. It is expected that existing traffic volume on identified local roads would be low and therefore noise level increases of greater than 2 dB are likely, triggering the relative noise increase identified in the Road Noise Policy and therefore requiring further consideration. This may not be the case for Pooncarie Road / Wentworth Street given this is a regional road and is likely to have higher volumes than many of the proposed secondary and water supply routes (and therefore may not exceed 2dB).

As existing traffic volumes on the identified routes are not available, a high-level screening assessment has been undertaken to estimate noise level contributions from construction-related traffic using the Transport for NSW's Construction Noise Estimator (created by the former Roads and Maritime Services). This is available in Appendix F. Noise levels have been assessed based on peak (or maximum) movements along these

roads, to provide a conservative level of potential impacts to the nearest sensitive receiver located on the secondary or water access route.

The assessment found that construction traffic volumes alone are predicted to comply with relevant amenity-based road traffic noise levels set by the Road Noise Policy. However, it is expected that increases in road traffic noise of greater than 2dB could occur (with the potential exception of Pooncarie /Wentworth Road as stated above). TransGrid notes that any noise impacts associated with construction-related traffic would be transient (depending on the location where work is occurring in the construction corridor and the construction activities being carried out at the time) and temporary (occurring during the construction phase only).

Due to the possible increases in road traffic noise due to project-related traffic, and consistent with standard good practice, the construction noise and vibration management plan would consider feasible and reasonable noise measures to manage traffic noise impacts on public roads where exceedances above 2 dB are identified at any sensitive receiver (mitigation measure NV5).

9.3 Figures

9.3.1 Other figures

> Ensure font size is consistent and legible at A4 scale

All figures provided as part of the previous response to the Request for Information (dated 17 May 2021) have been updated to ensure that the font size is consistent and legible at A4 scale. The revised figures have been provided as Appendix C.

> Figure 1-2: Ensure arrows align with project infrastructure location

Figure 1-2 has been updated to ensure arrows align with the location of each element of proposed project infrastructure (refer to Appendix C).

> Figure 6-3c: Hendy Road label is covering WSP location

Figure 6-3c has been updated to ensure that the label representing Hendy Road has been moved to avoid overlapping the proposed location of the water supply point at Buronga (refer to Appendix C to this memorandum).

> Figure 17-1 Sensitive receivers:
  - For dwellings that are close to project infrastructure or access roads, confirm if these are dwellings (rather than identifying them as 'potential' dwellings)
  - Assign receiver ID to dwelling in Wentworth compound inset
  - Remove noise monitoring location
  - Remove Buronga inset
  - Include inset showing impacted receivers (construction noise) located near Murray River and Great Darling Anabranch

Figure 17-1 provided as part of the previous response to the Request for Information (dated 17 May 2021) has been updated to address the elements identified by DPIE above including:

> confirmation of the status of existing dwelling, where possible
> assigning a receiver ID to the dwelling within the Wentworth compound inset (ID R14914)
> removing the noise monitoring locations from the map and the legend
> removing the Buronga inset
> including additional inset maps showing the potentially impacted receivers (construction noise) located near the Proposal crossing points of the Murray River and the Great Darling Anabranch.

The revised map is provided as part of Appendix C.

9.3.2 Additional figures

Revise figures 9.2a to 9.2o of *Appendix D Revised Biodiversity Assessment Report* as follows and append to the RFI as a separate set of figures:

> Remove the 'proposal study area' and add the 'project site' boundary

> Edit the legend to identify project components i.e. Transmission line, towers and access roads / Disturbance area A

Figures 9.2a to 9.2o within Appendix D of the *Final Biodiversity Assessment Report* (provided to DPIE 21 May 2021) have been updated to address the elements identified by DPIE above including:

> removing the 'proposal study area' layer from the map series and including the 'project site' boundary layer
> updating the map series (including legend) to identify the key proposal components including indicative transmission line alignment, indicative transmission towers locations and currently proposed access roads / tracks.

The revised map series is provided as part of Appendix C.

9.4 Asbestos

TransGrid has identified asbestos containing paints on some older transmission towers. In the past, asbestos containing paints were used on parts of some transmission towers where the original paint (non-asbestos containing) was no longer present. The asbestos containing paint was applied to provide corrosion protection. Typically it was only applied to the transmission tower legs by hand and only as high as a person can reach. The paint has a very small percentage of asbestos fibres. The fibres are bonded in the paint substrate. The paint can, however, become aerosol if disturbed.

A TransGrid program has been underway for some time across the network to identify, strip (using chemical rather than mechanical methods) and remove the asbestos containing paint from the legs of the towers. SafeWork NSW has been consulted with and has endorsed the methods used in removing the paint. Provided the current method are used to remove the paint, the process involves minimal risk of harm to humans.

TransGrid has carried out extensive sampling and testing of its transmission lines to determine the extent of affected transmission towers. Asbestos containing paint was identified on the legs of 30 of the 60 transmission towers associated with the Buronga to Red Cliffs line (Line 0X1) (the four towers in Victoria and the first 26 towers in New South Wales heading north from the Murray River). These towers would be decommissioned as part of Project EnergyConnect (NSW – Western Section). Currently, TransGrid's construction contractor is considering options to address the parts of the towers with asbestos containing paint.

Asbestos containing paint was also identified on the legs of the first 31 transmission towers on the Buronga to Broken Hill line (referred to as Line 0X2) heading northwest from the Buronga Substation. While a new transmission line would be constructed adjacent to this existing line as part of Project EnergyConnect (NSW – Western Section), the existing affected towers would not be affected.

Project EnergyConnect (NSW – Western Section) includes a minor realignment of a small section of Line 0X2 immediately west of the Darling River (refer to Figure 5-4 in Appendix A (Updated proposal description (operation)) to the Amendment Report). Sampling and testing of the three towers, however, did not identify any asbestos.

9.5 Other information

Confirm the Project Site area in hectares

Based on the current design, the current Project site area is around 3,307.2 hectares.

Confirm Disturbance Area (a and b) in hectares

Based on the current design, the current extent of the Disturbance Area is as follows:

> Disturbance Area A: around 546.6 hectares
> Disturbance Area B: around 642.1 hectares.

9.6 Revised mitigation measures

In response to the biodiversity matters discussed in Section 1 of this RFI response, some mitigation measures have been updated since the preparation of the Submissions Report and Amendment Report for the project.

This has included revision of the following mitigation measures:

- B14
- B15
- B19
- TA2

A revised set if mitigation measures has been included in Appendix G. This table supersedes the version provided in Chapter 7 of the Submissions Report (WSP, 2021) and Appendix C of the Amendment Report (WSP, 2021) for the project.

Appendix A
Management residual operational noise impacts due to operation of 330kV transmission lines memorandum

MEMO

TO:	TransGrid
FROM:	WSP Australia
SUBJECT:	**EnergyConnect (NSW – Western Section)** **Management of residual operational noise impact due to operation of 330kV transmission lines**
OUR REF:	PS117658-NV-MEM-003-01 RevA
DATE:	**18 June 2021**

This memorandum discusses strategies concerning management of residual noise impact due to operation of the proposed 330kV transmission lines as part of the EnergyConnect (NSW – Western Section) (the project) in response to clarifications requested by the NSW Department of Planning, Industry and Environment (DPIE).

This memorandum should be read in conjunction with Environmental Impact Statement (EIS) for the project (including Technical Paper 8), the Amendment Report and Response to DPIE Request for Information.

1. BACKGROUND

Corona discharge noise associated with operation of the 330kV transmission lines has been assessed as per the NSW Noise Policy for Industry (NPfI). An exceedance of the Project Noise Trigger Levels (PNTLs) has been identified at three dwellings as summarised in Table 1.1. In accordance with the NPfI, consideration of mitigation at the noise source has previously been investigated by the designer BECA and it was deemed not feasible or reasonable to achieve noise reduction through change in the conductor design. Noise mitigation in the form of noise barriers (interrupting the noise transmission path) has also been considered and regarded not reasonable due to the isolated nature of the affected dwellings and the elevated position of the noise source.

Noise mitigation in the form of receiver-based treatments would be considered as per process in the NPfI. The magnitude of the residual operational noise impact is in the order of 4 to 8 dB for the assessed worst case conditions. Based on modelling conducted by BECA, when audible, the characteristic of corona discharge noise is not expected to contain any specific tone or attention-drawing characteristics outside of the easement of the transmission lines corridor.

However, the final location of the transmission lines centerline is still subject to detailed design and confirmation. There is therefore an opportunity that the residual noise impact may reduce from the assessed worst-case conditions.

It is also noted that wet weather conditions, which are the cause of the potential noise impacts resulting from the corona discharge, are predicted to occur for up to 30 per cent of the days in the year based on historical meteorological data (with one day per year with mist). These conditions can occur for only short durations on these days. During heavier rain events, the noise generated by the rain itself would be substantial and would

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potentially mask any noise from operation of the transmission line. Noise disturbance under such circumstances is therefore likely to be low risk.

Table 1.1 Operational noise impacts for residential receivers predicted to experience noise levels above the project noise trigger levels specified by the Noise Policy for Industry (EPA 2017) for the 330kV transmission line

ADDRESS/ LOT OF IDENTIFIED RECEIVER (TYPE)	RECEIVER ID	APPROXIMATE DISTANCE TO POSSIBLE TRANSMISSION LINE CENTRELINES[1]		ESTIMATED SOUND PRESSURE LEVELS (LEVEL OF EXCEEDANCE AGAINST 35 dB $L_{Aeq\ 15min}$ PNTL - dBA)			
				Base case (compliant at 442 m)		Base case +1% SVG (compliant at 548 m)2	
		Worst case (metres)	Best case (metres)	Worst case	Best case	Worst case	Best case
'Dunvegan' homestead complex 2042 Low Darling Road Wentworth, Lot 3 DP1189519 (2 residential dwellings)	R1489 R2023	250 320	370 440	39 (4) 37 (2)	36 (1) 35 (0)	41 (6) 39 (4)	38 (3) 37 (2)
Low Darling Road Wentworth, Lot 2 DP1189519 (shed with accommodation)	R2022	170	290	41 (6)	38 (3)	43 (8)	40 (5)

1. Results presented differ from the predictions contained in the EIS due to an identified discrepancy in distance measurements.

2. GUIDELINES

2.1 NPFI

In accordance with guidance from NPfI as discussed in the EIS, the possible residual noise impacts due to operation of the 330kV transmission lines are considered 'significant'. All noise mitigation measures to reduce noise levels at the source and to reduce noise transmission have been considered as per the NPfI and found to be neither reasonable nor feasible. As such targeting an appropriate internal ambient noise level within the dwellings is considered an acceptable mitigation measure.

2.2 INTERNAL NOISE LEVEL TARGETS

Appropriate internal ambient noise level targets are typically established per *AS/NZS 2107:2016 Acoustics—Recommended design sound levels and reverberation times for building interiors*. The recommended internal design target for residential buildings in rural areas is provided in Table 2.1.

Table 2.1 – AS 2107: Internal noise and reverberation criteria (residential buildings)

TYPE OF OCCUPANCY/ACTIVITY	RECOMMENDED DESIGN SOUND LEVEL L_{eq}, dBA
Houses in rural areas with negligible transportation	
Sleeping areas	25 – 30

Based on an outdoor noise levels of 43 dBA L_{eq} during the worst-case condition, an overall noise reduction of between 13 and 18 dB is required to be achieved through the building envelope to meet the appropriate internal noise target. This assumes that the affected rooms are sleeping areas. Where the noise affected rooms are less noise sensitive, lower noise reductions may be appropriate. AS2107:2016 does not provide specific guidance for less sensitive spaces such as living areas for "houses in rural areas with negligible transportation" but from other guidance the noise targets is typically 5 dB less onerous. This should be confirmed following an inspection of each building, which would help optimize the required level of treatment in each internal space of the dwellings.

As a general rule of thumb, the following overall noise reduction can generally be expected through the following scenarios:

- Reduction of 5 to 10 dB with a building façade with an opened window or door that is not greater than 20 per cent of the overall wall area. Due to the elevated nature of the possible noise source, consideration of property treatment would likely be required for most of the building envelope on all directions and the roof. The only possible exception would be a façade on the far side of a dwelling that does not have a line of sight to the transmission line.
- Reduction of ≥20 dB is typically achievable through a closed and well-sealed building envelope of standard timber-framed construction with external and internal claddings.

3. AT PROPERTY TREATMENTS

Various guideline documents are available in NSW jurisdiction concerning property treatment (e.g. DPIE's *Development Near Rail Corridors and Busy Roads – Interim Guideline*, TfNSW's *At-Receiver Treatment Guideline*). Typical considerations include:

- Fresh air ventilation systems that meet Building Code of Australia requirements with the windows and doors shut
- Upgraded windows, glazing and solid core doors
- Upgrading window and door seals
- The sealing of wall vents
- Upgrading mass of building envelope by installing additional internal wall/ ceiling lining
- The sealing of the underfloor below the bearers and appropriately treating sub-floors ventilation
- The sealing of eaves or any sound insulation weaknesses.

As per standard practice, at-property treatments if triggered would be determined in consultation with the landholder and informed by a detailed building condition survey and final predicted noise levels. Building condition surveys would determine if the internal noise target is met based on current building conditions or if treatment is required.

4. CONSIDERATION

Based on a preliminary survey conducted of the identified dwellings as indicated in Appendix A, the following findings were made of the general construction of the dwellings:

- Dwellings likely consist of timber structure of external cladding and internal lining
- External cladding observed to be sheet metal or weatherboard
- Sheet metal roof
- Standard single pane glass windows with standard timber window frame.

It is likely that a standard closed / well sealed timber-frame structure would achieve the required 18 dB reduction. Further building construction surveys would be required to confirm if internal noise levels are achieved based on the current condition or if additional treatment is required.

If treatment is required, effective treatment would likely consist of the sealing of sound insultation weaknesses in the structure, and/or provision of alternative means of air ventilation may be required (should compliance require doors and windows to remain closed). This may require the provision of active ventilation systems or air conditioning.

5. NEXT STEPS

The final predicted noise levels during the worst- and best-case scenarios would be confirmed during detailed design. Should exceedances still be identified and mitigation is required at the receiver to comply with AS2107 recommended internal design targets, TransGrid will consult with the impacted landholder to complete a condition survey of any legal dwelling and to implement agreed at-property treatments in accordance with environmental management measure NV2. As discussed in Section 4, building condition surveys would confirm if treatment is required.

APPENDIX A PHOTOS OF DWELLING IDENTIFIED TO EXPERIENCE POSSIBLE RESIDUAL NOISE IMPACT DUE TO OPERATION OF 330KV TRANSMISSION LINES

Figure A.1 Aerial indicating locations of dwellings identified to experience possible residual noise impact

Figure A.2 Photo of R1489 (metal cladded Managers Dwelling, corrugated tin roof, single pane windows)

Figure A.3 Photo of R2023 (weatherboard house, corrugated tin roof, single pane windows)

Figure A.4 External photo of R2022

Appendix B
Landscape and visual impact assessment memorandum

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MEMO

To: Emma Taylor, Principal Environmental Scientist, WSP

From: Suzie Rawlinson, Director

Date: 17 May, 2021

Re: **EnergyConnect (NSW – Western Section) SSI-10040**

Request for Additional Information - Landscape and visual amenity

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1. Introduction

A Request for Additional Information was received from the Department of Planning Industry & Environment, dated 7/5/2021. In relation to Visual, the following was requested:

'Provide a consolidated table of visual impact ratings for residential receivers that are predicted experience visual impacts, include:

- *Receiver ID number*
- *Distance to transmission line corridor or other project works; and*
- *Visual impact rating.'*

This memo provides the requested information, including a summary of the method used in to assess the potential for visual impact on residential receivers; a table which summarises the assessment of private residential receivers; and an updated plan showing the location of residential receivers.

2. Method for assessing visual impact from residential receivers

The assessment of visual impact on views from private residential properties in NSW is generally guided by the planning principles for 'view sharing' provided in the judgement of the NSW Planning Environment court in the *Tenacity Consulting V Warringah Council* [2004}, NSWLEC 140. View sharing is when a property … '*enjoys existing views and a proposed development would share that view by taking some of it away*.' (NSWLEC 140, 2004)

To determine whether view sharing is reasonable the judgement identifies a four-step assessment process. As the approach set out in this judgement is more suited to urban settings, adjustments to the method were made to account for the scale of the landscape and project were applied to the project.

The steps identified in the judgement were undertaken as follows:

Step 1: Assess views to be affected

- A desktop analysis of topography and vegetation cover were used to assess and describe the views to be affected.

Step 2: Consider from what part of the property the views are obtained

- The residence has been considered as one vantage point. If there is a potential adverse visual impact identified, then during detailed design a visit to the property may be required to confirm the orientation of the dwelling, location of living areas and extent of the visibility. The need for mitigation measures would be identified and options investigated in consultation with the landholder.

Step 3: Assess the extent of the impact

- Based upon a desktop assessment of landform, vegetation cover and distance, those properties where there would be a potential visual impact were identified and cross sections were prepared to illustrate the likely visibility of the proposal.
- In the EIS, the potential for visual impact was identified.

Step 4: Assess the reasonableness of the proposal that is causing the impact.

- the reasonableness of the proposal is usually considered in relation to development controls set by local government in their Local Environmental Plan and Development Control Plan. However, these controls are not applicable to a proposal of this type and scale, being a Critical State significant infrastructure project.
- If there is a potential visual impact, any opportunities for design refinements, such as adjustments to the transmission line structure positioning within the transmission line corridor for example, was identified and included in the mitigation measures section of the technical paper.

To respond to this RFI, an impact **rating of visual impact** has been added to each potentially affected residential receiver. A worst-case scenario has been assumed and a range has been included (where appropriate), as the final positioning of project elements may increase or decrease the visibility of the proposal elements, their scale and compatibility with the existing view. It is important to note that a view of the proposal does not necessarily constitute a visual impact.

3. Summary of the visual impact for residential receivers

3.1.1. Operations

A total of 15 residential receivers were considered (some representing groups of properties) and a potential for a visual impact has been identified for the following receptor locations:

- 'Regunyah' (R1967 and 1968), Renmark Road, Pine Camp
- 'Wilton', (R3385) Anabranch Mail Road,
- Shed with accommodation, (R1965) Wentworth;
- Shed with accommodation, (R2022) Low Darling Road, Wentworth; and
- 'Dunvegan' (R2023 and 1489), Low Darling Road.

We note that there was an additional property identified in the EIS, described as a residential property 500 metres east of the proposed transmission line north of the Sturt Highway. This property has since been identified as a shed related to rural activities and not a dwelling. Also, a receptor has been added where it has been identified that there is accommodation associated with a shed in Wentworth. The location of these receptors is shown in Figure 1, (updated from the plan included in the EIS Technical Paper).

The following table (Table 1) summarises the assessment undertaken in the EIS Technical Paper and includes a rating of visual impact for the project during operations. This table includes the approximate distance to an indicative transmission line alignment which has been used as a basis for indicative photomontage preparation in the EIS and also the transmission line corridor boundary, to allow for the potential adjustments to the positioning of project elements.

There are no residential receptors within 1.5 kilometres of the Buronga substation.

TABLE 1 : SUMMARY OF RESIDENTIAL RECEIVER ASSESSMENT DURING PROJECT OPERATIONS

Receiver ID no.	Property name and location	Approximate distance to the indicative transmission line alignment / transmission line corridor	Extent (magnitude) of change	Potential impact (low / moderate / high)
Lake Victoria cultural landscape and semi-arid plains character area				
R1967, 1968	'Regunyah' homestead, north of Renmark Road, Pine Camp	1.1 kilometre / 1 kilometre	View to broad open semi-arid landscape with some scattered intervening trees. There is likely to be some visibility of the upper portion of several transmission line structures in the middle to background of views.	Low
R3346	'Noola' homestead, south of Renmark Road	5.5 kilometres / 5.3 kilometres	Where not screened by intervening elements, there would be views to the transmission line structures rising above the intervening vegetation. There may be several structures crossing the background of these views.	Negligible
R3341	'Talgarry' homestead, east of Rufus Road	4 kilometres / 4 kilometres		Negligible
Mallee shrubland and rural landscape character area				
R2035	'Glen-Esk' homestead, Anabranch Mail Road	1.2 kilometres / 1 kilometre	There is more vegetation associated with the river which would increase the potential for screening of views to the proposed transmission line. Where not screened by intervening elements, there would be views to the transmission line structures rising above the intervening vegetation in background of these views.	Negligible
R3385	'Wilton' homestead, 3080 Anabranch Mail Road	780 metres / 720 metres	Views to the surrounding rural landscape on an undulating landform with scattered clumps of trees. There may be some visibility of the upper portion of several transmission line	Low

Receiver ID no.	Property name and location	Approximate distance to the indicative transmission line alignment / transmission line corridor	Extent (magnitude) of change	Potential impact (low / moderate / high)
			structures in the middle to background of views.	
R3387	'Allanvale' homestead, Anabranch Mail Road	4.3 kilometres / 4.1 kilometres	Due to the existing vegetation and undulating landform, these properties are not likely to have visibility of the proposal	Negligible
R3400	'Sturts Billabong' homestead, Low Darling Road	2.1 kilometres / 2 kilometres		Negligible
R2019	'Orchard Bend' homestead, Low Darling Road	2.2 kilometres / 2.0 kilometres		Negligible
R1489	'Dunvegan' homestead and managers residence, Low Darling Road, Wentworth	300 metres / 210 metres	These views would already be impacted by the existing 220kV transmission line. The proposal would realign and bring the alignment of the 220kV transmission line about 80 metres closer to the residences. There is the potential for some visibility of the upper portion of several of the new (larger scale) transmission line structures and the several realigned existing 220kV transmission line structures in the middle to background of views.	Moderate to high
R2023		350 metres / 280 metres		
R2022	Shed with accommodation, Low Darling Road, Wentworth	165 metres / 130 metres		Moderate to high
R1965	Shed with accommodation, Wentworth	700 metres / 620 metres	Views to the surrounding rural landscape on an undulating landform with scattered clumps of trees. Where not blocked by trees, there is the potential for some visibility of the upper portion of several transmission line structures seen adjacent to the existing 220kV transmission line structures in the middle to background of views.	Low
R1411	'Warriwillah', Ellerslie Road	2.6 kilometres / 2.6 kilometres	Due to the existing vegetation and undulating landform, this property is not likely to have visibility of the proposal.	Negligible
R2026	694 Arumpo Road	2.5 kilometres / 2.4 kilometres	Due to the existing vegetation, undulating landform, and distance, this property is not likely to have visibility of the proposal.	Negligible

Receiver ID no.	Property name and location	Approximate distance to the indicative transmission line alignment / transmission line corridor	Extent (magnitude) of change	Potential impact (low / moderate / high)
R2029	'Woorlong' homestead and residences on Drovers Drive on the north eastern outskirts of Gol Gol	3.2 kilometres / 3.1 kilometres	Due to the existing vegetation, undulating landform, and distance, this property is not likely to have visibility of the proposal. If the proposed transmission line is visible, these views would include the existing Buronga to Red Cliff 220kV transmission line.	Negligible
Murray River plains rural landscape				
R3432, R963, R978 to 980	Multiple residences to the east of the Sturt Highway, on the outskirts of Trentham Cliffs	Varies between 1.1 - 2.1 kilometres / 1 - 2 kilometres	If the proposed transmission line is visible, these views would include the existing Buronga to Red Cliff 220kV transmission line.	Negligible
R952-957	A group of residences south of the Sturt Highway at Monak	Varies between 1.2 - 1.9 kilometres / 1.1-1.8 kilometres	Views currently include the existing Buronga to Red Cliff 220kV transmission line. Due to the distance, and backdrop of vegetation, the proposal would be seen in the middle to background. The proposal would increase the size of the transmission towers but not substantially alter the character and amenity of these views.	Negligible

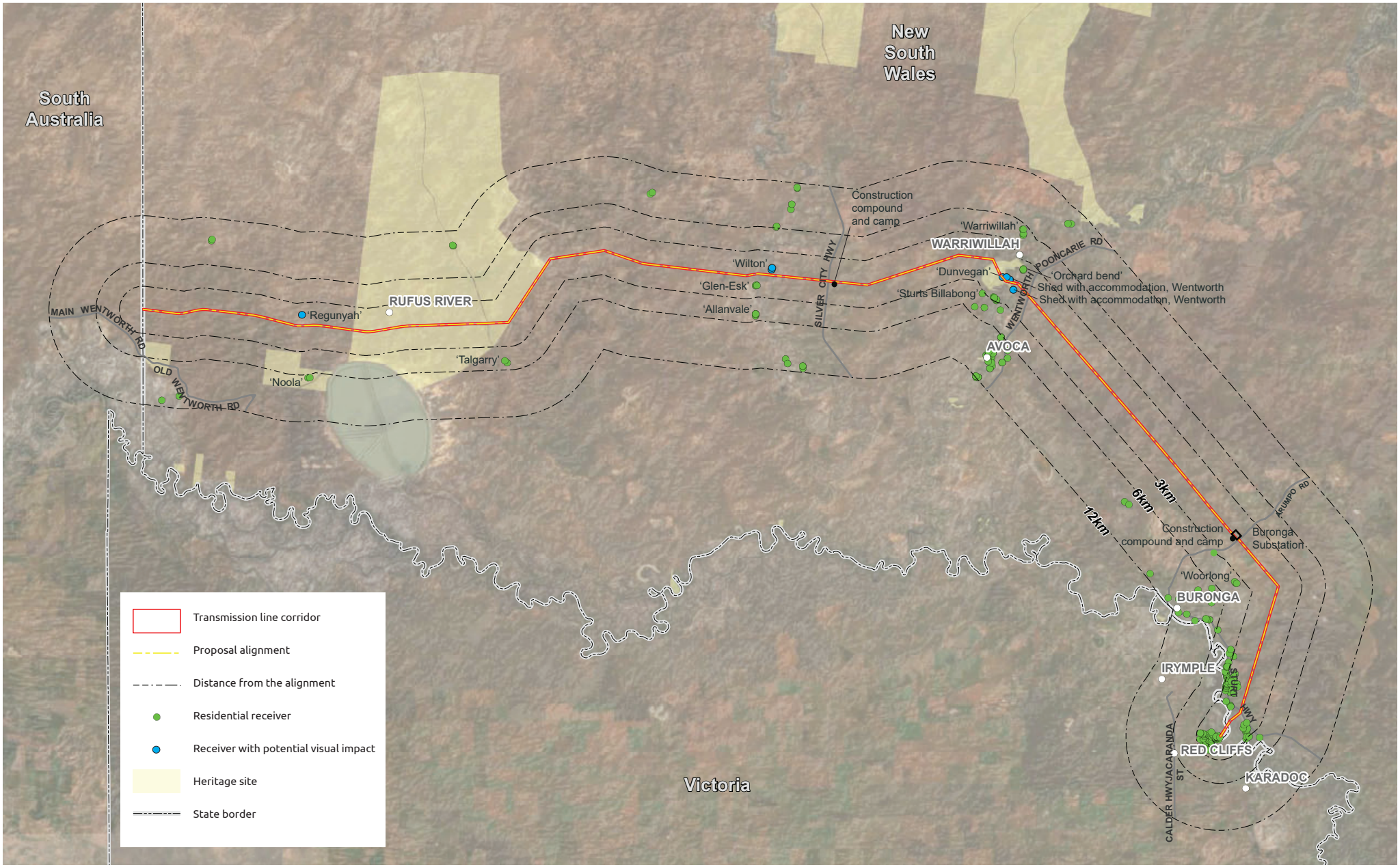
3.1.2. Construction

There is only one receptor group within 1.5 kilometres of a proposed compound or accommodation facility. This group relates to the property located at the Fort Courage Caravan Park, 1703 Old Renmark Road, Wentworth and it also includes a residence. The assessment of this property was included in the Addendum Report (refer to Appendix F). This assessment identified a potential moderate adverse visual impact during construction from the public road approaching this property. It is likely that there would be a low visual impact experienced from this residential receptor during construction. This impact would be short term and temporary. (Refer to Table 2)

There were also no visual impacts identified for residential receivers located near to the water supply points due to the small scale of the works (refer to Appendix F of the Amendment Report).

TABLE 2: SUMMARY OF RESIDENTIAL RECEIVER ASSESSMENT DURING PROJECT OPERATIONS

Receiver ID no.	Property name and location	Approximate distance to compound or accommodation facility	Extent (magnitude) of change	Potential visual impact (low / moderate / high)
R3144	Residence and Fort Courage Caravan Park, 1703 Old Renmark Road, Wentworth	680 metres (Residence) 570 metres (Caravan Park)	In views from the Residence and Fort Courage Caravan Park the proposed Wentworth construction compound and accommodation camp site would be seen in the background, partly filtered by trees. While the proposed Wentworth construction compound and accommodation camp are large in scale, it would comprise a small component in the background of views.	Low



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EnergyConnect

Landscape and visual impact assessment

Figure 1

Appendix C
Revised figures

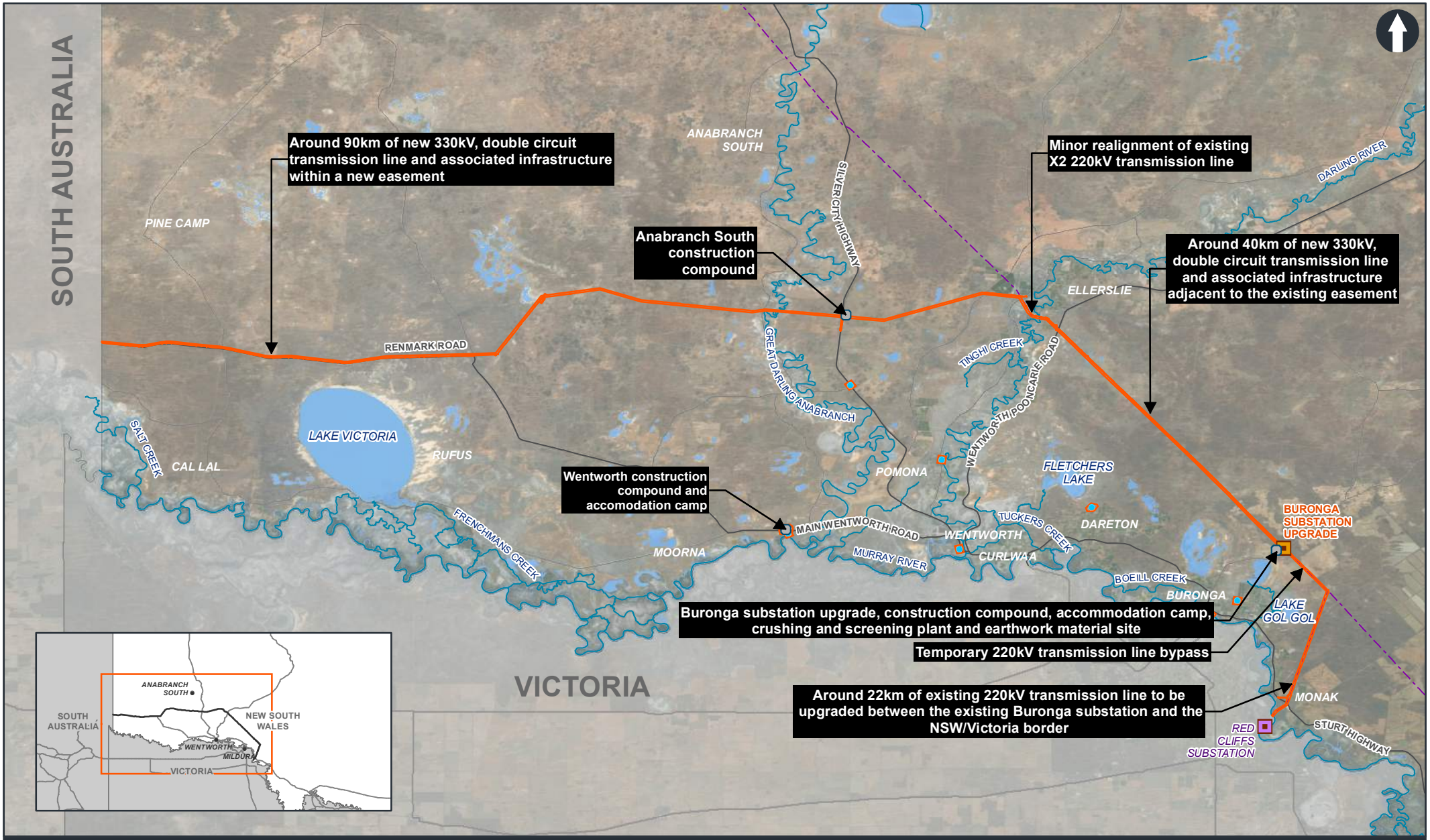

Figure 1-2

Overview of the proposal

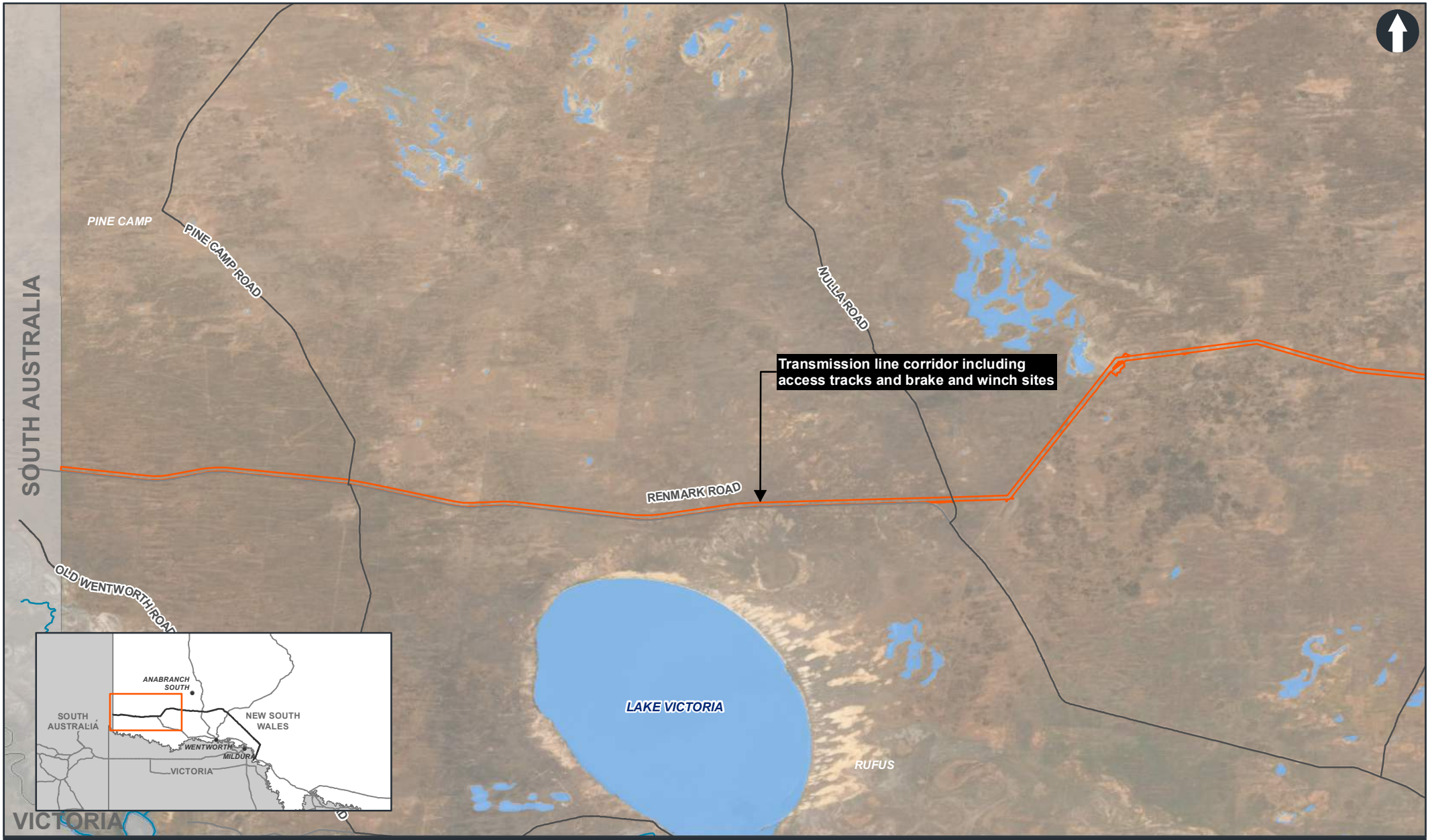

Figure 6-3a

Project Site

Construction overview

Source: NSWSS, ESRI, Transgrid, WSP

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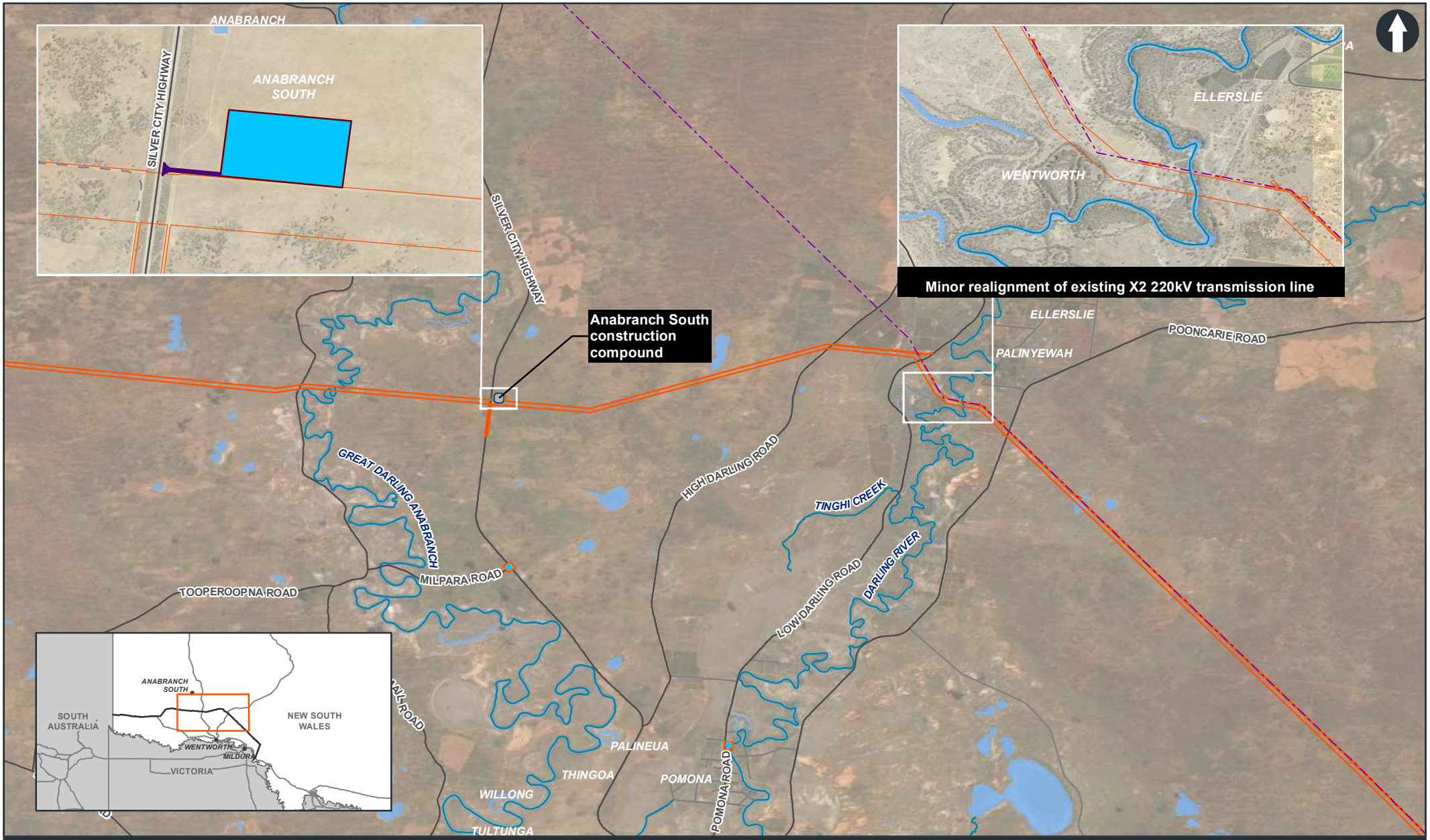

Figure 6-3b

Construction overview

- Existing transmission line infrastructure
- Project Site
- Water supply point
- Main construction compound and accommodation camp
- Access road (indicative)
- Construction compound

Source: NSWSS, ESRI, Transgrid, WSP

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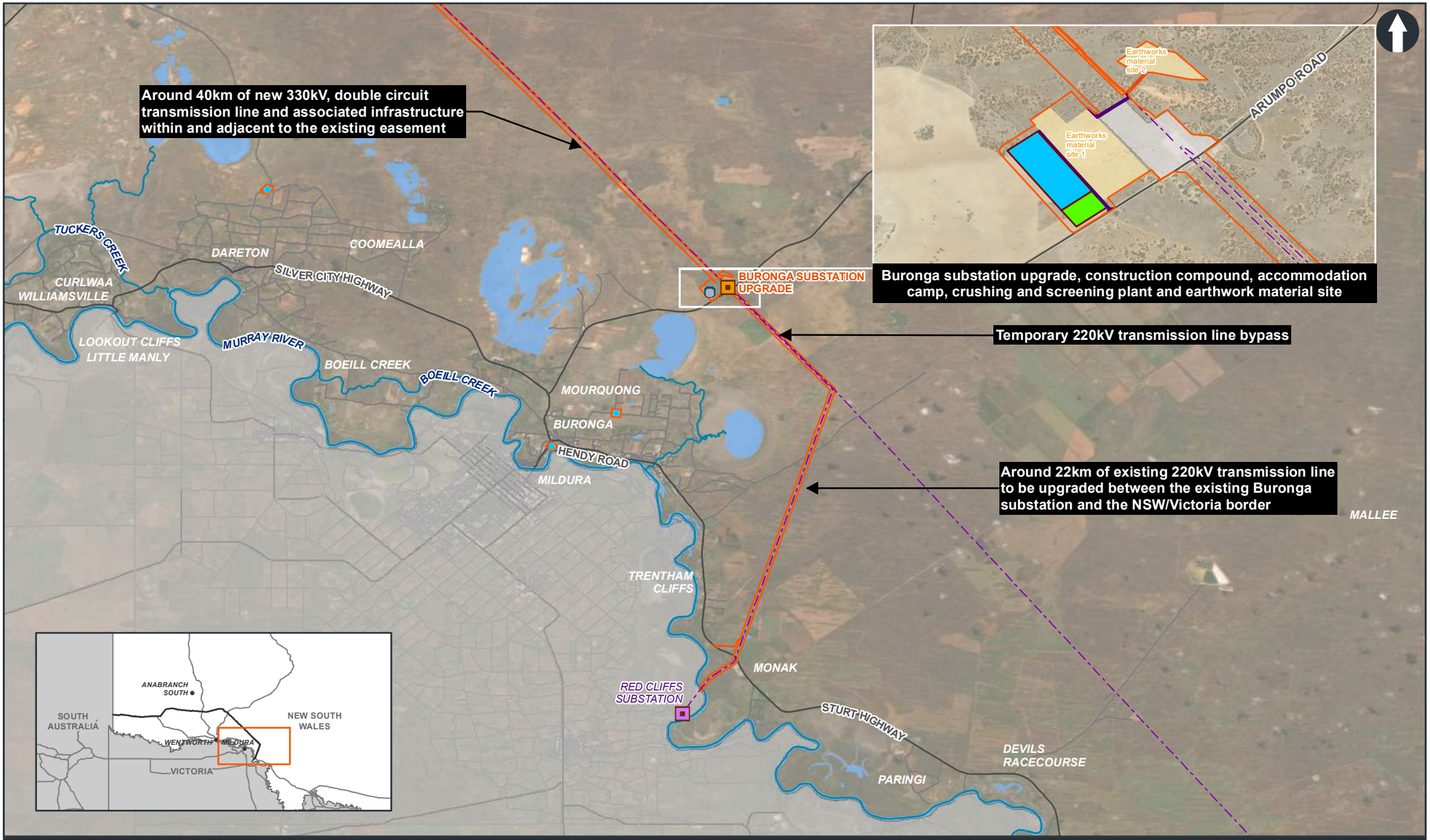

Source: NSWSS, ESRI, Transgrid, WSP

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Figure 6-3c

Construction overview

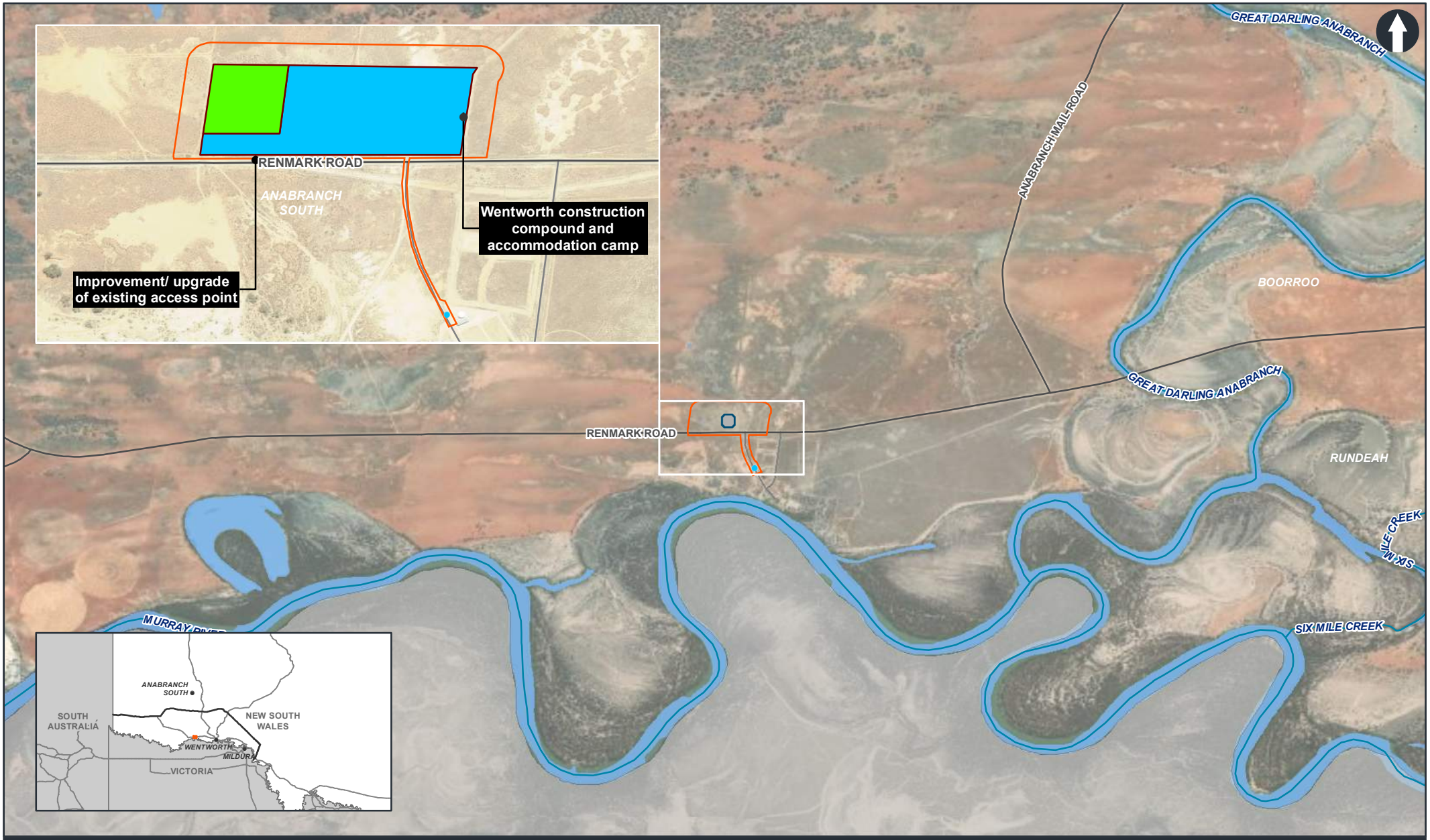

Figure 6-3d

Construction overview

Project Site
Water supply point
Main construction compound and accommodation camp
Accommodation camp
Construction compound

Source: NSWSS, ESRI, Transgrid, WSP

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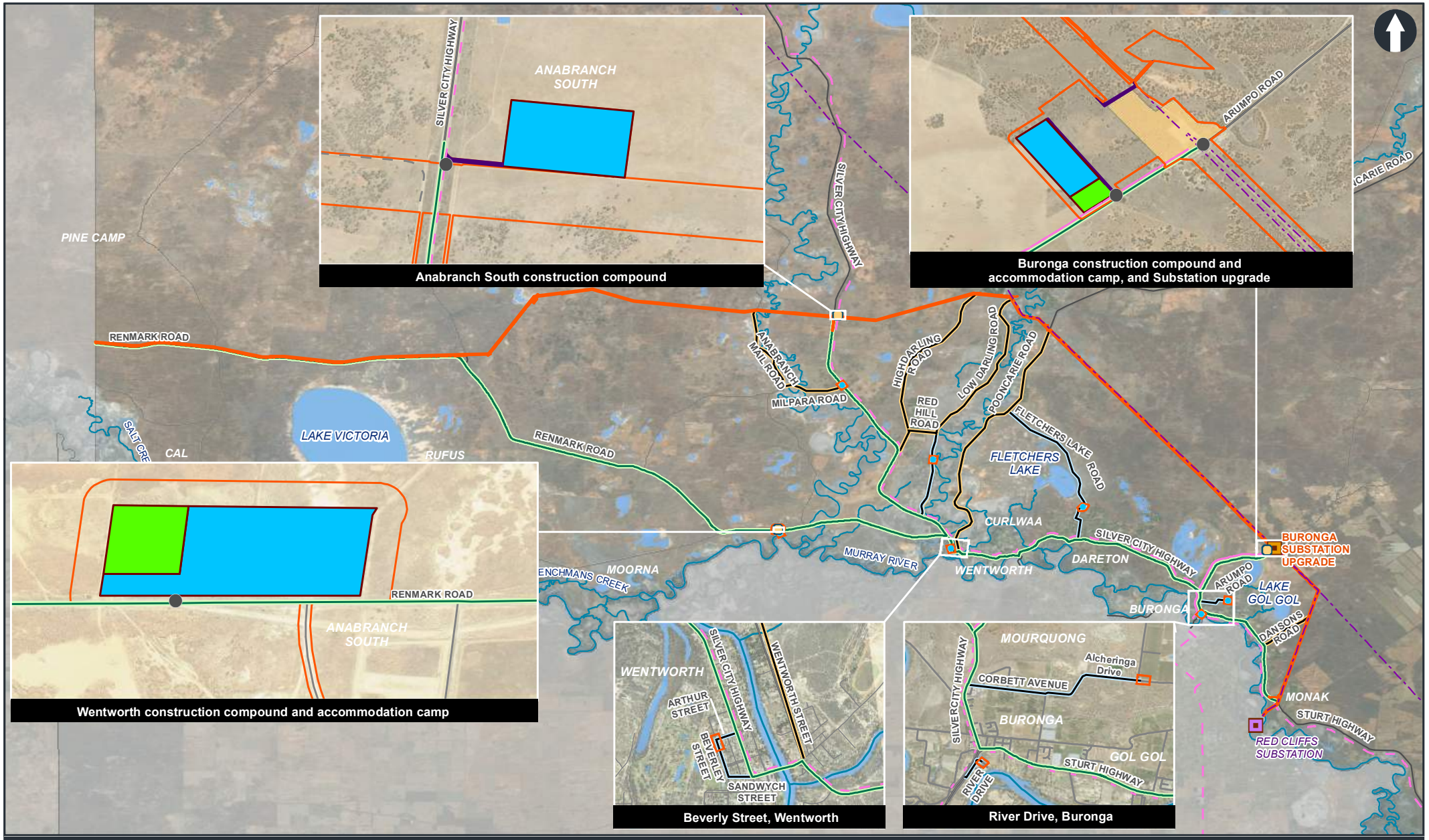


Figure 6.8

Proposed access routes

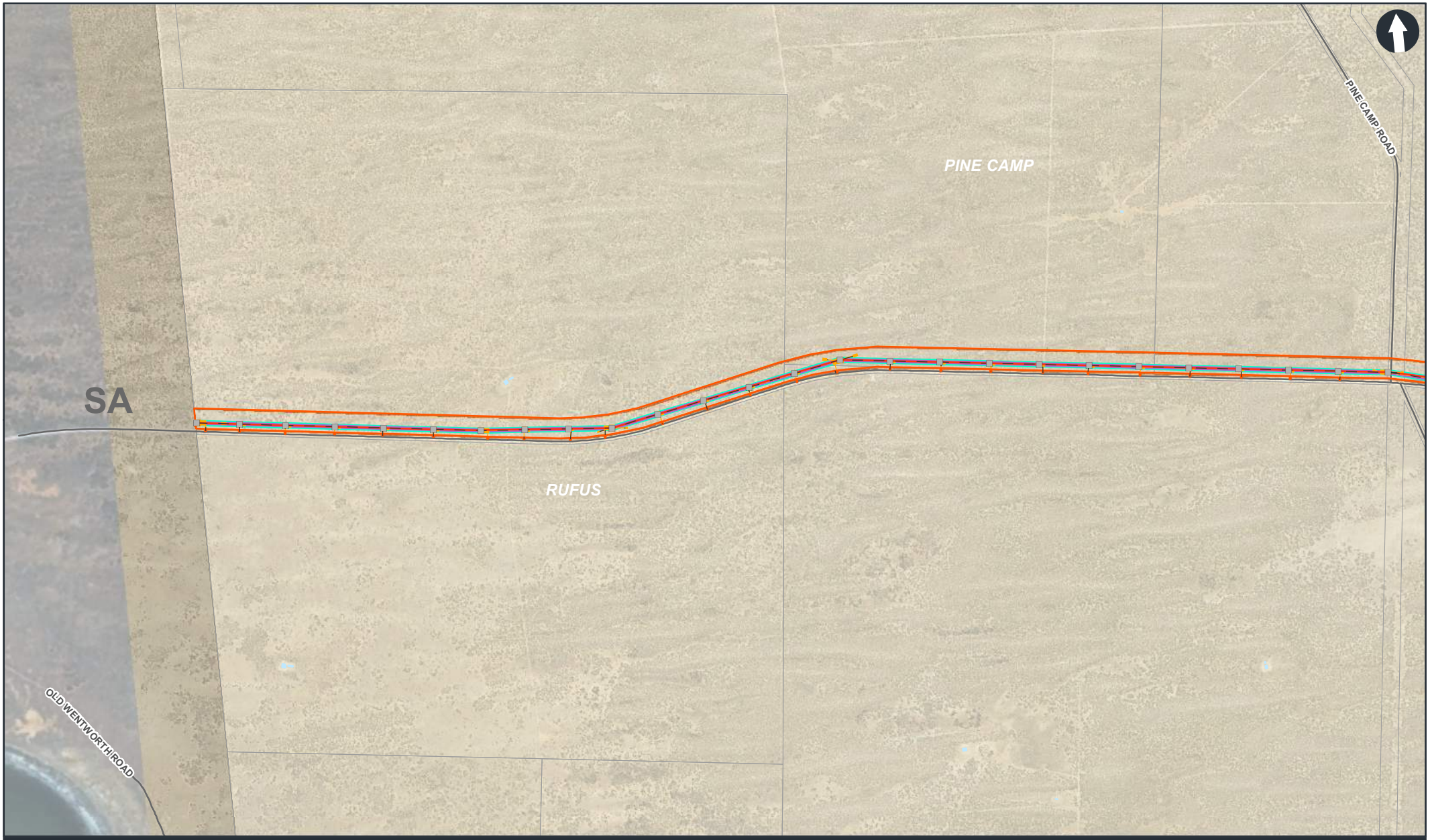


Figure 9.2a

Proposal indicative disturbance area including construction and operational impacts

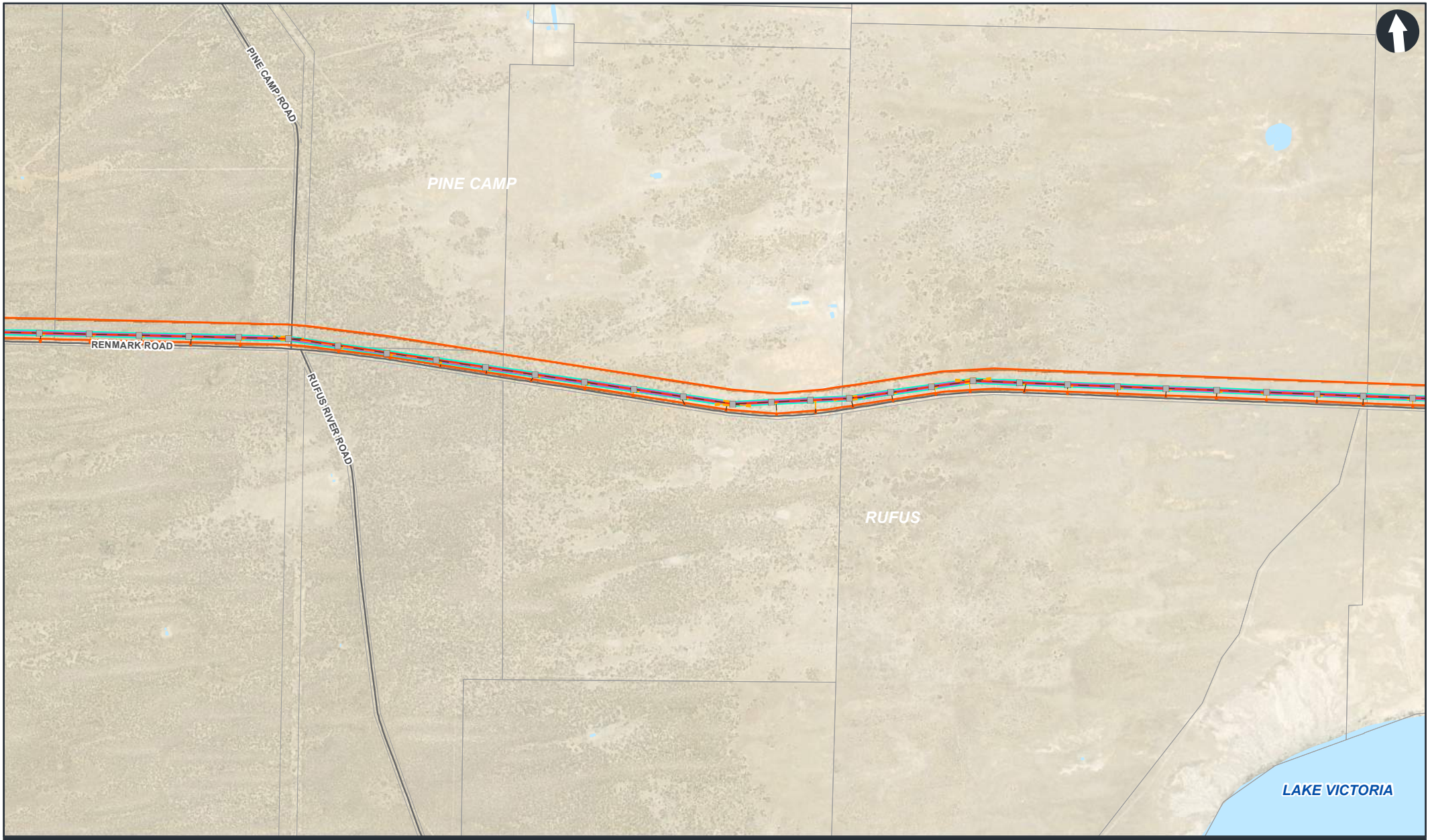


Figure 9.2b

Proposal indicative disturbance area including construction and operational impacts

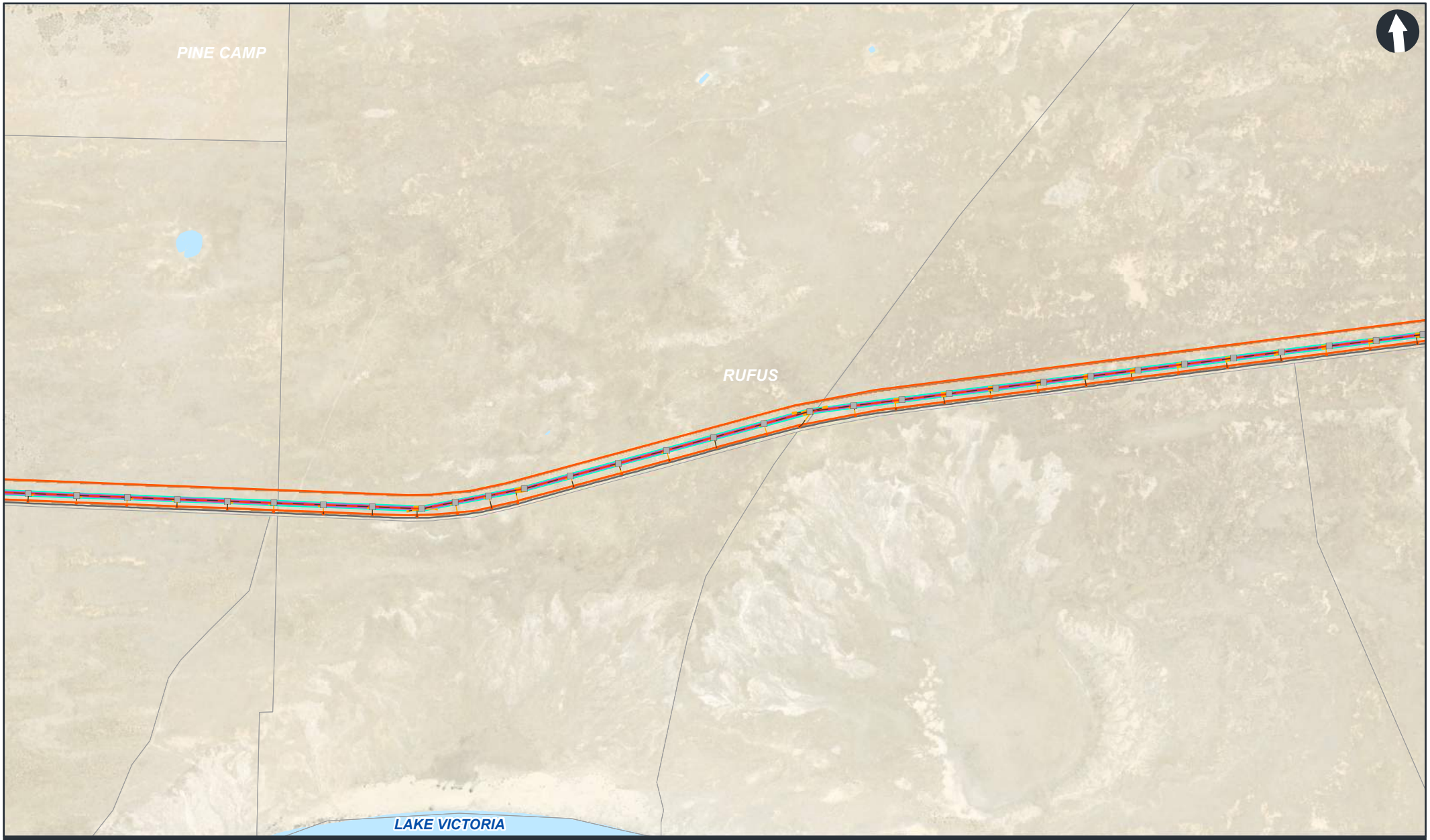


Figure 9.2c

Proposal indicative disturbance area including construction and operational impacts

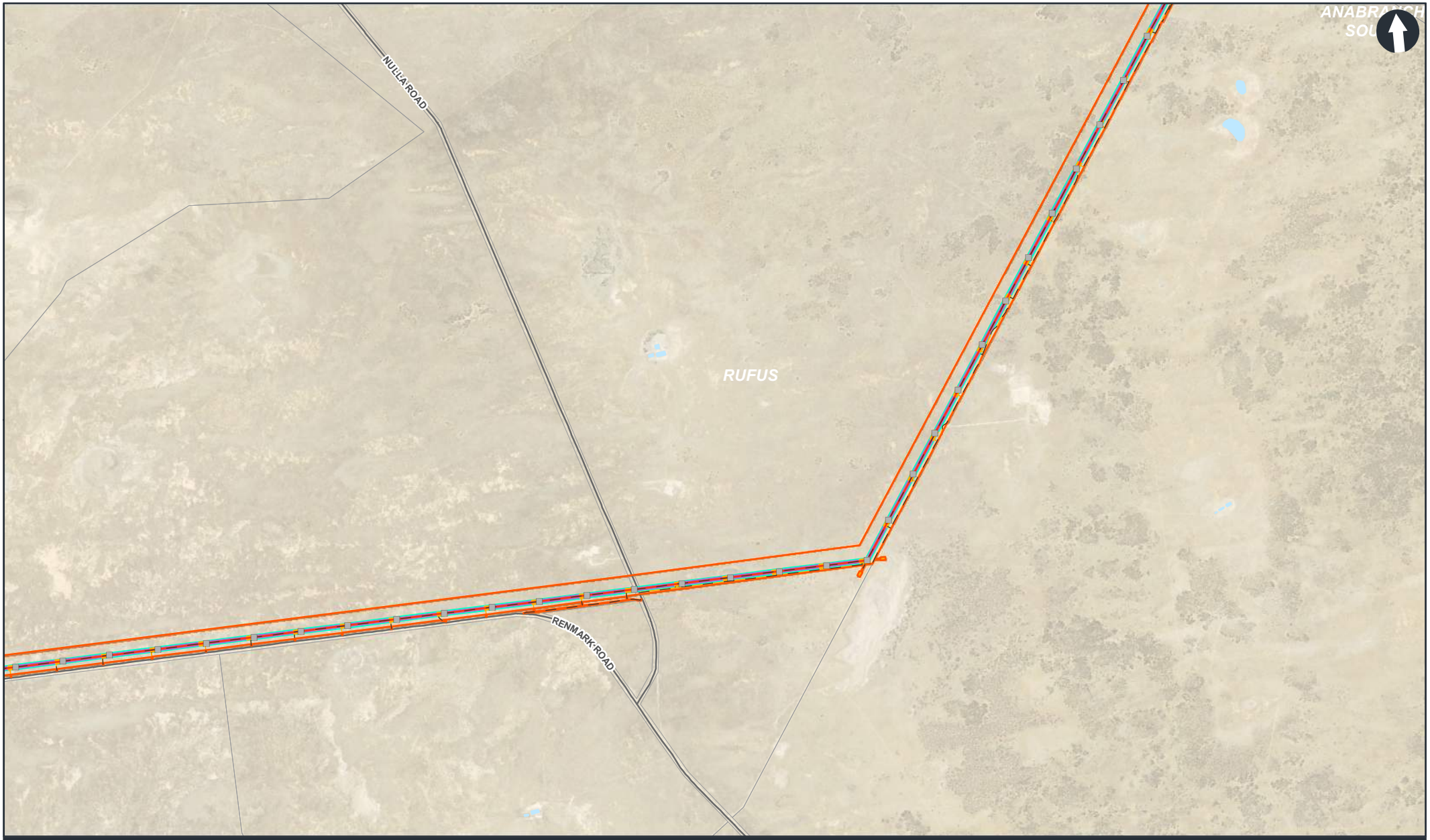


Figure 9.2d

Proposal indicative disturbance area including construction and operational impacts

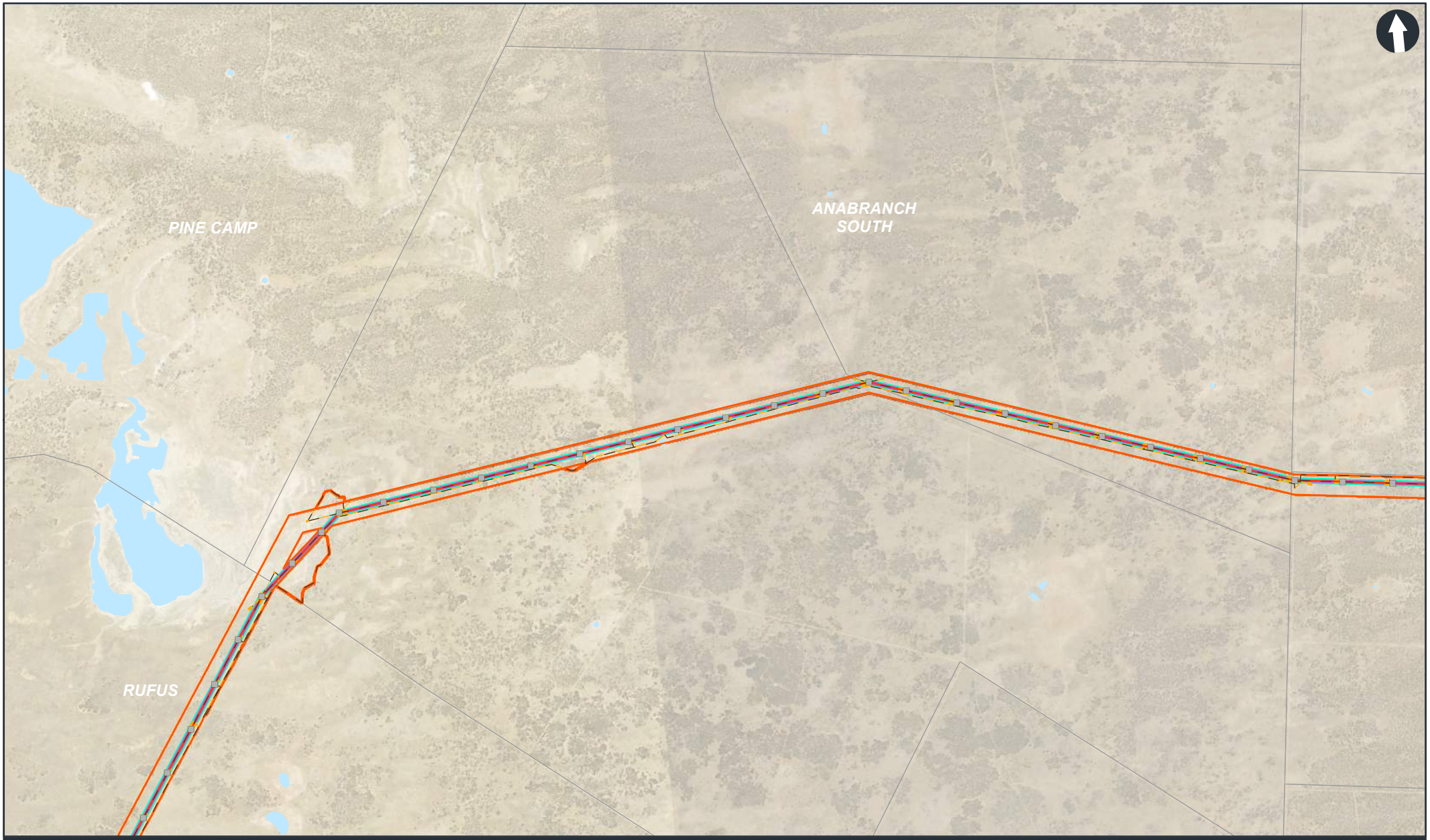


Figure 9.2e

Proposal indicative disturbance area including construction and operational impacts

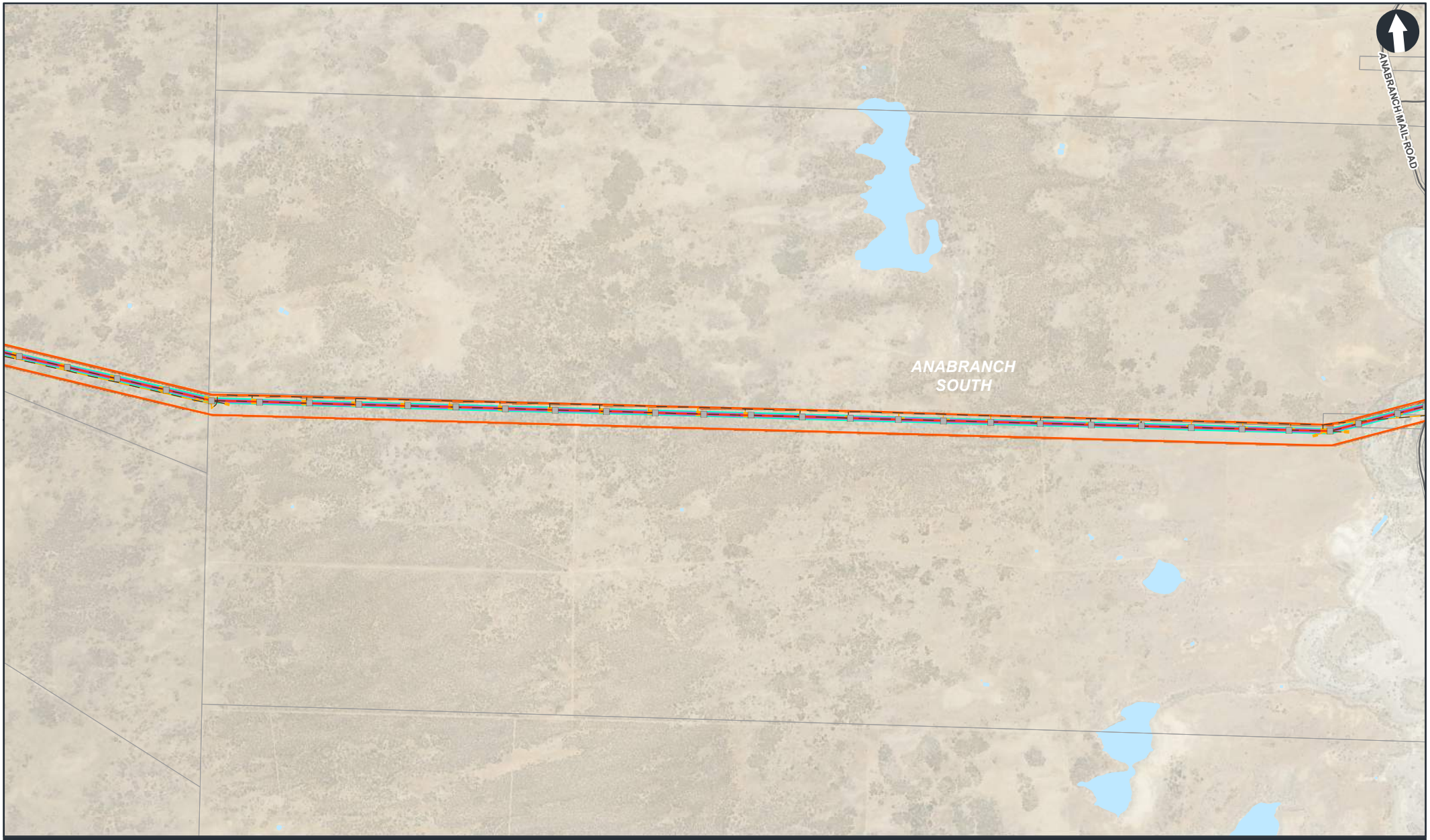


Figure 9.2f

Proposal indicative disturbance area including construction and operational impacts

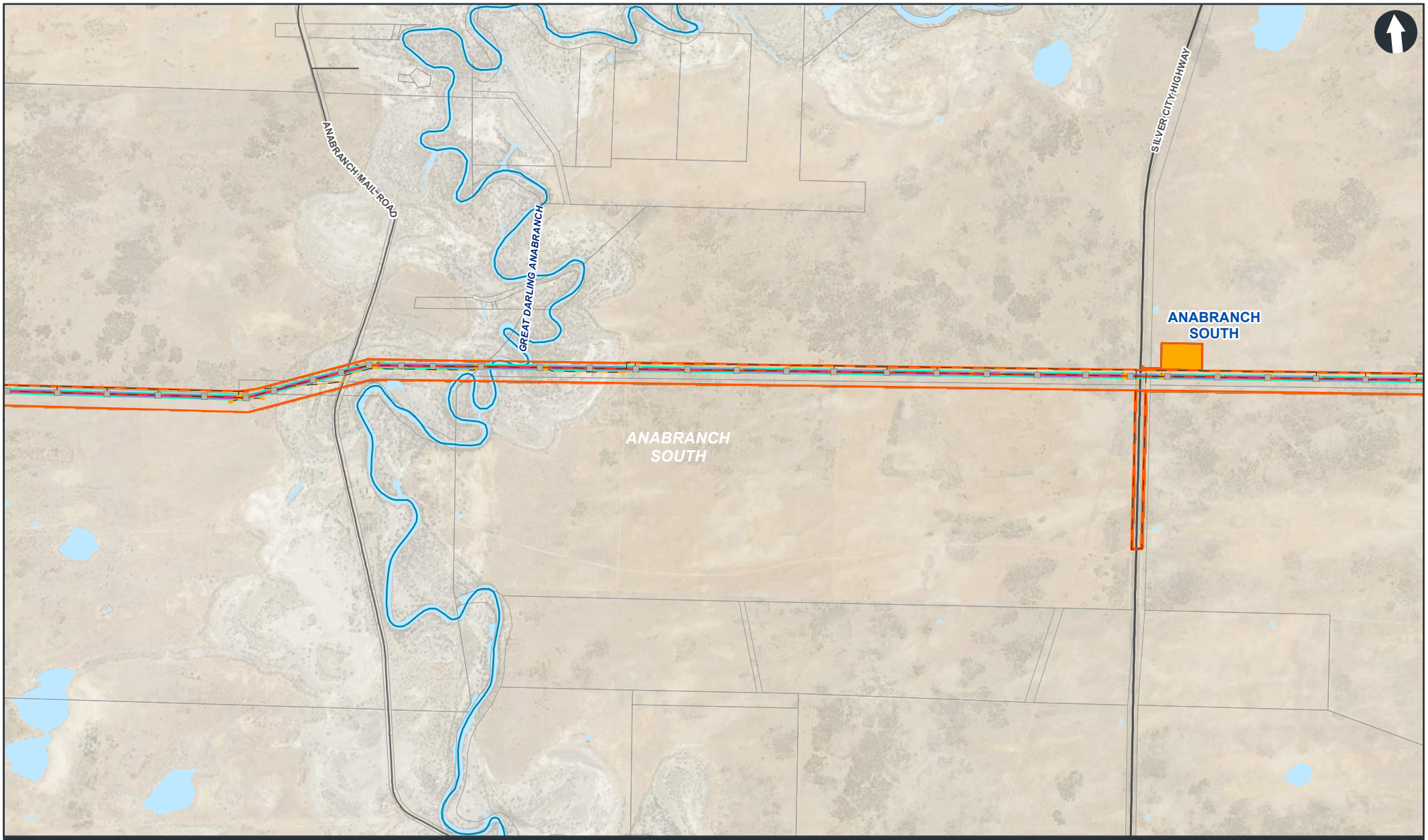


Figure 9.2g

Proposal indicative disturbance area including construction and operational impacts

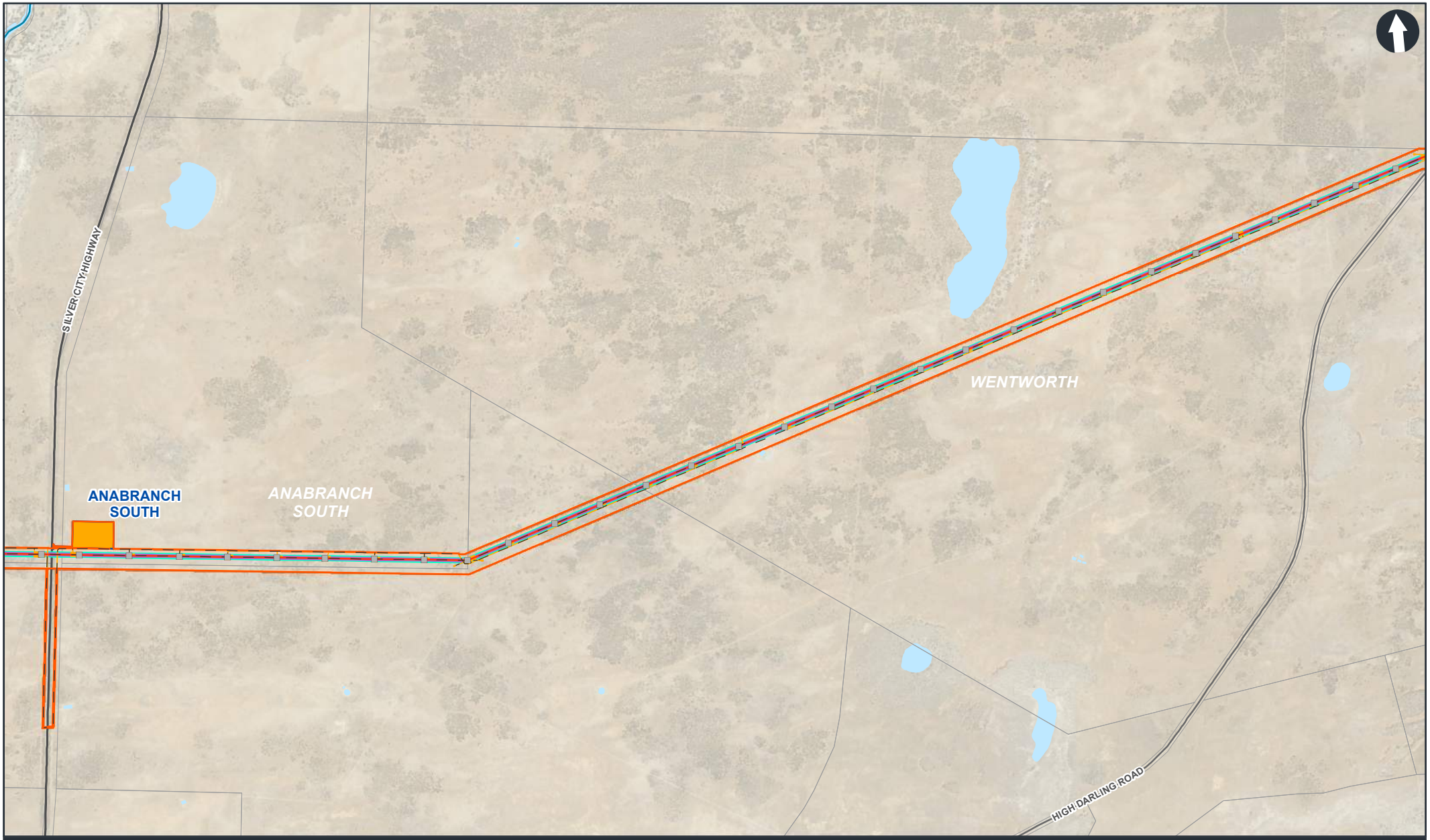


Figure 9.2h

Proposal indicative disturbance area including construction and operational impacts

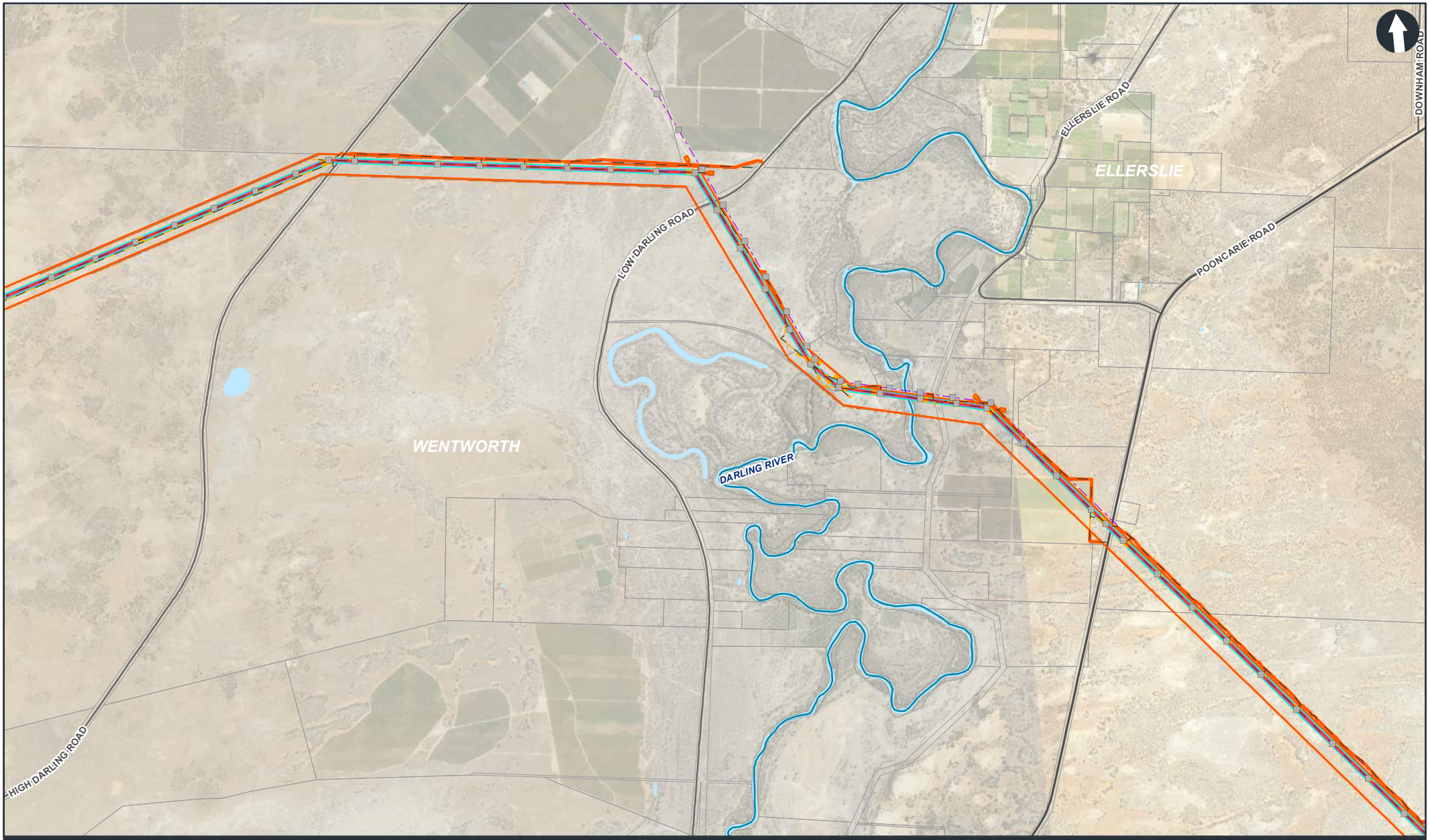


Figure 9.2i

Proposal indicative disturbance area including construction and operational impacts

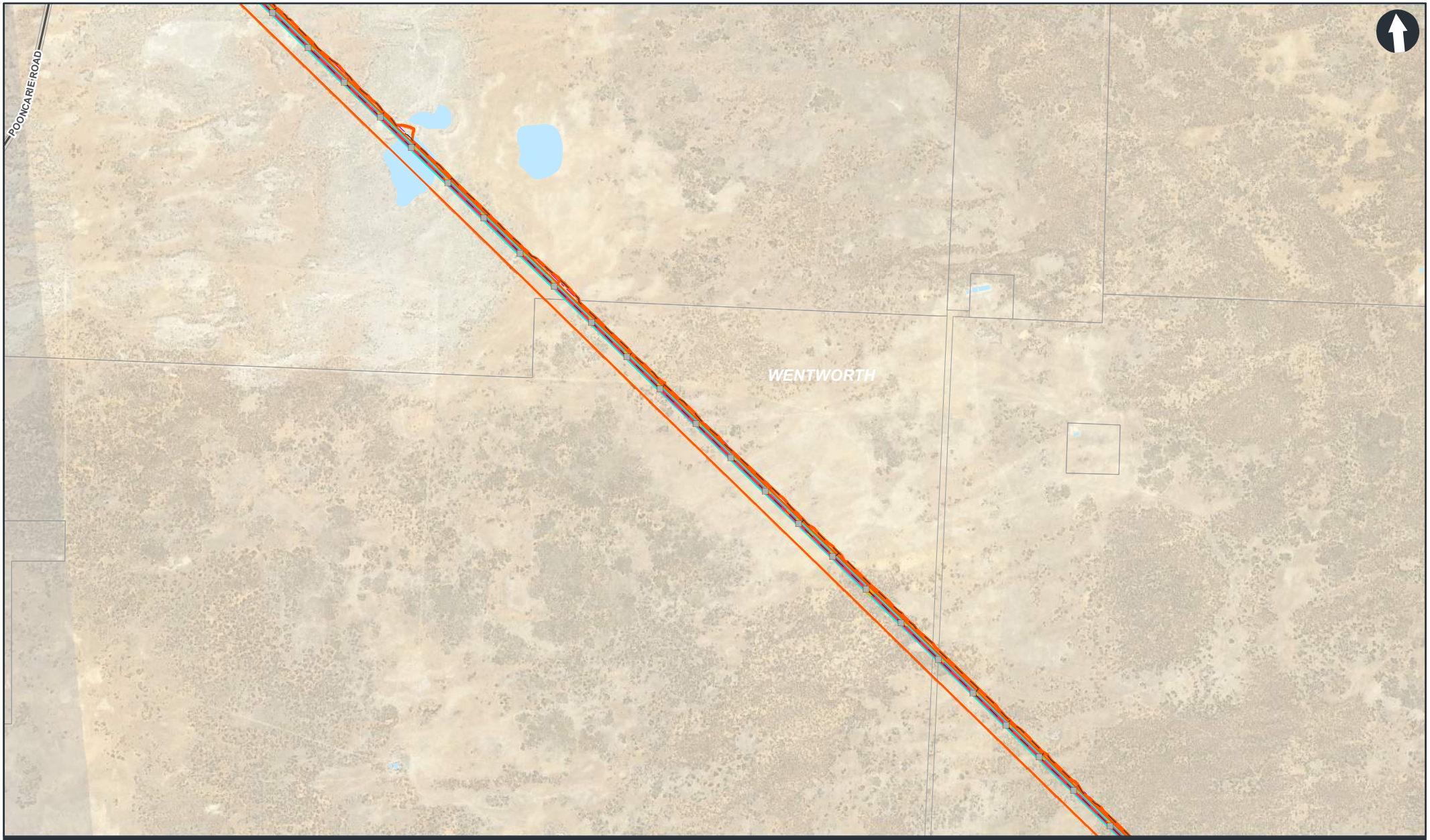


Figure 9.2j

Proposal indicative disturbance area including construction and operational impacts

Figure 9.2k

Proposal indicative disturbance area including construction and operational impacts

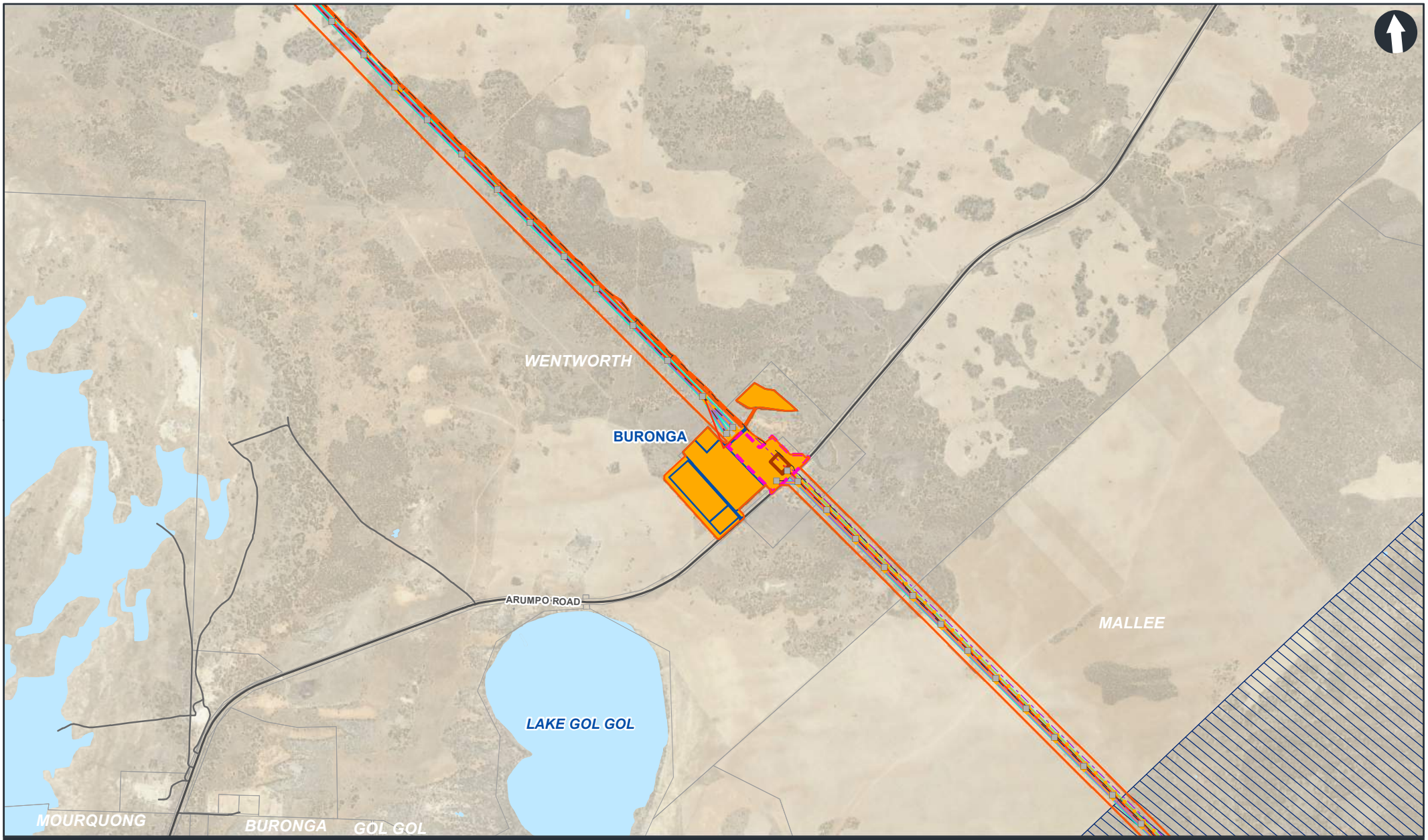


Figure 9.2l

Proposal indicative disturbance area including construction and operational impacts

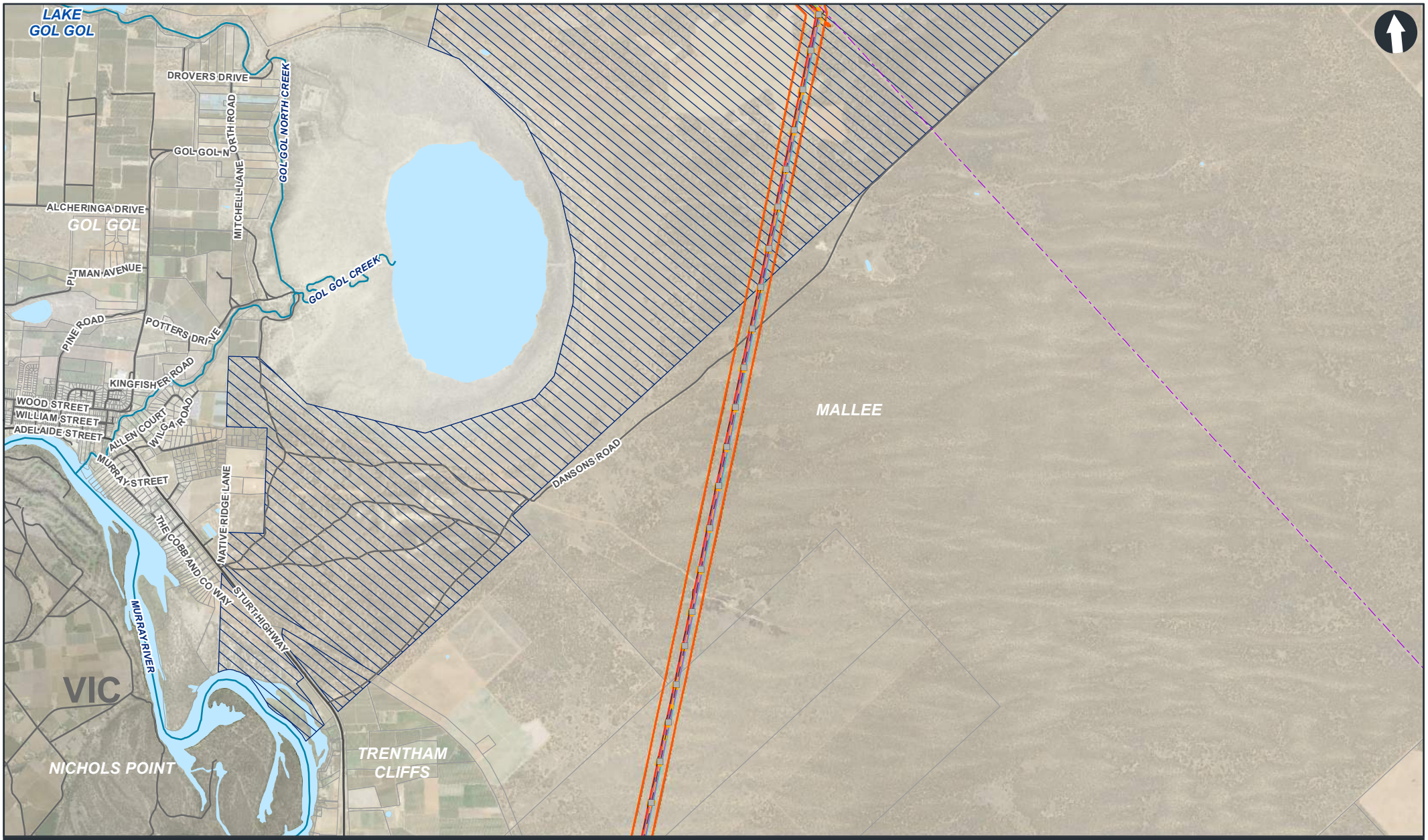


Figure 9.2m

Proposal indicative disturbance area including construction and operational impacts

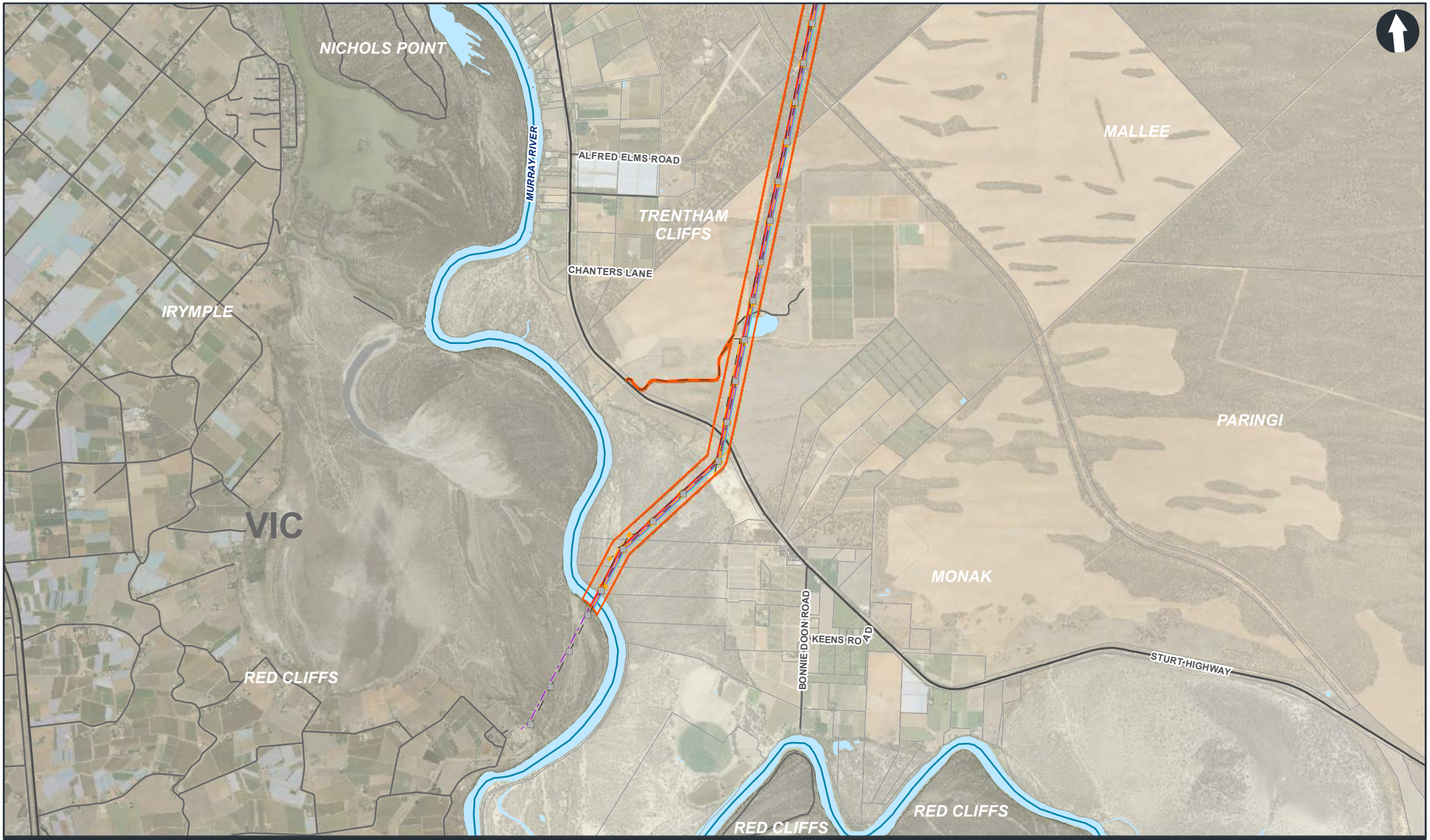


Figure 9.2n

Proposal indicative disturbance area including construction and operational impacts

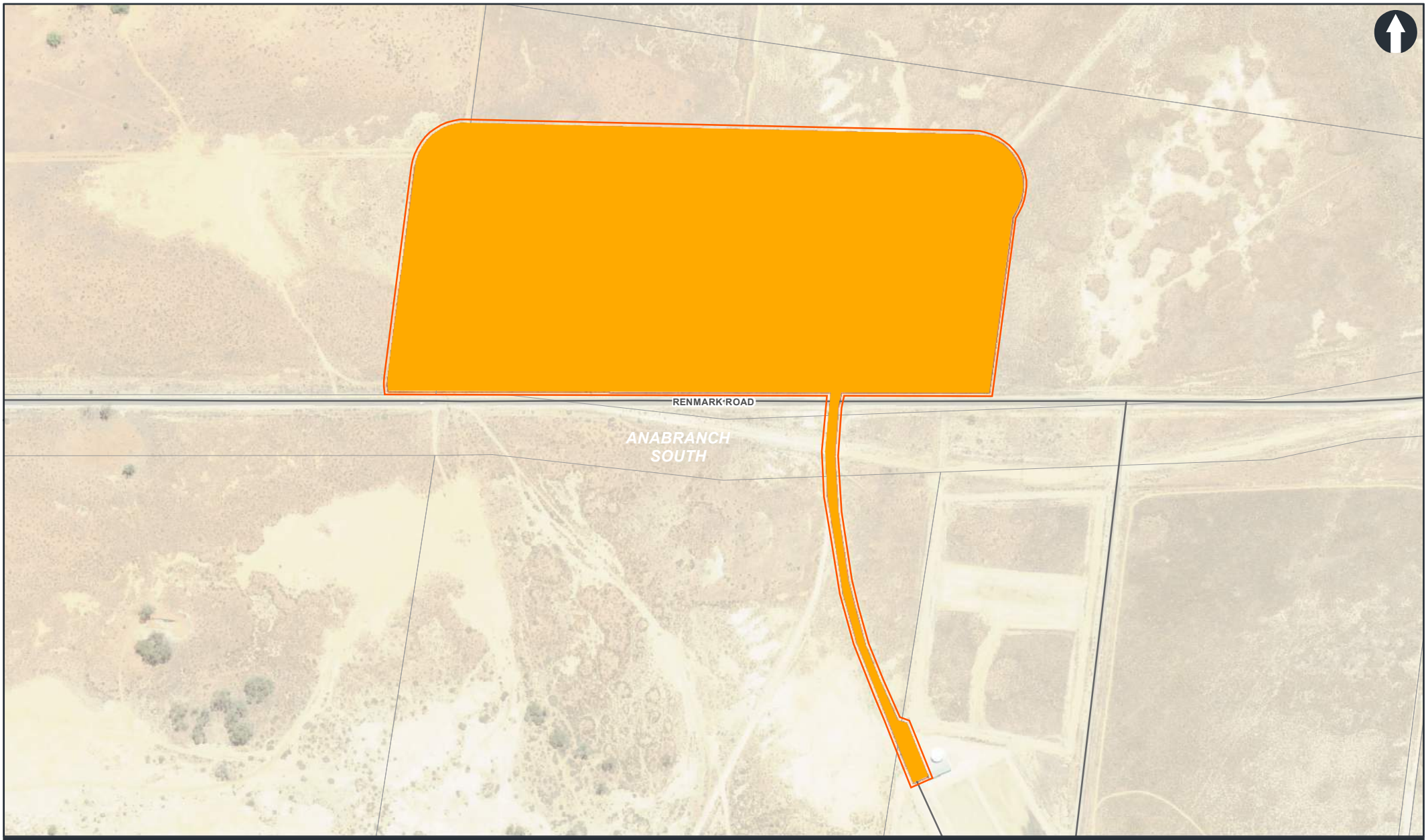
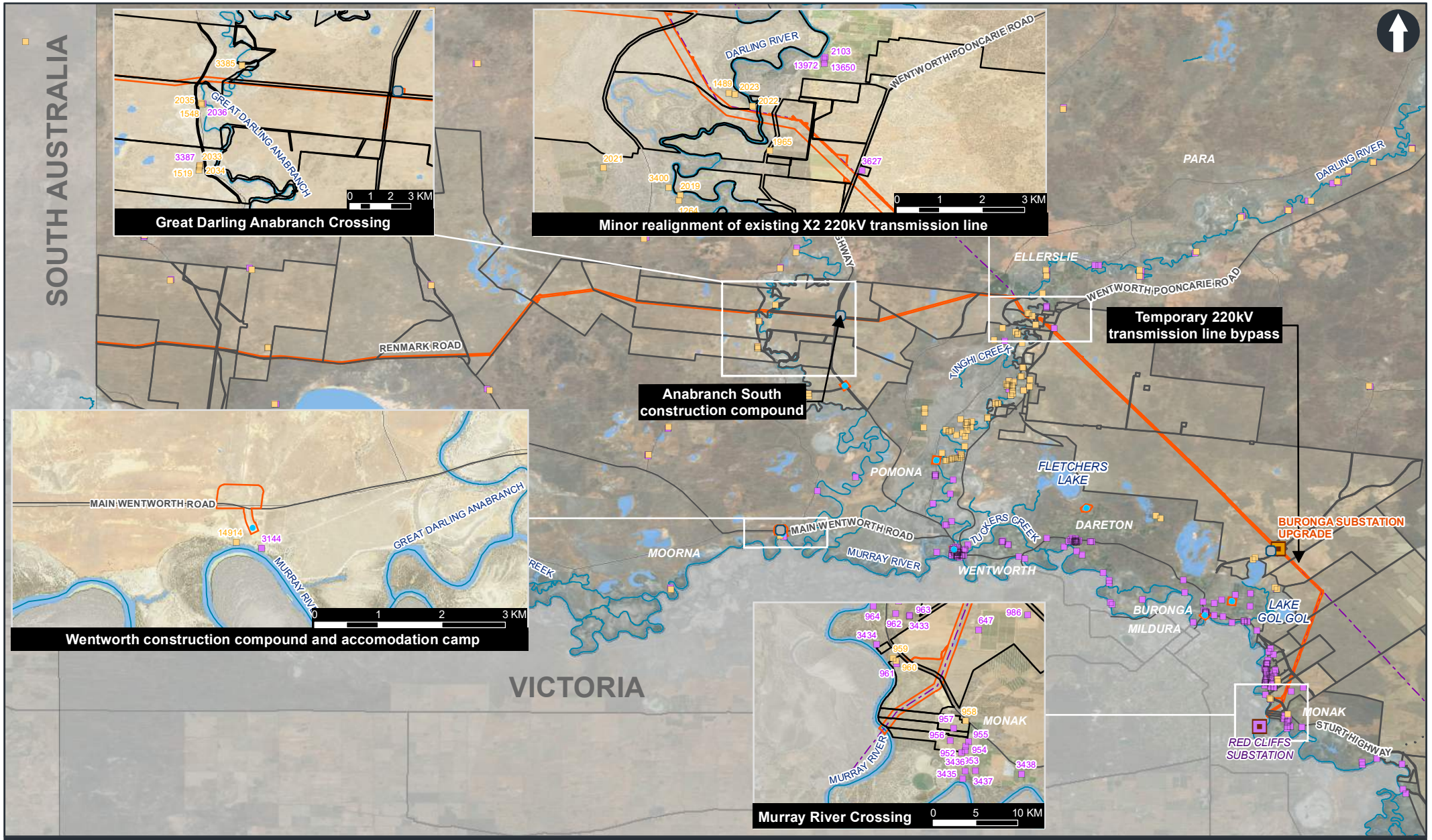


Figure 9.2o

Proposal indicative disturbance area including construction and operational impacts



Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\AUTW500241\WSP O365\EnergyConnect - General\5_Shared\54_Production\Maps\10_EIS\PECw\01_RFI\PS117658

Figure 17-1

Sensitive receivers

Appendix D
Additional PAD detail

12 May 2021

Ms Emma Taylor
Principal Environmental Scientist
& ACT Environment Planning Team Lead
WSP Australia Pty Limited

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Confidential

Dear Emma,

Re: EnergyConnect – Western Section

The table below provides consolidated detail regarding the possible archaeological significance of the PADs identified in the TransGrid EnergyConnect – Western Section project Aboriginal Cultural Heritage Assessment report.

The table has been provided in support of the Western Section EnergyConnect Revised Heritage Report at the request of DPIE.

Kind Regards

N. Hayes

Nicola Hayes
Associate Director

PAD	Assessed archaeological potential	Item(s)/ future linked to PAD (identifier and description)	Significance of item(s)/ feature	Potential significance of PAD (based on preliminary review of number and significance of items/landforms/ features on the surface of the PAD)[1]	Justification
PEC-W-PAD1	High	PEC-W-6 Midden & artefact scatter	moderate	High	Likely dateable stratified deposits with research value, possibility of residue analysis on grinding artefacts. Surface archaeology may show multiple activities occurring onsite.
PEC-W-PAD2	Moderate	PEC-W-10 through PEC-W-21 Midden, artefact scatter & hearth	moderate	Moderate	
PEC-W-PAD3	High	PEC-W-22 through PEC-W-38 Artefacts scatters, middens, and hearths	moderate	High	Likely dateable stratified deposits with research value, possibility of residue analysis on grinding artefacts. Large boulder core present. Surface archaeology may show multiple activities occurring onsite.
PEC-W-PAD4	Moderate	PEC-W-39 through PEC-W-43 Artefacts scatters and a hearth	moderate	High	Possible dateable stratified deposits with research value, possibility of residue analysis on grinding artefacts. Large in situ (site furniture) grinding mortar present (PEC-W-42). Surface archaeology may show multiple activities occurring onsite.
PEC-W-PAD5	High	PEC-W-45 Artefacts scatter	moderate	Moderate/High	Possibility of residue analysis on grinding artefacts
PEC-W-PAD6	Moderate	PEC-W-46 through PEC-W-48 Artefacts scatters	moderate	Moderate	

PAD	Assessed archaeological potential	Item(s)/ future linked to PAD (identifier and description)	Significance of item(s)/ feature	Potential significance of PAD (based on preliminary review of number and significance of items/landforms/ features on the surface of the PAD)[1]	Justification
PEC-W-PAD7	High	PEC-W-49 through PEC-W-42 and PEC-W-54 and 55 Artefacts scatters	moderate	Moderate	
PEC-W-PAD8	High	PEC-W-61 Hearths and artefact scatter	moderate	High	Many in situ clay hearths on eroded surfaces. Likely dateable stratified deposits with research value. Banks on Darling Anabranch
PEC-W-PAD9	Moderate	PEC-W-62 Isolated Find	moderate	Moderate	
PEC-W-PAD10	High	PEC-W-63 and 64 Isolated Find and Artefacts scatter	moderate	High	Possibility of residue analysis on grinding artefacts. Ground edge axe at base of low sand dune, heightened potential for burials. Adjacent to Darling Anabranch
PEC-W-PAD11	Moderate	PEC-W-65 About 40 metres artefact scatter and hearth	moderate	Moderate	
PEC-W-PAD12	High	nil		Moderate	
PEC-W-PAD13	Moderate	PEC-W-66 Hearths	moderate	Moderate	
PEC-W-PAD14	High	nil		Moderate/High	High sensitivity landform at confluence of current banks of Darling Anabranch, as well as two broader flood/paleo channels. High potential for multiple site features subsurface.

PAD	Assessed archaeological potential	Item(s)/ future linked to PAD (identifier and description)	Significance of item(s)/ feature	Potential significance of PAD (based on preliminary review of number and significance of items/landforms/ features on the surface of the PAD)[1]	Justification
PEC-W-PAD15	High	PEC-W-68 Artefact scatter and hearth	moderate	Moderate/High	High sensitivity landform on current banks of Darling Anabranch. High potential for multiple site features subsurface. Possible dateable stratified deposits with research value
PEC-W-PAD16	High	PEC-W-69 Artefact scatter and hearth	moderate	Moderate/High	High sensitivity landform on current banks of Darling Anabranch. High potential for multiple site features subsurface. Possible dateable stratified deposits with research value
PEC-W-PAD17	Moderate	PEC-W-70 Artefact scatter	moderate	Moderate	
PEC-W-PAD18	Moderate	PEC-W-71 and 72 Hearths	moderate	Moderate	
PEC-W-PAD19	High	PEC-W-77 Hearth	moderate	Moderate	
PEC-W-PAD20	Moderate	nil		Moderate	
PEC-W-PAD21	High	PEC-W-92 and PEC-W-93 Artefact, Hearth and middens	moderate	High	High sensitivity landform on locally elevated banks of Darling River and adjacent to flood channel/billabong. High potential for multiple site features subsurface including dateable stratified deposits with research value.

PAD	Assessed archaeological potential	Item(s)/ future linked to PAD (identifier and description)	Significance of item(s)/ feature	Potential significance of PAD (based on preliminary review of number and significance of items/landforms/ features on the surface of the PAD)[1]	Justification
PEC-W-PAD22	High	PEC-W-94 and PEC-W-95 Hearths	moderate	High	High sensitivity landform on locally elevated banks of Darling River. High potential for multiple site features. Approximately 50 hearths (PEC-W-94) of varying condition on eroded/disturbed surfaces. This site has dateable stratified deposits with high research value.
PEC-W-PAD23	High	PEC-W-96 Artefact scatter and hearths	moderate	Moderate/High	High sensitivity landform on banks of Darling River. High potential for multiple site features subsurface including dateable stratified deposits with research value.
PEC-W-PAD24	Moderate	PEC-G-7 Artefacts and hearths	moderate	Moderate	
PEC-W-PAD25	High	PEC-W-100 Artefacts	moderate	High	High sensitivity landform on tall dune to the north of a dry lake. Heightened potential for burials. High potential for multiple site features subsurface including dateable stratified deposits with research value.
PEC-W-PAD26	High	PEC-W-102 Artefact scatter and hearths	moderate	High	High sensitivity landform on tall leeward dune/lunette to the east of a dry lake. Heightened potential for burials. High potential for multiple site features subsurface including dateable stratified deposits with research value.
PEC-W-PAD27	Moderate	PEC-W-103 Artefact scatter and hearths	moderate	Moderate	Avoided

PAD	Assessed archaeological potential	Item(s)/ future linked to PAD (identifier and description)	Significance of item(s)/ feature	Potential significance of PAD (based on preliminary review of number and significance of items/landforms/ features on the surface of the PAD)[1]	Justification
PEC-W-PAD28	High	Scarred trees PEC-W-106 and PEC-W-107	-	Moderate	Banks of Murray River

Note 1: Significance level is preliminary at this stage. The significance level is subject to completion of the test excavation program including analysis of findings.

Appendix E
Traffic and transport assessment memorandum

MEMO

TO:	TransGrid
FROM:	WSP
SUBJECT:	**Traffic and Transport Assessment amendment**
OUR REF:	Traffic and Transport Assessment amendment: PS117658 – EnergyConnect (NSW – Western Section)
DATE:	**2 July 2021**

This technical memo has been prepared to respond to the request from Department of Planning, Industry and Environment of further information concerning traffic construction routes for EnergyConnect (NSW – Western Section) (The proposal). This memorandum is to be read in conjunction with the supporting environmental assessment documentation prepared for the proposal, including the Amendment Report.

1.1 SUMMARY TABLE OF ACCESS ROUTES

This section discusses the traffic and transport related aspects of the three types of identified access routes (primary, secondary and water supply) taken by vehicles involved in the construction of the proposal. These are shown in Figure 1 and discussed below:

— **Primary access routes** refer to the multiple potential haulage routes along roads to the proposed substation upgrade areas, the construction compound areas and the accommodation areas associated with the proposal. Details of the finalised proposed haulage routes from shipping port locations will be determined during detailed design. Shipping port location options are: the ports within Adelaide, Melbourne and Sydney/Wollongong/Newcastle. These roads include: Silver City Highway (B79), Sturt Highway (A20), Arumpo Road, Renmark Road and Pooncarie Road/Wentworth Street. The impact of the proposal on the identified primary access routes have been assessed in the EIS and supporting documentation.

— **Secondary access routes** refer to localised haulage routes that would be used to provide immediate access to the construction areas and would be used for short durations of the construction program (periods of less than one year). Heavy vehicles using these routes would likely consist of concrete trucks (semi-trailer agitator), semi-trailers, cranes, large trucks and trailers (quads). B-doubles would not use these roads. The impact of the proposal on the identified secondary access routes are further considered in this memorandum.

— **Water supply access routes** are haulage routes that originate from water supply points (within the study area) and have destinations to either construction compound and accommodation campgrounds or other construction areas. The Amendment Report (March 2021) identified the proposed water supply points but did not identify or assess

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the water supply routes or the associated traffic volumes. The proposed water supply routes and associated proposal-related traffic volumes have now been confirmed. The impact of the proposal on the identified secondary access routes are further considered in this memorandum.

The primary and secondary routes that would be used by construction-related traffic moving between construction compound and camp locations and access points to construction corridor are shown in Figure 1. The proposed routes that would be for water supply vehicle movements between the water supply points and the primary and secondary access routes are also shown in Figure 1.

The transport-related conditions of the three types of identified access routes (primary, secondary and water supply) taken by vehicles involved in the construction of the proposal have been summarised in Table 1.

In relation to oversized and overmass vehicles, less than 20 vehicles would be classified as an oversized and overmass vehicle and are factored into the heavy vehicle movement numbers provided in Table 1. The final number and schedule of these movements would be confirmed during detailed design but it is likely that the movements would be spread throughout the construction duration for logistical reasons.

In relation to water supply routes, Table 1 conservatively assumes that each water supply point (and associated routes) would be used at the specified frequencies over the full duration of the construction phase. In reality, the use of the secondary access routes would vary depending on the location of the corridor where construction is occurring at the time, the construction activities being carried out and the nearest suitable water supply point.

There are instances where some sections of a single road on the nominated access routes are classified differently according to their function in the road network. For example, roads within Wentworth that form part of the Silver City Highway (Adams Street, Sandwych Street and Wentworth Street) are classified as State Roads. Elsewhere, other sections of these same roads are classified as local or regional.

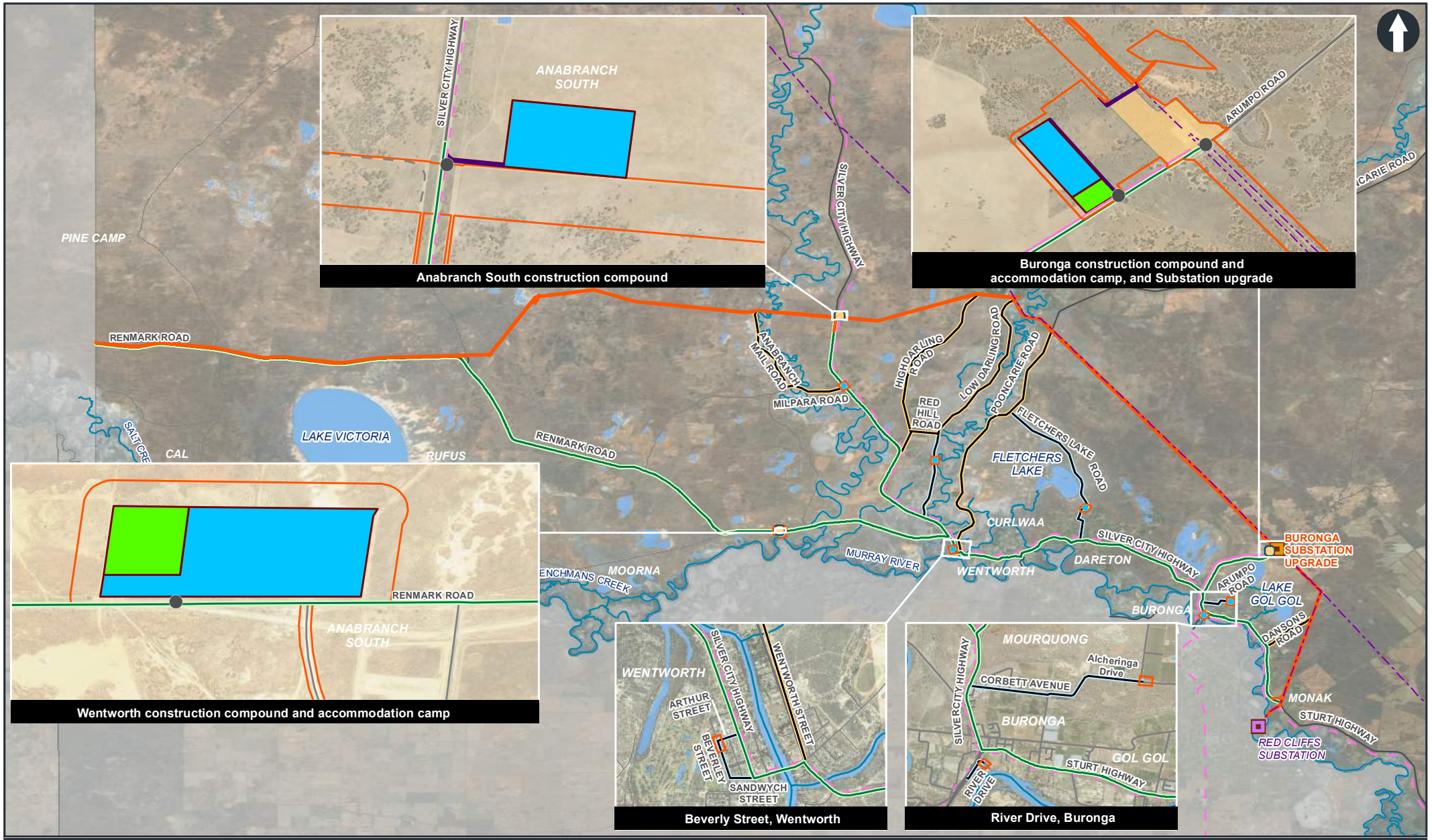

Figure 1

Proposed access routes

Table 1 Summary table

ROAD NAME	ROAD CONDITION	RELEVANT ROAD AUTHORITY	CONSTRUCTION PERIOD VEHICLE MOVEMENTS PER DAY (INDICATIVE)		DURATION OF USE DURING CONSTRUCTION
			PEAK	TYPICAL	
Primary					
Silver City Highway (B79) between Sturt Highway and the transmission line alignment	Sealed highway with line-markings. No pedestrian footpath or road shoulder. Two-lanes and two-way between Town Centres. Four-lanes and two-way within Town Centres of Wentworth, Dareton and Buronga.	Transport for NSW (State Road)	Light Vehicles: — 500 vehicles per day Heavy Vehicles: — 400 vehicles per day	Light Vehicles: — 280 vehicles per day Heavy Vehicles: — 280 vehicles per day	Duration of full construction program
Sturt Highway (A20) between Silver City Highway and Keens Road in Monak (near transmission line alignment)[1]	Sealed highway with line-markings. Narrow road shoulder in both directions. Two-lanes and two-way.	Transport for NSW (State Road)	Light Vehicles: — 500 vehicles per day Heavy Vehicles: — 400 vehicles per day	Light Vehicles: — 280 vehicles per day Heavy Vehicles: — 154 vehicles per day	Duration of full construction program
Arumpo Road between Silver City Highway and the Buronga Substation	Sealed road with centreline marking and with unsealed road shoulders. Two-lanes and two-way.	Wentworth Shire Council (Regional Road)	Light Vehicles: — 500 vehicles per day Heavy Vehicles: — 400 vehicles per day	Light Vehicles: — 280 vehicles per day Heavy Vehicles: — 280 vehicles per day	Duration of full construction program
Renmark Road between Silver City Highway and the South Australian border with South Australia	Partially sealed road with centreline marking and with unsealed road shoulders. Two-lanes and two-way.	Wentworth Shire Council (Regional Road)	Light Vehicles: — 500 vehicles per day Heavy Vehicles: — 400 vehicles per day	Light Vehicles: — 280 vehicles per day Heavy Vehicles: — 280 vehicles per day	Duration of full construction program

ROAD NAME	ROAD CONDITION	RELEVANT ROAD AUTHORITY	CONSTRUCTION PERIOD VEHICLE MOVEMENTS PER DAY (INDICATIVE)		DURATION OF USE DURING CONSTRUCTION
			PEAK	TYPICAL	
Secondary					
Wentworth Street between Silver City Highway and Pooncarie Road	Sealed road with centreline marking and no road shoulders. Two-lanes and two-way.	Wentworth Shire Council (Regional Road)	Light Vehicles: — 60 vehicles per day Heavy Vehicles: — 100 vehicles per day	Light Vehicles: — 40 vehicles per day Heavy Vehicles: — 25 vehicles per day	Less than one year
Pooncarie Road between Wentworth Street and the transmission line alignment	Sealed road with centreline marking and unsealed road shoulders. Two-lanes and two-way.	Wentworth Shire Council (Regional Road)	Light Vehicles: — 60 vehicles per day Heavy Vehicles: — 100 vehicles per day	Light Vehicles: — 40 vehicles per day Heavy Vehicles: — 25 vehicles per day	Less than one year
Anabranch Mail Road between Renmark Road and the transmission line alignment Milpara Road between Anabranch Mail Road and Silver City Highway	Unsealed road with no road shoulders. Two-way road.	Wentworth Shire Council (Local Road)	Light Vehicles: — 100 vehicles per day Heavy Vehicles: — 50 vehicles per day	Light Vehicles: — 60 vehicles per day Heavy Vehicles: — 25 vehicles per day	Less than one year
High Darling Road between Silver City Highway and the transmission line alignment	Mostly unsealed road with no road shoulders. Two-way road.	Wentworth Shire Council (Local Road)	Light Vehicles: — 60 vehicles per day Heavy Vehicles: — 50 vehicles per day	Light Vehicles: — 40 vehicles per day Heavy Vehicles: — 25 vehicles per day	Less than nine months

ROAD NAME	ROAD CONDITION	RELEVANT ROAD AUTHORITY	CONSTRUCTION PERIOD VEHICLE MOVEMENTS PER DAY (INDICATIVE)		DURATION OF USE DURING CONSTRUCTION
			PEAK	TYPICAL	
Low Darling Road between Pomona Road and the transmission line alignment	Mostly sealed road with unsealed road shoulders. Two-lanes and two-way.	Wentworth Shire Council (Local Road)	Light Vehicles: — 60 vehicles per day Heavy Vehicles: — 50 vehicles per day	Light Vehicles: — 40 vehicles per day Heavy Vehicles: — 25 vehicles per day	Less than six months
Red Hill Road between High Darling Road and Low Darling Road	Mostly unsealed road with no road shoulders. Two-way road.	Wentworth Shire Council (Local Road)	Light Vehicles: — 60 vehicles per day Heavy Vehicles: — 50 vehicles per day	Light Vehicles: — 40 vehicles per day Heavy Vehicles: — 25 vehicles per day	Less than six months
Dansons Road between Sturt Highway and the transmission line alignment	Unsealed road with no road shoulders. Two-way road.	Wentworth Shire Council (Local Road)	Light Vehicles: — 100 vehicles per day Heavy Vehicles: — 50 vehicles per day	Light Vehicles: — 60 vehicles per day Heavy Vehicles: — 25 vehicles per day	Less than one year

ROAD NAME	ROAD CONDITION	RELEVANT ROAD AUTHORITY	CONSTRUCTION PERIOD VEHICLE MOVEMENTS PER DAY (INDICATIVE)		DURATION OF USE DURING CONSTRUCTION
			PEAK	TYPICAL	
Water Supply					
Alcheringa Drive between Melaleuca Street and Gol Gol N Road Corbett Avenue between Silver City Highway and Melaleuca Street	Mostly sealed road with unsealed road shoulders. Two-lanes and two-way.	Wentworth Shire Council (Local Road)	Heavy Vehicles: — 40 vehicles per day	Heavy Vehicles: — 30 vehicles per day	Full construction program
Fletchers Lake Road between Silver City Highway and Pooncarie Road Pooncarie Road between Wentworth Street and the transmission line alignment	Sealed road with centre-line marking and unsealed road shoulders. Two-lanes and two-way.	Wentworth Shire Council (Local Road)	Heavy Vehicles: — 40 vehicles per day	Heavy Vehicles: — 30 vehicles per day	Full construction program
River Drive between Sturt Highway and Murray River (potable water)	Partially sealed road with unsealed road shoulders. Two-way road.	Wentworth Shire Council (Local Road)	Heavy Vehicles: — 6 vehicles per day	Heavy Vehicles: — 4 vehicles per day	Full construction program

ROAD NAME	ROAD CONDITION	RELEVANT ROAD AUTHORITY	CONSTRUCTION PERIOD VEHICLE MOVEMENTS PER DAY (INDICATIVE)		DURATION OF USE DURING CONSTRUCTION
			PEAK	TYPICAL	
Sandwych Street between Silver City Highway and Beverly Street Beverly Street between Sandwych Street and Arthur Street Arthur Street between Silver City Highway and Beverly Street (potable water)	Sandwych Street and Beverley Street are sealed roads with line-markings and road shoulders in both directions. Beverley Street also has angled parking spots in the northbound direction. Arthur Street is a sealed road with unsealed road shoulders for kerbside parking. All roads have two-lanes and are two-way.	Wentworth Shire Council (Local Road)	Heavy Vehicles: — 4 vehicles per day	Heavy Vehicles: — 2 vehicles per day	Full construction program
Alcheringa Drive between Melaleuca Street and Gol Gol N Road Corbett Avenue between Silver City Highway and Melaleuca Street	Unsealed road with no road shoulders. Two-way road.	Wentworth Shire Council (Local Road)	Heavy Vehicles: — 40 vehicles per day	Heavy Vehicles: — 30 vehicles per day	Full construction program

ROAD NAME	ROAD CONDITION	RELEVANT ROAD AUTHORITY	CONSTRUCTION PERIOD VEHICLE MOVEMENTS PER DAY (INDICATIVE)		DURATION OF USE DURING CONSTRUCTION
			PEAK	TYPICAL	
Oxley Road between Pomona Road and Darling River Pomona Road between Silver City Highway and Low Darling Road Red Hill Road between High Darling Road and Low Darling Road High Darling Road between Silver City Highway and the transmission line alignment Low Darling Road between Pomona Road and the transmission line alignment	Oxley Road and Pomona Road are sealed roads with unsealed road shoulders. All roads have two-lanes and are two-way.	Wentworth Shire Council (Local Road)	Heavy Vehicles: — 40 vehicles per day	Heavy Vehicles: — 30 vehicles per day	Full construction program

Notes:

1. The Sturt Highway within Wentworth comprises parts of Adams Street, Sandwych Street and Wentworth Street.

1.2 ASSESSMENT METHDOLOGY AND METRICS

To assess the impact of the Proposal to the additional routes identified, reference is made to the traffic flow capacity detailed in Transport for NSW (*formerly Roads and Maritime Services*) Guide to Traffic Generating Developments. Table 2 shows the indicative level of service and the corresponding theoretical peak hour traffic flows typically applied for urban roads which are subjected to interrupted flows (i.e. interruptions from turning traffic at minor intersections and access driveways).

Table 2 Urban road peak hour flows per direction

LEVEL OF SERVICE	ONE LANE (VEH/HR)
A	200
B	380
C	600
D	900
E	1400

Source: RTA Guide to Traffic Generating Developments (October 2002)

The guideline indicates a desirable traffic flow to be maintained up to a Level of Service (LoS) C for weekday peak hour traffic, which equals to approximately 600 vehicles per hour for each lane. In recreational peak hours (i.e. peaks associated with tourist or recreational activity), traffic flow of up to LoS D is generally accepted, which translates to approximately 900 vehicles per hour.

It is however noted that the roads observed in the study area are generally high-speed and subjected to few accesses to abutting roads or properties. These road conditions generally present minor or uninterrupted traffic flows and can accommodate higher traffic capacity in excess of 1,800 vehicles/hour for LoS E. As such, the assessment based on the LoS presented in Table 2 can be considered conservative for the study area.

1.3 IMPACT ASSESSMENT

1.3.1 SECONDARY ACCESS ROUTES

Secondary access routes would provide intermediate access to the transmission line corridor and would only be required at certain times (for periods of less than one year) over the full construction program. These routes are required to ensure the efficient movement of construction equipment and materials via the public road network to sections of the transmission line corridor where:

- Access points on primary access routes are considerably distanced from certain sections of the corridor, and/or
- Where key waterways prevent access across the corridor.

For example, the use of Anabranch Mail Road and Milpara Road would provide access to sections of the construction corridor west of the Great Darling Anabranch that would otherwise need to be accessed along the construction corridor from the access point on Renmark Road.

The use of the secondary access routes would vary depending on the location of the corridor where construction is occurring at the time, the construction activities being carried out and

the nearest suitable water supply point. Peak construction traffic volumes along the secondary routes would occur during discrete construction activities (for example concrete deliveries for transmission tower foundations). Any peak movements would therefore only occur for a short duration over the duration specified in Table 1.

The highest amount of additional traffic generated from construction on the identified secondary access routes is 160 vehicle movements per day (along Pooncarie Road). This approximates to a peak hourly construction traffic rate of 16 vehicle movements per hour.

Considering the desired theoretical threshold (LOS C) of 600 vehicle movements per hour per traffic lane, an increase of 16 vehicles movements per hour is approximately three per cent of this threshold. Therefore, the impact of traffic generated from construction on the secondary access route roads are expected to be minimal and would maintain desirable road flow conditions.

The study did not initially include these roads for capacity assessments, as such no traffic counts are available on these roads for a detailed assessment. However, these roads are observed to have similar traffic, access and land use conditions as those observed on the local and regional roads included for the study.

Roads such as Renmark Road (regional) and Arumpo Road (higher-order local) were recorded to have low traffic volumes with an Average Daily Traffic of less than 50 vehicles per day and 330 vehicles per day respectively. Traffic counts at a number of traffic survey locations in the study area suggest that the peak hour traffic accounts for approximately ten per cent of the daily traffic.

Taking Arumpo Road as an example, this is accounts to approximately 33 vehicles travelling during the peak period and the additional construction traffic would increase this to approximately 49 vehicles per hour (eight per cent of desirable theoretical traffic flow of the road).

The impact of the construction of the proposal to the roads on secondary access routes are considered minimal and therefore no upgrades are proposed to the road network.

1.3.2 WATER SUPPLY ROUTES

The water supply journeys could occur across different times of day and are spread across various locations such as those listed in Table 1.

There are limited alternatives in most instances to access water supply points identified in the Amendment Report. Some access points would travel through local streets within towns, such as Wentworth and Buronga (River Drive). In these instances, both are existing potable water access points managed by Wentworth Shire Council and the shortest route to and from the primary access routes have been identified. Further, movements attributed to the proposal at these locations (travelling along River Drive, Sandwych Street, Beverly Street and Arthur Street) have been minimised to less than six heavy vehicle movements (three trips) per day at peak.

Water supply vehicles would travel to construction compounds and accommodation camps, and/or to work areas along the transmission line corridor via the nominated primary or secondary access routes, using the same secondary access routes for the same reasons detailed earlier within this memorandum in Section 1.2. The water supply vehicles movements are accounted for in the traffic volumes assigned to the primary routes.

No water supply vehicle movements are required to supply water to the Wentworth main construction compound and accommodation camp site as it would be directly connected to a

water source via a new pipeline. Water supply vehicle movements between this compound/camp and construction locations are factored into the traffic volumes along the primary routes.

The highest amount of additional traffic generated from construction on the identified water supply route roads (see Table 1) is 40 vehicle movements per day. Assuming that ten per cent of these movements occur during the peak hour, this approximates to a peak hourly construction traffic rate of four vehicle movements per hour, or one per cent of the desirable theoretical threshold (LoS C).

There are roads that serve as both water supply routes and secondary access routes – Anabranch Mail Road, Milpara Road, Pooncarie Road and Wentworth Street. The vehicle movements generated from the water supply routes, combined with the peak hourly construction traffic rate of 16 vehicles movements per hour from the secondary access routes, would result in a total of about 20 vehicles movements per hour..

Considering the desirable theoretical threshold (LoS C) of 600 vehicle movements per hour per lane, an increase of 20 vehicle movements per hour is approximately three per cent of the road's capacity.

Therefore, the effect of traffic generated from construction on the water supply route roads, considered in culmination with the secondary access route roads, are expected to keep the performance of the effected road network well above desired flow conditions.

In addition, over the process of refilling, the heavy vehicles providing water supply are expected to refill off-road adjacent to the destination. Therefore, the refilling process is not expected to interact with moving traffic on the road.

1.4 MITIGATION AND MANAGEMENT MEASURES

The assessment indicates that the additional vehicle movements along the secondary and water supply routes due to construction-related traffic would be unlikely to result in any significant changes in traffic flow and associated impacts. As a result, there is no need to upgrade the roads to increase capacity.

Mitigation measure TA2 requires the completion of pre-condition surveys for roads used by construction vehicles, and to develop mechanisms to repair damage to the road network caused by construction vehicles in consultation with the relevant roads authorities. To maintain safe conditions, regular inspections would be carried out, in consultation with the relevant roads authority, to monitor the condition of these roads. Any identified issues attributable to proposal-related use would be rectified to maintain road safety. Following completion of construction works, any damage to the roads caused by the proposal-related vehicles would be rectified in consultation with the relevant roads authority.

The amended mitigation measure TA2 is provided in Table 3. Blue text identifies the amendments (inclusions) to the mitigation

Table 3 Revised mitigation measure TA2

REFERENCE	MITIGATION MEASURE	TIMING	APPLICATION LOCATION(S)
TA2	Road pre-condition will be carried out for the public road network in the vicinity of access points to construction compounds, construction camps and construction areas, and for roads for which proposal-related traffic within the Wentworth Shire LGA will be the main source of traffic prior to the use of the roads by proposal-related heavy vehicles The pre-condition surveys will be undertaken in consultation with relevant councils and road owners. This will include identification of existing conditions and mechanisms to repair damage to the road network caused by construction vehicles associated with the proposal. Construction haulage routes would be subject to regular inspection at a frequency to be determined in consultation with the relevant roads authority to monitor the condition of these roads.	Pre-construction and construction	All roads that intersect with the transmission line corridor or are on haulage routes

1.5 CONSULTATION

TransGrid has notified the residents along each proposed secondary and water supply routes of the intention to use the roads to support construction. The notifications were issued via letter box drop on 17th and 18th June 2021. The notification included contact details for the TransGrid project team if the residents required additional information or wish to discuss the proposal.

Appendix F
Construction noise risk from secondary access routes and water supply access routes memorandum

MEMO

TO:	TransGrid
FROM:	WSP Australia
SUBJECT:	**EnergyConnect (NSW – Western Section)** **High level assessment of construction noise risk from secondary access routes and water supply access routes**
OUR REF:	Appendix_F - Road traffic noise memo
DATE:	**21 June 2021**

This technical memorandum has been prepared to respond to the request of further information lodged by Department of Planning, Industry and Environment concerning road traffic noise along secondary access routes and water supply access routes for EnergyConnect (NSW – Western Section) (the proposal).

This advice should be read in conjunction with the Environmental Impact Statement (EIS) – Technical Paper 8 concerning noise and vibration for the proposal.

1. BACKGROUND

Since the display of the EIS, it has been identified that additional construction-related traffic movements would occur on local and regional roads, as a result of secondary access routes and water supply access routes. This technical memorandum provides a high-level risk assessment and consideration of noise mitigation and management requirements.

2. ROAD NOISE POLICY

The potential impacts from construction traffic associated with the proposal when traveling on public roads are assessed under the NSW Roads Noise Policy (RNP) (DECCW, 2011).

Road noise assessments concerning construction-related traffic on public roads are typically conducted in the following manner:

— Screening assessment: the RNP application notes state that 'for existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level as a result of the development should be limited to 2 dB above that of the noise level without the development. This limit applies wherever the noise level without the development is within 2 dB of, or exceeds, the relevant day or night noise assessment criterion'. A 2 dB noise level increase equates to approximately 60% increase in traffic volume (assuming similar traffic mix and speed).

— Quantitative assessment of noise levels: with the appropriate information, estimation of absolute L_{Aeq} road traffic noise levels can be performed and compared to the road traffic noise criteria (as summarised Table 1) for arterial/sub-arterial roads and local roads road types.

Table 1 Road traffic noise criteria for receivers on existing roads affected by the additional traffic from land use developments

ROAD TYPE	EXTERNAL ROAD TRAFFIC NOISE CRITERIA[1]	
	Day 7 am – 10 pm	Night 10 pm – 7 am
Freeway/arterial/sub-arterial roads	60 dB $L_{Aeq\ 15hr}$	55 dB $L_{Aeq\ 9hr}$
Local roads	55 dB $L_{Aeq\ 1hr}$	50 dB $L_{Aeq\ 1hr}$

The consideration of mitigation is generally only necessary if the RNP road noise criteria are exceeded and the relative increase in road noise levels is greater than 2 dB. Information required to complete such assessment are typically:

— Existing traffic volumes, percentages of heavy vehicles and sign-posted speed limits

— Expected traffic generation (light and heavy vehicles) as a result of the proposed construction works.

3. INPUTS AND ASSUMPTIONS

As existing traffic volumes on the identified routes are not available, a high-level screening assessment has been undertaken to estimate noise level contributions from construction-related traffic using the TfNSW RMS Construction Noise Estimator. Noise levels have been assessed based on peak (or maximum) movements, to provide a conservative level of potential impacts to the nearest sensitive receivers.

This screening assessment has been completed based on the following assumptions:

— As information regarding existing sign-posted speed limit is not available for all identified secondary routes or water supply routes, construction traffic speed has been assumed to be up to 60 km/h, with the exception of Pooncarie Road/ Wentworth Street which have been assessed with a speed limit range of 50km/h to 100 km/h. This is considered a reasonable assumption for the majority of identified roads, consistent with observed sign-posted speed limits of regional local roads. Differences in road traffic noise contributions from vehicles travelling at 50km/h versus 60km/h would be negligible and would not result in any noticeable changes in the predicted results in this assessment.

— Proposal-related traffic movements would occur during the day (corresponding with the proposed construction hours).

— Road surface corrections are applied based on +0 dB correction for Dense Graded Asphalt (DGA), + 3 dB for chip seal and +5 for unsealed road treatments

— Noise levels have been estimated for the nearest (and potentially most impacted) receiver on the identified access routes

— Traffic movements associated with the secondary supply routes include light and heavy vehicles

— Traffic movements associated with the water supply routes include heavy vehicles only. Light vehicles have not been considered to use these routes for water supply.

— Pooncarie Road / Wentworth Street is identified as a regional road, therefore the relevant $L_{Aeq\ 15hr}$ criterion has been applied. The identified 'daily' total movements are assumed to occur entirely during the 15-hour period of 7 am to 10 pm. All other roads are local roads where $L_{Aeq\ 1hr}$ for the peak hour has been applied.

— Construction traffic noise has been assessed based on peak daily movements. Peak hour construction traffic is assumed to be 10 per cent of the peak daily movements. Where the daily peak volume is less than 10 movements, the peak hourly volume is assumed to be 1 movement per hour.

As existing traffic volumes on the identified local routes are not available, a quantitative estimation of noise level increase is not possible at this stage. It is expected that existing traffic volume on identified local roads would be low and therefore noise level increases of greater than 2 dB are likely, triggering the 2 dB relative noise increase identified in the RNP application notes.

It is considered that existing traffic volumes on Pooncarie Road / Wentworth Street (a regional road), are likely to be slightly higher, therefore it is likely that this 2 dB relative noise increase would not be exceeded.

This assessment has adopted conservative assumptions regarding peak hour traffic volumes; noise levels are conservative and do not take into account any screening from intervening topography or structures. Further, conservative assumptions have been made around actual speeds on affected roads; where speeds are reduced, noise levels would necessarily reduce at the nearest identified receivers.

4. ASSESSMENT

Based on the high-level calculations conducted based on the assumptions outlined in Section 3, noise level contributions from construction traffic have been assessed to the nearest (and potentially most-impacted) receiver on the identified access routes. Noise level contributions have been assessed for secondary access routes in Table 2 and water supply routes in Table 3.

Water supply to Wentworth construction compound and accommodation camp would be via a direct connection to an existing water supply pipeline. Water delivery movements between the Wentworth construction compound and camp and construction locations along the alignment would use the primary access routes described and assessed in the EIS and Amendment Report. The assumed traffic volumes along the primary routes already account for the water supply vehicle movements. As such, no additional traffic noise assessment of water supply vehicle movements to and from the Wentworth construction compound and camp was required.

Table 2 High level risk assessment of construction related traffic noise levels – Secondary Access Routes

Location	Road surface and modelled speed (km/h)	Typical and Max (daily) movements	Duration of activity	Nearest residential receiver(s) (estimated)	Estimated noise level contribution from construction traffic (dBA)
Regional / Sub-Arterial Roads, RNP Criteria 60 dBA $L_{eq\ 15hr}$					
Pooncarie Road/ Wentworth Street	Dense graded asphalt (DGA), 50 km/h to 100 km/h	LV Typ = 40 LV Max = 60 HV Typ = 25 HV Max = 100	<1 year	Around 60 residential receivers. Nearest receiver around 15 metres from street frontage.	54-57 $L_{eq\ 15hr}$
Local Roads, RNP Criteria 55 dBA $L_{eq\ 1hr}$					
Anabranch Mail Road, Milpara Road	Unsealed, 60 km/h	LV Typ = 60 LV Max = 100 HV Typ = 25 HV Max = 50	<1 year	Around 6 residential receivers. Nearest receiver around 70 metres from street frontage.	53 $L_{eq\ 1hr}$
High Darling Road	Unsealed, 60 km/h	LV Typ = 40 LV Max = 60 HV Typ = 25 HV Max = 50	<9 months	Less than 15 residential receivers. Nearest receiver around 330 metres from street frontage.	<50 $L_{eq\ 1hr}$
Low Darling Road, Red Hill Road	Unsealed, 60 km/h	LV Typ = 40 LV Max = 60 HV Typ = 25 HV Max = 50	<6 months		<50 $L_{eq\ 1hr}$
Danson Road	Unsealed, 60 km/h	LV Typ = 60 LV Max = 100 HV Typ = 25 HV Max = 50	<1 year	No noticeable dwellings.	n/a

1. Peak hour traffic volumes assumed to be 10% of daily peak volumes

Table 3 High level risk assessment of construction related traffic noise levels – Water Supply Routes

Location	Affected Roads	Road classification	Typical and Max (daily) movements	Duration	Nearest residential receiver(s) (estimated)	Estimated noise level contribution from construction traffic (dBA)
Regional / Sub-Arterial Roads, RNP Criteria 60 dBA $L_{EQ\ 15HR}$						
Pooncarie Road	Pooncarie Road	Dense graded asphalt, 60 km/h to 100 km/h	HV Max = 40 HV Typ = 30	Full construction program	Around 60 residential receivers. Nearest receiver around 15 metres from street frontage.	56 – 58 $L_{eq\ 15hr}$
Local Roads, RNP Criteria 55 dBA $L_{eq\ 1hr}$						
Alcheringa Road, Buronga	Alcheringa Road, Corbett Avenue	Dense graded asphalt, 60 km/h	HV Max = 40 HV Typ = 30	Full construction program	Around five residential receivers along the road, Nearest around 15 metres from street frontage.	52 $L_{eq\ 1hr}$
Fletchers Lake Road, Dareton	Fletchers Lake Road	DGA, 60 km/h	HV Max = 40 HV Typ = 30	Full construction program	Around 20 residential receivers along the route with frontage along the route. Nearest receiver around 10 metres from street frontage.	54 $L_{eq\ 1hr}$
River Drive, Buronga	River Drive	DGA, 50 km/h	HV Max = 6 HV Typ = 4	Full construction program	Around 15 residential receivers along the route with frontage along the route. Nearest receiver around 10 metres from street frontage.	48 $L_{eq\ 1hr}$
Beverley Street, Wentworth	Beverley Street Sandwych Street, Beverly Street, Arthur Street	DGA, 50 km/h	HV Max = 4 HV Typ = 2	Full construction program	Less than 40 residential receivers along the route. Nearestreceiver around 5 metres from street frontage.	52 $L_{eq\ 1hr}$

Location	Affected Roads	Road classification	Typical and Max (daily) movements	Duration	Nearest residential receiver(s) (estimated)	Estimated noise level contribution from construction traffic (dBA)
Regional / Sub-Arterial Roads, RNP Criteria 60 dBA $L_{EQ\ 15HR}$						
Silver City Highway intersection with Milpara Road, Anabranch South	Anabranch Mail Road Milpara Road	Chip seal, 60 km/h Unsealed, 60 km/h	HV Max = 40 HV Typ = 30	Full construction program	Around 6 residential receivers. Nearest receiver around 70 metres from the Street frontage.	47 $L_{eq\ 1hr}$ (Chip seal) 51 $L_{eq\ 1hr}$ (Unsealed)
690 Pomona Road, Pomona	Oxley Road (DGA) Pomona Road (DGA) Low Darling Road (DGA)	DGA, 60 km/h	HV Max = 10 HV Typ = 6	Full construction program	Around 30 residential receivers. Nearest receiver around 15 metres from street frontage.	52 $L_{eq\ 1hr}$ (DGA) 59 $L_{eq\ 1hr}$ (unsealed)
690 Pomona Road, Pomona	Red Hill Road (unsealed) High Darling Road (unsealed)	Unsealed, 60 km/h	HV Max = 10 HV Typ = 6	Full construction program	Nearest receiver around 250 metres from street frontage on Red Hill Road and 330 metres on High Darling Road.	<45 $L_{eq\ 1hr}$ (unsealed)

1. Peak hour traffic volumes assumed to be 10% of daily peak volumes

5. SUMMARY

Based on available information, noise levels contribution from construction traffic alone are predicted to comply with relevant amenity-based noise criteria at the nearest identified sensitive receivers along each proposed route. However, contributions in all instances (with the exception of Pooncarie Road / Wentworth Street) are assumed to be above the 2 dB relative increase. It is noted that the predicted road traffic noise levels and associated increases would occur only during the day-time period as defined by the RNP and not during the more sensitive night-time period. Any noise impacts associated with construction-related traffic would be transient (depending on the location where work is occurring on the alignment and the construction activities being carried out at the time) and temporary (occurring during the construction phase only). .

With regard to the appropriateness of noise mitigation measures, as outlined in the Amendment Report/Submissions Report for the proposal, mitigation measure NV5 commits to preparing a Construction Noise and Vibration Management Plan that examines ‘examine feasible and reasonable noise measures to manage traffic noise impacts on public roads where exceedances above 2 dB are identified at any sensitive receiver’. This measure is expected to be broadly appropriate and applicable for the management of construction noise from these additional construction traffic routes.

Appendix G
Revised mitigation measures

The below table provides additional mitigation amendments in response to the biodiversity and traffic matters discussed in Section 1 and 9 respectively of this Request for further information response. This supersedes the version provided in Chapter 7 of the Submissions Report (WSP, 2021) and Appendix C of the Amendment Report (WSP, 2021) for the project.

Additional measures added in response to this Request for further information response are shown in blue ~~or strikeout~~.

Table G.1 Revised mitigation measures

Reference	Mitigation measures	Timing	Application location(s)
Biodiversity			
B1	Impacts to matters of biodiversity conservation significance will be avoided to the greatest extent practicable during finalisation of the detailed design and construction methodology for the project. Micro-siting of the transmission line infrastructure and associated construction working areas and other areas of disturbance will occur to avoid impacts wherever practicable. Site features with the highest biodiversity conservation significance, in particular, threatened species recorded and their habitat, including *Acacia acanthoclada*, *Atriplex infrequens*, *Austrostipa nullanulla*, *Dodonaea stenozyga* and *Santalum murrayanum,* will be given the highest priority.	Detailed design	All locations
B2	Where vegetation disturbance activities are required in areas that have not previously been subject to biodiversity survey, additional survey will be carried out prior to works occurring to inform detailed design and construction methodology. These surveys will be carried out by a suitably qualified ecologist.	Detailed design	All locations
B3	Opportunities to locate site offices, compounds and ancillary facilities in areas of limited biodiversity value (e.g. cleared land or areas of native vegetation with vegetation integrity scores of less than 17 (in accordance with the NSW Government Biodiversity Assessment Method Operational Manual) will be prioritised.	Detailed design	All locations
B4	Existing tracks and clearings will be used, where possible, to avoid the construction of new tracks. Where this is not possible, the design will seek to minimise impacts to native vegetation as a priority.	Detailed design	Transmission line corridor

Reference	Mitigation measures	Timing	Application location(s)
B5	Transmission line structures will be located and constructed to minimise impact to vegetated riparian corridors, wherever practicable.	Detailed design	Transmission line within the riparian zone as defined by "Guidelines for riparian corridors on waterfront land" (DPI – Office of Water, July 2012) of Great Darling Anabranch, Darling River and/or Murray River
B6	Conductor line-marking techniques will be implemented during detailed design to minimise bird strike. Use of bird diverters, most likely consisting of the "flapper" variety, will be implemented. Positioning and exact diverter model will be finalised during detailed design but at minimum these will be used within one kilometre of wetland / riverine habitats to reduce impacts on aerial fauna species from collision and allow safer passage within these areas.	Detailed design	Transmission line – within one kilometre of wetland / riverine habitats (i.e. Great Darling Anabranch, Darling River and Murray River)
B7	TransGrid will establish a series of 20-metre-wide connectivity corridors near tower locations that occur in woodland vegetation. These would occur at strategic locations that would be developed as part of a Connectivity Strategy under the Biodiversity Management Plan. These connectivity corridors will involve native vegetation retention up to the 10 metre wide temporary construction centreline clearing zone to better facilitate woodland connectivity.	Detailed design	All locations
B8	A two year monitoring program following the completion of construction will be implemented to better understand interactions of bird species with the transmission lines and towers. Problematic interactions identified during the program would be considered and options for addressing them implemented as practicable. Options that would be considered include nesting deterrents in high risk areas, installation of alternative nest habitat, relocation of nests or their deconstruction in certain circumstances.	Operation	Transmission line – within one kilometre of wetland / riverine habitats (i.e. Great Darling Anabranch, Darling River and Murray River)

Reference	Mitigation measures	Timing	Application location(s)
B9	TransGrid will make a one off funding contribution targeted at further scientific study into the impacts of electric and magnetic fields on birds in Australia.	Prior to completion of construction	Not applicable
B10	Nest boxes will be provided to offset the loss ~~to~~ of tree hollow fauna habitat in accordance with a Supplementary Hollow and Nest Strategy. The strategy will include the following requirements: > survey of tree hollows and nests within the proposed clearing extents > the size, type, number and location of nest boxes required will be based on the results of the ecological surveys > appropriately sized nest boxes will be installed within the vicinity of hollow-bearing trees (subject to landholder agreement and suitable existing trees being present) no more than two weeks prior to clearing of the tree > all nest boxes in a particular location will be installed within 6 months after clearing > "nest boxes" will include consideration of natural tree hollow re-use and new tree hollow creation > measures to address and manage nests (such as raptor nests) pre-clearing will be included.	Pre-construction and construction	All locations where hollow bearing trees are being removed
B11	Pre-clearing surveys will be completed prior to clearing at each location by a suitability qualified ecologist. The proposed clearing extents will be marked out on site prior to the pre-clearing surveys. During the surveys, the ecologist will: > survey the proposed clearing extent > identify any fauna that will require relocation prior to clearing > confirm the location and mark out the extents of any biodiversity exclusion zones > confirm that hollow-bearing trees within and adjacent to the clearing extents are prominently marked/tagged > confirm that nest boxes are in place (where required) in suitable locations adjacent to areas to be cleared, or suitable locations for installation have been identified.	Pre-construction	All locations
B12	The results of the pre-clearing surveys will be used to update and confirm the accuracy of sensitive area maps.	Pre-construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
B13	Biodiversity exclusion zones for retained vegetation, including identified threatened flora populations ~~that have a high susceptibility to trampling and compaction~~, will be clearly identified by a suitably qualified ecologist prior to the commencement of clearing or any site activity that could damage the vegetation within the exclusion zone. Biodiversity exclusion zones will be physically marked and demarcated, and included on sensitive area maps, prior to clearing.	Pre-construction	All locations
B14	Training on biodiversity management practices and the requirements for the project will be provided to all relevant project personnel, including relevant sub-contractors, through inductions, toolbox talks and targeted training. Construction workforce will be supplied with sensitive area maps (showing clearing boundaries and exclusion zones), including updates as required.	Construction	All locations
B15	~~The predicted clearing of native vegetation by the proposal will be monitored against the recorded clearing~~ Clearing of native vegetation will be monitored to confirm actual impacts to biodiversity values to inform any final biodiversity offset requirements within the biodiversity offset package. The final offset requirements will be informed by a BAM-C calculation on the recorded clearing. Any additional credit liability identified by this calculation will be met.	Construction	All locations
B16	Shrub or ground stratum native vegetation within vegetated riparian zones (within the definition of *Water Management Act 2000*) of the Great Darling Anabranch, Darling River and/or Murray River (and other defined riparian areas) will be protected to the greatest extent practicable, with vegetation clearing ideally limited to the tree stratum only, with trunk bases being retained in-situ.	Construction	Transmission line within the riparian zone as defined by "Guidelines for riparian corridors on waterfront land" (DPI – Office of Water, July 2012) of Great Darling Anabranch, Darling River and/or Murray River

Reference	Mitigation measures	Timing	Application location(s)
B17	Activities within vegetated riparian zones will be managed to minimise impacts to aquatic environments. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated.	Construction	Transmission line within the riparian zone as defined by "Guidelines for riparian corridors on waterfront land" (DPI – Office of Water, July 2012) of Great Darling Anabranch, Darling River and/or Murray River
B18	A species unexpected finds protocol will be implemented if threatened ecological communities, flora and fauna species, not assessed in the biodiversity assessment, are identified in the disturbance area.	Construction	All locations
B19	TransGrid will maintain vegetation for the project in accordance with commitments in the EIS, as amended in the Amendment Report. Vegetation maintenance protocols will be developed accordingly prior to the commencement of any vegetation maintenance activities within the easement and implemented during the operational phase of the project. The vegetation maintenance protocols will identify and address the biodiversity exclusion zones identified in the construction phase and the areas within the maintenance zone where the vegetation is not of a height/growth form that will ever require management. Relevant TransGrid operational personnel and associated vegetation maintenance contractors will receive in training in the vegetation maintenance protocols prior to the commencement of any vegetation maintenance.	Operation	All locations

Reference	Mitigation measures	Timing	Application location(s)
B20	TransGrid will retire the total quantum of the project's biodiversity offset credit liability confirmed in accordance with the Biodiversity Assessment Method. TransGrid will develop a Biodiversity Offset Package that identifies measures to address the project's offset obligations and the timing and responsibility for implementation. Before commencing any project activities that impact biodiversity values, TransGrid will: · confirm the Biodiversity Offset Package with the Department of Planning, Industry and Environment, and · provide security to the Minister for Planning and Public Spaces for a Biodiversity Conservation Fund payment to cover any outstanding offset credit liability if the package is not implemented.	Construction	All locations
Aboriginal heritage			
AH1	The detailed design and construction methodology, and associated final disturbance area, will be developed to avoid impacts to features/items of Aboriginal archaeological significance as far as practical. Avoidance and minimisation of impact to features/items and Potential Archaeological Deposits (PADs) of moderate or higher archaeological significance will be prioritised.	Detailed design	All locations

Reference	Mitigation measures	Timing	Application location(s)
AH2	Aboriginal stakeholder consultation will be carried out in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a). Engagement with Registered Aboriginal Parties (RAPs) will consist of the following: > Aboriginal heritage site surveys (AH3) – review of proposed methodologies and involvement in the survey activities in the field (for ground or vegetation disturbance outside of previously surveyed areas) > test excavation activities (AH4) – review of proposed methodologies and involvement in the test excavation activities in the field > review of the draft addendum report/s (relating to surveys (AH3), test excavations (AH4) and scar trees (AH5)), and consultation on the draft reports which will typically be in the form of a RAP meeting > provision of final addendum report/s will be provided to RAPs (AH3, AH4, AH5) > involvement in establishment of Aboriginal heritage exclusion zones prior to construction commencing (AH7). Further cultural information will be gathered during consultation undertaken in association with these activities. All addendum reports to the Aboriginal Cultural Assessment Report (CHAR) will be provided to RAPs for comment, and input will be considered, and actioned wherever practicable.	Detailed design and pre-construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
AH3	An Aboriginal heritage survey will be carried out with RAPs where ground or vegetation disturbance activities are required in all locations outside of the previously surveyed heritage survey area (including water supply points), prior to works occurring in any such areas. These surveys will be carried out in accordance with the *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW* (2010). If no sites are found or if sites are found and they will not be impacted, then a letter report will be provided that gives notification of this and clearance to proceed. Where sites are located and will be impacted, a draft survey addendum report/s to the ACHAR will be prepared for each of these survey areas. The report(s) will: > detail findings of the survey activities > detail where test excavation is required in accordance with AH4 to inform detailed design > outline any additional mitigation strategies beyond those required by AH5 to AH12 > be presented to the RAPs for comment. Final reports will be provided to RAPs and to Heritage NSW for their information prior to the commencement of construction that impacts these locations.	Detailed design and pre-construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
AH4	In developing the detailed design and construction methodology, the construction contractor will review the location of all identified PADs and will aim to avoid and/or minimise direct impacts to the identified PADs. Where direct impacts cannot be avoided, test excavation programs will be carried out in the parts of any PADs where direct impact is likely (including where the root-ball of trees are being removed). The purpose of the test excavations will be to determine the presence or absence and significance of subsurface archaeological deposits. Test excavations works will be carried out in accordance with a methodology that is presented to and consulted on with the RAPs. Test excavation addendum report/s to the ACHAR will be prepared for each test excavation program(s) which will: > detail findings of the test excavation activities > outline how the detailed design has been further developed to avoid or minimise impacts to the identified constraints/features of significance/PADs > as applicable, detail any additional mitigation strategies beyond those required by AH6 to AH12, and the required timing for these to be implemented > be presented to the RAPs for comment. Final reports will be provided to RAPs and to Heritage NSW prior to the commencement of construction that impacts these locations. The addendum report(s) may be staged to enable progressive commencement of construction. Any additional mitigation strategies beyond those required by AH6 to AH12, and the required timing of implementation, will be included with the Construction Environmental Management Plan and implemented accordingly.	Detailed design and pre-construction impacts to sites/features/ PADs	PEC-W-6, PEC-W-11, PEC-W-12, PEC-W-15, PEC-W-17, PEC-W-18, PEC-W-27, PEC-W-31, PEC-W-36, PEC-W-37, PEC-W-45, PEC-W-47, PEC-W-50, PEC-W-51, PEC-W-55, PEC-W-63, PEC-W-100, PEC-W-102, PEC-G-7 PEC-PAD1 through PEC-PAD14, PEC-PAD-16 through PEC-PAD26, and PEC-PAD-28

Reference	Mitigation measures	Timing	Application location(s)
AH5	All scarred trees identified during archaeological survey will be assessed by a qualified arborist to determine tree age and likely cause of the scarring in order to confirm the scientific significance prior to any impact to the scarred trees. Impacts to all scarred trees (including those of cultural significance) will be avoided where possible through design or construction methodology and must only be removed for permanent infrastructure and/or to meet Vegetation Clearance Requirements at Maximum Line Operating Conditions (TransGrid, 2003). If any scarred tree cannot be avoided, the tree will be subject to 3D scanning, followed by salvage of the scarred trunk. The results of this assessment will be reported on in addendum reports. Reports will be provided to RAPs for comment. Final reports will be provided to RAPs and to Heritage NSW.	Detailed design and pre-construction impacts	PEC-W-57, PEC-W-67, PEC-W-80, PEC-W-85, PEC-W-86, PEC-W-88, PEC-W-90, PEC-W-91, PEC-W-99, PEC-W-104, PEC-W-105, PEC-W-106, PEC-W-107, PEC-W-108, PEC-W-109, PEC-W-110, PEC-W-111, PEC-W-112, PEC-W-113, PEC-W-115, PEC-W-118, PEC-W-121, PEC-W-122, PEC-W-127, PEC-W-128, PEC-W-130

Reference	Mitigation measures	Timing	Application location(s)
AH6	All portions of artefact scatters that are to be directly impacted will require surface collection prior to construction commencement in those areas. Additionally, based on the outcomes of the test excavation, items or PADs will be subject to surface collection or salvage prior to the commencement of construction in those areas. The activities will be documented in a surface collection report.	Detailed design and pre-construction impacts	Surface collection (artefact scatters impacted by disturbance area A) PEC-W-6, PEC-W-7, PEC-W-11, PEC-W-12, PEC-W-15, PEC-W-17, PEC-W-18, PEC-W-27, PEC-W-31, PEC-W-35, PEC-W-36, PEC-W-37, PEC-W-45, PEC-W-47, PEC-W-50, PEC-W-51, PEC-W-55, PEC-W-63, PEC-W-74, PEC-W-75, PEC-W-100, PEC-W-102, PEC-W-114, PEC-W-119, PEC-G-7, 39-6-0030

Reference	Mitigation measures	Timing	Application location(s)
AH7	Aboriginal heritage exclusion zones will be established to protect: > known features/items of significance that have been identified to remain in-situ throughout construction (and not subject AH6) > scarred trees that are to remain in-situ. Suitable controls will be identified in the heritage management sub-plan, which may include site fencing and sediment control. Aboriginal heritage zones will be demarcated by a suitably qualified archaeologist in consultation with the RAPs prior to the commencement of construction at each location. Areas of PADs that are located within areas of vegetation clearance where ground disturbance will not occur will be managed through construction methodologies and will not be delineated as exclusion zones. These methodologies will be developed in the heritage sub-plan.	Pre-construction	PEC-W-1, PEC-W-4, PEC-W-5, PEC-W-6, PEC-W-7, PEC-W-10, PEC-W-12, PEC-W-23, PEC-W-27, PEC-W-29, PEC-W-30, PEC-W-35, PEC-W-36, PEC-W-37, PEC-W-38, PEC-W-45, PEC-W-46, PEC-W-47, PEC-W-48, PEC-W-49, PEC-W-52, PEC-W-53, PEC-W-54, PEC-W-60, PEC-W-61, PEC-W-62, PEC-W-66, PEC-W-66, PEC-W-78, PEC-W-81, PEC-W-82, PEC-W-100, PEC-W-101, PEC-W-102, 46-3-0086
AH8	Construction planning and management will ensure that indirect impacts to features of heritage significance located outside areas of direct impact do not occur (including physical disturbance from surface water drainage or other mechanism).	Construction	All locations
AH9	Cultural and historic heritage awareness training will be carried out for all personnel working on the proposal prior to the personnel participating in construction activities. The training shall cover features of heritage significance within and adjacent to project locations and project protocols that must be complied with to minimise and manage potential impacts to those features.	Construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
AH10	If at any time during construction, any items of potential Aboriginal archaeological or cultural heritage significance, or human remains are discovered, they will be managed in accordance with the Aboriginal heritage unexpected finds protocol (refer to Appendix 2 of the *Non-Aboriginal and Aboriginal Cultural Assessment Report* (Navin, 2021)).	Construction	All locations
AH11	A temporary repository of any retrieved archaeological material and Aboriginal objects will be appropriately secured and under the care of the archaeological consultant. The strategy for the long-term conservation of salvaged or collected Aboriginal objects will be determined in consultation with the RAPs.	Construction	As relevant
AH12	Features/items of heritage significance that will remain in-situ within the transmission line easement will be mapped and recorded within GIS systems managed by TransGrid. Relevant TransGrid systems and procedures will be updated as required with protocols that will be implemented during operation to ensure that impacts to the features/items of significance do not occur during maintenance activities. to ensure inadvertent impacts do not occur during maintenance activities.	Operation	Transmission line
Non-Aboriginal heritage			
NAH1	A non-Aboriginal heritage exclusion zone will be established for sites PEC-W-H-1 and PEC-W-SE-H1 (Survey Marker Trees). These sites will be fenced during construction and vegetation clearance for the proposal, to avoid inadvertent impacts during works. If impacts cannot be avoided, then the tree will be archivally recorded and research undertaken to confirm the nature and history of the item prior to impact occurring.	Detailed design and pre-construction	Transmission line
NAH2	Should the disturbance area for the proposal extend beyond the survey area, further assessment by an archaeologist will be carried to determine the likelihood of occurrence and significance of potential archaeology and impacts from the proposal (including built heritage) prior to the commencement of construction in these areas. The results of this assessment will be reported on in addendum reports for non-Aboriginal heritage. Reports will be provided to Heritage NSW.	Detailed design and pre-construction	Transmission line

Reference	Mitigation measures	Timing	Application location(s)
NAH3	If at any time during construction, any items of potential non-Aboriginal archaeological significance, or human remains are discovered, they will be managed in accordance with the non-Aboriginal unexpected finds protocol (refer to Appendix 2 of the *Non-Aboriginal & Aboriginal Cultural Heritage Assessment Report* (Navin, 2021)).	Construction	All locations
Land use and property			
LP1	During detailed design, access tracks (temporary and permanent) will be determined in consultation with landholders and to minimise impacts to agricultural activities to the greatest extent possible. Where permanent tracks are required, a single access track will be designed to serve both temporary and permanent purposes, where possible.	Detailed design	All locations
LP2	The locations of transmission line structures, (other permanent structures and the extents of associated construction areas or compounds) will be located where possible to avoid or minimise impacts, or as agreed with the affected landholder, on: > cropping and irrigated horticultural land > areas used for set up and pack up of agricultural equipment, entry points and turning areas > radiocommunication sensitive areas > drainage catchments for farm dams > locations of high biosecurity risk.	Detailed design	All locations
LP3	Final transmission line easement will be located parallel with existing transmission lines or road corridors or along property boundaries, where possible, to reduce potential fragmentation of properties and disturbance to existing land uses, subject to the outcomes of land access negotiations with affected landholders.	Detailed design	All locations

Reference	Mitigation measures	Timing	Application location(s)
LP4	To minimise disruption to agricultural activities: > landholders will be consulted regarding any required adjustments to property infrastructure (fences, access tracks, etc) and the proposed timing and location of construction works, especially where some restriction on vehicular or stock movements will be necessary. Appropriate arrangements will be negotiated with the affected parties and in place prior to any such disruption > property infrastructure (such as gates) will be managed in accordance with landholder requirements and any damage caused by construction will be repaired promptly > use of existing roads, tracks and other existing disturbed areas will be prioritised > where access is required across open spaces, care will be exercised to ensure that minimum damage is caused to the surface by confining vehicular or plant movement, as far as possible, to one route.	Pre-construction and construction	All locations
LP5	Disturbed areas will be stabilised and appropriately rehabilitated as soon as feasible and reasonable following the completion of construction. This will be carried out in consultation with the relevant landholder.	Construction	All locations
LP6	Procedures will be implemented so that potential impacts or conflicts between livestock and construction activities are appropriately managed. Procedures will be developed in consultation with affected landholders will include management of: > noise intensive activities during sensitive periods within the livestock production cycle (such as lambing and calving) > vehicle movements and other activities within the vicinity of livestock > movement of stock away from potential stressors created by construction activities.	Construction	Transmission line

Reference	Mitigation measures	Timing	Application location(s)
LP7	Biosecurity controls will be implemented during construction to minimise the risk of off-site transport or spread of disease, pests or weeds. Controls will include (but not limited to): > inspections and cleaning of vehicles, machinery, and personnel equipment prior to movement on and off the construction work areas or between properties > minimising movements across adjoining farmland including trip numbers and locations > additional measures where localised areas of high biosecurity risks have been identified. The specific controls applicable to a property will be identified in consultation with the affected landholder. The effectiveness of these controls will be regularly monitored.	Construction	All locations
LP8	Where present, weeds will be managed in consultation with Western Local Land Services (LLS), Wentworth Shire Council and NSW Department of Primary Industries.	Construction	All locations
LP9	In the event of new infestations of notifiable weeds as a result of construction activities, the relevant control authority will be notified as per *Biosecurity Act 2015* and Biosecurity Regulation 2017.	Construction	All locations
LP10	Fencing and access arrangements along the transmission line easement, such as locked gates, will be determined in consultation with landholders and implemented.	Operation	Transmission line
LP11	Biosecurity controls, confirmed in consultation with the affected landholders, will be implemented during operation to minimise the risk of off-site transport or spread of disease, pests or weeds during maintenance activities.	Operation	All locations
LP12	Where present within the operational transmission line easement and associated areas for permanent infrastructure, weeds will be managed in accordance with the *Biosecurity Act 2015*.	Operation	All locations
LP13	Management of access including opening and closing of gates and monitoring of fencing will be done in accordance with landholder requirements. Any damage caused by maintenance activities will be repaired promptly.	Operation	All locations

Reference	Mitigation measures	Timing	Application location(s)
Landscape and visual amenity			
LV1	Opportunities for the retention and protection of existing trees within the disturbance area will be identified during detailed construction planning. Trees that do not pose any risk to the safe operation of the transmission infrastructure will be retained where practicable.	Detailed design	Whole of proposal
LV2	Temporary and permanent access will be designed to minimise vegetation removal, changes to landform, and visual impacts.	Detailed design	Whole of proposal
LV3	Proposed permanent engineering batters and water management measures will be designed to integrate with the existing landforms and natural features.	Detailed design	Whole of proposal
LV4	Lighting at construction compound and accommodation camps will be designed and operated in accordance with AS4282-2019 Control of the obtrusive effects of outdoor lighting.	Detailed design	Construction compound and accommodation camps
LV5	Transmission line structures, where possible, are designed: > to maximise distance from private residences > to use local vegetation and landform to provide screening from residences or from the road > to be regularly spaced to reduce the potential visual impact where the proposal alignment is visible for a long duration, and in open landscapes > to be positioned alongside existing transmission line structures where they are adjacent to existing transmission lines where feasible > to avoid the location of transmission line structures on locally prominent landforms > to minimise clearing along creeklines.	Detailed design	Whole of proposal
LV6	Where the transmission line crosses a roadway, transmission line structures will be located to maximise the distance from the roadway where feasible and where it will achieve an improved visual amenity outcome, where feasible and reasonable.	Detailed design	Transmission line
LV7	The Tree Protection Zone (as defined in AS4970-2009 Protection of Trees on Development Sites) of retained trees within or immediately adjacent to the disturbance area will be protected through the restriction of construction activities (refer Section 4.2 of AS4970-2009), to minimise the impact of the works on the long term health of these trees.	Pre-construction	Whole of proposal

Reference	Mitigation measures	Timing	Application location(s)
LV8	Opportunities for screening vegetation to be provided on private property will be investigated where, once at a mature height, will reduce an identified visual impact from a residence. This will be undertaken in negotiation with the affected resident. This will be informed by further assessment to determine the extent of the impact and appropriateness of any screening vegetation. Any such screening vegetation will be planted prior to completion of construction and will be maintained by the landholder.	Construction	Transmission line
LV9	Lighting at the substation will be designed and operated in accordance with AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting.	Operation	Buronga substation
Social and economic			
SE1	A Community and Stakeholder Engagement Plan will be implemented. This will include: > targeted stakeholder consultation with Local Government, chamber of commerce, Traditional Owners, landholders, emergency services and service providers to ensure plans for the proposal are integrated with local needs and priorities and proactively respond to community or stakeholder concerns including those of neighbouring or nearby landholders > culturally appropriate ceremonies of recognition aligned with proposal activities and key milestones, in alignment with the TransGrid Reconciliation Action Plan.	Detailed design and construction	All locations
SE2	All acquisitions of privately-owned land would be carried out in consultation with the landholders through the private treaty process or in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991* and the supporting NSW Government Land Acquisition Reform 2016.	Detailed design	All locations

Reference	Mitigation measures	Timing	Application location(s)
SE3	A Local Business and Employment Strategy will be implemented to guide local opportunities during construction, and where possible, align with existing plans and strategies of Wentworth Shire Council and Mildura Rural City Council, and TransGrid's Reconciliation Action Plan. The initiatives will be prepared in consultation with Wentworth Shire Council, Mildura Rural City Council and key community stakeholders and organisations in the region. The strategy will consider local market conditions and capacity, and will include initiatives for: > local supplier and labour procurement targets > Aboriginal workforce and business participation > training and upskilling programs for local labour force > programs to inform local businesses of contracting opportunities and requirements > consideration of use of available local infrastructure and services for construction activities such as the Wentworth Aerodrome, where feasible > transitioning the local workforce following the completion of construction.	Detailed design and construction	All locations
SE4	A Community Benefit Plan will be implemented to guide opportunities to deliver benefits to local communities during and following construction. The plan will be prepared in consultation with Wentworth Shire Council, Mildura Rural City Council and key community stakeholders and organisations in the region, and will align with TransGrid's Community Partnerships Program. The plan will include (but is not limited to): > initiatives to create positive social contributions in local communities and to respond to community priorities and needs > initiatives for Aboriginal heritage impacts of the proposal to be managed in partnership with local Aboriginal organisations > exploring opportunities to repurpose temporary infrastructure to address local infrastructure needs.	Detailed design and construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
SE5	A Workforce Management Plan will be implemented to provide construction workforce support services to promote health and wellbeing and to manage positive social integration with existing communities. The plan will be prepared in consultation with Wentworth Shire Council, Mildura Rural City Council and social infrastructure service providers near accommodation camps so that the needs of the construction workforce are coordinated to minimise pressure on existing health services and social infrastructure.	Detailed design and construction	All locations
Hydrology, flooding and water quality			
HF1	Permanent operational infrastructure and landforms within the transmission line corridor will be designed and implemented/formed to minimise any potential scour and erosion risks associated with surface water runoff.	Detailed design	All locations
HF2	Detailed construction planning will consider flood risk at construction areas. This will include identification of measures that will be implemented to not worsen flood impacts downstream and on other property and infrastructure during construction up to and including the 1% AEP flood event, and review of site layout and staging of construction works to avoid or minimise obstruction of overland flow paths and to limit the extent of flow diversion required. Procedures as detailed in the flood emergency management procedures will be implemented in response to flood events, including the evacuation of personnel.	Pre-construction and construction	Transmission line and construction sites within flood prone land

Reference	Mitigation measures	Timing	Application location(s)
HF3	A water quality monitoring program will be implemented to establish baseline water quality conditions in the Darling River, Darling Anabranch and Murray River prior to construction, and to observe any changes in water quality that may be attributable to the proposal during construction. The frequency, location and duration of sampling will be detailed in the monitoring program, but will include: > at least two monitoring locations located downstream and upstream of the proposal on the Darling River, Darling Anabranch and, Murray River > monitoring for total dissolved solids, total suspended solids, total nitrogen and total phosphorus. Sampling will commence at least 6 months prior to the commencement of construction at each respective location, and then monthly during construction until the surfaces in the vicinity of the waterways that were disturbed by proposal activities are adequately stabilised and no longer pose a significant sedimentation risk to the waterways. The monitoring program will include corrective and preventative actions that will be taken to address any water quality issues caused by the proposal, as indicated by the water quality monitoring results.	Pre-construction and construction	Transmission line - Darling River, Darling Anabranch, and Murray River
HF4	Water supply options and management will be undertaken in accordance with agreements between the construction contractor and Wentworth Shire Council.	Construction	All locations
HF5	Erosion and sediment measures will be implemented in accordance with the principles and requirements in: > *Managing Urban Stormwater – Soils and Construction, Volume 1* (Landcom 2004), and *Volumes 2A and 2C* (NSW Department of Environment, Climate Change and Water 2008), commonly referred to as the 'Blue Book' > *Best Practice Erosion and Sediment Control* (IESCA – 2008) > TransGrid's *HSE Guideline* > *Guidelines for Controlled Activities on Waterfront Land* (NRA 2018).	Construction	All locations
HF6	Maintenance works in the vicinity of waterways will be conducted in accordance with the TransGrid's HSE Guideline.	Operation	Transmission line

Reference	Mitigation measures	Timing	Application location(s)
Air quality			
AQ1	Construction air quality management measures will be detailed in the Air Quality Management Plan and implemented during construction to minimise particulate and gaseous emissions as far as possible. Measures will include (but not limited to): > use of water sprays or dust suppression surfactants as required for dust suppression where required and appropriate > adjusting the intensity of activities based on observed dust levels and weather forecasts > minimising the amount of materials stockpiled and position stockpiles away from surrounding receivers > vehicle movements to be strictly limited to designated entry/exit routes and parking areas, and measures to minimise the tracking of material onto paved roads > covering of loads > stabilising disturbed areas as soon as practicable, including new access routes > minimising the extent of disturbance as far as practicable > regularly conducting visual inspections of dust emissions and applying additional controls as required.	Construction	All locations
AQ2	Ensure that all vehicles and machinery are fitted with appropriate emission control equipment and maintained in a proper and efficient manner.	Construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
AQ3	Measures will be implemented at concrete batching plants to minimise emissions to air as far as possible and will be regularly inspected with additional controls implemented as required. Measures to minimise emissions to air may include: > all aggregate and sand will be stored appropriately in storage bins or bays to minimise dust generation, and material will not exceed the height of the bay > cement silos and hoppers will be fitted with dust filters > all inspection points and hatches will be fully sealed > all dry raw materials to be transferred into the bowl of an agitator via front end loaders by maintaining adequate moisture levels and/or an enclosed conveyor > the cement silo will be fitted with fitted with emergency pressure alert and automatic cut off overfill protection > transfer of cement from storage to batching will occur via sealed steel augers > regularly inspect dust emissions and apply additional controls as required.	Construction	Concrete batching plant(s)
AQ4	To minimise dust emissions associated with the proposed crushing and screening activities, the following will be implemented: > ensure screen covers are fitted to the screening operations > control dust emissions from crushing operations using water sprinklers, where required and appropriate > inspect the water sprinklers on a regular basis to ensure operational efficiency > where practicable, install wind breaks in appropriate locations adjacent to the dust generating equipment and processes > prior to crushing, dampen the rocks during dry weather conditions.	Construction	Buronga substation construction compound

Reference	Mitigation measures	Timing	Application location(s)
AQ5	To ensure potential odour emissions from the wastewater treatment plants are minimised, the following additional management measures will be implemented: > prevent excessive inorganic material accumulating on the screens by disposing of screened material in waste bins on a regular basis > place waste bins containing screened material and sludge as far away as practicable from the construction compound and accommodation sites > ensure waste bins are fully closed at all times > remove screened material and sludge from site at regular intervals and dispose in an appropriate manner.	Construction	Buronga substation and Wentworth construction compound and accommodation sites
Noise and vibration			
NV1	An Operational Noise Review will be prepared to confirm the predicted noise impacts from the proposal (based on the final detailed design) and refine the operational mitigation measures that will be implemented so operational noise impacts complies with the proposal noise trigger levels, where feasible and reasonable.	Detailed design	All locations
NV2	Where exceedances of the proposal specific trigger noise levels are predicted, feasible and reasonable operational noise and vibration mitigation measures will be further investigated during detailed design, in consultation with the affected receivers. This may include (in order of priority): > land use planning and provision of appropriate buffer distances to increase the distance between the final transmission line alignment and the surrounding sensitive receivers and ultimately minimise the number of sensitive receivers within the audible risk noise zones > noise control at the noise source > noise control along the noise transfer path, such as noise barriers. > noise control at the receiver, such as 'at property' treatment to upgrade aspects of the dwellings including the façade or ventilation systems. Additional measures identified through this process will be implemented prior to commencement of operation.	Detailed design	Transmission line (330kV only)

Reference	Mitigation measures	Timing	Application location(s)
NV3	Construction methodologies and measures that minimise noise and vibration levels during construction will be investigated during detailed design and implemented where feasible and reasonable. This will be supported through the completion of additional assessments (where construction noise levels are likely to exceed relevant noise management levels) based on the final construction methodology). This will: > consider the proposed layouts of work areas or construction compounds and accommodation camps > the noise and vibration generating activities that will take place > assess the predicted noise and vibration levels against the relevant management levels > incorporate feasible and reasonable mitigation and management measures in accordance with the ICNG.	Detailed design and construction	All locations
NV4	Further engagement and consultation with affected receivers will be carried out to understand their preferences for mitigation and management measures where exceedances of noise management levels are predicted. Based on this consultation, appropriate mitigation and management options will be considered and implemented where feasible and reasonable to minimise the impacts.	Detailed design and construction	All locations
NV5	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared by the construction contractor prior to construction works and will (as a minimum): > examine feasible and reasonable noise mitigation where management levels are likely to be exceeded > examine feasible and reasonable noise measures to manage traffic noise impacts on public roads where exceedances above 2 dB are identified at any sensitive receiver > describe associated noise and vibration monitoring programs, as required > describe proactive and reactive strategies for dealing with any noise complaints > outline community consultation measures including notification requirements. This CNVMP will be implemented for the duration of construction.	Detailed design and construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
NV6	An out of hours works (OOHW) protocol will be implemented for all construction activities likely to generate noise levels above the relevant noise management level at any sensitive receiver outside the standard construction hours defined in *Interim Construction Noise Guideline* (DECC, 2009). The OOHW protocol and will include: > details of what works are required outside standard construction hours > noise management safeguards and other reasonable and feasible mitigation and management measures (including agreement with sensitive receivers), including avoiding or minimising activities or the use of equipment likely to generate the highest noise levels, and implementing respite periods where works are likely to result in NML exceedances for sensitive receivers > community consultation procedures, including letterbox drops, notification protocols, and site contact information for the works > complaints handling procedures. The OOHW protocol would not apply to the operation of the accommodation camps at Buronga and Wentworth.	Detailed design and construction	All locations
NV7	Where noise intensive equipment is to be used near sensitive receivers and is likely to result in an exceedance of the applicable noise management level, the works will be scheduled during standard construction hours (unless agreements with affected sensitive receivers have been reached).	Construction	All locations
NV8	Where residences or other sensitive receivers/structures are within the minimum working distances for vibration (as identified in Table 17-3 of the EIS): > different construction methods with lower source vibration levels will be investigated and implemented, where feasible > attended vibration measurements will be undertaken at the start of the works to determine actual vibration levels at the structure. Works will cease if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria.	Construction	All locations
NV9	Temporary batching plants along the transmission line corridor will be positioned to ensure compliance with NMLs at the nearest sensitive receivers.	Construction	Transmission line

Reference	Mitigation measures	Timing	Application location(s)
NV10	If blasting is required, a blasting vibration and overpressure assessment will be completed to demonstrate that blasting and associated activities will not exceed noise and vibration limits at residences or other sensitive receivers. Based on outcomes of this assessment, a blast management strategy will be implemented that details how blasting will be carried out in a manner that complies with relevant noise and vibration limits, and notification requirements with landholders.	Construction	Blasting
Traffic			
TA1	Site access / egress points will be designed to minimise conflicts with vehicle movements on the road network and in accordance with relevant safety requirements. This may include the provision of acceleration and deceleration lanes at accommodation camp locations. Any designs will be in accordance with the Traffic Control at Worksites, Austroads Guide to Road Design and Austroads Guide to Traffic Management, and approved by the relevant road authority.	Detailed design	All roads that intersect with the transmission line corridor or are on haulage routes
TA2	Road pre-condition will be carried out for the public road network in the vicinity of access points to construction compounds, construction camps and construction areas, and for roads for which proposal-related traffic within the Wentworth Shire LGA will be the main source of traffic prior to the use of the roads by proposal-related heavy vehicles. The pre-condition surveys will be undertaken in consultation with relevant councils and road owners. This will include identification of existing conditions and mechanisms to repair damage to the road network caused by construction vehicles associated with the proposal. Construction ~~haulage~~ access routes will be subject to regular inspections, ~~at a frequency to be determined~~ in consultation with the relevant roads authority, to monitor the condition of these roads. Any identified issues attributable to project-related use will be rectified to maintain road safety.	Pre-construction and construction	All roads that intersect with the transmission line corridor or are on haulage routes
TA3	The community will be notified in advance of proposed road network changes through appropriate forms of communication.	Construction	All locations
TA4	Road Occupancy Licence(s) will be sought (as required) for any road closures (full or partial) prior to any such closure. The timing of any closures will be carried out to minimise impacts to the road network in accordance with the conditions of the licence.	Construction	All roads that intersect with the transmission line corridor or are on haulage routes

Reference	Mitigation measures	Timing	Application location(s)
TA5	Permits from the National Heavy Vehicle Regulator (NHVR) will be obtained where required to provide oversized and overmass vehicles access during construction. Permit applications will be supported by a Vehicle Movement Plan (VMP), prepared to indicate the proposed heavy vehicle route(s). The Vehicle Movement Plan will consider activities of adjoining land uses and safety of the public, particularly when entering urban areas from rural highways.	Construction	All roads that intersect with the transmission line corridor or are on haulage routes
TA6	Construction access/egress, and construction movements, will be managed to ensure pedestrian and cyclist safety.	Construction	Sturt Highway (George Chaffey Bridge)
TA7	Adjustments to haulage routes in response to road closures by Wentworth Shire Council (e.g. during wet weather conditions or during other maintenance or other upgrade activities) will be identified in consultation with Wentworth Shire Council and affected residents, and suitable management measures identified and implemented.	Construction	Local roads within the study area
TA8	Access to properties for emergency vehicles will be provided at all times.	Construction	All locations
TA9	Access to properties will be maintained or alternative arrangements agreed in consultation with landholders.	Construction	All locations
TA10	Following completion of construction, condition surveys will be carried out. Any damage as a result of construction vehicles will be repaired following the completion of construction (and as needed through the construction period to maintain safe road conditions).	Construction	All roads that intersect with the transmission line corridor or are on haulage routes
TA11	TransGrid will commit to a Road Maintenance Agreement with Wentworth Shire Council to ensure appropriate remediation of roads used by project-related vehicles to address any damage and deterioration caused by the construction of the proposal.	Construction	Roads maintained by Wentworth Shire Council

Reference	Mitigation measures	Timing	Application location(s)
Hazards and risk			
HR1	The proposal will be designed and constructed in accordance with the Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields (1 Hz – 100 kHz) (International Commission on Non-Ionizing Radiation Protection (ICNIRP), 2010) The design will meet the EMF exposure guidelines set out in Table 19-2 of the EIS and worst case scenarios within TransGrid's *Transmission Line Design Manual – Major New Build*.	Detailed design	All locations
HR2	A minimum 50m wide managed Asset Protection Zone will be provided to the hazard perimeter of the fixed construction equipment and camp site buildings unless an alternative fire protection approach that achieves the same level of bushfire risk management is identified by a suitably qualified specialist during detailed design. Any Asset Protection Zone will be regularly maintained to provide a maximum grass height of 100mm -150mm during the prescribed Bushfire Danger Period and when the grassland fuel reaches 70 per cent cured. Vegetation inside the main construction compounds and accommodation camp sites will be regularly maintained to a maximum height of 75mm.	Detailed design and construction	Main construction compounds and accommodation camps
HR3	Buildings within the construction compound and camp site will be constructed to comply with Section 3 and Section 5 (BAL 12.5) of A.S. 3959 – 2018 –'Construction of Buildings in Bushfire Prone Areas'. The sub-floor space of each building will be enclosed with stainless steel flymesh securely fixed to the external wall/s and buried into the ground. All joints will be overlapped and sealed.	Detailed design and construction	Main construction compounds and accommodation camps
HR4	Water for fire-fighting operations will be confirmed during detailed design with consideration to occupancy density and site layout. This will include onsite static water supply and fire-fighting hose reels. All weather access having a minimum width of 4 metres will be provided to the static water supply tanks.	Detailed design and construction	Main construction compounds and accommodation camps
HR5	Consultation with emergency services, including the Rural Fire Service and Fire and Rescue NSW will be undertaken during detailed design to ensure emergency access provisions are provided during operation.	Detailed design	All locations

Reference	Mitigation measures	Timing	Application location(s)
HR6	Prior to the occupation of the construction camps and offices, all bush fire protection and mitigation measures would be certified as compliant with relevant regulatory requirements by a suitably qualified bush fire consultant	Construction	Main construction compounds and accommodation camps
HR7	Shielding will be used and a water supply (nine kilogram water fire extinguisher) and trained operator present during all outdoor hot works/grinding activities, and during vegetation slashing within and adjacent to the construction compound and camp sites. No outdoor hot works will be undertaken during periods of Total Fire Ban and Catastrophic Fire Weather Days unless there is a suitable fire suppression unit present on site and only with prior agreement with local fire services.	Construction	All locations
HR8	All chemicals, fuels or other hazardous substances will be stored in accordance with the supplier's instructions and relevant legislation, Australian Standards and applicable guidelines. The capacity of any bunded area shall be at least 130 per cent of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s shall be shown on the site plans.	Construction	All locations
HR9	Dangerous goods and hazardous substances will be transported in accordance with relevant legislation and codes, including the *Dangerous Goods (Road and Rail Transport) Act 2008*, Road and Rail Transport (Dangerous Goods) (Road) Regulation 1998 and the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (National Transport Commission, 2007).	Construction	All locations
HR10	Appropriate spill containment equipment will be provided and located at strategic, accessible locations.	Construction	All locations
HR11	Security measures will be implemented to minimise the risk of arson within and adjoining construction areas. The location of appropriate security measures will be determined using a risk based approach.	Construction	All locations
HR12	All chemicals or other hazardous substances at the Buronga substation will be stored in bunded and weatherproof facilities away from drainage lines, and in accordance with supplier's instructions and relevant legislation, Australian Standards and applicable guidelines. The capacity of the bunded area will be at least 130 per cent of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s will be shown on the site plans.	Operation	Buronga substation

Reference	Mitigation measures	Timing	Application location(s)
HR13	Emergency spill procedures will be implemented to avoid and manage accidental spillages of fuels, chemicals or fluids during operation and maintenance activities in accordance with the TransGrid's HSE Guideline. Environmental spill kits will be provided at strategic, accessible locations, and staff will be trained in spill response procedures.	Operation	All locations
HR14	The proposal will be designed, operated and maintained in accordance with TransGrid's Bushfire Risk Management Plan. This includes reduction in fuel loads, management of asset protection zones and inspections of infrastructure.	Operation	All locations
HR15	The Buronga substation Emergency Response Manual will be updated to include the new proposed design and required revised emergency response procedures.	Operation	Buronga substation
Soils, contamination and groundwater			
SCG1	Locations of transmission line structure foundations, and ancillary construction sites will be positioned to avoid disturbance to any known farm dams where practicable.	Detailed design and pre-construction	Transmission line
SCG2	Existing areas of waterlogging and poor drainage will be avoided, where possible, with regard to both access tracks and permanent structures.	Detailed design	Locations mapped as moderate to high-risk salinity
SCG3	Construction materials will be selected to withstand high saline soil and groundwater environment (where applicable).	Detailed design and pre-construction	Locations mapped as moderate to high-risk salinity
SCG4	A review of additional geotechnical and hydrogeology data, and any publicly available mapping of high priority groundwater dependant ecosystems (GDEs) as documented in the latest relevant water sharing plan, will be carried out to confirm the groundwater conditions and to: > determine if any additional mitigation measures are required to limit groundwater inflows, or impacts to GDEs > confirm no or minimal impact to groundwater sources as per the minimal impact criteria listed within the Aquifer Interference Policy.	Detailed design and pre-construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
SCG5	Disturbance to areas of medium risk of contamination will be avoided or minimised where practicable during construction. This includes the position of foundations for transmission line structures and ancillary construction sites. Areas of medium risk of contamination that will be disturbed by construction activities will be further investigated including completion of a site inspection. Where considered to be required, a Phase 2 investigation will be completed in accordance with NEPM 2013. Mitigation measures identified through further investigation will be implemented.	Detailed design and pre-construction	All locations
SCG6	To limit the potential for groundwater inflows, the construction methodology for transmission line structure foundations will ensure that excavations will not occur within 40 metres of the Darling River, Great Darling Anabranch or Murray River. Where groundwater may be encountered, the design and construction methodology will be adjusted to minimise groundwater inflows. The depth of groundwater will be confirmed prior to commencement of construction at each relevant transmission line structure locations.	Detailed design and pre-construction	All locations
SCG7	Direct impacts to registered bores GW088454 (nested), GW087531 and GW600452 will be avoided, where possible. If the bores are: > not required to be removed during construction, then they will be clearly demarcated with a 5x5 metre construction exclusion zone > are to be removed during construction or unavoidably damaged, then make good provisions will apply in consultation with the registered bore owner.	Pre-construction and construction	Transmission line - Registered bores GW088454 (nested), GW087531 and GW600452
SCG8	Prior to ground disturbance in areas of potential acid sulfate soil occurrence (e.g. in low lying areas surrounding former or current lakes and river beds), testing will be carried out to determine the presence of actual and/or potential acid sulfate soils. If acid sulfate soils are encountered, they will be managed in accordance with the *Acid Sulfate Soil Manual* (ASSMAC, 1998) and TransGrid's HSE Guideline.	Pre-construction and construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
SCG9	Prior to ground disturbance, a visual inspection will be undertaken for the presence of saline soils. Areas of known or suspected salinity will be subject to further testing as required. If salinity is confirmed, excavated soils will be managed in accordance with *Book 4 Dryland Salinity: Productive use of Saline Land and Water* (NSW DECC 2008) and the *Salinity Training Manual* (DPI, 2014) to manage salinity impacts. Erosion controls will be implemented in accordance with *The Blue Book* (Landcom, 2004).	Pre-construction and construction	All locations
SCG10	Earthworks and construction activities that result in compaction of soils will be limited where possible in areas within 40 metres of the Darling River, Murray River and Great Darling Anabranch to prevent potential impacts to groundwater.	Pre-construction and construction	Transmission line – locations adjacent to the Darling River, Murray River and Great Darling Anabranch
SCG11	A bore condition assessment is to be conducted prior and post construction on GW088454 (nested), GW087531 and GW600452 where required to identify any adverse impact to the bores integrity that may have resulted during construction. If impacts are identified, repair or replacement of the bore will be undertaken in discussion with the registered owner.	Pre-construction and construction	Registered bores GW088454 (nested), GW087531 and GW600452
SCG12	Construction materials, spoil and waste will be suitably stored to minimise the potential for soil, groundwater or water quality impacts.	Construction	All locations
SCG13	The discovery of previously unidentified contaminated material will be managed in accordance with a contamination unexpected finds procedure.	Construction	All locations

Reference	Mitigation measures	Timing	Application location(s)
SCG14	The application of treated wastewater will be managed so that: > Application rates account for soil conditions and the protection of water quality (including groundwater). This includes salinity conditions and the prevention of runoff from application areas > buffer distances to sensitive receivers (such as waterways and farm dams) as set out in *Designing and Installing On-Site Wastewater Systems* (WaterNSW, 2019) are met > climatic conditions are considered during application to ensure treated wastewater is applied to intended areas > equipment used will reflect the management of human, livestock and environmental risks.	Construction	All
SCG15	Incident response procedures for wastewater treatment plants (and use of treated wastewater) will be implemented to avoid, minimise and manage accidental spills or other incidents that impact the function of the wastewater treatment plants.	Construction	Accommodation camps
SCG16	A site-specific risk assessment will occur for locations where there is a risk of encountering UXO. The risk assessment will be carried out prior to any activities that could interact with UXO. This will include field verification to validate the historical assessment of UXO contamination and identify appropriate mitigation practices. The risk assessment will occur with input from an appropriate UXO specialist and will identify if and when an explosives engineer is required during site activities. An unexpected finds procedure will be implemented. The procedure will specify the actions that site personnel must take to minimise the risk to and from any UXO encountered. The management actions identified in the risk assessment will be implemented prior to and during all relevant site activities. All personnel conducting intrusive works within an identified UXO area will be provided with appropriate safety and awareness briefing(s) prior to the participating in the intrusive works.	Construction	Til Til UXO area Oak Plains UXO area

Reference	Mitigation measures	Timing	Application location(s)
Waste management and resources			
WM1	The proposal will achieve an ISCA verified 'Design' and 'As-built' rating of Excellent under v1.2 of the IS rating tool.	Detailed design and construction	All locations
WM2	Measures to minimise excess spoil generation will be investigated at detailed design. This will include a focus on optimising the design to minimise spoil volumes and the reuse of material on-site.	Detailed design	All locations
WM3	Opportunities to re-use or recycle construction and demolition waste will be investigated during detailed design.	Detailed design	All locations
WM4	All waste will be assessed, classified, managed and disposed of in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014).	Construction	All locations
WM5	Waste streams will be segregated to avoid cross-contamination of materials and maximise reuse and recycling opportunities.	Construction	All locations
WM6	All waste generated and surplus spoil to be removed from the construction of the proposal will be transported to appropriately licensed waste disposal ~~or~~ transfer facilities or other facilities lawfully able to accept materials.	Construction	All locations
WM7	Waste during operations will be managed in accordance with TransGrid's existing Environmental Management System and processes for the identification, classification, handling and management of waste.	Operation	All locations
WM8	All waste will be assessed, classified, managed and disposed of in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014).	Operation	All locations
Cumulative impacts			
CI1	Co-ordination of traffic management arrangements between major construction projects will occur in consultation with the relevant road authorities (Transport for NSW and local councils) and/or other proponents as relevant. This will consider any potential conflicts in relation to deliveries and identified haulage routes during the program.	Construction	Silver City Highway and Arumpo Road