

Appendix E – Environmental assessment



TransGrid

Environmental Assessment

Western Sydney Airport
Transmission Line 39 Relocation

August 2017

Document Preparation History

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Certification

I certify that I have prepared this environmental assessment (EA) generally in accordance with the *NSW Code of Practice for Authorised Network Operators* (NSW Department of Planning and Environment 2015) and the information is neither false nor misleading. The EA addresses, to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposed activity in respect of any impacts which were not assessed as part of the Western Sydney Airport Environmental Impact Statement finalised on 15 September 2016.

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Executive Summary

TransGrid proposes to relocate a 3.2 kilometre section of a single circuit, 330 kilovolt (kV) overhead transmission line (Transmission Line 39) that crosses Commonwealth land designated to be developed for the Western Sydney Airport (the proposed activity). The transmission line would be diverted generally around the edge and wholly within the airport site in the form of an underground cable.

The proposed activity, (also known as the TransGrid Relocation Works in the Airport Plan which accompanied the Western Sydney Airport Environmental Impact Statement (WSA EIS)), includes the following works:

- > Installation of an underground high voltage transmission cable;
- > Construction of above ground to below ground transition points near the boundary of the airport site;
- > Construction of a laydown area, access roads and watercourse crossing structures to facilitate construction as well as provide maintenance access; and
- > Removal of the existing above ground transmission line.

The TransGrid Relocation Works are authorised by an Airport Plan determined under the *Airports Act 1996*. The Airport Plan was determined on 5 December 2016, following finalisation of the WSA EIS on 15 September 2016. A condition of the authorisation is that work (other than Preparatory Activities) must not commence on the relocation until a TransGrid Relocation Plan has been approved by an Approver. A pre-requisite to the submission of the TransGrid Relocation Plan is that (Condition 4(4)(a) is satisfied:

“an environmental assessment which would substantially satisfy the requirements for the assessment of environmental impacts under the laws which would apply to the TransGrid Relocation Works if the Act did not apply to the TransGrid Relocation Works has been completed in respect of any impacts of the TransGrid Relocation Works which were not assessed as part of the EIS”.

The WSA EIS assessed the impacts of the clearance and earthworks across an area identified in the airport plan as the indicative Construction Impact Zone (shown in Figure 2 of the Airport Plan). The TransGrid Relocation Works, to which this assessment relates, will occur entirely within the Construction Impact Zone outlined in Figure 2 of the Airport Plan and as assessed by the WSA EIS.

Accordingly, in respect of impacts not previously assessed in the WSA EIS, this Environmental Assessment (EA) draws on the environmental assessment framework under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Additionally, the EA substantially satisfies the environmental assessment requirements stipulated in the Department of Planning & Environment’s *NSW Code of Practice for Authorised Network Operators* (2015).

The main impact of the proposed activity is the clearing of two threatened ecological communities and one threatened flora species protected under the NSW *Threatened Species Conservation Act 1995* and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. However the scope of clearing would be within the Construction Impact Zone for the Western Sydney Airport, and was assessed through the Western Sydney Airport EIS and would be offset through the implementation of the Biodiversity Offset Delivery Plan (BODP), in accordance with the Airport Plan.

The proposed activity would also be undertaken in the vicinity of a number of known Aboriginal heritage sites as identified in the WSA EIS. Identified Aboriginal heritage sites would be demarcated as ‘no go zones’ and avoided to prevent accidental damage. An unexpected finds protocol would also be prepared and implemented to ensure accidental damage to other (unknown) sites is avoided. Additionally, management of Aboriginal heritage would be undertaken in accordance with the prescribed mitigation measures in Table 28-13 of the WSA EIS. This would involve the preparation and implementation of an Aboriginal survey and salvage program plan prior to construction works occurring relating to the construction and connection of the proposed underground cable. The Department of Infrastructure and Regional Development will develop an initial Aboriginal survey and salvage program plan in relation to the carrying out of preparatory activities for the Western Sydney Airport development. This initial survey and salvage programme plan including other

associated measures, such as an unexpected finds protocol, will be developed in consultation with Aboriginal stakeholders and other stakeholder groups.

Potential impacts on previously unrecorded Aboriginal heritage during the construction of the two transition sites would be managed in accordance with the unexpected finds protocol that will be developed.

The proposed activity would also be in proximity to the curtilage of some known non-Aboriginal heritage sites however no direct impacts would occur and indirect impacts such as vibration are not considered likely given the nature of the proposed activity and the plant and equipment to be used.

The proposed activity would involve trenching across the existing alignment of The Northern Road. Accordingly, traffic congestion and other impacts are expected given that The Northern Road is a classified road and a regional transport link. Construction would be staged to minimise disruption to users of The Northern Road and works would likely be undertaken at night to reduce traffic congestion to an acceptable level. Further consultation will be undertaken with Roads and Maritime Services regarding the potential impacts and any other mitigation required.

The construction impacts would be temporary during the indicative 18 month construction program. Potential impacts during operation would be limited given the cable would be buried and disturbed area remediated post construction. Electric and magnetic fields from the operation of the underground cable were assessed to be within the guideline levels for human exposure.

Measures to mitigate potential impacts identified in the EIS and this EA would be consolidated in a Relocation Plan (known as the TransGrid Relocation Plan) to be prepared to satisfy condition 4 of the Airport Plan. This plan, once approved, would act as an overarching environmental management framework to guide development of construction environmental management plans for the proposed activity.

This EA concludes that the proposed activity would not result in significant environmental impacts additional to those identified and assessed in the WSA EIS.

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1. Introduction

1.1 Proposed activity overview

Transmission Line 39 is a 330 kilovolt (kV), single circuit overhead transmission line that extends 114 kilometres between the Sydney West and Bannaby substations. An approximate 3.2 kilometre section of Transmission Line 39 crosses Commonwealth land that is the designated site for Western Sydney Airport (the airport site).

The proposed activity involves demolition of a 3.2 kilometre section of the existing overhead transmission line and construction of a proposed 3.8 kilometre underground cable that generally follows the perimeter of the airport site. The proposed activity is described in detail in Section 3.

The proposed activity is required to facilitate the use of the Western Sydney Airport site as an airport and was included in the approval of the Western Sydney Airport Environmental Impact Statement (WSA EIS) and the Airport Plan that was determined under the *Airports Act 1996* on 5 December 2016.

The proposed activity is also known as the TransGrid Relocation Works in the Airport Plan which accompanied the WSA EIS and includes the following works:

- > Installation of an underground high voltage transmission cable;
- > Construction of above ground to below ground transition points near the boundary of the airport site;
- > Construction of a laydown area, access roads and crossing structures to facilitate construction as well as provide maintenance access; and
- > Removal of the existing above ground transmission line.

The proposed activity is described in detail in Section 3.

1.2 Purpose of the environmental impact assessment

Condition 4 (4)(a) of the Airport Plan for Western Sydney Airport requires that an environmental assessment is completed which....

“...would substantially satisfy the requirements for the assessment of environmental impacts under the laws which would apply to the TransGrid Relocation Works if the Act did not apply to the TransGrid Relocation Works has been completed in respect of any impacts of the TransGrid Relocation Works which were not assessed as part of the (Western Sydney Airport) EIS.”

This environmental assessment (EA) therefore has been prepared to satisfy condition 4 (4)(a) of the Airport Plan for Western Sydney Airport under the *Airports Act 1996*. This EA draws on the environmental assessment framework under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Additionally, the EA substantially satisfies the environmental assessment requirements stipulated in the NSW Department of Planning & Environment’s *NSW Code of Practice for Authorised Network Operators*.

1.3 Approval process

This EA has been prepared to satisfy condition 4 (4)(a) of the Airport Plan for Western Sydney Airport under the *Airports Act 1996*. The condition requires the completion of the EA prior to the approval of the TransGrid Relocation Plan. The TransGrid Relocation Plan may be approved by the Infrastructure Minister or a Senior Executive Service Officer within the Department of Infrastructure and Regional Development.

The Transgrid Relocation Plan would act as an overarching environmental management framework to guide development of construction environmental management plans for the proposed activity. Environmental mitigation and management measures included in the WSA EIS and this Environmental Assessment would be included in construction environmental management plans, to be developed in accordance with the Transgrid Relocation Plan for for the proposed activity.

2. Consideration of options

2.1 Purpose and need of the proposed activity

The proposed activity is necessary to allow for the construction and operation of Western Sydney Airport and maintain the transmission of electricity between Sydney West and Bannaby electrical substations. The existing overhead transmission line crosses part of the site that will be used for construction of Western Sydney Airport.

2.2 Alternative options considered

2.2.1 Do nothing

The 'do nothing' option would involve leaving Transmission Line 39 in its current position. This option is not feasible as the proposed activity is required for the construction and operation of Western Sydney Airport.

2.2.2 Relocation options

Three options were considered for the relocation of the existing overhead transmission line. These options considered both overhead transmission lines and underground cables. The sections below outline the options considered and the assessment of each option and its suitability. The location of each of the options is shown in Figure 2-1.

Option 1 and 1a – Longer overhead route

This option would involve construction of an overhead transmission line about 12 kilometres in length which would be positioned about two to three kilometres to the north and west of the airport site. This option would require the removal of about seven kilometres of the existing overhead transmission line.

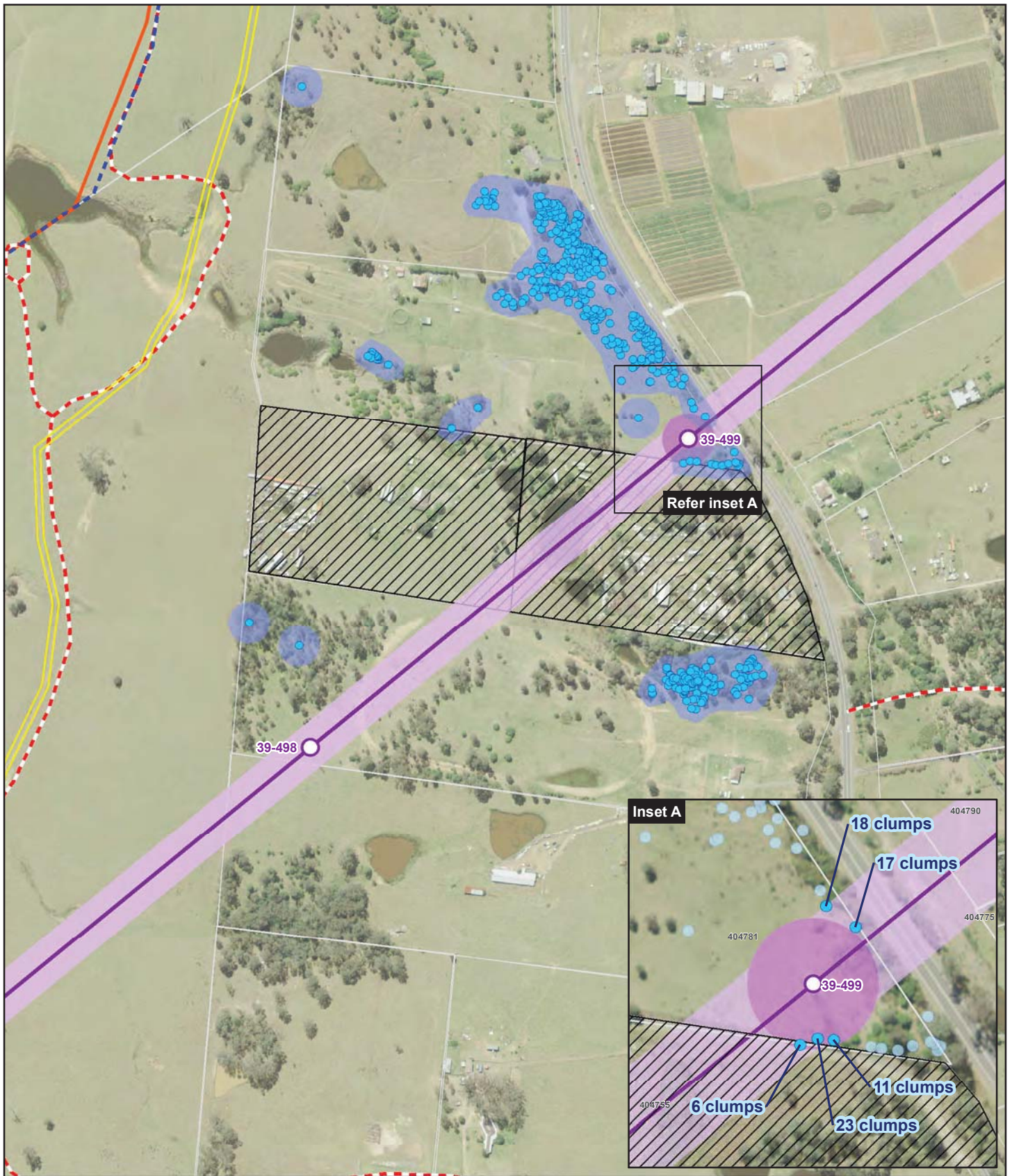
Prior to the feasibility assessment undertaken, an alternate shorter overhead route was developed (Option 1A). This alternate alignment was similar to Option 1, however some minor localised adjustments were undertaken.

Option 2 – Shorter overhead route

This option would involve construction of an overhead transmission line about six kilometres in length which would be positioned about 300 to 400 metres north of the airport site. This option would involve the removal of about five kilometres of the existing overhead transmission line.

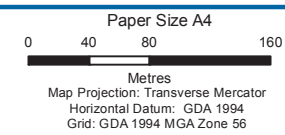
Option 3 – Underground cable at perimeter of airport site (Current Alignment)

The option would include two transition sites with associated termination towers at the northern and southern ends of the cable route. The total length of the cable would be approximately 3.8 kilometres. This option would involve the removal of about 3.2 kilometres of the existing overhead transmission line. It should be noted that the northern termination tower is located outside the Commonwealth boundary and therefore has been considered in a separate environmental assessment undertaken by TransGrid.



LEGEND

- | | | |
|---|--|--|
| Commonwealth land | Transmission tower | <i>Pimelea spicata</i> (endangered species under the TSC Act and EPBC Act) |
| Existing overhead transmission line | Area not surveyed | <i>Pimelea spicata</i> (records within buffer zone) |
| Proposed underground transmission cable | Survey area (25m from tower 39-499) | <i>Pimelea spicata</i> occupied habitat |
| Proposed access and laydown | Survey area (20m from transmission line) | |



TransGrid
REF Transmission Line 39 Diversion

Job Number 21-26292
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***Pimelea spicata* records**

Figure 1

Option comparison

The overhead options were considered to have similar benefits and risks. However the positioning of Option 2 closer to the airport site results in a number of the towers being required within the obstacle limitation surface area of the Western Sydney Airport. For this reason, Option 2 was not carried forward into the feasibility design.

Further revision of Option 1 resulted in the generation of a new route (Option 1A) which was considered in the feasibility assessment as the preferred aboveground transmission line alignment.

Option 3 was ultimately selected as the preferred option. Option 3 was also the option contemplated by the WSA EIS and authorised in the Airport Plan. Table 2-1 provides an overview of the benefits and risks associated with options 1A and 3 that provide the rationale for the selection of Option 3.

Table 2-1: Summary of benefits and risks of above and underground options

Issue	Option 1/1A	Option 3
Property	Crosses a number of private and public land parcels which would require acquisition. Traverses land subject to a Native Title Claim.	Located on the airport site and therefore acquisition not required.
Visual impacts	Introduction of a new overhead transmission line in areas which currently do not have such infrastructure, which would introduce new visual impacts.	Minimal as the underground cable is buried. Some visual impact at transition points.
Biodiversity	Impacts on flora and fauna not addressed by the Western Sydney Airport Environmental Impact Statement (WSA EIS) and therefore additional impacts and potentially additional offsetting requirements. Requires larger easement (i.e. 50–60 m) and therefore results in greater impacts.	Contained within the Construction Impact Zone assessed through the WSA EIS process and indicatively shown in Figure 2 of the determined Airport Plan. Requires a smaller easement (18- 20 metres) and therefore results in less ground disturbance.
Aboriginal heritage	Known and potentially unknown Aboriginal sites located in the vicinity which would require further assessment.	Known Aboriginal sites located along alignment. No requirement for further assessment.
Removal of existing transmission line	Removal of longer section of the existing transmission line resulting in slightly increased cost.	Removal of shorter section of the existing transmission line resulting in slightly decreased cost.

3. Proposed activity description

3.1 Proposed activity location

The proposed activity, located at the Western Sydney Airport site (the site) is about 50 kilometres west of Sydney at Badgerys Creek and about one kilometre southeast of Luddenham. The site is within the Liverpool local government area and entirely on Commonwealth land.

The site is mainly characterised as rural with a history of agricultural activities and scattered residences with occasional farm dams and patches of native vegetation. The site also intersects The Northern Road.

A large part of the airport site, including the site of the proposed activity, would be cleared of existing vegetation and structures for the development of the airport.

3.2 Detailed proposed activity scope

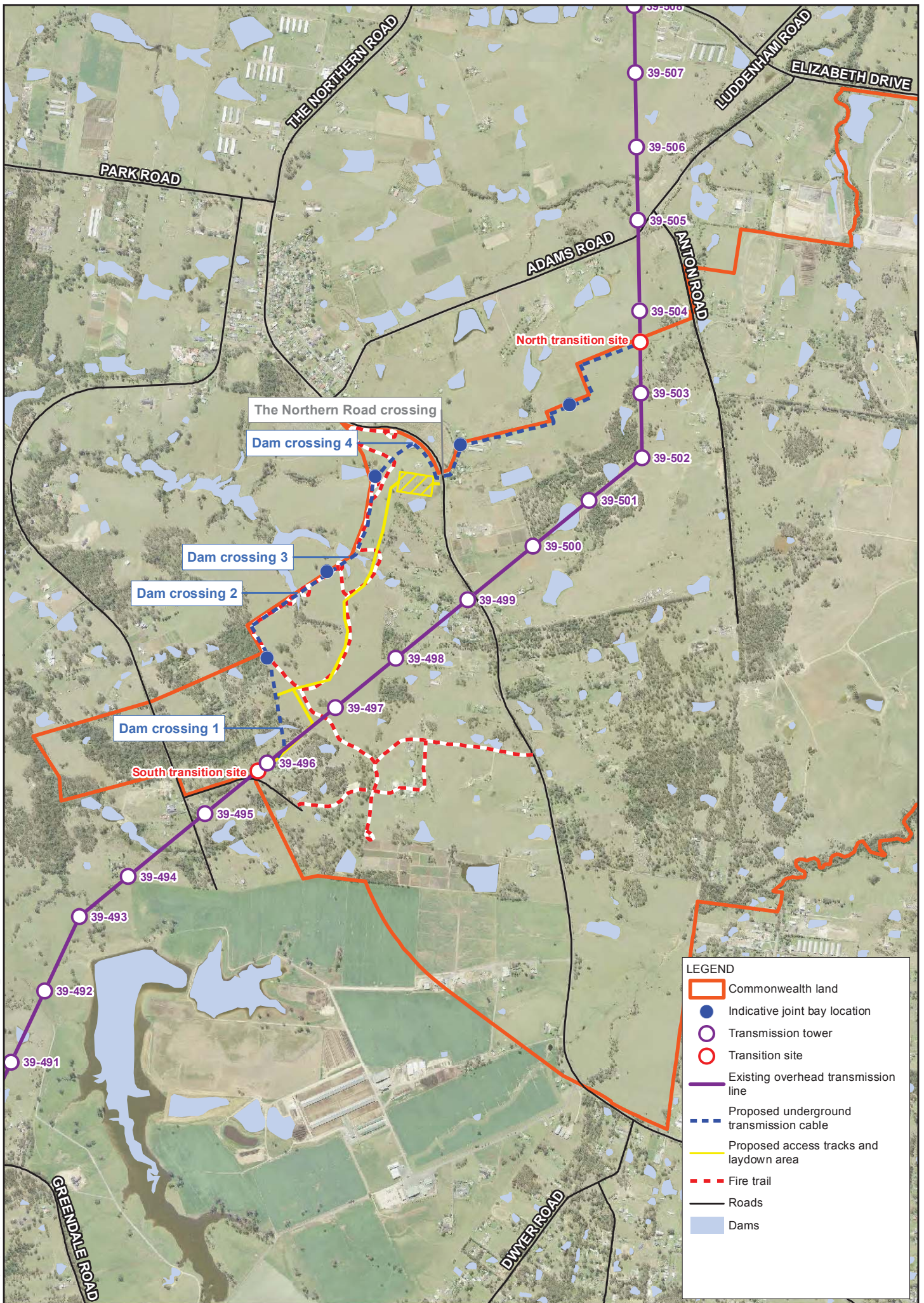
Section 3.5.2 of the Airport Plan outlines the need for the relocation and removal of a range of existing utilities from the airport site to facilitate development for the Western Sydney Airport. Part 3 Section 3.10 outlines the conditions to be completed in accordance with subsection 96B(9) of the Airports Act, including the need for TransGrid to undertake relocation of the transmission line in accordance with a TransGrid Relocation Plan.

The proposed relocation activity consists of the following key activities:

- > installation of an underground high voltage transmission cable;
- > construction of above ground to below ground transition points on the boundary of the airport site;
- > construction of a laydown area, access roads and watercourse crossing structures to facilitate construction as well as provide maintenance access; and
- > removal of the existing above ground transmission line.

The proposed underground cable and underground/overhead transition sites, existing overhead transmission line and temporary construction access tracks and laydown areas are shown in Figure 3-1.

The proposed activity scope is detailed further in Sections 3.2.1, 3.2.2 and 3.2.3.



N:\AU\Sydney\Projects\2124265\GIS\Maps\Deliverables\TransmissionLineREF\SMA_TLREF.CL.mxd

Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprice

Figure 3-1 Proposed activity

0 250 500 1,000

Metres



3.2.1 Underground/overhead transition sites

Transition sites would be established at the northern and southern ends of the underground cable to connect it to the existing overhead transmission line located outside the airport site. The location of the transition sites is shown in Figure 3-1.

Northern transition site

The northern transition site would be located within a fenced yard which would be approximately 20 metres by 40 metres. The transition site would include surge arrestors, current sensors, cable sealing ends, conductor supports and three concrete landing poles about 15 metres tall.

The terminal tower for this transition site is located outside of the airport site and does not form part of the proposed activity.

Southern transition site

The southern transition site would be located within a fenced yard which would be approximately 35 metres by 40 metres. The transition site would include surge arrestors, current sensors, cable sealing ends, conductor supports and three concrete landing poles about 15 metres tall. The southern transition site would also include busbars and supports, a secondary system shed and an isolation transformer for a backup 415 volt supply from the distributor network.

The southern transition site would include the provision of a 30 metre high terminal tower to the north-east of the transition site. This structure would be contained within the fenced yard.

3.2.2 Underground cable

Alignment

The proposed underground cable would generally follow the airport site perimeter for about 3.8 kilometres between the southern and northern underground/overhead transition sites (see Figure 3-1).

Cable arrangement and surface infrastructure within the easement

The underground cable is proposed to be constructed in a split trench arrangement which results in two separate parallel trenches each containing cabling. The typical cross section of these trenches within the easement is shown in Figure 3-2.

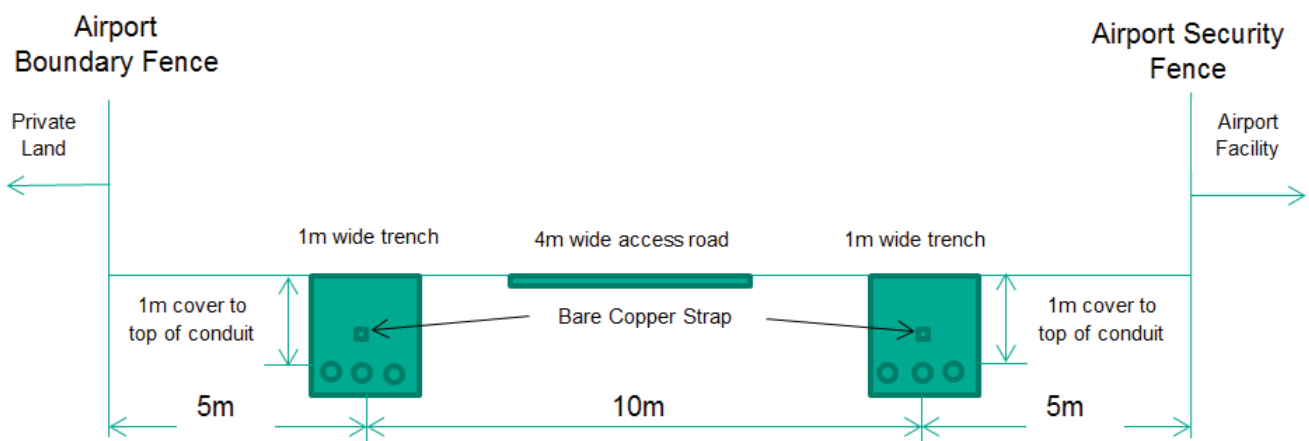


Figure 3-2: Typical cross section of proposed underground cable

Each trench would contain three cables which would be laid in conduits and buried at a minimum depth of one metre. The cable arrangement within each trench is shown in Figure 3-2. The cable trenches would be backfilled with thermal stabilised backfill, which would enhance the heat dissipation from the cables. This would allow the use of cables with the minimum possible cross sectional area to achieve the required ratings.

Each trench would also include communication cabling to assist TransGrid with the monitoring and management of the entire transmission line (including beyond the extent of the proposed activity).

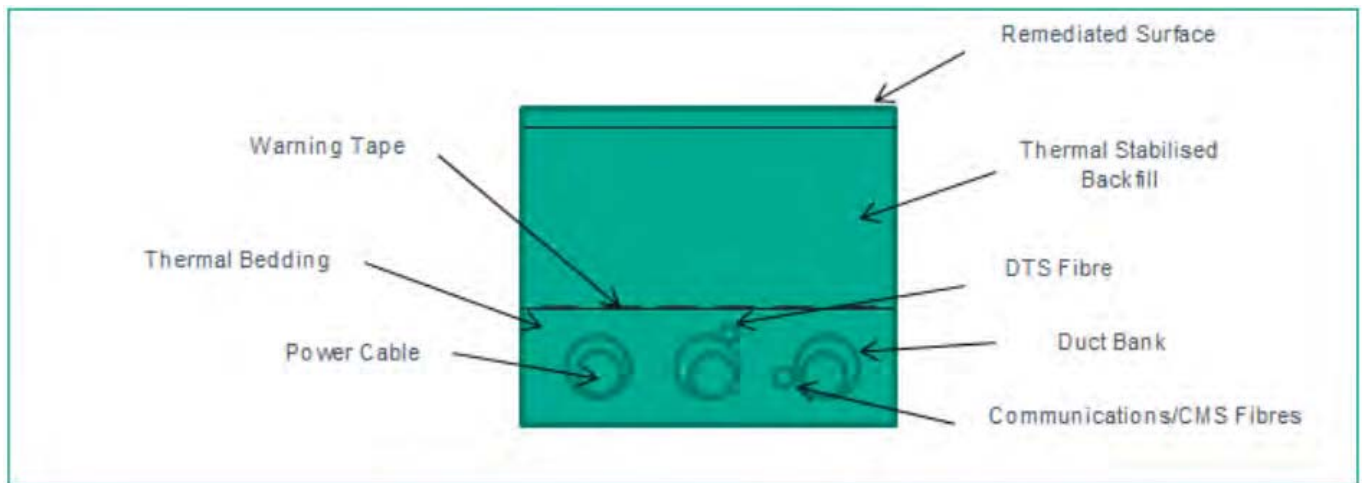


Figure 3-3: Typical cross section of proposed underground cable trench

Joint bays would be required to connect lengths of cable together along the proposed underground cable. It is estimated that about five bays would be required for each cable; these bays occur at the approximate locations shown in Figure 3-1. The actual location of the joint bays would be confirmed during detailed design. Cable joint bays would consist of a precast concrete structure (refer to Figure 3-4) where cables would be joined. These bays would be buried in sand to allow access when required during future maintenance activities (including during emergencies).

An access track would also be provided along the entire easement for maintenance purposes. This would be positioned between the two trenches. The access track would be constructed of gravel or road base (to be confirmed during detailed design).

Dam crossings

The proposed underground cable would cross existing dams at the four locations shown in Figure 3-1.

A number of methods are available for dam crossings, which include:

- > filling the dam and trenching through the fill material
- > draining and trenching beneath the dam
- > under-boring the dam
- > installation of a cable bridge.

Filling and trenching is preferred for dams entirely on the airport site given they would not be used following development of the airport. Crossing 4 (as shown in Figure 3-1) is the only crossing confirmed to be filled as part of the proposed activity. The design for Crossing 1 will be confirmed during detailed design, however for the purpose of this assessment, it is assumed that the crossing would be in the form of a cable bridge or would be filled then trenched.

Installation of a cable bridge is preferred for dams partially on the airport site as they may be in continued use and this option would not affect the capacity or flow of a dam. This would occur at crossings 2 and 3 as shown in Figure 3-1.



Figure 3-4: Joint bay

The Northern Road crossing

The proposed underground cable would cross The Northern Road at the location shown in Figure 3-1. Detailed design of this crossing would be undertaken to determine the exact nature of this crossing particularly due to the presence of a number of existing utilities in the vicinity of the proposed crossing.

Rehabilitation of corridor

All disturbed areas not required for operation of the proposed underground cable would be rehabilitated and stabilised as soon as practicable after disturbance.

Testing and commissioning

Following completion of construction activities, the cable would be tested, connected to the transmission line and energised.

3.2.3 Overhead transmission line demolition and removal

Following the commissioning of the proposed underground cable, the existing overhead section of the transmission line within the airport site would be decommissioned and demolished.

Decommissioning and demolition would involve the removal of eight steel transmission structures and the associated conductors, fittings and earth wires; however the concrete footings would remain in-situ and later removed as part of the construction of Western Sydney Airport.

3.3 Construction activities

3.3.1 Construction methodology

Construction of the proposed activity would involve the following key stages:

- > construction of access tracks
- > establishment of laydown area/compound area
- > construction of new transition sites
- > construction of proposed underground cable
- > testing and commissioning of new transmission line
- > decommissioning and removal of existing transmission line
- > site demobilisation.

Construction access tracks

Access to construction areas would be available via the following:

- > new access track to provide access to the northern transition site from Anton Road and to the south transition site from The Northern Road. The access track would also provide access to the cable easement and the laydown area
- > along the proposed underground cable easement
- > along the existing transmission line easement which can be accessed from either existing roads (e.g. The Northern Road) or via the new access track mentioned above.

The proposed new access track would be constructed of gravel/road base and would provide improved wet weather access particularly for large equipment such as cranes. The track would be approximately four metres wide with the alignment shown in Figure 3-1. It is anticipated that the new access track would remain in-situ to facilitate future construction activities within the airport site.

Some minor ground improvements (such as grading or the placement of gravel or similar material) would be required to provide access along the existing transmission line easement in order to access the existing transmission towers. The need for any further tracks would be confirmed during detailed design or construction planning.

Construction laydown area

A construction laydown area would be established at the location shown in Figure 3-1. This laydown area would be located west of The Northern Road near the proposed underground cable crossing. The laydown area would be about 165 metres by 65 metres in size. The laydown area would also function as a construction compound and would support the construction phase of the proposed activity. The primary purpose of the laydown area is for the storage of equipment and materials as they arrive to site. Materials would then be moved to where works are occurring along either the existing or new transmission line alignments.

The laydown area/compound would also potentially include the following facilities:

- > demountable site offices
- > toilet facilities
- > vehicle parking
- > storage areas for equipment, material and waste.

The laydown area /compound would be accessed via a new access track from The Northern Road.

Construction of new transition sites

Works at the two transition sites would be undertaken within the proposed infrastructure yard areas. Works would generally involve the assembly and installation of prefabricated components with cranes and elevated work platforms. Clearing of vegetation would be required within the boundary of each transition site to facilitate construction.

Civil works at the transition sites would include bulk earthworks to establish a level bench at each transition site followed by the establishment of foundations for primary plant. Additionally, excavations for the new northern and southern termination tower footings would be established. It is anticipated that 169 and 773 cubic metres of spoil would be generated at the northern and southern transition sites respectively. The above numbers are considered to be worst-case should the spoil excavated not be suitable for reuse as part of rehabilitation works at these sites.

Construction of proposed underground cable

Preparation of the easement

To mark the alignment of the proposed underground cable, small concrete pegs would be installed along the easement. The pegs would be placed at about 50 metre intervals along the easement or at any change in direction of the transmission line. Cable markers would also be provided at The Northern Road crossing in the form of metallic plates on the kerb at either end of the road crossing.

The easement would be progressively cleared to allow for trenching. The clearance area would be delineated to ensure clearance activities are contained within the 18 to 20 metre wide easement. Topsoil would be stripped and stockpiled outside the easement for reuse along the easement once all excavation has been backfilled.

All vegetation waste would be collected and disposed of at an appropriately licenced facility. Alternatively, vegetation would be mulched on site and stockpiled for potential reuse. All vegetation clearing would be undertaken in accordance with the prescribed mitigation measures in Section 5.1.3.

Trenching, cable installation and backfilling

Construction activities associated with trenching would include:

- > excavating trenches, including stockpiling spoil material on site for potential reuse in the filling of dams (subject to confirmation of suitability for this purpose)
- > spreading granular bedding material such as sand or gravel along the base of the trench before cable laying
- > installing the cable (further detail provided below)
- > backfilling the trench with imported thermal stabilised backfill
- > reuse of stockpiled topsoil to rehabilitate the surface.

Trenching methods would include both machine trenching and hand trenching. Trenching would generally be carried out using excavators and a small compactor. Rock breakers may also be required where bedrock is encountered during excavation. Hand trenching would only be used in areas where an excavator is unable to undertake the trenching works.

The trench would be constructed in sections and would aim to minimise the time in which any one section of trench remains open. The above method would be repeated for each new section of the transmission line. Trench shoring would be provided to prevent collapse of the trench. To achieve the required cable rating, a concrete duct with a minimum thickness of 150 millimetres would be established within the trench.

Approximately 12,000 cubic metres of soil is expected to be excavated for the proposed underground transmission cable. The cable trench would be backfilled with thermal stabilised backfill to enhance the heat dissipation from the cables to achieve operational requirements, resulting in surplus spoil. Where applicable, surplus spoil would be reused onsite as fill for the dams or stockpiled within the airport site (to be confirmed as part of construction planning for the airport) for future activities as part of the construction of the airport. Any

spoil not suitable for reuse due to contamination or other issues would be removed from the airport site and disposed at an appropriately licenced facility.

Cable laying

The cables would be installed by pulling from the cable drum and winch sites. Pulling pits would also be required along the alignment to assist in moving the cable through the trench system, thus preventing damage to the cable sheath. Cable drum and winch sites and pulling pits would be required for each section of the proposed underground cable. The location of these sites and pits would be determined during detailed design. Once laid, the cable trenches would be backfilled.

Joint bays

During the construction of the joint bays, temporary joint bay huts would be erected over the joint bay to provide a safe and secure working environment during cable jointing activities. An example of a temporary joint bay hut is shown in Figure 3-5.



Figure 3-5: Temporary joint bay hut

Rehabilitation of corridor including new access track and cable markers

Following the rehabilitation of the land surface, the new access track would be constructed along the easement with the use of gravel/road base. All areas not forming part of the access track would be stabilised through seeding for grass. Reuse of topsoil would also provide a seed bank for grass to regrow.

Cable markers would then be driven into the surface to identify the location of the cables.

The Northern Road crossing

The construction of the cable across The Northern Road would likely be undertaken utilising open trenching methods. The Northern Road north of Bringelly Road is a classified road controlled by Roads and Maritime and has a traffic volume of approximately 15,593 vehicles per day. To minimise impacts on traffic along The Northern Road, works would likely be undertaken outside standard construction hours. Works would only affect

part of the road with a full road closure not proposed. All requirements of these works would be confirmed with Roads and Maritime Services by consultation during detailed design.

Following trenching activities, the pavement of The Northern Road would be reinstated to Roads and Maritime Services specifications. Reinstatement would occur as soon as possible following completion of trenching.

Alternately, there is potential that the cable ducts may be thrust beneath The Northern Road.

Testing and commissioning of proposed underground cable

Prior to the removal of the existing transmission line, the underground cable would be tested and commissioned.

Decommissioning and removal of existing transmission line

Following the commissioning of the underground cable, the decommissioning and removal of the existing transmission line can commence. The removal of existing overhead transmission line infrastructure would involve:

- > removal of conductors and earthwires from transmission towers
- > de-stringing of transmission towers by controlled pulling and coiling
- > staged disassembly of transmission towers and bundling of steel members.

A number of temporary measures would be implemented during the removal of infrastructure for health and safety reasons including the installation of working earths, protection at road crossings and exclusion zones near towers.

Removal of the existing overhead transmission line would involve the use of cranes, elevated work platforms, winches and excavators. Depending on ground conditions, level construction benches (measuring about 10 metres by 10 metres) may be established at the base of transmission towers to support the safe operation of cranes, elevated work platforms and other plant and equipment. Prior to the removal of transmission line infrastructure, working earths would be placed on conductors for safety purposes. Conductors and earthwires would then be removed from transmission towers and pulleys would be installed to allow controlled de-stringing. Once conductors and earthwires are removed and de-stringing is complete, transmission towers would be disassembled in a staged manner with cranes and elevated work platforms. Steel members of the transmission towers would be sequentially unbolted and lowered to the ground.

Waste materials from the removal of the existing overhead transmission line would be transported to suitably licensed facilities using scrap trucks. Suitable materials such as wires or transmission tower members would be reused or recycled if practicable.

Access to work areas along the transmission line corridor would be undertaken via the existing easement which would be accessed via neighbouring roads, existing access tracks and/or access tracks constructed as part of the proposed activity.

3.3.2 Construction plant and equipment

A range of plant and equipment would be required for construction/ demolition. The following is an indicative list of plant and equipment which would be required for the proposed activity:

- > light vehicles
- > four-wheel drives
- > reticulated heavy vehicles
- > excavators
- > cranes (including up to 100 tonnes)
- > elevated work platforms
- > dump trucks
- > brake and winch trucks

- > cable drums
- > timber shredder
- > rock-breaker.

The proposed activity would require approximately 30 workers each day during the construction period.

3.3.3 Construction schedule

The indicative construction schedule for the proposed activity is summarised in Table 3-1.

Table 3-1: Indicative construction schedule

Proposed activity	Start date	Approximate duration
Site preparation	December 2017	2 months
Southern transition site works	December 2017	3 months
Northern transition site works	March 2018	3 months
Construction and connection of proposed underground cable	April 2018	15 months
Demolition of existing overhead transmission line	June 2019	1 month

3.3.4 Construction hours

Noise generating works would be limited to the recommended standard hours for construction work outlined in the *Interim Construction Noise Guideline* (DECC, 2009) which are:

- > Monday to Friday 7:00am to 6:00pm.
- > Saturday 8:00am to 1:00pm.
- > no works on Sundays or Public Holidays.

Work outside standard hours could include:

- > delivery of materials outside standard hours requested by police or other authorities for safety reasons (i.e. drums of conductor)
- > works on The Northern Road in line with any requirements of Roads and Maritime Services
- > emergency work to avoid the loss of lives and/or property
- > work timed to correlate with system planning outages.

If additional noise generating works outside standard construction hours are needed, they would require justification in accordance with the *Interim Construction Noise Guideline* (DECC, 2009) and the formal written consent of the Department of Infrastructure and Regional Development prior to occurring.

3.4 Property identification

The proposed activity would be located entirely on Commonwealth land, on the following land parcels:

- > Lot 1 on DP838361
- > Lot 32 on DP259698
- > Lot 1 on DP851626.

3.5 Operation and maintenance

The proposed underground cable would provide the same level of transmission as the existing overhead transmission line at 330 kV. Maintenance activities would include:

- > routine inspection of the underground cable
- > half-yearly inspection of cable bridges
- > three yearly cable sheath and link testing.

If repairs to the proposed underground cable are required, they would typically involve mobilisation of the construction equipment discussed in Section 3.3.2. The section of the transmission line to be repaired would be excavated, removed, replaced, backfilled and remediated. Based on similar activities, repair and replacement of a section of transmission line would take about two months.

The installation of two separate cables in parallel trenches would provide a level of contingency in the event of a failure during operation and potential for continuation of service during maintenance activities.

Repairs and other maintenance activities would likely occur during the operation of Western Sydney Airport and would therefore comply with its operating rules, including the obstacle limitation surface that would limit the height of construction equipment such as the crane.

4. Planning context and consultation

The proposed activity is located on the Western Sydney Airport site, which is Commonwealth land. Accordingly, the Western Sydney Airport was assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and was consequently authorised subject to conditions. This EA has been prepared in accordance with the conditions of the approval as stipulated in the Western Sydney Airport Plan.

4.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the principal environmental law administered by the Commonwealth. The EPBC Act aims to protect matters of national environmental significance, which are defined under the Act as:

- > world heritage properties
- > national heritage places
- > wetlands of international importance
- > listed threatened species and ecological communities
- > migratory species protected under international agreements
- > nuclear actions
- > Commonwealth marine areas
- > The Great Barrier Reef Marine Park
- > water resources in relation to coal seam gas or large coal mining developments.

The environment is also protected in the following situations under the EPBC Act:

- > where actions proposed are on, or will affect Commonwealth Land and the environment
- > where Commonwealth Agencies are proposing to take an action.

Actions that are likely to have a significant impact on one or more of these matters of national environmental significance are termed controlled actions and require approval by the minister.

The Western Sydney Airport was determined to be a controlled action under the EPBC Act and subsequently required the preparation of an EIS for assessment by the Environment Minister. The Western Sydney Airport EIS was finalised in September 2016. The Airport Plan was determined in accordance with section 96B of the *Airports Act 1996* on 5 December 2016 by the Minister for Urban Infrastructure following receipt of a notice from the Environment Minister. The Airport Plan incorporates over 40 conditions that were included in the Environment Minister's notice.

4.2 Airports Act 1996

The *Airports Act 1996* regulates the development, ownership and operation of airports. The Act allows for the declaration of airport sites and determination of airport plans.

The proposed activity is located within the airport site for Western Sydney Airport. The proposed activity is also authorised by the Airport Plan for Western Sydney Airport.

With regard to Section 99(v) of the Act, the proposed activity is building work that would occur before the airport completion date and would be required to be consistent with the Airport Plan.

The Airport Plan for Western Sydney Airport contains a number of conditions relevant to the proposed activity. These conditions are reproduced below.

4. TransGrid Relocation Works

- (1) *The Site Occupier must not permit TransGrid Relocation Works (other than Preparatory Activities) to commence until a TransGrid Relocation Plan has been prepared and approved in accordance with this condition.*

- (2) *TransGrid must:*
 - (a) *prepare; and*
 - (b) *submit to an Approver for approval;**a TransGrid Relocation Plan in respect of the TransGrid Relocation Works.*
- (3) *TransGrid must not carry out TransGrid Relocation Works inconsistently with the approved TransGrid Relocation Plan.*
- (4) *The criteria for approval of the TransGrid Relocation Plan are that an Approver is satisfied that:*
 - (a) *an environmental assessment which would substantially satisfy the requirements for the assessment of environmental impacts under the laws which would apply to the TransGrid Relocation Works if the Act did not apply to the TransGrid Relocation Works has been completed in respect of any impacts of the TransGrid Relocation Works which were not assessed as part of the EIS;*
 - (b) *the plan includes appropriate management and mitigation measures to avoid, minimise or manage, the identified environmental impacts of the TransGrid Relocation Works;*
 - (c) *the plan identifies the persons responsible for implementing the plan; and*
 - (d) *the plan is otherwise appropriate.*

...

37. *Informing others of conditions*

- (2) *TransGrid must take reasonable steps to ensure that each person involved in carrying out TransGrid Relocation Works is informed of, and complies with, the approved TransGrid Relocation Plan.*

This EA has been prepared to fulfil condition 4 (4)(a) and inform the measures to be included in the TransGrid Relocation Plan in satisfaction of condition (4)(b) of the Airport Plan.

4.3 NSW Environmental Planning and Assessment Act 1979

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) provide the framework for development and environmental assessment in NSW.

As outlined in Section 4.2, the proposed activity was determined under the *Airports Act 1996* and not under State planning legislation (EP&A Act). Notwithstanding this, as per condition 4 (4)(a) of the Airport Plan, an environmental assessment for the relocation of Transmission Line 39 must be undertaken in a manner that substantially satisfies the requirements for the assessment of environmental impacts under the laws which would apply should the proposed activity be located outside Commonwealth land in relation to impacts not previously assessed under the WSA EIS. In this case, TransGrid would assess a proposed activity of this nature under Part 5 of the EP&A Act. In accordance with Section 111 of the EP&A Act, TransGrid is required to assess potential environmental impacts of their actions to the fullest extent possible.

The *NSW Code of Practice for Authorised Network Operators* (NSW Department of Planning and Environment 2015) was established to guide the assessment of activities undertaken by authorised network operators, such as TransGrid. Pursuant to the Code, the level of assessment for the proposed activity was considered to be a Class 4. Accordingly, this EA has adopted the assessment framework established for Class 4 activities. Additionally, this EA has taken into consideration the factors listed under Clause 228 of the *Environmental Planning and Assessment Regulation 2000* in Section 6.

4.4 Other environmental legislation

Other legislative requirements and their applicability to the proposed activity are listed in Table 4-1.

Table 4-1: Other environmental legislation

Legislation considered	Relevance to the proposed activity
NSW <i>Roads Act 1993</i>	<p>The <i>Roads Act 1993</i> is administered by Roads and Maritime Services, councils or the Department of Primary Industries - Lands. Under Section 138 of the <i>Roads Act 1993</i>, a person must not impact or carry out work on or over a public road otherwise than with the consent of the appropriate roads authority.</p> <p>As TransGrid is a network operator under the Electricity Supply Act 1995, approval is not required from council under Section 138 of the <i>Roads Act 1993</i> to undertake works over unclassified roads (local roads) due to the application of Clause 5 of Schedule 2 of the <i>Roads Act 1993</i>. The proposed activity would involve works within The Northern Road corridor and therefore an approval would be required.</p>
NSW <i>Threatened Species Conservation Act 1995</i> (TSC Act)	<p>While not specifically applicable to this assessment, the TSC Act was considered. It lists a number of threatened species, populations or ecological communities to be considered in deciding whether there is likely to be a significant impact on threatened biota, or their habitats. If any of these could be impacted by the project, an assessment of significance that addresses the requirements of Section 5A of the EP&A Act must be completed to determine the significance of the impact.</p> <p>Clearance of TSC Act listed vegetation and impacts on TSC Act listed flora and fauna species outlined in Section 5.1. Assessment of the clearance of this vegetation and/or species has occurred as part of the WSA EIS.</p> <p>It is noted that the TSC Act will be replaced by the <i>Biodiversity Conservation Act 2016</i> which is expected to commence on 25 August 2017. As assessment of impacts on vegetation forming part of the proposed activity was undertaken as part of the Commonwealth Approval, any changes due to the new legislation would not be applicable to the proposed activity.</p>

4.5 Other environmental approvals or permits required

Following consideration of the proposed activity and the applicable environmental legislation, the following permits are required for the proposed activity:

- > Section 138 permit under the *Roads Act 1993*
- > Section 200 permit under the EPBC Act.

4.6 Consultation

TransGrid have undertaken consultation with the community, government agencies and other key stakeholders in conjunction with the Department of Infrastructure and Regional Development. TransGrid has also consulted with Government Agencies in accordance with TransGrid's Consultation Protocol (2016b).

In accordance with Clause 13 of the *State Environmental Planning Policy (Infrastructure) 2007*, written notice of the intention to carry out the development was issued to Liverpool City Council on 13 April 2017. No response

was received from Liverpool City Council. Letters were also sent to Penrith City Council, the Civil Aviation Safety Authority, Air Services Australia, the NSW Environment Protection Authority and Roads and Maritime Services.

Penrith City Council responded to the written notice on 15 May 2017 and did not have any objections to the proposed activity. While no other responses were received, ongoing consultation with Roads and Maritime Services has been undertaken.

Consultation with Roads and Maritime Services was generally associated with the construction of new access roads to the airport site off The Northern Road and Eaton Road. Issues were raised by Roads and Maritime Services surrounding the safe access to the equipment laydown area and internal access road off The Northern Road. Consequently, it was proposed a slip lane be established along The Northern Road at the airport site access point to ensure traffic safety. As this work occurs outside the airport boundary within the road reserve of The Northern Road, approval has been sought separately under Part 5 of the EP&A Act. This is detailed in the *Summary Environmental Report - Line 39 Sydney West to Western Sydney Airport Optical Ground Wire Installation* (TransGrid 2017).

Local residents potentially directly affected by the proposed activity (namely residents along Eaton Road, Luddenham) were notified in writing on 23 May 2017 of the proposed activity, however no responses were received.

4.7 Public exhibition and feedback

In accordance with TransGrid's Consultation Protocol, this EA will be placed on public exhibition for a period of 20 business days. This includes placing the EA on TransGrid's website (www.transgrid.com.au/what-we-do/projects/Pages/default.aspx), seeking feedback from the community and government departments who were previously consulted regarding the proposed activity. Additionally, all parties previously consulted will also be notified in writing seven days prior to placing the EA on TransGrid's website, informing of them of the review process and the opportunity to provide a formal submission.

Following the exhibition of the EA, TransGrid will prepare a *Submission Report* (if required), which provides a formal response to the submissions received during the public exhibition period and how they have been taken into account.

5. Environmental impact assessment

The environmental impact assessment is based on a review of the information developed for the Western Sydney Airport EIS (Department of Infrastructure and Regional Development 2016) and the updated ecological survey work, completed in accordance with Condition 30 of the Airport Plan in the development of the Stage 1 Biodiversity Assessment Report (BAR) for the Western Sydney Airport.

The EIS included an assessment of the existing environment at and surrounding the airport site, including, amongst other attributes, surface water monitoring and modelling, flora and fauna surveys, Aboriginal and non-Aboriginal heritage surveys, and social and economic baseline research. The proposed activity is located within the Stage 1 Construction Impact Zone of the airport site.

5.1 Ecology

5.1.1 Existing environment

The proposed activity location includes a range of vegetation zones including cleared land with minimal biodiversity value and patches of native vegetation containing protected flora species and communities.

A number of protected fauna species also have the potential to occur at the airport site. Ecological values detected in and around the Western Sydney Airport site are listed in Table 5-1 and shown in Figure 5-1.

In addition to the flora and fauna surveys undertaken for the Western Sydney Airport EIS, additional targeted surveys for the Spiked Rice-flower were undertaken in May 2017 as part of updated ecological survey work for the Stage 1 BAR for Western Sydney Airport. This will inform the Department of Infrastructure and Regional Development's development of the Biodiversity Offset Delivery Plan (BODP), in accordance with Condition 30 of the Airport Plan. The results of this survey are detailed further in Appendix B.

Table 5-1: Ecological values

Ecological value	Protected status	Occurrence	Likelihood of impact at the proposed activity location
<u>Vegetation communities</u>			
Grey Box – Forest Red Gum grassy woodland on flats	Critically endangered under the EPBC and TSC Act as Cumberland Plain Woodland and Shale-gravel Transition Forest	Present	High
Forest Red Gum – Rough-barked Apple grassy woodland	Endangered under the TSC Act as River Flat Eucalypt Forest	Present	High
Broad-leaved Ironbark – Grey Box – Melaleuca decora grassy open forest	Endangered under the TSC Act as Shale Gravel Transition Forest	Present	Nil
<u>Flora</u>			
<i>Pultenaea parviflora</i>	Vulnerable under the EPBC Act and Endangered under the TSC Act	Present	Nil
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>	Endangered population under the TSC Act	Present	Nil

Ecological value	Protected status	Occurrence	Likelihood of impact at the proposed activity location
<i>Pimelea spicata</i> (Spiked Rice-flower)	Endangered under the EPBC and TSC Acts	Present	High
<i>Dillwynia tenuifolia</i>	Vulnerable under the TSC Act	Present	Nil

Fauna

Grey-headed Flying-fox	Vulnerable under the EPBC and TSC Acts	Present	Low
Cumberland Plain Land Snail	Endangered under the TSC Act	Present	Moderate
Little Eagle	Vulnerable under the TSC Act	Present	Low
Little Lorikeet	Vulnerable under the TSC Act	Present	Low
Scarlet Robin	Vulnerable under the TSC Act	Present	Low
Varied Sittella	Vulnerable under the TSC Act	Present	Low
Black Bittern	Vulnerable under the TSC Act	Present	Low
Blue-billed Duck	Vulnerable under the TSC Act	Present	Low
Dusky Woodswallow	Vulnerable under the TSC Act	Present	Moderate
East Coast Freetail Bat	Vulnerable under the TSC Act	Present	Low
Eastern False Pipistrelle	Vulnerable under the TSC Act	Present	Low
Eastern Bentwing Bat	Vulnerable under the TSC Act	Present	Low
Large-footed Myotis	Vulnerable under the TSC Act	Probably recorded (anabat)	Low
Greater Broad-nosed Bat	Vulnerable under the TSC Act	Possibly recorded (anabat)	Low
Eastern Cave Bat	Vulnerable under the TSC Act	Possibly recorded (anabat)	Low
Yellow-bellied Sheath-tail Bat	Vulnerable under the TSC Act	Possible	Low
Swift Parrot	Critically endangered under the EPBC Act, Endangered under the TSC Act	Likely	Low
Powerful Owl	Vulnerable under the TSC Act	Likely	Low
Masked Owl	Vulnerable under the TSC Act	Likely	Low
Flame Robin	Vulnerable under the TSC Act	Likely	Low
Hooded Robin	Vulnerable under the TSC Act	Possible	Low
Diamond Firetail	Vulnerable under the TSC Act	Likely	Low

Ecological value	Protected status	Occurrence	Likelihood of impact at the proposed activity location
Speckled Warbler	Vulnerable under the TSC Act	Possible	Low
Black-chinned Honeyeater	Vulnerable under the TSC Act	Possible	Very low
Gang-gang Cockatoo	Vulnerable under the TSC Act	Possible	Very low
Glossy Black-cockatoo	Vulnerable under the TSC Act	Possible	Very low
Barking Owl	Vulnerable under the TSC Act	Possible	Low
Square-tailed Kite	Vulnerable under the TSC Act	Possible	Low
Australian Painted Snipe	Endangered under the EPBC and TSC Acts	Possible	Nil.
Australasian Bittern	Endangered under the EPBC and TSC Acts	Possible	Nil.
Freckled Duck	Vulnerable under the TSC Act	Possible	Nil.

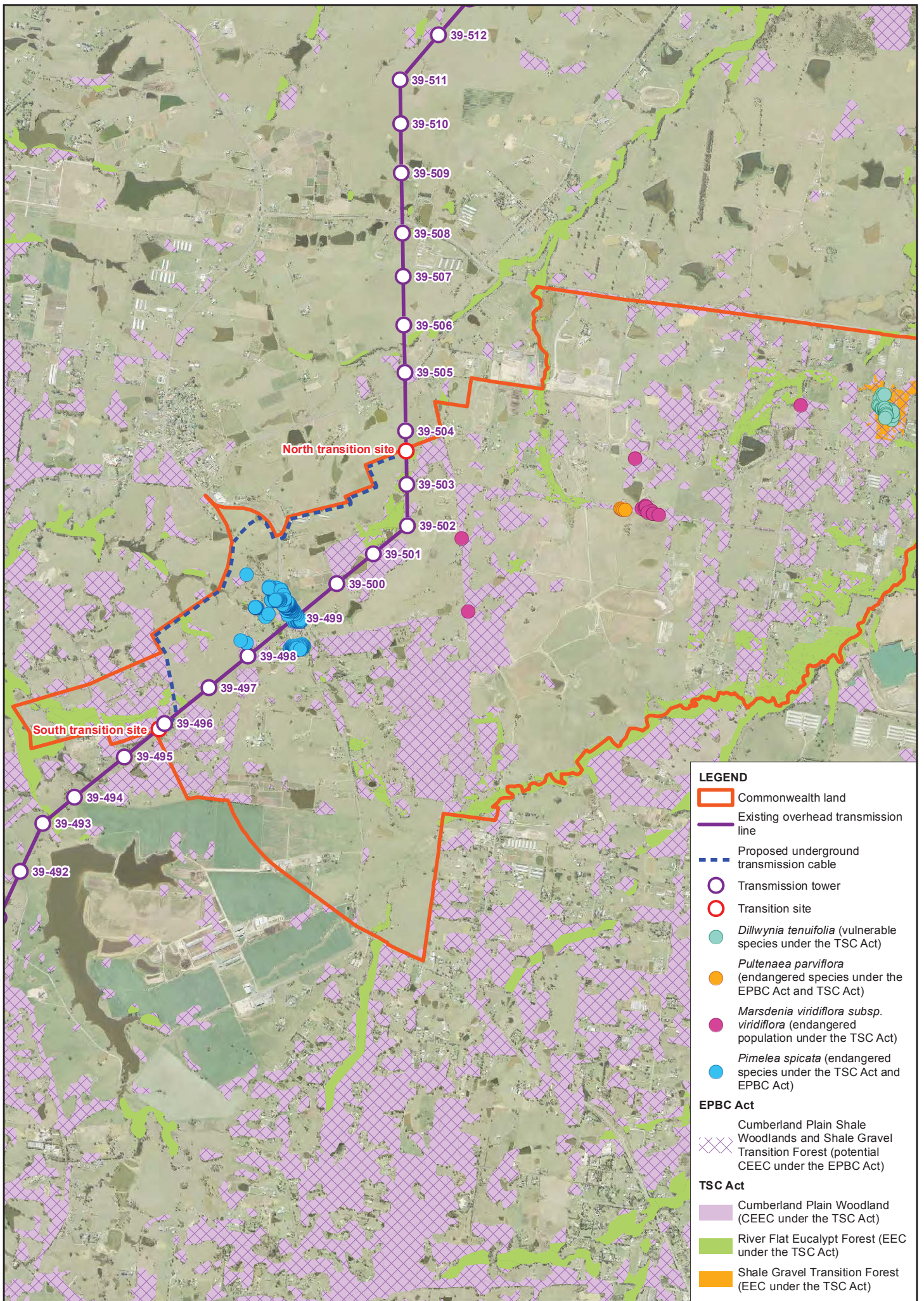
Aquatic ecology

A number of waterways in and around the site are classified as key fish habitat. The main waterways in the area are Duncans Creek, Oaky Creek and Cosgroves Creek. These main waterways are classified as moderately to minimally sensitive key fish habitat.

The site of the proposed activity does not intersect these main waterways but intersects a number of minor tributaries and farm dams. The tributaries are generally first or second order waterways and, along with associated or isolated farm dams, are not considered to be key fish habitat.

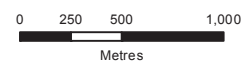
Noxious weeds

A number of weeds have been identified within the airport site including alligator weed, madeira vine, bridal creeper, lantana, African boxthorn, prickly pear, blackberry, salvinia and fireweed. It is considered that other environmental weeds have the potential to occur at the site of the proposed activity.



Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprjrc

Figure 5-1 Threatened flora and ecological communities



5.1.2 Impact assessment

Construction

Terrestrial ecology

The proposed activity would be confined to the indicative Stage 1 Construction Impact Zone for the Western Sydney Airport and would have impacts on biodiversity that were anticipated and assessed in the Western Sydney Airport EIS and the Stage 1 BAR. The impacts on biodiversity would be offset through the BODP. This section provides an overview of the identified ecological values and impacts of the proposed activity.

Site preparation and construction/demolition would involve clearing along the easement for the proposed underground cable and some additional clearing for access tracks and laydown areas. Some clearing may also be required for the potential establishment of construction benches needed as part of the demolition of the existing overhead Transmission Line 39 within the airport site. Typically, clearing for the establishment of a construction bench would be approximately 10 metres by 10 metres.

The proposed activity has the potential to directly impact River Flat Eucalypt Forest (Forest Red Gum – Rough-barked Apple grassy woodland) which is listed as endangered under the TSC Act and Cumberland Plain Woodland (Grey Box – Forest Red Gum grassy woodland) which is listed as critically endangered under the EPBC and TSC Acts. The estimated area of clearing for the proposed activity, based on vegetation mapping developed for the Western Sydney Airport EIS, is summarised in Table 5-2. No other threatened communities are located within the footprint of the proposed activity. The proposed activity would also result in the clearance of 9.74 hectares of cleared or exotic vegetation.

The proposed activity also has the potential to directly impact small patches or individuals of Spiked Rice-flower which is listed as endangered under the EPBC and TSC Acts. Based on site surveys (see Appendix B), approximately 75 individuals or small clumps of Spiked Rice-flower may be removed. Impacts on these individuals would be minimised where possible as outlined in Section 5.1.3.

Clearing as part of the proposed activity also has the potential to directly or indirectly affect protected fauna species through mortality or loss of habitat. These potential impacts are primarily related to clearing, which would also disturb ground cover and other habitat features such as hollow bearing trees.

The impacts of the proposed activity on the identified biodiversity values are not expected to be significant. A summary of the Assessments of Significance for the identified biodiversity values for the proposed activity are provided in Appendix C.

Aquatic ecology

The proposed activity is not expected to directly affect key fish habitat but has the potential to indirectly affect key fish habitats in Duncans Creek, Oaky Creek, Cosgroves Creek through erosion and sedimentation, mobilisation of contaminants or change to surface water flows. These potential impacts are minor and unlikely and would be mitigated with the implementation of the measures outlined in Section 5.6.3 and Section 5.7.3.

Operation

Operation of the proposed activity would have negligible impacts on ecological values.

Table 5-2: Estimated area of vegetation clearance for the proposed activity (ha)

Vegetation	Overhead transmission line	Underground cable	Access and laydown	Total
Good condition Grey Box – Forest Red Gum grassy woodland	0.01	0.12	—	0.13
Poor condition Grey Box – Forest Red Gum grassy woodland	1.98	1.39	1.11	4.48
Good condition Forest Red Gum – Rough-barked Apple grassy woodland	—	0.21	—	0.21
Poor condition Forest Red Gum – Rough-barked Apple grassy woodland	0.4	—	—	0.4
Cleared land and exotic vegetation	2.98	4.61	2.15	9.74

Clearing has been calculated on the following assumptions: 20 m corridor for underground power cable, 50 m corridor for overhead transmission line, 10 m corridor for access tracks.

5.1.3 Mitigation measures

The following mitigation measures would be implemented to minimise ecological impacts:

- > Disturbed sites shall be stabilised, and areas not required for operation shall be returned to as close to their original condition as soon as possible.
- > Where possible impacts to known locations of the Spiked Rice-flower are to be minimised to allow the completion of mitigation measures identified in the WSA EIS and required by the Airport Plan, including seed collection and flora propagation. The construction corridor is to be fenced off in the vicinity of locations containing the Spiked Rice-flower.
- > Weed control mitigation and management strategies shall be implemented. All herbicide use shall be in accordance with TransGrid requirements, and only TransGrid approved herbicides shall be used. Weed control strategies shall include:
 - Vehicle check procedures, including wash/brush down if required, to reduce the spread of weeds via vehicles and machinery.
 - Target areas of potential new outbreaks including soil stockpiles, roadsides and any other disturbed areas.
 - Cleaning of vehicle tyres, undersides and radiator grills before leaving a property (as appropriate), cleaning of footwear and minimising soil movement between locations.
 - Mitigation of noxious and problematic weeds and pests should they be found at the activity site.
 - Working from clean area towards weedy area to reduce the spread of weeds into areas that are currently weed free (as appropriate).
- > All hot works shall be undertaken in accordance with TransGrid's Hot Work Procedure.
- > No fires or burning of materials shall occur on site.

5.2 Aboriginal cultural heritage

5.2.1 Existing environment

A number of Aboriginal heritage sites are located in and around the site of the proposed works. These Aboriginal heritage sites are shown in Figure 5-2. Seven of these Aboriginal heritage sites are situated within about 250 metres of the proposed activity and are listed in Table 5-3.

In addition to the known sites, there is potential for previously unidentified Aboriginal heritage sites to occur, including subsurface artefacts. The site of the proposed activity intersects a number of mapped minor tributaries and potentially minor outcrops or ridges that would classify as high risk landscapes where there is considered to be an elevated potential for previously unidentified Aboriginal heritage sites to occur.

Table 5-3: Known Aboriginal cultural heritage sites

Site ID	Description	Distance
B32	Surface artefact occurrence	20 metres
B91	Surface artefact occurrence	205 metres
B113	Surface artefact occurrence	120 metres
B114	Surface artefact occurrence	25 metres
B116	Surface artefact occurrence	110 metres

Site ID	Description	Distance
B122	Surface artefact occurrence	75 metres
B134	Subsurface artefact occurrence	140 metres

^a Distances are calculated from the centreline of the proposed works and are approximate only.

5.2.2 Impact assessment

Construction

Site preparation and construction of the proposed activity would involve ground disturbance that has the potential to remove or harm Aboriginal cultural heritage values. The Aboriginal heritage sites with the potential to be removed or harmed are listed in Table 5-3 and shown in Figure 5-2. Of these, B32 and site B114 have the most potential to be affected due to their close proximity to the proposed activity. Where possible, impacts to these items would be avoided.

Site B32 would be about 20 metres from centreline of the existing overhead transmission line and within the nominal 50 metre corridor where the proposed activity would occur but would be separated from the existing overhead transmission towers and is expected to be avoided. Site B32 is also about 20 metres from the centreline of a proposed access track but would not be within the nominal 10 metre corridor where the proposed activity would occur and is also expected to be avoided.

Site B114 would be about 25 metres from the centreline of the existing overhead transmission line and toward the edge of the nominal 50 metre corridor where the proposed activity would occur but would be separated from the existing overhead transmission towers and is expected to be avoided. The other identified Aboriginal heritage sites are located away from the proposed activity and would not be affected. Site B32, Site B114, the other sites and the proposed activity are shown in Figure 5-2.

Site B32 and Site B114 would be demarcated and declared as no go zones prior to the start of the proposed activity to avoid impacts to these sites. Their exact location and extent of the sites would be determine as part of work for the initial survey and salvage programme plan.

In addition to the identified Aboriginal heritage sites, there is also potential for the proposed activity to encounter previously unidentified sites. The risk of this occurring is more pronounced in higher risk landscapes, including mapped minor watercourses as discussed in Section 5.2.1. The Department of Infrastructure and Regional Development will develop an initial Aboriginal survey and salvage program plan in relation to the carrying out of preparatory activities for the Western Sydney Airport development. This would involve the preparation and implementation of an Aboriginal survey and salvage program plan prior to construction works occurring relating to the construction and connection of the proposed underground cable. The survey and salvage program plan will be developed and implemented in consultation with Aboriginal stakeholders and other stakeholder groups. The site survey and salvage program would include areas affected by the proposed activity including access tracks, laydown area and easements for the overhead transmission line and underground cable.

Previously unidentified Aboriginal heritage sites would be identified and managed in accordance with the initial Aboriginal survey and salvage program plan, once developed or other measures, including an unexpected finds protocol. The workforce for the proposed activity would receive induction training regarding Aboriginal heritage sites and their management.

The positioning of stockpiles would consider any impacts to Aboriginal heritage and would avoid any impacts. The positioning of stockpiles would be considered through the development of an Erosion and Sediment Control Plan (ESCP) that will be prepared as part of construction environmental management plans, to be developed in accordance with the TransGrid Relocation Plan.

Mitigation of potential impacts to Aboriginal heritage sites is discussed further in section 5.2.3.

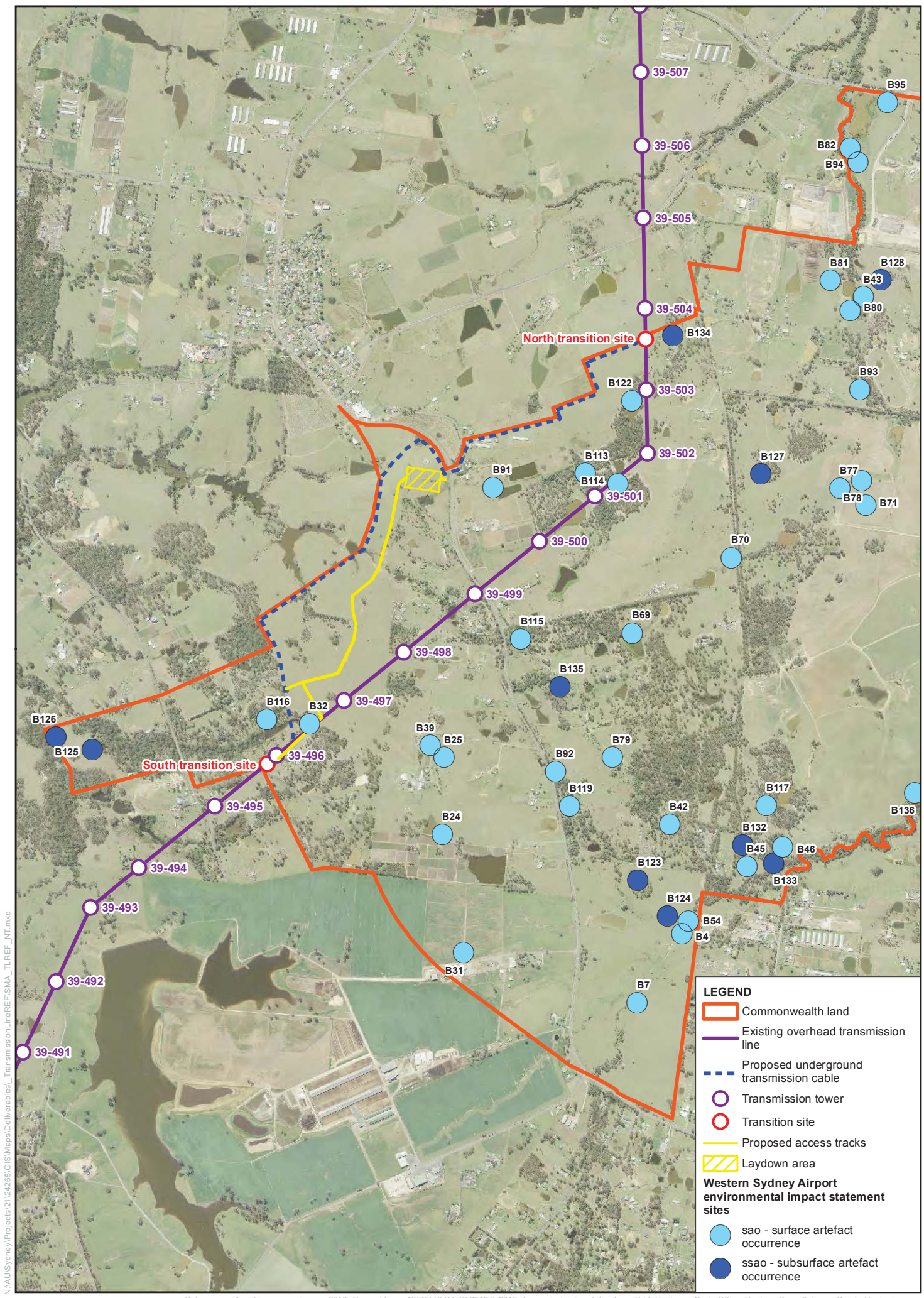
Operation

Operation of the proposed activity is not expected to have any additional impact on Aboriginal cultural heritage values. Indirect contextual impacts on Aboriginal heritage sites are not expected as the proposed underground cable would not be visible or otherwise noticeable.

5.2.3 Mitigation measures

The following mitigation measures would be implemented to minimise impacts on Aboriginal cultural heritage values:

- > Aboriginal heritage sites and high risk landscapes should be considered for inclusion when developing the initial survey and salvage program plan in relation to the carrying out of preparatory activities for the Stage 1 development. If identified sites based on targeted surveys cannot be avoided, these would be managed in accordance with the approved initial survey and salvage program plan and Aboriginal Cultural Heritage Construction Environmental Management Plan (CEMP).
- > The location of Aboriginal heritage sites B32 and B114 would be confirmed by an archaeologist on site prior to works commencing to determine an appropriate buffer and demarkation as a no go zone. The construction corridor is to be fenced off in the vicinity of known Aboriginal sites to ensure construction activities, vehicles and personnel do not impact on these sites. The location of these sites and an appropriate buffer is to be delineated in consultation with an appropriately qualified archaeologist as part of work for the development and approval of the initial survey and salvage program plan. If site impact is determined, after consultation, to be unavoidable, any mitigation will be in accordance with the approved initial survey and salvage programme plan, and once approved the Aboriginal Cultural Heritage Management Plan CEMP.
- > All TransGrid access tracks, work sites, stockpile sites and the powerline easement would be managed in accordance with the unexpected finds protocol. In the event that a site or artefact is identified during construction works (unexpected find), works would cease at the location, and the find reported in accordance with the protocol. No work would commence in the vicinity of the find until any procedures required under the protocol have been implemented.



Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprice

Figure 5-2 Aboriginal heritage



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5.3 Non-Aboriginal heritage

5.3.1 Existing environment

Built heritage

A number of non-Aboriginal heritage items are located in and around the site of the proposed works.

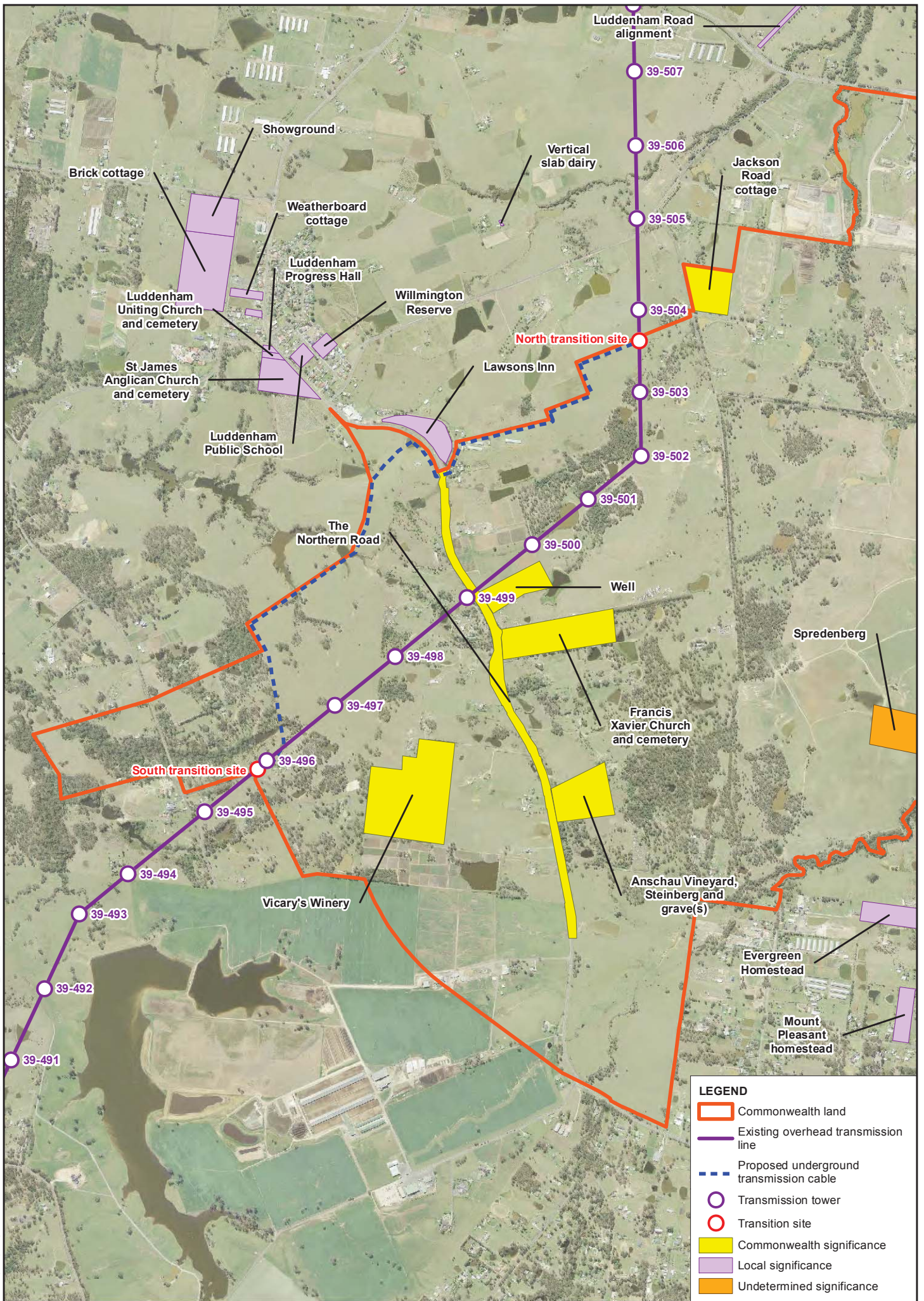
These non-Aboriginal heritage items are typically buildings, which may also have subsurface archaeological values. The non-Aboriginal heritage items in the general area of the proposed works are shown in Figure 5-3. Five of these non-Aboriginal heritage items are situated within about 250 metres and the proposed works and are listed in Table 5-4.

Table 5-4: Identified non-Aboriginal heritage items

Item	Significance	Distance
The Northern Road	Local	0 metres
Well	Local and Commonwealth	20 metres
Lawson's Inn	Local	25 metres
Jackson Road cottage	Local and Commonwealth	225 metres
St Francis Xavier Church and cemetery	Local and Commonwealth	230 metres

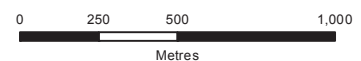
^a Distances are calculated from the centreline of the proposed works to the curtilage of the non-Aboriginal heritage item and are approximate only

Archival recording and the demolition of heritage items located within the airport site has commenced. As part of these works the well and Jackson Road cottage identified in Table 5-4 have been recorded and demolished. Based on this these two items are assumed to no longer be of heritage significance.



Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprice

Figure 5-3 Non-Aboriginal heritage



5.3.2 Impact assessment

Construction

Construction has the potential to directly or indirectly affect non-Aboriginal heritage items including The Northern Road, Lawson's Inn and St Francis Xavier church as discussed in Section 5.3.1.

The Northern Road would be directly affected by the proposed activity and it would be intersected by open trenching during construction. The scale of the impact would be very small as a proportion of the road alignment and the affected area would be restored after construction as outlined in Section 3.2. This section of The Northern Road would also be removed as part of the development of the airport once the diversion of this road occurs.

St Francis Xavier Church is situated in the vicinity of the existing overhead transmission line. Indirect impacts from vibration are considered to be very unlikely given the nature of proposed activities in the overhead transmission line corridor.

Lawson's Inn is situated in the vicinity of the proposed underground power cable. Indirect impacts from vibration are considered to be unlikely given the type of plant and equipment involved and the relatively shallow depth of planned excavation. Further assessment would be necessary if blasting is required.

There is also potential for previously unidentified non-Aboriginal heritage items to be encountered. This is considered to be probable however measures to prevent impacts to these items to the extent practicable in the unlikely event of a discovery are included in Section 5.3.3.

Operation

The proposed activity would not result in any impacts to non-Aboriginal heritage during operation.

5.3.3 Mitigation measures

The following mitigation measures would be implemented to minimise non-Aboriginal heritage impacts:

- > In the event that a site or artefact of potential non-Aboriginal significance is identified during construction works (unexpected find), works shall cease at the location. The find shall be immediately reported to TransGrid, and the unexpected finds protocol complied with.

5.4 Traffic and access

5.4.1 Existing environment

Key roads in and around the site of the proposed activity are The Northern Road and Elizabeth Drive. These roads and their annual average daily traffic are summarised in Table 5-5.

The performance of these roads and the broader road network in and around the airport site was assessed in the Western Sydney Airport EIS. The assessment indicated the existing road network was relatively unconstrained, however the model predicted some areas of congestion in the broader road network including the M4, M5 and M7 motorways and Narellan Road.

Table 5-5: Annual average daily traffic for identified key roads

Location	Annual average daily traffic (vehicles per day)
The Northern Road north of Bringelly Road	16,944
The Northern Road north of Elizabeth Drive	16,654
Elizabeth Drive east of The Northern Road	7,311

5.4.2 Impact assessment

Construction

The main potential impacts of the proposed activity are open trenching of The Northern Road and generation of traffic on The Northern Road and other external roads during construction.

Open trenching across The Northern Road would require temporary and partial road closure with the potential to disrupt traffic. The trenching would be staged to retain one traffic lane at a given time and maintain regional connectivity. It also is expected that these works would be undertaken at night to minimise traffic impacts, subject to Road and Maritime Services requirements.

The period over which the works would impact on The Northern Road is considered to be short-term and with the management of traffic in line with Roads and Maritime Services requirements, impacts are considered to be manageable. At no stage would full closure of The Northern Road be required.

Access tracks and laydown areas to support the construction and demolition at the proposed activity location would be contained to the airport site and utilise existing fire trails in some areas (see Figure 3-1). The use of these access tracks and laydown areas would reduce impacts to public roads.

Additional road traffic noise is expected to be negligible in the context of existing road traffic noise given the relatively low volume of construction trips that would be required. However, transport of cable drums or other large plant and equipment may comprise an oversize load that may temporarily disrupt traffic along access routes. There is potential that any oversized loads would be transported outside standard construction hours to minimise traffic impacts.

Detailed planning regarding the timing and nature of the works including the transport of heavy loads would be carried out in consultation with the relevant local councils, NSW Roads and Maritime Services and NSW Police as necessary. The results of consultation would inform mitigation measures outlined in Section 5.4.3.

Operation

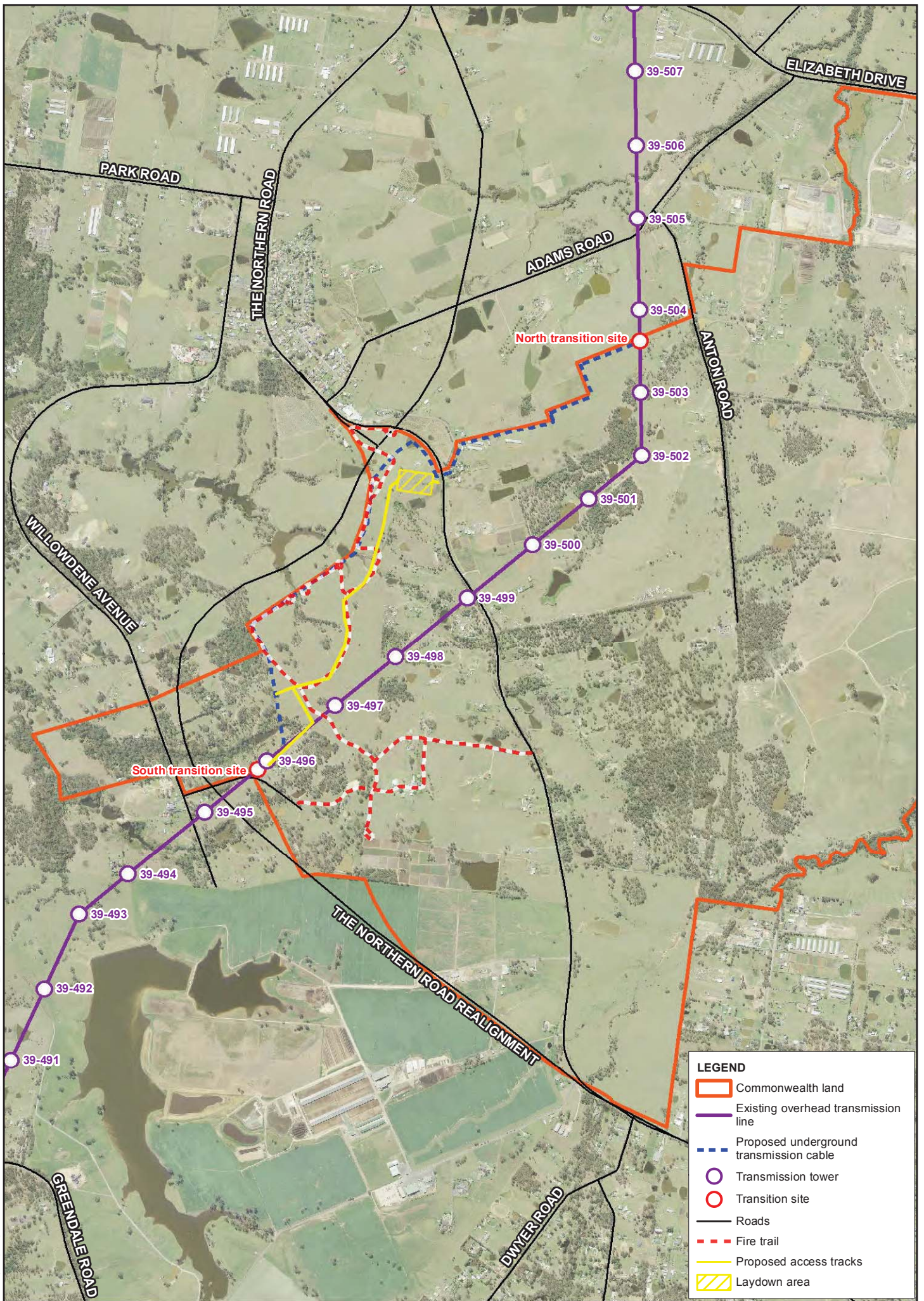
Potential impacts during operation of the proposed underground cable would be limited to those associated with the mobilisation of plant and equipment for maintenance activities. These activities would be minor, infrequent and temporary. The Northern Road is planned for realignment from its current alignment through the airport site to near the southwest of the airport site. The realignment would be outside the proposed underground cable corridor and would not be affected by maintenance activities.

Access along the underground cable corridor would be provided via a new access track which would be located within the easement between the two cable trenches. The use of this access would ensure that maintenance activities would not impact Western Sydney Airport or adjacent land uses.

5.4.3 Mitigation measures

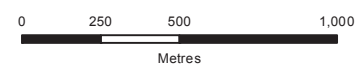
The following mitigation measures would be implemented to minimise traffic and access impacts:

- > Transportation and equipment delivery shall be in accordance with Roads and Maritime Services and Council requirements.
- > New access tracks required for the completion of the works shall be constructed in accordance with the approved plan of work that shall comply with the Soils and Construction Volume 2C Unsealed Roads (DECC, 2008).
- > Traffic, transportation and access mitigation and management strategies shall be documented and implemented in accordance with the construction environmental management plans developed in accordance with the TransGrid Relocation Plan and updated as required. This shall include:
 - The management of the delivery of equipment and materials.
 - Access to and from the site including nominated roads and site access tracks.
 - Parking.
 - Speed limits.



Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprice

Figure 5-4 Roads and access tracks



5.5 Land use

5.5.1 Existing environment

The site of the proposed activity is mainly characterised by rural properties including agricultural activities and scattered residences with occasional farm dams and patches of native vegetation. The site of the proposed activity also includes a portion of The Northern Road.

The site of the proposed activity is currently zoned for Commonwealth special activities under the *Liverpool Local Environmental Plan 2008* with a small part to the west zoned for primary production. Future land use is outlined in the land use plan contained within the Airport Plan. The site of the proposed activity is zoned for business development, aviation logistics and aviation activities in the land use plan.

Land use in the future is expected to transition from existing uses to the operation of Western Sydney Airport, which is expected to commence operation in the mid-2020s. Land use in the broader region is also expected to urbanise in accordance with strategic planning initiatives such as the Western Sydney Priority Growth Area.

5.5.2 Impact assessment

Construction would have negligible impacts on land use given the site would be vacated prior to commencement and the proposed activity would not interfere with construction of Western Sydney Airport.

Construction of the underground cable would cross The Northern Road and has potential to temporarily disrupt local access and regional connectivity. Potential impacts and mitigation measures with regard to the Northern Road are discussed further in Section 5.4.

Demolition of the existing overhead transmission line would essentially involve a return of the existing land use to open space in advance of the development of Western Sydney Airport.

Operation of the proposed activity would have negligible impacts on land use. The cable would be buried at the perimeter of the airport site and as such would not interfere with the operation of the airport.

The presence of the underground cable would preclude excavation or other development within the easement area, however development would otherwise be constrained by airport operations.

5.5.3 Mitigation measures

No measures are considered necessary to mitigate land use impacts.

5.6 Geology and soils

5.6.1 Existing environment

The site of the proposed activity occurs at elevations between about 70 and 110 metres above sea level.

The main geological formation at the site of the proposed activity is the Bringelly Shale geological unit composed of claystone and siltstone and some sandstone. The site of the proposed activity also crosses the Luddenham Dyke, a linear mass of basalt, analcite, augit, feldspar and magnetite associated with a gentle ridge running southeast to northwest at about 100 to 110 metres above sea level.

The site is covered by overlying weathered material and kurosol type soils of the Luddenham and Blacktown soil landscapes. The soils have low to moderate fertility with generally slight to moderate erosion potential.

Acid sulphate soils are not expected to be encountered as the site is not estuarine or coastal and is between about 70 and 110 metres above sea level.

Contamination investigations observed evidence of potential contamination including chemical containers, spill stains, dumped rubbish, demolition stockpiles and fill material. Potential contaminants associated with these observations include fuels, lubricants, solvents, acids, herbicides, pesticides and other chemicals. Known contamination (including asbestos) is mapped in Figure 5-5.

A review of mapping held by the NSW Department of Trade and Investment indicated that the Western Sydney Airport site is not located within an area of potential to contain naturally occurring asbestos within the underlying geology.

5.6.2 Impact assessment

Construction

Site preparation and construction (including demolition of the existing transmission line) would involve the following activities which would involve the disturbance, excavation and stockpiling of soil:

- > clearing of vegetation
- > trenching activities
- > establishment of construction benches for the decommissioning of the existing line
- > excavation associated with access tracks
- > filling of existing dams on site.

About 12,000 cubic metres of soil is expected to be excavated as part of the proposed activity. If not properly managed, the above activities have the potential to cause erosion and sedimentation. Measures to manage erosion and sedimentation are outlined in Section 5.6.3.

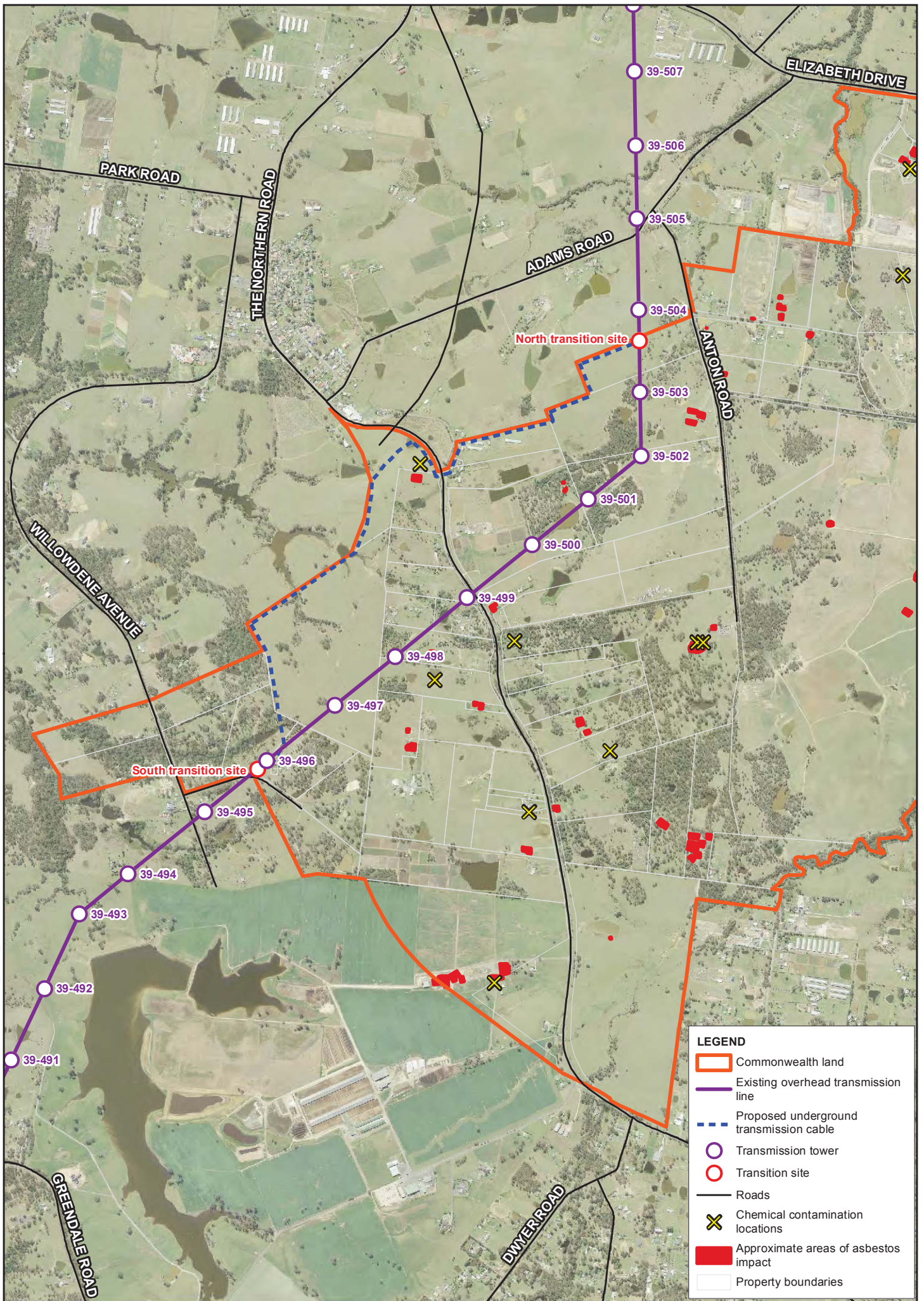
Areas of known contamination (including asbestos) are present within about 100 metres of the site of the proposed activity (see Figure 5-5). While these areas of known contamination are not within the site of the proposed activity, there is nonetheless potential for contamination to be encountered.

Site preparation and construction/demolition activities would have the potential to encounter contamination. Disturbance or excavation of contaminated areas has the potential to mobilise contaminants causing harm to human health or the environment. Improper handling and disposal of contaminated spoil also has the potential to result in harm to the environment. The scale of potential impact would be proportionate to the contamination encountered however with the implementation of standard mitigation measures it is expected that potential impacts would be minimal. Measures to manage contamination are outlined in Section 5.6.3.

Site preparation and construction/demolition activities would involve the use of fuels and other chemicals that have the potential to contaminate land in the event of a leak or spill. Substantial leaks or spills that would contaminate land are unlikely to occur and would be avoided through the implementation of measures discussed in Section 5.6.3.

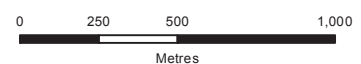
Operation

Operation of the proposed underground cable would have negligible impacts in terms of geology and soils. Leaks or spills during maintenance would be avoided through the measures outlined in Section 5.6.3.



Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprice

Figure 5-5 Indicative location of contamination



5.6.3 Mitigation measures

The following mitigation measures would be implemented to minimise geology and soil impacts:

- > An Erosion and Sediment Control Plan (ESCP) shall be prepared as part of construction environmental management plans to be developed in accordance with the TransGrid Relocation Plan. All erosion and sediment control measures shall be designed, implemented and maintained in accordance with relevant sections of “Managing Urban Stormwater: Soil and Construction Volume 1” (Landcom, 2004) (“the Blue Book”) (particularly Section 2.2) and “Managing Urban Stormwater: Soil and Construction Volume 2A – Installation of Services” (DECC, 2008)”. The ESCP shall apply to stockpiles, site boundaries, access tracks and laydown areas. Exposed surfaces shall be kept to a minimum to limit the potential for erosion.
- > Cleared vegetation would be mulched for use in erosion control at construction sites.
- > Soil stockpiles would be covered and stabilised with vegetation or mulch. Topsoil would be stockpiled at a maximum height of two metres, where practicable.
- > Any material or soil suspected of contamination shall be sampled and analysed by a NATA registered laboratory and managed in accordance with the *Waste Classification Guidelines* (EPA, 2014), the *Guidelines on the Duty to Report Contamination* (EPA, 2015) and the *Contaminated Land Management Act 1997*.
- > Providing excess spoil is free of contamination, it may be stockpiled within the airport site for future use as part of earthworks required for the Stage 1 development. The positioning of this material is to be confirmed with Department of Infrastructure and Regional Development. Stockpiles shall be stabilised in manner as to prevent erosion in line with the Erosion and Sediment Control Plan.
- > Construction plant and vehicles shall be cleaned of any mud or soils prior to access onto public roads. Vehicles and equipment shall be confined to existing roads and defined site access tracks.
- > Any imported fill shall be certified at source location (e.g. Quarrymaster or property owner) as pathogen and weed free Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM) in accordance with the NSW *Protection of the Environment Operations Act 1997* (POEO Act) and the *Protection of the Environment (Waste) Regulation 2014* (POEO Waste Regulation).
- > Environmental spill kits containing spill response materials suitable for the works being undertaken shall be kept on site at all times and be used in the event of a spill.
- > All chemicals or other hazardous substances shall be stored in bunded and weatherproof facilities away from drainage lines. The capacity of the bunded area shall be at least 130% of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s shall be shown on the Site Plans.

5.7 Hydrology and water quality

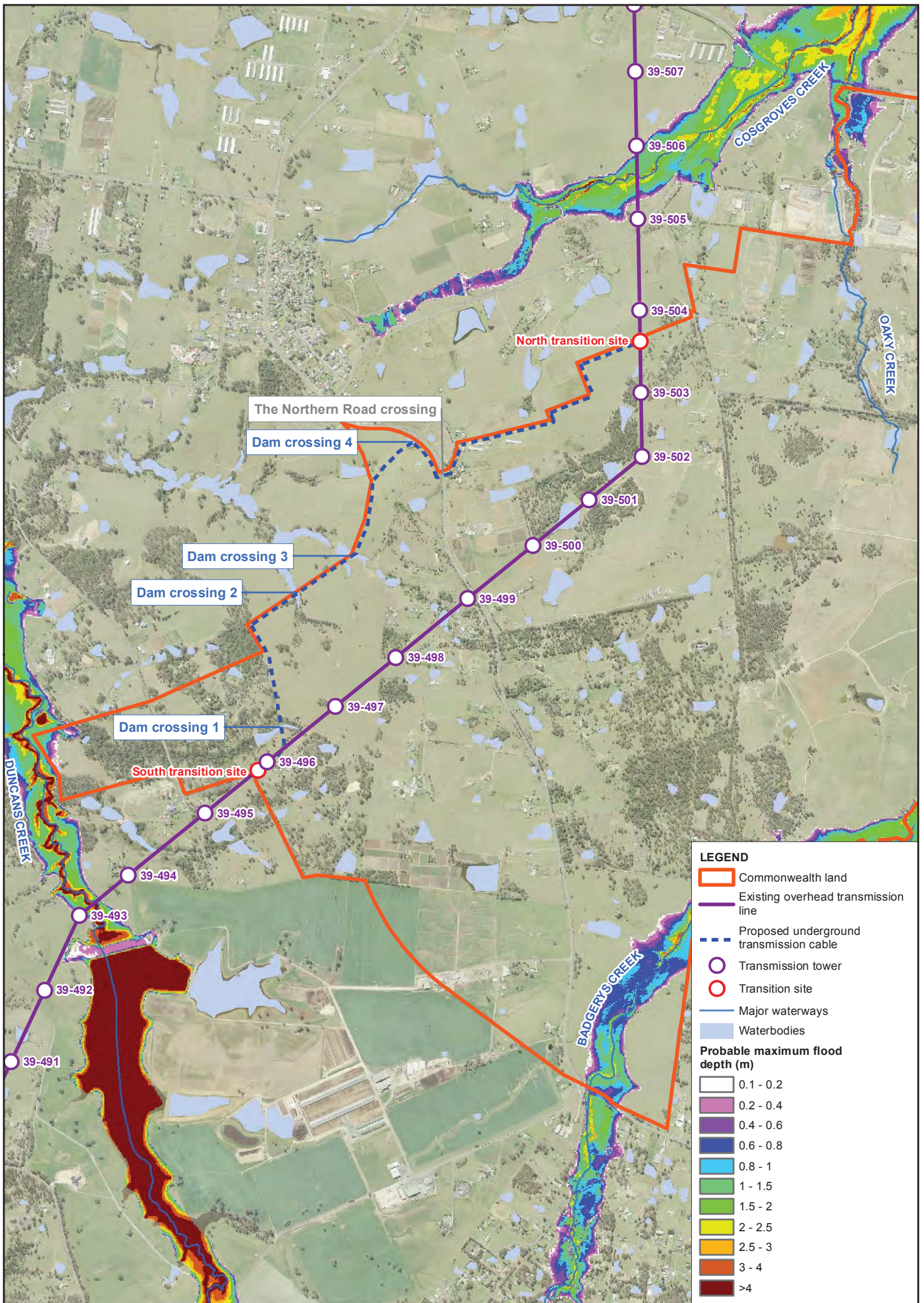
5.7.1 Existing environment

The site of the proposed activity is located within the catchments of Duncans Creek and Cosgroves Creek (including Oaky Creek). The proposed activity location does not intersect the main waterways but crosses a number of minor tributaries and farm dams. Flood modelling of the catchments indicated the proposed activity is not in the floodplains of the main waterways, however there is potential for localised flooding. Minor tributaries and flood extents in and around the proposed activity location are shown in Figure 5-6.

Surface water quality in and around the site of the proposed activity is generally fairly poor especially in terms of nutrients that are well above the relevant standards. The site of the proposed activity is not within a drinking water catchment managed by WaterNSW.

Groundwater in weathered material overlying the Bringelly Shale at the site of the proposed activity may be encountered at depths below around 2.4 metres while shallower groundwater may be present in association with alluvial areas. Larger confined aquifers are located at depths of around 3 to 12 metres.

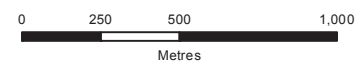
Groundwater quality is fairly degraded with limited beneficial reuse potential. Groundwater quality data shows elevated lead, zinc, copper, nitrogen, phosphorous, nitrate and sulphate in various locations.



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Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprice

Figure 5-6 Mapped waterways and flooding



5.7.2 Impact assessment

Construction

Site preparation and construction/demolition would involve clearing, trenching, and filling or bridging of dams would involve disturbance and excavation at minor drainage lines and farm dams. The main potential impact to surface water features is sedimentation. Measures to manage sedimentation are outlined in Section 5.6.3.

Site preparation and construction/demolition would involve the use of fuels and other chemicals that have the potential to contaminate water in the event of a leak or spill. Substantial leaks or spills having the potential to contaminate surface water or groundwater are unlikely to occur and would be avoided through implementation of measures outlined in Section 5.6.3.

The proposed activity has the potential to alter the local hydrology of the site through minor alteration of the topography of drainage lines and filling or bridging of dams. Any such changes would be very minor and temporary and the topography of drainage lines would be remediated and restored to the natural surface level. Potential impacts of filling or bridging of dams would be managed as outlined in Section 5.6.3.

Trenching for the proposed underground transmission cable would be to a depth of about one to two metres and as such groundwater is not generally expected to be encountered. Groundwater may be encountered in restricted areas such as drainage lines but the volume of water encountered is expected to be limited.

Operation

Operation of the proposed underground cable would have negligible impacts in terms of surface water hydrology and water quality. Leaks or spills during maintenance would be avoided as outlined in Section 5.6.3.

Groundwater is not expected to occur and the underground cable route would be designed to any prevent any ingress. As such, groundwater related impacts are not expected to occur during operation.

5.7.3 Mitigation measures

The following mitigation measures (in conjunction with those outlines in Section 5.6.3) would be implemented to minimise hydrology and water quality impacts:

- > Spoil shall be stockpiled in a manner so as to avoid the possibility of sediments entering waterways (including stormwater drains) or migrating off-site.
- > Any bulk fuel/herbicide or hazardous material transport vehicles shall be parked on level ground a minimum of 40 metres away from waterways (including drainage and irrigation channels). No refuelling or bulk herbicide preparation shall occur within 40 metres of a waterway or open site drains.
- > Any spills of oil, fuel and other liquids shall be contained, cleaned up promptly and immediately reported to the TransGrid site representative.
- > Dam bridges would be designed to maintain downstream flows.
- > Release of water associated with drainage of dams or dewatering would be performed in a controlled manner that prevents erosion, sedimentation or scouring of receiving waterways. The water would be treated to an appropriate quality prior to release with consideration to the receiving waterway and its classification under the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines and local standards under the *Airports (Environment Protection) Regulations 1997* if applicable.

Draining and filling of dams would also be carried out in accordance with the Erosion and Sediment Control Plan discussed in Section 5.6.3.

5.8 Noise and vibration

5.8.1 Existing environment

Ambient noise in and around the site of the proposed activity is low and characteristic of the existing rural nature of the area. The main existing sources of noise are road traffic, particularly The Northern Road, and some commercial activities surrounding properties.

Nearby noise sensitive receivers include the town of Luddenham about one kilometre to the northwest of the proposed activity along with scattered rural residential receivers, including one mapped on Eaton Road in the order of 60 metres from the proposed activity. These noise sensitive receivers are shown in Figure 5-7.

Residences outside of the airport site, such as those in and around Luddenham, may be sensitive to noise and vibration.

Current background vibration is negligible given the absence of industrial activities in and around the site.

5.8.2 Impact assessment

Construction

The proposed activity would involve the use of construction plant and equipment discussed in Section 3.3.2. Mobilisation of heavy and light construction vehicles would also generate additional road traffic noise on the external road network and in relation to proposed access tracks to and from the site.

Construction activity has a low potential to generate noise noticeable at nearby noise sensitive receivers (see Figure 5-7) due to the limited number of receivers located in close proximity to the proposed activity. Construction would also occur progressively along the alignments of the existing overhead transmission line and proposed underground cable and therefore noise impacts at nearby sensitive receivers is expected to be short-term as each section of the cable is installed. The majority of the works would be undertaken during daytime hours and therefore impacts on any nearby receivers would be minimal. Mitigation measures would also be implemented to minimise and potential noise impacts.

The proposed activity would include the trenching of the crossing of The Northern Road out of hours due to the requirements to minimise impacts on traffic along The Northern Road. The nearest noise sensitive receiver to the crossing of the Northern Road is about 250 metres away. The occupants of this dwelling and any other nearby residences would be consulted regarding the need for mitigation once the timing of any night works are determined.

Construction is considered unlikely to generate significant vibration given the type of plant and equipment involved and the relatively shallow depth of planned excavation. As such, vibration noticeable at adjacent properties and residences is considered to be unlikely. Blasting is assumed to not be required.

Additional road traffic noise is expected to be negligible in the context of background road traffic noise given the relatively low volume of vehicles (approximately 20 to 30 vehicles movements per day) that would be required for the proposed activity compared to the existing daily traffic volumes on roads surrounding the airport site. The transport of high mass plant and equipment (e.g. large cranes or cable drum) may be required to be transported at night for road safety reasons (subject to consultation with Roads and Maritime Services, Liverpool Council and NSW Police), which may temporarily generate elevated noise at residential properties along the transport route (once the final routes are confirmed with consultation with relevant stakeholders). Elevated noise levels generated from the delivery of high mass materials and equipment are expected to be short-term (i.e. time for vehicles to drive past) and infrequent and would cease at the completion of construction.

Operation

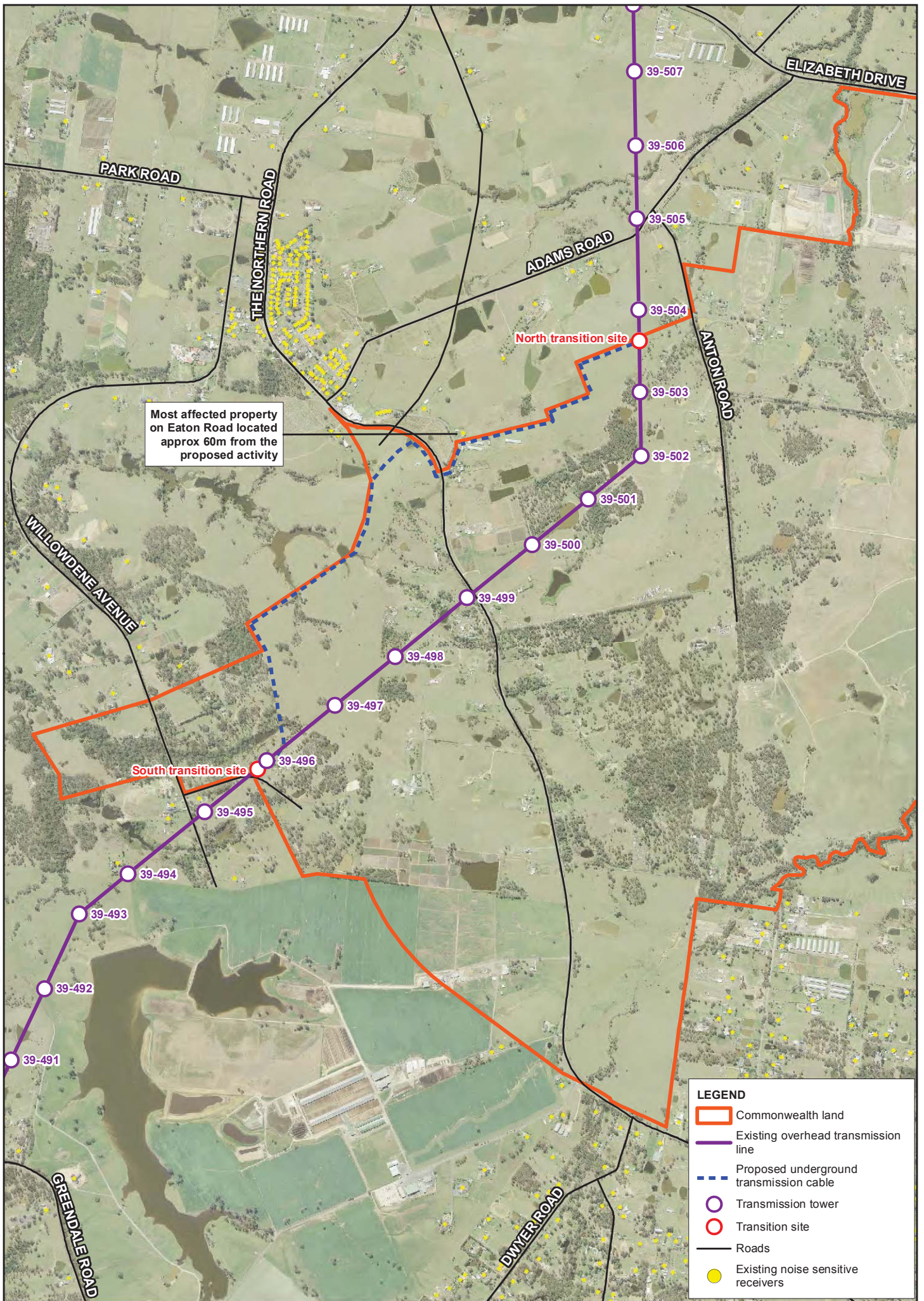
Operation of the proposed underground cable would not generate noise. Maintenance activities would have the potential to generate noise impacts. These activities would be minor, infrequent and temporary.

Overall, potential noise impacts would be limited and would be mitigated with the implementation of the measures outlined in Section 5.8.3.

5.8.3 Mitigation measures

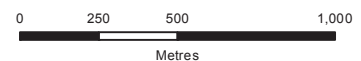
The following mitigation measures would be implemented to minimise noise and vibration impacts:

- > Noise generating works shall be in accordance with the *Interim Construction Noise Guideline* (DECC, 2009):
 - 7:00am – 6:00pm Monday to Friday.
 - 8:00am – 1:00pm Saturdays.
 - No work on Sundays or Public Holidays.
- > Work outside normal hours, on Sundays and public holidays, shall only comprise:
 - The delivery of materials outside normal hours requested by police or other authorities for safety reasons.
 - Emergency work to avoid the loss of lives and/or property.
 - Work timed to correlate with system planning outages.
 - Works at The Northern Road to minimise traffic impacts and to comply with any Roads and Maritime Services requirements.
- > Other noise generating works outside of the standard construction hours shall require the formal written consent of Department of Infrastructure and Regional Development and require justification in accordance with the *Interim Construction Noise Guideline* (DECC, 2009).
- > Neighbouring properties to the north of the airport site shall be notified as to the timing and duration of the construction works and at least 7 days prior to commencing work.



Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprice

Figure 5-7 Noise sensitive receiver locations



5.9 Air quality and climate change

5.9.1 Existing environment

Air quality within the region of the proposed activity is typical of a rural landscape with limited pollution sources. Air quality monitoring data collected between 2005 and 2014 from the NSW Office of Environment and Heritage (OEH) monitoring stations in Bringelly, Macarthur/Campbelltown West, Liverpool and Richmond were used to describe the local air quality.

Generally, air quality for the local area is good, with the exception of isolated high pollution days or extreme events such as dust storms and bushfires. Uncontrolled combustion events such as bushfires will influence regional observations of particulate matter (PM₁₀ and PM_{2.5}) and to a lesser extent, nitrogen oxides.

The highest concentration of sensitive receivers are located around the southeast of Luddenham while there are also some isolated residences located on rural properties, including one mapped on Eaton Road in the order of 60 metres from the proposed activity. These places are shown in Figure 5-7.

5.9.2 Impact assessment

Construction

The proposed activity has the potential to impact on air quality during construction from excavation, vegetation clearance, construction vehicles driving over exposed soils and wind blowing over stockpiles and exposed surfaces. The operation of construction plant and equipment would also result in additional exhaust emissions in the area.

Impacts due to the generation of dust and exhaust emissions from construction sites would be low and temporary as the works would only impact on a particular section of the cable route for a short period of time prior to moving to the next section. Although the position of any soil stockpiles is to be determined with the Department of Infrastructure and Regional Development, dust emissions from the stockpiles are expected to be minimised with the implementation of standard mitigation measures. The proposed mitigation measures are discussed in Section 5.9.3.

Construction would generate negligible greenhouse gas emissions and have negligible climate change impact.

Operation

The proposed activity would not result in any air quality impacts during operation.

Operation of the proposed activity would provide for the continuation of the transmission of electricity between Sydney West and Bannaby electrical substations. As such, the proposed activity does not represent a change to the existing conditions of energy use and would not contribute appreciably to climate change.

5.9.3 Mitigation measures

Construction

The following mitigation measures would be implemented to minimise air quality and climate change impacts:

- > If necessary, dust suppression techniques shall be implemented and incorporated into the ESCP as per the techniques outlined in the “Blue Book”, such as water spraying of surfaces and covering stockpiles.
- > All surplus soils and materials from excavations, which cannot be reused on site, shall be removed from site by covered trucks.
- > Vehicles and equipment shall be maintained in accordance with the manufacturer’s specifications.
- > Residual raw materials shall be returned to the supplier, resold or reused at another site at the end of the project or recycled.
- > Materials shall be sourced from local suppliers, where feasible, to reduce the distance that materials need to be transported to the site.

- > Air quality mitigation and management strategies shall be documented and implemented in accordance with the CEMP. This shall include:
 - Reducing vehicle speeds when in the vicinity of residences to minimise the generation of nuisance dust.
 - Progressively revegetating or otherwise rehabilitating disturbed areas as works are completed.

Operation

No specific air quality and climate change mitigation measures are proposed during operation.

5.10 Visual amenity

5.10.1 Existing environment

The site of the proposed activity and surrounds are characterised by a gently undulating landform within a highly modified landscape. The site of the proposed activity is mainly characterised by rural properties including agricultural activities and scattered residences with occasional farm dams and patches of native vegetation. The overall landscape character is open and rural with expansive views possible from surrounding hill tops and higher elevations to the west.

A number of residences are outside the airport site but in the vicinity of the proposed activity. These places are shown in Figure 5-7.

5.10.2 Impact assessment

Construction

Construction of the proposed activity has the potential to generate minor visual impacts at visual receivers including the occupants of residents and commuters on surrounding roads. The visual impacts would be characterised by earthworks, storage of plant and equipment and soil stockpiling. Given the relatively sparse distribution of receivers in the surrounding area, the potential for visual impacts is considered to be limited. Visual impacts would be temporary and transient as construction activities progress and disturbed areas are rehabilitated.

Operation

The proposed activity is unlikely to result in long-term adverse visual impacts.

The proposed activity would result in the construction of two new overhead/ underground towers and removal of eight others and their related conductors. The transition sites would introduce an additional type of electricity asset that would be visible to the community, noting there are very few visual receivers in the vicinity currently (see Figure 5-7). The underground cable would not result in any visual impact once buried.

In the medium to longer term, the site would be developed into an operating airport which would introduce a pronounced visual change into the region. This change would be accompanied by ongoing urban development as well as construction of other transport infrastructure in the region. The construction of this limited new infrastructure would be readily absorbed into other macro changes in visual amenity.

5.10.3 Mitigation measures

Construction

The following mitigation measures would be implemented to minimise visual impacts:

- > All construction plant, equipment, waste and excess materials shall be contained within the designated boundaries of the work site and the construction laydown area and shall be removed from the site following the completion of construction.

Operation

No specific visual amenity mitigation measures are proposed during operation.

5.11 Waste

5.11.1 Impact assessment

Construction

The proposed activity has the potential to generate the following wastes:

- > Waste from vegetation clearing activities.
- > General construction waste such as excess concrete, timber, paper, plastic and metal.
- > Redundant conductors, lattice tower structures, steel and concrete foundations, overhead earth wire, fittings and other infrastructure from the existing transmission line. Redundant infrastructure would be reused where feasible and applicable.
- > Domestic waste including food scraps, aluminium cans, glass bottles, plastic and paper containers, and putrescible waste generated by construction personnel.
- > Wastewater generated from mobile toilet facilities located at the equipment laydown area.

Approximately 12,000 cubic metres of soil is expected to be excavated for the proposed underground transmission cable. Trenches and pits for the new transmission line would need to be backfilled with thermal stabilised backfill to enhance the heat dissipation from the cables to achieve operational requirements, resulting in surplus spoil. Surplus spoil, providing it is suitable, would be stockpiled for reuse such as filling of farm dams and other future activities as part of the construction of Western Sydney Airport. Any spoil which is surplus to this or not suitable for reuse on site would be removed and disposed of at an appropriately licenced facility.

Waste would be removed as soon as reasonably practical to ensure that works areas are maintained in a tidy and litter free condition. All waste would be transported and disposed of in accordance with the *Waste Classification Guidelines* (EPA, 2014) and the *Protection of the Environment Operations Act 1997*. At the completion of works, a check would be made to ensure that all waste has been removed.

Operation

The proposed activity would potentially result in minimal waste during maintenance activities. During these periods, all waste would be removed at the completion of any works.

5.11.2 Mitigation measures

The following mitigation measures would be implemented to minimise waste impacts:

- > Waste mitigation and management strategies shall be documented and implemented in accordance with the construction environmental management plans which would be developed in accordance with the TransGrid Relocation Plan, TransGrid Waste Procedures and associated Work Instructions. This shall include:
 - Waste management facilities on-site including their set-up, use, management removal and waste tracking documentation.
 - Waste hierarchy application including information demonstrating the reduction of the amount of waste produced and the maximised reuse and recycling opportunities utilised.
 - Appropriate waste management across all possible waste items produced.
- > Soil to be reused onsite would be tested for contamination in accordance with the *Waste Classification Guidelines* (EPA, 2014).
- > All waste, including surplus and contaminated soils, which cannot be reused shall be classified in accordance with the *Waste Classification Guidelines* (EPA, 2014), removed from the site and disposed of

at a facility that can lawfully accept the waste in accordance with the POEO Act and POEO Waste Regulation.

- > Concrete trucks shall be permitted to flick wet wipe their discharge chutes with the effluent discharged into prepared bored holes, prepared excavations/formwork or a watertight receptacle for disposal (to be shown on the ESCP). No concrete washout is permitted. All surplus concrete shall be returned to the concrete suppliers for recycling and not be discharged on site.

5.12 Electric and magnetic fields

5.12.1 Existing environment

Electric and magnetic fields (EMF) are part of the natural environment and electric fields are present in the atmosphere and static magnetic fields are created by the earth's core. EMF is also produced wherever electricity or electrical equipment is in use. Transmission lines, electrical wiring, household appliances and electrical equipment all produce power frequency EMF.

An electric field is the force that fills the space around every electric charge, including any powered electrical appliance or conductor (e.g. a transmission line). Electric fields are measured in volts per metre (V/m) or kilovolts per metre (kV/m). They occur both naturally and as a result of power generation, and are produced every time voltage runs through a wire. The higher the voltage, the stronger the electric field. Electric fields are strongest closest to the wires and their level reduces quickly with distance. Most materials act as a shield or barrier to electric fields.

Magnetic fields are produced by the flow of an electric current through a wire and are measured in milligauss (mG). The higher the current, the greater the magnetic field. Like electric fields, magnetic fields are highest closest to the wire and their level reduces quickly with distance. Most materials would not act as a shield or barrier to magnetic fields. Together, the electric and magnetic fields are referred to as EMF.

All types of electrical equipment, including transmission lines, produce EMF. For a transmission line, the strength of the electric field generally varies with the operating voltage of the line (measured in volts), while the magnetic field strength is related to the current flowing in the line (measured in amps). The current flowing in the line is dependent upon the load or power flow, and would vary with consumer demand (which varies on a daily and seasonal basis). The strength of EMF fields at ground level below the existing overhead transmission line through the airport site, are also dependent on the height of the wires above the ground and their configuration on the transmission structures. Underground electricity cables also emit EMF which can penetrate through the ground into the external environment, however typically they are at much lower levels than overhead lines.

5.12.2 Impact assessment

Construction

Construction would not generate EMF and would therefore not require management. The existing overhead transmission line would not be electrified during demolition and hence EMF risks would be negligible.

Operation

The scientific literature on EMF exposure is extensive, complex and inconclusive. In addressing the question of adverse health effects, TransGrid relies on expert advice from health authorities in Australia and from around the world. This includes the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), which is the Federal Government agency responsible for providing health assessments and recommendations to the Government on matters relating to EMF.

ARPANSA has adopted the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for limiting exposure to EMF (2010). The ICNIRP Guidelines express limits in terms of 'Reference Levels' and 'Basic Restrictions' under general public and occupational exposure conditions.

The Basic Restriction values are expressed as the internal electric fields which can be induced in the body without adverse health outcomes. As the Basic Restriction values apply within body tissue, it is difficult and impractical to measure them. For that reason, Reference Levels, which are simpler to measure, are provided as an alternative means of showing compliance with the Basic Restrictions. If desktop study and/or direct field measurements show that the EMF is below the Reference Levels, the EMF is well within the Basic Restrictions.

The Reference Levels contained in the ICNIRP 2010 Guidelines are listed in Table 5-6.

Table 5-6: ICNIRP EMF reference levels

Exposure Characteristic	Electric Field	Magnetic Field
Public Exposure	5 kV/m	2,000 mG
Occupational Exposure	10 kV/m	10,000 mG

Reference levels are taken as instantaneous root mean squared values.

The proposed activity includes the installation of two 330kV cables in separate trenches with a separation distance of 10 metres. The EMF characteristics of the required cable arrangement were modelled with the EMF generated by the underground cables expected to be:

- > A maximum of 52 mG at the edge of the easement
- > A maximum of 414 mG within the easement.

The strength of magnetic field generated by the proposed activity is well below the ICNIRP reference levels in Table 5-6 and are equivalent to the magnetic field associated with a range of household appliances and are well within the ICNIRP Reference Levels. The electric field, by relation to the magnetic field, would also be expected to be well below the reference levels in the ICNIRP. As such, electric field generation from the cable was not modelled as a metallic screen which surrounds the cable essentially provides a shield, which limits electric field dispersion.

The results were also referred to AirServices Australia, who advised that the EMF is not expected to impact on aviation equipment located in the vicinity of the proposed cable route.

The above assessment is based on normal continuous line operation. Under line fault conditions, there is a possibility of higher magnetic fields that can extend for short distances outside the easement. These fields are present for very short durations (<120 milliseconds) and are not expected to impact on the airport.

5.12.3 Mitigation measures

The following mitigation measures would be implemented to minimise EMF impacts:

- > All designs shall be in accordance with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to EMF (ICNIRP 2010).

5.13 Social and economic considerations

5.13.1 Existing environment

The proposed activity is located within Western Sydney, which is characterised by a mix of densely populated, highly urbanised areas and small towns, semi-rural and wilderness areas—notably the Blue Mountains National Park. The nearest settlement to the proposed activity is the town of Luddenham about 1 kilometre to the northwest with a population of about 1,500 people.

The social and economic characteristics of Western Sydney, including the areas surrounding the proposed activity location and the airport site, are expected to change substantially with the implementation of numerous strategic planning initiatives including the Western Sydney Priority Growth Area, Western Sydney Airport, South West Rail Link extension and Western Sydney Infrastructure Plan.

5.13.2 Impact assessment

Construction

Potential social and economic impacts of the proposed activity derive from the presence of the construction workforce at the airport site and surrounding area and amenity impacts of construction.

The construction workforce for the proposed activity would be relatively small particularly when compared to any other works associated with the airport site development. The workforce would not affect the demographics of the area or demand for social services.

Construction has the potential to generate noise, air and visual disturbances that may comprise a slight reduction in amenity to residents in close proximity to the works as discussed in Sections 5.8, 5.9 and 5.10. These potential impacts are expected to be minor.

Operation

The proposed activity would benefit the community as it would maintain the transmission of electricity between Sydney West and Bannaby substations and facilitate the reliable supply of electricity while also enabling the development of the Western Sydney Airport.

Of the environmental issues typically of most concern to the community, both the visual impact and the EMF fields potentially generated would be reduced and minimised as a result of the proposed activity.

Routine maintenance and inspection of the cable would not impact the socio-economic setting of the surrounding area or the future use of the site as an airport.

5.13.3 Mitigation measures

No mitigation measures are considered necessary to mitigate social and economic impacts. Mitigation measures for noise, air and visual amenity impacts are discussed in Sections 5.8, 5.9 and 5.10.

5.14 Cumulative impacts

5.14.1 Existing environment

Cumulative impacts are incremental environmental impacts caused by the combination of past, present and reasonably foreseeable future actions. Cumulative impacts accumulate over time, from one or more sources. Whilst impacts may be insignificant in isolation, significant impacts may occur when individual effects are considered in combination. The assessment of cumulative impacts focused on the proposed activity's interaction with other projects in the vicinity of the proposed activity, and where construction and/or operational timeframes are likely to be concurrent.

A review of the Major Projects Assessments database on the Department of Planning and Environment website did not identify any major approved projects within the vicinity of the proposed activity, other than Western Sydney Airport. The realignment of The Northern Road would likely comprise a major project that has the potential to interact with the proposed activity, depending on the timing of construction.

There is also potential for minor construction projects to occur in proximity to the proposed activity during construction. Such minor projects generally relate to small residential developments and building alterations.

More importantly, removal of the overhead transmission line will facilitate the development of the Western Sydney Airport which will result in significant employment and economic benefits to the western Sydney region, to NSW and Australia.

5.14.2 Impact assessment

The proposed activity was authorised as part of the determination of the Western Sydney Airport Plan. Therefore any impacts associated with the interaction of the proposed activity and the construction and operation of the Western Sydney Airport cannot be considered to be cumulative in nature.

When considering The Northern Road and other minor construction projects in conjunction with the proposed activity, there is some potential for cumulative impacts from noise, traffic and dust to occur should the works coincide with the timing of the proposed activity. These cumulative impacts would be considered to be minor, temporary and localised in nature given that the works would progressively move along the underground cable and aboveground transmission line within the airport site.

Additionally, no permanent cumulative visual impacts are expected as the proposed activity is not expected to significantly alter the visual setting within and surrounding the airport site.

5.14.3 Mitigation measures

No additional mitigation measures are considered necessary.

5.15 Summary of impacts

The majority of potential impacts would occur during construction of the underground cable and demolition of the existing transmission line, and these are not additional to those identified through the Western Sydney Airport EIS. The key potential impacts are:

- > vegetation clearing (including potential impacts to threatened flora, fauna and ecological communities)
- > potential harm to Aboriginal heritage sites
- > potential traffic impacts on The Northern Road.

To mitigate these impacts, the recommended mitigation measures would be implemented.

Other potential impacts including erosion and sedimentation, noise and vibration, air quality, visual amenity, waste and social and economic considerations are expected to be readily managed.

It is considered that the proposed activity is unlikely to have impacts on of the environment, beyond those assessed through the Western Sydney Airport EIS.

6. Consideration of statutory factors

6.1 Section 111 and 5A of the EP&A Act

As this EA has adopted the environmental assessment framework which would be applied should the proposed activity not be located on Commonwealth land, consideration of relevant statutory factors has been applied. Under Section 111 of the EP&A Act, there is a requirement to consider the effect of the proposed activity on certain agreements, wilderness areas and biodiversity values. Table 6-1 provides a summary of how each of the factors has been considered

Table 6-1: Consideration of Section 111 of EP&A Act – duty to consider environmental impact

Factor	Comment
1 Examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.	Section 5 of this EA has considered all matters affecting or likely to affect the environment.
2(a) Consider the effect on any conservation agreement entered into under the <i>National Parks and Wildlife Act 1974</i> and applying to the whole or part of the land to which the activity relates.	The proposed activity would not affect land subject to a conservation agreement under the <i>National Parks and Wildlife Act 1974</i> .
2(b) Consider the effect on any plan of management adopted under that Act for the conservation area to which the agreement relates.	No plan of management is in place pertaining to any component of the airport site.
2(c) Consider the effect on any joint management agreement entered into under the <i>Threatened Species Conservation Act 1995</i> .	The proposed activity would not affect land subject to a joint management agreement under the <i>Threatened Species Conservation Act 1995</i> .
2(d) Consider the effect of any biobanking agreement entered into under Part 7A of the <i>Threatened Species Conservation Act 1995</i> that applies to the whole or part of the land to which the activity relates.	The proposed activity would not affect land subject to a biobanking agreement under the <i>Threatened Species Conservation Act 1995</i> .
3 Consider the effect on any wilderness area (within the meaning of the <i>Wilderness Act 1987</i>) in the locality in which the activity is intended to be carried on.	The proposed activity would not affect a wilderness area under the <i>Wilderness Act 1987</i> .
4(a) Consider the effect on critical habitat	The proposed activity would not affect critical habitat.
4(b) Consider whether there is likely to be a significant effect on threatened species, populations and ecological communities, and their habitats	The proposed activity would not result in impacts on threatened species, populations and ecological communities and their habitats which are likely to be significant. Potential impacts are discussed in Section 5.1.
4(c) Consider the effect on any other protected fauna or protected native plants within the meaning of the <i>National Parks and Wildlife Act 1974</i> .	The proposed activity is not expected to significantly impact protected flora and fauna. Potential impacts are discussed in Section 5.1.

6.2 Clause 228 of the EP&A Regulation

If the approval of the proposed activity was being sought under Part 5 of the EP&A Act, there would be a requirement to address Clause 228(2) of the EP&A Regulation, which details those factors that must be taken into account when consideration is given to the likely impact of any activity on the environment. Table 6-2 provides a summary on how this EA has addressed each of the Clause 228 factors.

Table 6-2: Consideration of Clause 228 factors

Factor	Potential impact
a. any impact on a community	<p>The proposed activity is located on land which is owned by the Commonwealth and is to be developed for the Western Sydney Airport. The proposed activity is not expected to result in any long term impact on the surrounding community. Additionally, the long term supply of electricity would be maintained by the proposed activity.</p> <p>Some impacts would occur on surrounding properties, such as noise and air quality impacts, however these impacts would be short-term in nature as the works move through the underground cable and overhead transmission line easements.</p>
b. any transformation of a locality	<p>The proposed activity would result in a minor change in the visual amenity in the vicinity of the works. Overall these aspects are not considered to result in any substantial transformation of the locality particularly considering the amount of development which is expected to occur both within and surrounding the airport site.</p>
c. any environmental impact on the ecosystems of the locality	<p>The proposed activity would cause minor environmental impacts on the ecosystems of a locality as discussed in Section 5.1.</p>
d. any reduction of the aesthetic, recreational, scientific or other environmental quality	<p>The proposed activity would result in some short-term amenity impacts during construction. This includes potential changes to visual amenity, noise levels and dust generation. All these issues are expected to be minor in nature.</p>
e. any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations	<p>The proposed activity would impact The Northern Road which is considered to be an item of local significance. No other non-Aboriginal heritage items are expected to be affected.</p> <p>The proposed activity has the potential to impact on known and unknown Aboriginal heritage items. Known and unknown items would be avoided by cordoning off the areas of known sites and training workers in an unexpected finds protocol.</p>
f. any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)	<p>The proposed activity would involve clearing of native vegetation that may comprise habitat for threatened species. The extent of clearing, the associated fragmentation and the importance of the potential habitat is not considered to be a significant impact.</p>
g. any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	<p>The proposed activity would involve clearing of native vegetation that may comprise habitat for threatened species. The extent of impact would be minor and would not endanger any species of animal, plant or other form of life living on land, water or in the air.</p>

Factor	Potential impact
h. any long-term effects on the environment	The proposed activity is not expected to have any effects on the environment.
i. any degradation of the quality of the environment	The proposed activity is not expected to result in any long term material degradation of the environment.
j. any risk to the safety of the environment	The proposed activity is not expected to pose any risk to the safety of the environment. The magnetic and electric fields generated by the proposed activity are expected to be well below the ICNIRP reference levels for public and occupational exposure.
k. any reduction in the range of beneficial uses of the environment	The proposed activity is not expected to cause a reduction in the beneficial use of the environment. The purpose of the proposed activity is to ensure that construction of the Western Sydney Airport can proceed without impacting on power supply for the community.
l. any pollution of the environment	The proposed activity would generate emissions during construction but none are expected to be above acceptable levels following the implementation of standard mitigation measures.
m. any environmental problems associated with the disposal of waste	The disposal of waste is not expected to cause any environmental problems as it would be managed in line with the mitigation measures discussed in Section 5.11.2. It is intended that as far as possible, waste materials from demolition of the existing tower and electricity infrastructure would be recycled.
n. any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposed activity would not increase demands on resources that are likely to be in short supply.
o. any cumulative environmental effect with other existing or likely future activities	As discussed in Section 5.14.2, there may be a localised cumulative increase in noise, traffic and dust if the realignment of The Northern Road or other large approved developments are constructed in proximity to the proposed activity. These impacts are however expected to be minor and temporary in nature.
p. any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposed activity is not in a coastal location and would not affect coastal processes or hazards.

6.3 Matters of NES under EPBC Act

Potential impacts of the proposed activity on matters of National Environmental Significance (NES) under the EPBC Act are explained in Table 6-3.

Consideration of matters of NES is necessary to satisfy conditions of approval for Western Sydney Airport and the proposed activity under the *Airports Act 1996* as discussed in Section 4.2.

Table 6-3: Consideration of Matters of National Environmental Significance and Commonwealth land

MNES / Commonwealth land	Potential impact
Any impact on a World heritage property?	The proposed activity would not have any impact on a World heritage property.
Any impact on a National heritage place?	The proposed activity would not have any impact on a National heritage place.
Any impact on any wetlands of international importance?	The proposed activity would not have any impact on a wetland of international importance.
Any impact on a Commonwealth listed threatened species or ecological communities?	<p>The proposed activity would involve clearing of native vegetation that may comprise habitat for threatened species. The extent of clearing, the associated fragmentation and the importance of the potential habitat is not considered to be of an extent that would be likely to result in a significant impact.</p> <p>Additionally, vegetation communities listed under EPBC Act, which would be impacted as part of the proposed activity and the broader Western Sydney Airport development would be offset in accordance with the BODP to be prepared by the Department of Infrastructure and Regional Development in accordance with the Airport Plan.</p>
Any impacts on a Commonwealth listed migratory species?	The proposed activity would not have any impact on Commonwealth listed migratory species. The site is not considered important habitat for these species.
Any impact on a Commonwealth marine area?	The proposed activity would not have any impact on a Commonwealth marine area.
Any impact on the Great Barrier Reef Marine Park?	The proposed activity would not have any impact on the Great Barrier Reef Marine Park.
Does the proposed activity involve a nuclear action (including uranium mines)?	The proposed activity does not involve a nuclear action.
Does the proposed activity involve a water resource, in relation to coal seam gas development and large coal mining development?	The proposed activity does not involve a water resource in relation to coal seam gas or mining.
Is the proposed activity likely to have a significant impact on the environment on Commonwealth land or carried out by Commonwealth agency.	The proposed activity will be carried out by TransGrid which is a privately-owned company. The proposed activity is located on Commonwealth land. Section 5 of this EA has considered all matters affecting or likely to affect the environment and has not identified any significant impacts.

6.4 Consideration of Ecologically Sustainable Development

The principles of ESD are defined and listed in Section 6(2) of the *Protection of the Environment Administration Act 1991*, namely:

- > The precautionary principle
- > Intergenerational equity
- > Conservation of biological diversity and ecological integrity
- > Improved valuation, pricing and incentive mechanisms.

The principles of ESD and how they have been applied to the proposed activity are detailed below.

6.4.1 Precautionary Principle

The precautionary principle provides that “if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation”.

The assessment of potential environmental impacts as part of this environmental impact assessment has indicated that there would be no threats of serious or irreversible environmental damage as a result of the construction and operation of the proposed activity. Where potential environmental impacts have been considered likely to occur, mitigation measures have been proposed to minimise and manage any environmental impacts during construction and operation of the proposed activity.

6.4.2 Intergenerational Equity

The principle of intergenerational equity provides that “the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations”.

The proposed activity would provide for both current and projected electricity supply requirements, and thus caters for the electricity needs of both current and future generations. In addition, any potential short-term and long-term adverse environmental impacts would be minimised with the implementation of appropriate mitigation measures. Further, the proposed activity would not result in environmental or social impacts that would detrimentally limit the potential for future generations to enjoy and utilise the natural environment.

The proposed activity has been developed through an options assessment discussed in Section 2. This process has sought to minimise the environmental impacts while allowing for the development of Western Sydney Airport, which will facilitate urban development and job creation for current and future generations in the context of the broader urbanisation of Western Sydney.

6.4.3 Conservation of Biological Diversity and Ecological Integrity

This principle provides that “conservation of biological diversity and ecological integrity should be a fundamental consideration” in all of TransGrid’s activities. The proposed activity has been designed with consideration of avoiding and minimising impacts to biological diversity and preserving ecological integrity.

An assessment of ecological impacts was undertaken as part of this environmental impact assessment (refer to Section 5.1). It is unlikely that the biological diversity and ecological integrity of the proposed activity’s area would be compromised as the area to be cleared is relatively small and of limited habitat importance. Mitigation measures proposed in 5.1 would further minimise impacts on biodiversity.

It should be noted that all clearing for the proposed activity is within the indicative Construction Impact Zone for Western Sydney Airport, and would be offset through the BODP, to be developed by the Department of Infrastructure and Regional Development, in accordance with the Airport Plan.

6.4.4 Improved Valuation and Pricing of Environmental Resources

The principle of improved valuation, pricing and incentive mechanisms provides that “*environmental factors should be included in the valuation of assets and services*”.

This principle requires that costs to the environment should be factored into the economic costs of an activity. Environmental issues were considered as key matters in the project scoping/ route selection process and in the economic and financial feasibility assessments for the project. The basis for this principle is the concept that pricing and other financial arrangements relating to the proposed activity should reflect the social and environmental costs of the use of the resource on which it is based, including consideration of future values that may exceed current values as the resources become more scarce.

This environmental impact assessment has assessed the likely environmental impacts of the proposed activity. The proposed activity has taken into account these potential impacts and has identified mitigation measures to be implemented to avoid the possibility of significant adverse impacts and the loss of environmental values. The implementation of these environmental measures would increase both the capital construction and operating costs of the proposed activity. This demonstrates that environmental costs have been included in the costs of the proposed activity.

7. Environmental management

7.1 Construction environmental management

TransGrid is committed to conducting its activities and services, including the current proposed activity, in a manner that minimises pollution, environmental impacts, and complies with relevant legislation, industry standards and codes of practice. To achieve this, TransGrid maintains an Environmental Management System (EMS) that is certified under the international standard ISO 14001. All activities undertaken for the activity would be consistent with the EMS.

Appendix A provides a compilation of the mitigation measures recommended for the proposed activity throughout this EA. These mitigation measures form an integral part of the activity and have been taken into account in considering the likely significance of impacts.

Measures to mitigate potential impacts would be consolidated in the TransGrid Relocation Plan. This plan would act as the overarching environmental management framework for the development of any subsequent CEMPs by the construction contractor/s. This framework will be developed to be in accordance with TransGrid's procedure *Preparation of a Construction Environmental Management Plan* (TransGrid 2015c).

As part of the CEMPs to be prepared in accordance with the TransGrid Relocation Plan, environmental site maps shall also be prepared for site specific work locations. The scale of these maps may vary with the level of detail required to be included. The maps shall detail:

- > The location and extent of known environmental constraints and sensitivities at or near each site (such as waterways, heritage sites, no-go zones and highly noise affected residents);
- > The work site layout (such as vehicle parking, equipment lay-down, spoil locations); and
- > The extent of earthwork and the appropriate soil erosion and sedimentation control measures to be implemented at the site (such as benching, stormwater diversions, sediment fencing).

All workers shall receive induction training regarding the construction environmental management plans (including the CEMPs, site maps and any other sub-management plans), site environmental conditions and sensitivities identified in this environmental impact assessment, and receive training as appropriate. All workers shall also be advised of any changes to work scope, environmental site conditions or management plans. The inductions would be pursuant to Condition 37(2) of the Airport Plan, which requires TransGrid to take reasonable steps to ensure those involved in carrying out the proposed activity comply with the TransGrid Relocation Plan.

An Environmental Inspector shall be appointed by TransGrid to regularly audit the work activities to ensure that all mitigation measures are being effectively applied and that the work is being carried out in compliance with all environmental approval and legislative conditions.

All complaints received during the activity shall be recorded within a complaints register. Any environmental incidents shall be registered in TransGrid's Asset and Risk Management System and managed in accordance with TransGrid's procedures.

7.2 Operational environmental management

The operation of the proposed activity would be managed in accordance with TransGrid's Environmental Management System, which includes detailed maintenance procedures to minimise potential environmental impacts. Details of the environmental constraints identified as part of the Western Sydney Airport EIS and this environmental impact assessment, that are relevant to the ongoing operation and maintenance of the asset, would be included in TransGrid's Geographical Information System. Due diligence environmental checks, including environmental information generated from GIS where relevant, are undertaken before any maintenance works are carried out.

8. Conclusion

This environmental assessment has been prepared to satisfy condition 4 (4)(a) of the Airport Plan for the Western Sydney Airport under the *Airports Act 1996*. The condition requires consideration of the environmental impacts of the Transgrid Relocation, in respect of any impacts that were not assessed within the Western Sydney Airport EIS in accordance with the legislation that would apply to the proposed activity, irrespective of the approval under the *Airports Act 1996*. Accordingly, this assessment draws on the environmental assessment framework under Part 5 of the NSW EP&A Act and substantially satisfies the environmental assessment requirements stipulated in the NSW Department of Planning & Environment's *NSW Code of Practice for Authorised Network Operators*.

The environmental assessment provides a true and fair review of the activity in relation to its potential effects on the environment. The environmental assessment supports the conclusion that the activity is not likely to have a significant impact on the environment, including threatened species, populations, ecological communities or their habitats and recognises that the proposed activity is contained within the indicative Construction Impact Zone of the Stage 1 Western Sydney Airport, as assessed and approved through the EIS and shown in Figure 2 of the determined Airport Plan.

9. References

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- Transgrid. 2016a, *Western Sydney Airport Transmission Line 39 Diversion Scoping Study – Final Report*.
- TransGrid. 2016b, *TransGrid Consultation Protocol for Review of Environmental Factors (REFs) for Class 4 and Class 5 Activities*.
- TransGrid. 2017. *Summary Environmental Report - Line 39 Sydney West to Western Sydney Airport Optical Ground Wire Installation*

Appendix A Summary of mitigation measures

Mitigation measures	
Environmental management	
EM1	Construction Environmental Management Plans (CEMPs) shall be prepared, and submitted to TransGrid for review and endorsement prior to the commencement of works, including site establishment. The CEMPs shall be prepared in accordance with the TransGrid Relocation Plan and TransGrid's procedure 'Preparation of a Construction Environmental Management Plan'. The CEMPs shall be updated in line with changes to work plans and all workers shall be advised of changes.
EM2	All workers shall be inducted regarding the CEMPs, site environmental conditions and sensitivities identified in this environmental impact assessment and receive training as appropriate. Records shall be kept of this induction and training.
EM3	An Environmental Supervisor shall be included as part of the construction staff to oversee implementation of the CEMPs and to ensure that all mitigation measures are being effectively applied. TransGrid shall appoint an Environmental Inspector to regularly check that the work is being carried out in compliance with all environmental approval and legislative conditions.
EM4	The following additional environmental approvals/licences/permits are required for the activity: <ul style="list-style-type: none"> • Road Occupation Permit under the <i>Roads Act 1993</i> • <i>Section 201 approval under the EPBC Act 1999.</i>
EM5	All environmental incidents and near misses shall be reported to TransGrid. All pollution incidents that threatens or harms the environment shall be reported immediately to relevant authorities, and TransGrid, in accordance with the <i>Protection of the Environment Operations Act 1997</i> (POEO Act).
Ecology	
EC1	Disturbed sites shall be stabilised, and areas not required for operation shall be returned to as close to their original condition as soon as possible.
EC2	Where possible impacts to known locations of the Spiked Rice-flower are to be minimised to allow the completion of mitigation measures identified in the WSA EIS and required by the Airport Plan, including seed collection and flora propagation. The construction corridor is to be fenced off in the vicinity of locations containing the Spiked Rice-flower.

EC3	<p>Weed control mitigation and management strategies shall be implemented. All herbicide use shall be in accordance with TransGrid requirements, and only TransGrid approved herbicides shall be used. Weed control strategies shall include:</p> <ul style="list-style-type: none"> • Vehicle check procedures, including wash/brush down if required, to reduce the spread of weeds via vehicles and machinery. • Target areas of potential new outbreaks including soil stockpiles, roadsides and any other disturbed areas. • Cleaning of vehicle tyres, undersides and radiator grills before leaving a property (as appropriate), cleaning of footwear and minimising soil movement between locations. • Mitigation of noxious and problematic weeds and pests should they be found at the activity site. • Working from clean area towards weedy area to reduce the spread of weeds into areas that are currently weed free (as appropriate).
EC4	All hotworks shall be undertaken in accordance with TransGrid's Hot Work Procedure.
EC5	No fires or burning of materials shall occur on site.

Aboriginal cultural heritage

AH1	Aboriginal heritage sites and high risk landscapes should be considered for inclusion when developing the initial survey and salvage program plan in relation to the carrying out of preparatory activities for the Stage 1 development. If identified sites based on targeted surveys cannot be avoided, these would be managed in accordance with the approved initial survey and salvage program plan and Aboriginal Cultural Heritage Construction Environmental Management Plan (CEMP).
AH2	The location of Aboriginal heritage sites B32 and B114 would be confirmed by an archaeologist on site prior to works commencing to determine an appropriate buffer and demarcation as a no go zone. The construction corridor is to be fenced off in the vicinity of known Aboriginal sites to ensure construction activities, vehicles and personnel do not impact on these sites. The location of these sites and an appropriate buffer is to be delineated in consultation with an appropriately qualified archaeologist as part of work for the development and approval of the initial survey and salvage program plan. If site impact is determined, after consultation, to be unavoidable, any mitigation will be in accordance with the approved initial survey and salvage programme plan, and once approved the Aboriginal Cultural Heritage Management Plan CEMP.
AH3	All TransGrid access tracks, work sites, stockpile sites and the powerline easement would be managed in accordance with the unexpected finds protocol. In the event that a site or artefact is identified during construction works (unexpected find), works would cease at the location, and the find reported in accordance with the protocol. No work would commence in the vicinity of the find until any procedures required under the protocol have been implemented.

Non-Aboriginal cultural heritage

NH1	In the event that a site or artefact of potential non-Aboriginal significance is identified during construction works (unexpected find), works shall cease at the location. The find shall be immediately reported to TransGrid, and the unexpected finds protocol complied with.
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Traffic and access	
TA1	Transportation and equipment delivery shall be in accordance with Roads and Maritime Services and Council requirements.
TA2	New access tracks required for the completion of the works shall be constructed in accordance with the approved plan of work that shall comply with the Soils and Construction Volume 2C Unsealed Roads (DECC, 2008).
TA3	Traffic, transportation and access mitigation and management strategies shall be documented and implemented in accordance with the construction environmental management plans developed in accordance with the TransGrid Relocation Plan and updated as required. This shall include: <ul style="list-style-type: none"> • The management of the delivery of equipment and materials. • Access to and from the site including nominated roads and site access tracks. • Parking. • Speed limits.
Land use	
—	No mitigation measures proposed.
Geology and soils	
GS1	An Erosion and Sediment Control Plan (ESCP) shall be prepared as part of construction environmental management plans to be developed in accordance with the TransGrid Relocation Plan. All erosion and sediment control measures shall be designed, implemented and maintained in accordance with relevant sections of “Managing Urban Stormwater: Soil and Construction Volume 1” (Landcom, 2004) (“the Blue Book”) (particularly Section 2.2) and “Managing Urban Stormwater: Soil and Construction Volume 2A – Installation of Services” (DECC, 2008)”. The ESCP shall apply to stockpiles, site boundaries, access tracks and laydown areas. Exposed surfaces shall be kept to a minimum to limit the potential for erosion.
GS2	Cleared vegetation would be mulched for use in erosion control at construction sites.
GS3	Soil stockpiles would be covered and stabilised with vegetation or mulch. Topsoil would be stockpiled at a maximum height of two metres, where practicable.
GS4	Any material or soil suspected of contamination shall be sampled and analysed by a NATA registered laboratory and managed in accordance with the Waste Classification Guidelines (EPA, 2014), the Guidelines on the Duty to Report Contamination (EPA, 2015) and the Contaminated Land Management Act 1997.
GS5	Providing excess spoil is free of contamination, it may be stockpiled within the airport site for future use as part of earthworks required for the Stage 1 development. The positioning of this material is to be confirmed with the Department of Infrastructure and Regional Development. Stockpiles shall be stabilised in a manner as to prevent erosion in line with the Erosion and Sediment Control Plan.
GS6	Construction plant and vehicles shall be cleaned of any mud or soils prior to access onto public roads. Vehicles and equipment shall be confined to existing roads and defined site access tracks.

GS7	Any imported fill shall be certified at source location (e.g. Quarrymaster or property owner) as pathogen and weed free Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM) in accordance with the NSW Protection of the Environment Operations Act 1997 (POEO Act) and the Protection of the Environment (Waste) Regulation 2014 (POEO Waste Regulation).
GS8	Environmental spill kits containing spill response materials suitable for the works being undertaken shall be kept on site at all times and be used in the event of a spill.
GS9	All chemicals or other hazardous substances shall be stored in bunded and weatherproof facilities away from drainage lines. The capacity of the bunded area shall be at least 130% of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s shall be shown on the Site Plans.

Hydrology and water quality

HW1	Spoil shall be stockpiled in a manner so as to avoid the possibility of sediments entering waterways (including stormwater drains) or migrating off-site.
HW2	Any bulk fuel/herbicide or hazardous material transport vehicles shall be parked on level ground a minimum of 40 metres away from waterways (including drainage and irrigation channels). No refuelling or bulk herbicide preparation shall occur within 40 metres of a waterway or open site drains.
HW3	Any spills of oil, fuel and other liquids shall be contained, cleaned up promptly and immediately reported to the TransGrid site representative.
HW4	Dam bridges would be designed to maintain downstream flows.
HW5	Release of water associated with drainage of dams or dewatering would be performed in a controlled manner that prevents erosion, sedimentation or scouring of receiving waterways. The water would be treated to an appropriate quality prior to release with consideration to the receiving waterway and its classification under the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines and local standards under the Airports (Environment Protection) Regulations 1997 if applicable.

Noise and vibration

NV1	Noise generating works shall be in accordance with the Interim Construction Noise Guideline (DECC, 2009): <ul style="list-style-type: none"> • 7:00am – 6:00pm Monday to Friday. • 8:00am – 1:00pm Saturdays. • No work on Sundays or Public Holidays.
NV2	Work outside normal hours, on Sundays and public holidays, shall only comprise: <ul style="list-style-type: none"> • The delivery of materials outside normal hours requested by police or other authorities for safety reasons. • Emergency work to avoid the loss of lives and/or property. • Work timed to correlate with system planning outages. • Works at The Northern Road to minimise traffic impacts and to comply with any Roads and Maritime Services requirements.

NV3	Other noise generating works outside of the standard construction hours shall require the formal written consent of the Department of Infrastructure and Regional Development and require justification in accordance with the Interim Construction Noise Guideline (DECC, 2009).
NV4	Neighbouring properties to the north of the airport site shall be notified as to the timing and duration of the construction works and at least 7 days prior to commencing work.

Air quality and climate change

AQ1	If necessary, dust suppression techniques shall be implemented and incorporated into the ESCP as per the techniques outlined in the “Blue Book”, such as water spraying of surfaces and covering stockpiles.
AQ2	All surplus soils and materials from excavations, which cannot be reused on site, shall be removed from site by covered trucks.
AQ3	Vehicles and equipment shall be maintained in accordance with the manufacturer’s specifications.
AQ4	Residual raw materials shall be returned to the supplier, resold or reused at another site at the end of the project or recycled.
AQ5	Materials shall be sourced from local suppliers, where feasible, to reduce the distance that materials need to be transported to the site.
AQ6	Air quality mitigation and management strategies shall be documented and implemented in accordance with the CEMP. This shall include: <ul style="list-style-type: none"> • Reducing vehicle speeds when in the vicinity of residences to minimise the generation of nuisance dust. • Progressively revegetating or otherwise rehabilitating disturbed areas as works are completed.

Visual amenity

VA1	All construction plant, equipment, waste and excess materials shall be contained within the designated boundaries of the work site and the construction laydown area and shall be removed from the site following the completion of construction.
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Waste

WA1	Waste mitigation and management strategies shall be documented and implemented in accordance with the construction environmental management plans which would be developed in accordance with the TransGrid Relocation Plan, TransGrid Waste Procedures and associated Work Instructions. This shall include: <ul style="list-style-type: none"> • Waste management facilities on-site including their set-up, use, management removal and waste tracking documentation. • Waste hierarchy application including information demonstrating the reduction of the amount of waste produced and the maximised reuse and recycling opportunities utilised. • Appropriate waste management across all possible waste items produced.
WA2	Soil to be reused onsite would be tested for contamination in accordance with the Waste Classification Guidelines (EPA, 2014).

WA3	All waste, including surplus and contaminated soils, which cannot be reused shall be classified in accordance with the Waste Classification Guidelines (EPA, 2014), removed from the site and disposed of at a facility that can lawfully accept the waste in accordance with the POEO Act and POEO Waste Regulation.
WA4	Concrete trucks shall be permitted to flick wet wipe their discharge chutes with the effluent discharged into prepared bored holes, prepared excavations/formwork or a watertight receptacle for disposal (to be shown on the ESCP). No concrete washout is permitted. All surplus concrete shall be returned to the concrete suppliers for recycling and not be discharged on site.

Electric and magnetic fields

EF1	All designs shall be in accordance with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to EMF (ICNIRP 2010).
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Socio-economic

—	No mitigation measures proposed.
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Appendix B Spiked Rice-flower survey results



Memorandum

16 June 2017

To TransGrid

Copy to

From Malith Weerakoon

Tel +61 2 9239 7427

Subject Spiked Rice-flower (*Pimelea spicata*) surveys

Job no. 2126292

1 Introduction

Transmission Line 39 (Line 39) forms a 330 kilovolt (kV) connection between TransGrid's Sydney West and Bannaby substations and is approximately 114 kilometres (km) in length. An approximate 3.2 km section of the transmission line transects the Western Sydney Airport (WSA) site located at Badgerys Creek. To facilitate the construction and operation of the WSA, this section of the transmission line requires realignment. The realignment would involve the installation of an approximate 3.8 km long underground 330 kV cable along the northern site boundary of the WSA site between two transition points (Northern and Southern), located at each end of the line deviation.

The Western Sydney Airport was determined to be a controlled action under the EPBC Act and subsequently required the preparation of an Environmental Impact Statement (EIS) for assessment by the Commonwealth Department of Environment and Energy. The EIS was finalised on 15 September 2016 with a Revised Draft Airport Plan. The Airport Plan was determined on 5 December 2016, including all conditions notified by the Environment Minister under section 96B of the *Airport Act 1996*. To support an environmental assessment (EA) to be prepared to satisfy condition 4(4)(a) of the Airport Plan, GHD were engaged to undertake a targeted survey of the threatened Spiked Rice-flower (*Pimelea spicata*), which was recently identified within the WSA site.

The population of Spiked Rice-flower was recorded in March 2017 at three properties in the north-western portion of the airport site, within the Stage 1 Construction Impact Zone (see Figure 1). 3713 clumps of Spiked Rice-flower have been recorded at the airport site adjacent to the Northern Road. The population is likely to extend into two adjacent properties, but access has never been obtained to survey these properties. The population of the Spiked Rice-flower at the airport site was not described in the Western Sydney Airport EIS, prepared by GHD (2016) because it had not been recorded at the time the EIS was prepared.

The Spiked Rice-flower is listed as an endangered species under the NSW *Threatened Species Conservation Act 1995* (TSC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act* (EPBC Act). The Department of Infrastructure and Regional Development (DIRD) requested TransGrid conduct a targeted survey for this species within the existing and proposed easements for the transmission line to help assess and manage potential impacts to the Spiked Rice-flower population and inform the relevant biodiversity offset requirements.

In Western Sydney the Spiked Rice-flower is associated with Cumberland Plain Woodland or with areas that formerly supported this ecological community on well-structured clay soils, derived from



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Wianamatta shale (DEC, 2005). Spiked Rice-flower plants can occur in highly degraded areas that no longer support native vegetation and that are dominated by exotic grasses. A population at a site may consist only of underground tubers and the soil seed bank during droughts or because of excessive grazing or weed infestation. The species is known to grow rapidly and flower in response to disturbance events such as fire and/or favourable rainfall. Populations have grown and flowered in habitat subject to severe African Olive (*Olea europaea* subsp. *cuspidata*) infestations after clearing of the olive (Cuneo, P. Australian Botanic Garden, pers. comm.). It has been assumed that too frequent disturbance may exhaust the soil seed bank at a site. Threats to the Spiked Rice-flower include clearing of occupied habitat, grazing, weed infestation and inappropriate fire regimes (DEC, 2005).

2 Methodology

A targeted survey for the Spiked Rice-flower was conducted by two GHD ecologists on the 3rd and 4th of May 2017. A known population of Spiked Rice-flower within 100m of the nearest transmission tower (39-499) was used as a reference population for the survey to confirm that the species was flowering at the time of the survey. The area surveyed did not include those areas surveyed in 2017 as part of the WSA biodiversity activities.

The survey area comprised the proposed 20m easement surrounding the new below-ground cable route, a 50x50m area search around the base of existing transmission towers within the existing transmission line easement, within a 20m corridor between transmission towers and within the footprint for proposed access tracks (provided by TransGrid on the 11th and 14th April 2017). This survey area comprises the potential disturbance area for the proposed activity.

Targeted surveys involved walked transects with personnel spaced 10m apart, with a focus on potential habitat within near-intact native vegetation or derived native grasslands. Where suitable habitat was present, a random meander search was also implemented along the fringes of the surveyed footprint and into adjacent woodland.

Potential habitat for the Spiked Rice-flower was identified based on the habitat associated with the known population at the airport site, the NSW Office of Environment and Heritage (OEH) threatened species profile, vegetation mapping from the biodiversity assessment for the Western Sydney Airport EIS (GHD 2016) and the experience and judgement of GHD ecologists on site.

3 Results

3.1 Overview

The majority of the survey area was able to be inspected on foot over two days. The reference population of Spiked Rice-flower was flowering, confirming that conditions were suitable for detection of the species.

A property at 2039 The Northern Road was unable to be surveyed due to access restrictions (see Figure 1). Given the proximity of the Spiked Rice-flower populations adjoining this property to the north and south, this species also is also likely to occur within the transmission line easement within this property.



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A large proportion of the survey area showed signs of disturbance by clearing, grazing or farming. These areas featured low condition vegetation dominated by exotic grasses such as Paspalum (*Paspalum dilatatum*), Kikuyu (*Pennisetum clandestinum*) and Rhodes Grass (*Chloris gayana*). Small areas of the survey area contain derived native grasslands and a mix of regenerating native mid storey species including Blackthorn (*Bursaria spinosa*).

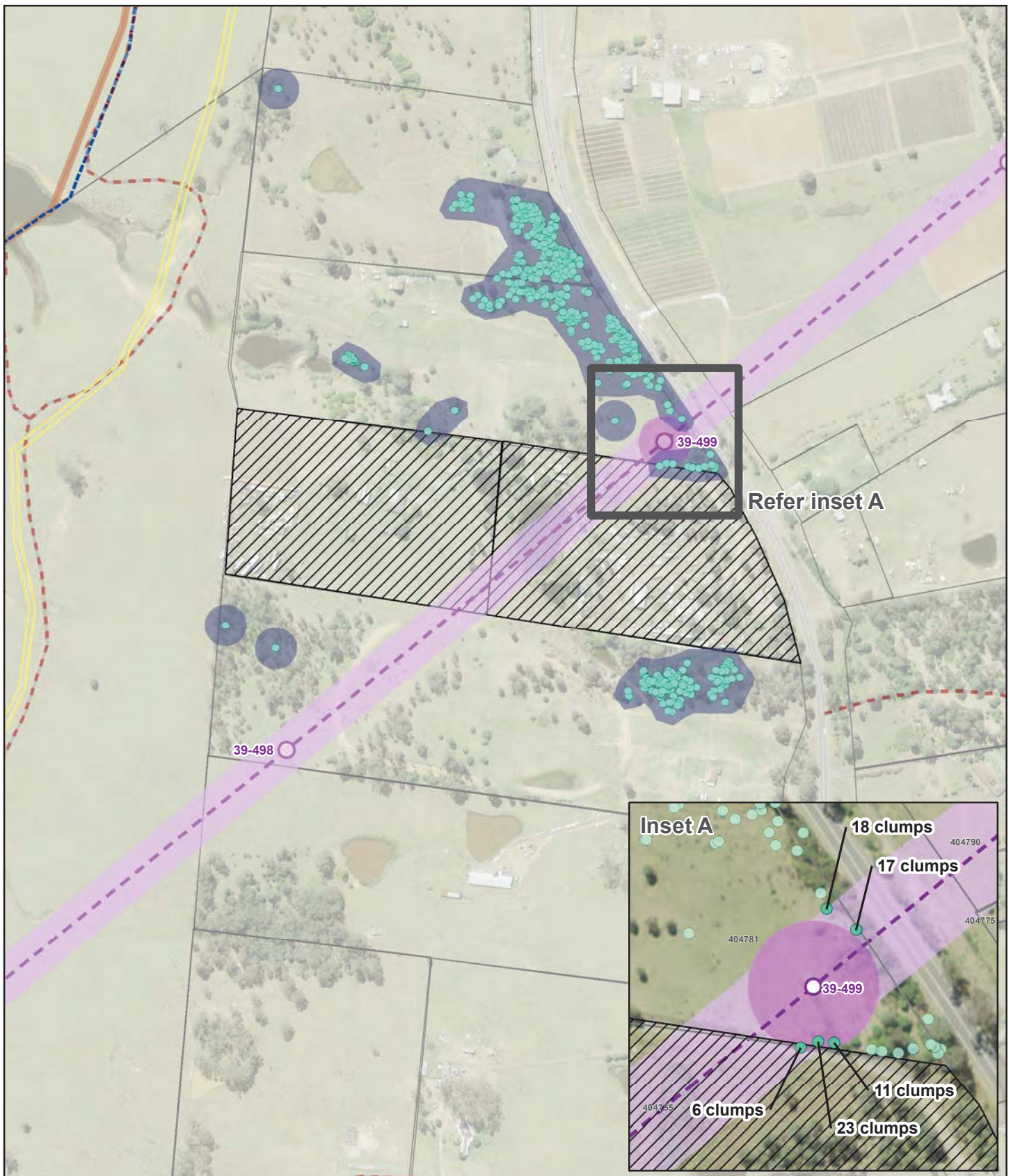
3.2 Existing transmission towers and existing transmission line easement

Seventy-five clumps of Spiked Rice-flower were recorded within the survey area, comprising 40 clumps within the 50m x 50m area surrounding transmission tower 39-499 and 35 clumps within the easement adjacent to The Northern Road (see Figure 1). These plants had previously been recorded during surveys for the Western Sydney Airport in March 2017. The majority of these plants were flowering. These plants comprise around 2% of the clumps of Spiked Rice-flower recorded at the airport site.

A significant majority of Spiked Rice-flowers observed in the survey area occurred in poor condition Grey Box - Forest Red Gum grassy woodland on flats (HN528). This vegetation zone comprises a derived native grassland dominated by Kangaroo Grass (*Themeda triandra*). A mid storey of Blackthorn and African Olive was also present in areas adjacent to internal fencing. Based on a 20m buffer area around the locations of known Spiked Rice-flower, there is an estimated total of 0.12 hectares of occupied Spiked Rice-flower habitat in the survey area that could be disturbed by the proposed activity. There is a further 3.41 hectares of potential habitat in native vegetation and 5.13 hectares of potential habitat in exotic vegetation that could be impacted by the removal of the existing transmission line easement. The extent of potential Spiked Rice-flower habitat that could be disturbed by the proposed activity is summarised in Table 1.

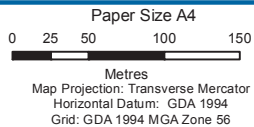
3.3 Underground cable

No Spiked Rice-flower was recorded within the proposed 20m easement of the new below-ground cable route. Construction of the proposed underground cable and associated easement and access tracks would result in impacts of up to 1.73 hectares of potential Spiked Rice-flower habitat in native vegetation and 4.61 hectares of potential habitat in exotic vegetation. The extent of potential Spiked Rice-flower habitat that could be disturbed is summarised in Table 2.



LEGEND

- Commonwealth land
- Existing aboveground transmission line within Commonwealth land
- Proposed belowground transmission line
- Proposed access and laydown
- Area not surveyed
- Survey area (25m from tower 39-499)
- Survey area (20m from transmission line)
- Transmission line poles
- Pimelea spicata* (endangered species under the TSC Act and EPBC Act)
- Pimelea spicata* (records within buffer zone)
- Pimelea spicata* occupied habitat



TransGrid
REF Transmission Line 39 Diversion

Job Number 21-26292
Revision A
Date 25 May 2017

***Pimelea spicata* records**

Figure 1



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Table 1 Potential and known Spiked Rice-flower habitat impacted by the removal of the existing transmission line easement

Type of work	Vegetation zone	Area (ha)
Removal of existing overhead transmission line and towers	Good condition Grey Box - Forest Red Gum grassy woodland on flats (HN528)	0.01
	Poor condition Forest Red Gum - Rough-barked Apple grassy woodland (HN526)	0.40
	Poor condition Grey Box - Forest Red Gum grassy woodland on flats (HN528)	1.41
	Poor condition Grey Box - Forest Red Gum grassy woodland on hills (HN529)	0.57
	Cleared and exotic vegetation	2.98
Access tracks for the removal of existing transmission line and towers	Poor condition Grey Box - Forest Red Gum grassy woodland on flats (HN528)	1.03
	Poor condition Grey Box - Forest Red Gum grassy woodland on hills (HN529)	0.08
	Cleared and exotic vegetation	0.45
Laydown area	Cleared and exotic vegetation	1.70
Total native vegetation		3.49
Total cleared and exotic vegetation		5.13
Total		8.62

Table 2 Potential Spiked Rice-flower habitat impacted by the construction of the underground cable

Type of work	Vegetation zone	Area impacted (ha)
Creation of proposed below-ground cable route	Good condition Forest Red Gum - Rough-barked Apple grassy woodland (HN526)	0.21
	Good condition Grey Box - Forest Red Gum grassy woodland on flats (HN528)	0.02
	Good condition Grey Box - Forest Red Gum grassy woodland on hills (HN529)	0.10
	Poor condition Grey Box - Forest Red Gum grassy woodland on flats (HN528)	1.13



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Poor condition Grey Box - Forest Red Gum grassy woodland on hills (HN529)	0.26
Cleared and exotic vegetation	4.61
Total native vegetation	1.73
Total cleared and exotic vegetation	4.61
Total	6.34

4 Recommendations

A Construction Environmental Management Plan (CEMP) shall be prepared, and submitted to TransGrid for a review and compliance check prior to the commencement of works. The CEMP shall be prepared in accordance with TransGrid's procedure Preparation of a Construction Environmental Management Plan and incorporate all mitigation measures identified in the REF (GHD, 2017).

Specific mitigation measures are required to minimise impacts on the Spiked Rice-flower. Ecological processes such as pollination, seed fall and dispersal would continue in this population and potentially contribute to the maintenance of the broader regional population up to the point that it is cleared for construction of the airport which is likely to be the end of 2018. Spiked Rice-flower at the airport site will be the subject of a threatened flora propagation program and potentially a translocation program. It will be important to maintain these populations until these programs have been implemented.

The following specific mitigation measures are recommended to minimise impacts on the Spiked Rice-flower:

- Mapping of Spiked-Rice Flower locations on environmental site maps in accordance with the CEMP.
- A suitably qualified ecologist or environmental officer should be engaged prior to any clearing works to clearly demarcate vegetation protection areas and especially the location of Spiked Rice-flower clumps.
- The purposeful modification of on ground work methods to avoid impacts to individual Spiked Rice-flower as far as is practicable.
- The use existing fire trails as access tracks where practical.
- A targeted for Spiked Rice-flower survey at 2039 The Northern Road once access has been granted to this property.

5 Assessment of significance

An assessment of significance of impacts on the local population of Spiked Rice-flower has been conducted in accordance with Section 5A of the *Environmental Planning and Assessment Act 1979* (EPA Act).



Table 3 Spiked Rice-flower

Spiked Rice-flower (<i>Pimelea spicata</i>)
a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,
<p>3713 clumps of Spiked Rice-flower have been recorded at the airport site within 3.66 hectares of occupied habitat (GHD unpublished). The majority of these plants occur adjacent to The Northern Road, Luddenham in the north-western portion of the airport site (see Figure 1). Only a very small proportion of these clumps (75) within 0.12 hectares of occupied habitat occur in the disturbance footprint for removal and diversion of the Line 39 transmission line easement. While this species is cryptic by nature, the species was recorded during its flowering period where it was more conspicuous. Extensive targeted surveys of the airport site have only recorded this species in this localised area.</p> <p>Mature Spiked Rice-flower seed disperses poorly with the majority of seedlings germinating close to adults. A soil seedbank is known to be maintained in the presence of a suitable disturbance regime (OEH 2017). It is assumed that where mature plants were recorded, a soil seedbank will also be present within the disturbance footprint.</p> <p>Potential impacts of the proposed activity on the life cycle of the species would comprise the disturbance of up to 75 Spiked Rice-flower clumps, 0.12 hectares of occupied habitat and up to 14.88 hectares of potential habitat. Impacts would be associated with slashing of vegetation for vehicular access, vehicle movements and excavation. No habitat would be permanently removed by the proposed activity. Impacts to around 2% of the 3713 clumps of Spiked Rice-flower and 3% of occupied habitat that have been recorded at the airport site is highly unlikely to disrupt the life cycle of the local population such that it would become extinct. The 98% of the local population that would remain undisturbed and its associated soil seed bank and potential habitat are likely to be sufficient to maintain a viable, self-sustaining population until vegetation removal is required for the construction of the airport site in the near-future.</p> <p>Vegetation management measures would be included in the CEMP for the proposed activity to minimise direct impacts to individual Spiked Rice-flowers and to avoid direct and indirect impacts on potential habitat. Overall, given the limited extent of impacts and the mitigation measures proposed, the proposed activity is not likely to have an adverse effect on the life cycle of the species such that a local population is likely to be placed at risk of extinction.</p>
b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,
Not applicable to this threatened species.
c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
Not applicable to this threatened species.
(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,



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Not applicable to this threatened species.

d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

A maximum of 0.12 of occupied habitat would be removed or modified for the proposed activity. A further 14.84 hectares of potential habitat for Spiked Rice-flower would be disturbed by the proposed activity including cleared and exotic vegetation, Cumberland Plain Woodland vegetation and River-flat Eucalypt Forest. This may include impacts through slashing for vehicular access.

Vegetation would be allowed to regenerate in the majority of the disturbance area after construction and would be maintained as grassland or shrub land until the complete removal of vegetation for construction of the airport site which is planned to commence in late 2018.

The post-activity condition would be equivalent to the majority of the potential and occupied Spiked Rice-flower habitat at the airport site. Some habitat may be permanently degraded through factors such as soil compaction and competition with other plant species particularly in the immediate vicinity of the underground cable and access tracks. Any Spiked Rice-flowers that survive or regenerate in the easement would be at risk of harm from maintenance activities.

The proposed impact mitigation and environmental management measures are likely to mitigate against any substantial effects on potential habitat outside of the immediate disturbance footprint until the complete removal of vegetation for construction of the airport site which is planned to commence in late 2018

The proposed activity may further modify habitat for Spiked Rice-flower through edge effects, weed infestation and erosion. However many of these factors are pre-existing within the existing transmission line easement.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposal, and

The disturbance footprint for the proposed activity is predominantly located within cleared agricultural land dominated by exotic vegetation. The diversion of the transmission line would remove narrow linear strips of vegetation from along the already disturbed edges of patches of native vegetation. This would include mostly regrowth vegetation or low condition grassland, with some areas of better condition vegetation. The disturbance area would continue to function as potential Spiked Rice-flower habitat after construction until the removal of occupied habitat as part of vegetation clearing construction of the airport site. Pollination, seed fall and other ecological processes would continue to occur around and through the disturbance area. The proposed activity would not permanently remove any habitat and so will not directly isolate or fragment any areas of potential habitat for this species.

In this context, the proposal would not have an adverse effect on habitat connectivity.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

A maximum of 0.12 hectares of occupied habitat would be removed or modified for the proposed activity containing approximately 75 Spiked Rice-flower clumps, which is approximately 2% of the total number of clumps recorded at the airport site.



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The proposed activity would remove or modify a further 14.84 hectares of potential habitat for the Spiked Rice-flower. The majority of this potential habitat has been modified through past agricultural and grazing activities and would have lower value.

Potential habitat within the disturbance area is not likely to be important to the long term survival of the species in the locality, given there are 3713 clumps of the species recorded nearby at the airport site.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

There is no critical habitat listed or nominated for the Spiked Rice-flower.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The proposed activity will result in harm to a maximum of 75 clumps of Spiked Rice-flowers and the removal or modification of occupied and potential habitat (see part d above)

The recovery plan for Spiked Rice-flower identifies a number of priority actions intended to ensure the long term conservation of the species in the wild (DEC, 2005). The removal of 75 clumps of Spiked Rice-flower from the disturbance area is inconsistent with the stated objective to: “conserve *Pimelea spicata* using land-use and conservation planning mechanisms” (DEC, 2005).

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity would contribute to the operation of the ‘clearing of native vegetation’ key threatening process (KTP) through the removal of 5.22 hectares of native vegetation that comprises occupied or potential habitat for the species.

The proposed activity also has the potential to indirectly cause or increase the operation of the following KTPs that are of potential relevance to this species:

Invasion of plant communities by perennial exotic grasses – the proposed activity would create disturbed edges through native vegetation and potentially transfer exotic grass propagules

Infection of native plants by *Phytophthora cinnamomi* - the proposed activity would disturb soil within and adjoining native vegetation and potentially transfer fungi spores.

The proposed activity would also include environmental management measures to reduce potential impacts on soil, water and native vegetation. These measures would help to mitigate against the operation of these KTPs.

Conclusion of Assessment of Significance

The proposed activity is unlikely to result in a significant impact on *Pimelea spicata*, pursuant to s.5A of the EP&A Act given:

- A small proportion of individuals recorded within the local population (around 2%) and 3% of occupied habitat would be disturbed the proposal activity;



Memorandum

- Up to 0.12 hectares of occupied Spiked Rice-flower habitat would be modified or degraded by the proposed activity; and
- Up to 14.84 hectares of potential Spiked Rice-flower habitat would be modified or further degraded by the proposed activity

The impacts on the removal of *Pimelea spicata* for the construction of the airport site would be addressed in the Biodiversity Offsets Delivery Plan.

6 Conclusion

A targeted survey for the Spiked Rice-flower was conducted on the 3rd and 4th of May 2017 to support the environmental assessment for the proposed diversion of the overhead transmission line within the proposed Western Sydney Airport site. Seventy-five clumps of the Spiked Rice-flower were recorded within the survey area and adjacent to The Northern Road. Up to 0.12 hectares of occupied Spiked Rice-flower habitat and 14.84 hectares of Spiked Rice-flower potential habitat would be disturbed or modified as part of the proposed activity. The likely significance of impacts on the Spiked Rice-flower was assessed pursuant to section 5A of the EP&A Act. The proposed activity is not likely to have a significant effect on the Spiked Rice-flower, and therefore a Species Impact Statement is not required. The impacts on the removal of Spiked Rice-flower for the construction of the airport site would be addressed in the Biodiversity Offsets Delivery Plan.

Regards

A handwritten signature in black ink, appearing to read 'm/w', enclosed in a light blue rectangular box.

Malith Weerakoon
Ecologist



Memorandum

7 References

Department of Environment and Conservation (2005) *Pimelea spicata R. Br. Recovery Plan*.
Department of Environment and Conservation (NSW), Hurstville NSW.

GHD (2016) *Western Sydney Airport; Environmental Impact Statement*. Report prepared for the
Department of Infrastructure and Regional Development.

GHD (2017) *Western Sydney Airport; Transmission Line 39 Diversion; Review of Environmental
Factors*. Report prepared for TransGrid

Office of Environment and Heritage (OEH) (2017) *Threatened Species Profile Search- Spiked Rice
Flower (Pimelea spicata)*. Accessed at:

<http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10632>

Appendix C Significance assessment

Impacts on EPBC listed biota

The significant impact guidelines 1.1 Impacts on EPBC Act listed biota are set out in the ‘Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999’ (DoE 2013a). These guidelines help identify MNES that are known or may occur at the proposed activity location and that have the potential to suffer a significant impact.

These guidelines outline a ‘self-assessment’ process, including detailed criteria to help assist persons in deciding whether or not a referral is required. In addition to the flora and fauna surveys undertaken for the Western Sydney Airport EIS, additional targeted surveys for the Spiked Rice-flower were undertaken in May 2017 as part of updated ecological survey work for the Stage 1 BAR for Western Sydney Airport. This will inform the Department of Infrastructure and Regional Development’s development of the Biodiversity Offset Delivery Plan (BODP), in accordance with Condition 30 of the Airport Plan. The likely significance of impacts of the proposed activity on these elements, informed by the EIS and Stage 1 BAR, are assessed below.

Table 1 Likely significance of impacts on threatened biota

Species/ Threatened ecological community	EPBC Act Status	Likelihood of occurrence in proposed activity location	Risk of impact	Quantum of impact	Significance of impact	Referral required?
Cumberland Plain Woodland	Critically Endangered Ecological Community	Present.	Certain. Direct impacts within a local occurrence of the community.	Temporary removal of up to 0.13 and 4.48 hectares of good and poor condition vegetation in a local occurrence of the community.	Unlikely.	No
Spiked Rice-flower	Endangered	Present. 75 individuals recorded which comprise a larger population	Certain. Known and potential habitat will be temporarily disturbed and possibly cleared.	Temporary removal of up to 0.12 hectares of known habitat and 14.88 hectares of potential habitat	Unlikely.	No
Grey-headed Flying Fox	Vulnerable	Possible	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely.	No
Swift Parrot	Critically Endangered	Possible	Low.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely	No

Impacts on plants, animals and their habitats

The significant impact guidelines for actions on or impacting upon Commonwealth land and actions by Commonwealth agencies, are set out in the Significant impact guidelines 1.2 (DSEWPC 2013). The guidelines identify the elements of the environment that require specific consideration and criteria to help determine whether or not an action is likely to result in a significant impact. The elements of the environment that are relevant to this biodiversity assessment are plants, animals and their habitat. The likely significance of impacts of the proposed activity on these elements are assessed below.

Plants

Table 2 Likely significance of impacts on plants

Significance criteria	Assessment of impacts
Is there a real chance or possibility that the action will:	
<ul style="list-style-type: none"> involve medium or large-scale native vegetation clearance 	<p>The demolition of a 3.2 kilometre section of the existing overhead transmission line and construction of a proposed 3.8 kilometre underground cable would result in direct impacts within a 14.96 hectare disturbance footprint, including 5.22 hectares of native vegetation. The extent of clearing of vegetation and habitats within the proposal activity location is summarised in Table 5-2. The majority of the proposed activity location is cleared land, cropland or exotic grassland (around 65%). Native vegetation removal at the airport site comprises land clearance as defined under the EPBC Act.</p>
<ul style="list-style-type: none"> involve any clearance of any vegetation containing a listed threatened species which is likely to result in a long-term decline in a population or which threatens the viability of the species 	<p>The proposal activity location includes at least 75 individuals comprising a local population of <i>Pimelea spicata</i>. Demolition of the existing overhead transmission line would remove part of a larger population as well as occupied and potential habitat. Refer to Appendix B for the assessment of significance for this species.</p> <p>No other threatened flora species or populations have been recorded at the proposed activity location.</p>
<ul style="list-style-type: none"> introduce potentially invasive species 	<p>Construction and demolition of transmission lines would involve a moderate level of vegetation removal but will mostly occur in previously cleared areas that contain mostly regrowth or grassland within an existing easement. The proposed activity would therefore not create some new edges on vegetation and habitat adjoining the site. Construction activities may, in general, increase the degree of weed infestation in adjacent areas through dispersal of weed propagules (seeds, stems and flowers) into areas of native vegetation via erosion (wind and water), workers' shoes and clothing or construction vehicles.</p> <p>Measures to manage weeds and to reduce the risk of spreading weeds off site in soil or water would be implemented during construction.</p>
<ul style="list-style-type: none"> involve the use of chemicals which substantially stunt the growth of native vegetation, or 	<p>Construction vehicles and equipment would cause a minor localized increase in the risk of hydrocarbon contamination or other pollutants. Measures to manage harmful substances and to avoid impacts on vegetation, soil or water and specifically to prevent discharge of harmful substances off site would be implemented during the construction and maintenance of the transmission easement. Any accidental mobilisation of harmful substances during construction would not be 'regular' (if at all) and are unlikely substantially to stunt the growth of native vegetation.</p>
<ul style="list-style-type: none"> involve large-scale controlled burning or any controlled burning in sensitive areas, including areas which contain listed threatened species? 	<p>The proposed activity would not result in large-scale controlled burning or any controlled burning in areas containing listed threatened plant species</p>

Animals

Table 3 Likely significance of impacts on animals

Significance criteria	Assessment of impacts
Is there a real chance or possibility that the action will:	
<ul style="list-style-type: none"> cause a long-term decrease in, or threaten the viability of, a native animal population or populations, through death, injury or other harm to individuals 	<p>More mobile common fauna such as birds, bats and larger mammals would be able to move to adjacent areas, or would be part of a larger local population. Some less mobile individuals of these populations (e.g. nestlings) may be subject to death or injury during clearing operations. The loss of these individuals is not likely to threaten the viability of the population.</p> <p>Individuals of other guilds including frogs, reptiles and the threatened Cumberland Plain Land Snail are likely to occur within the proposal activity location and may also be impacted by clearing operations.</p>
<ul style="list-style-type: none"> displace or substantially limit the movement or dispersal of native animal populations 	<p>The proposed activity would cause temporary displacement of fauna and/or mortality of less mobile fauna that are within the Stage 1 development construction impact zone at the time of construction activities. Some fauna may be able to seek refuge and persist in alternative habitat outside the airport site.</p> <p>The gap in habitat created by the construction of a transmission line easement would not be inhospitable to fauna nor a barrier to ecological processes such as dispersal. Mobile, aerial fauna species that comprise part of the ecological community would continue to occur in areas of open space around the proposal activity location.</p>
<ul style="list-style-type: none"> substantially reduce or fragment available habitat for native species 	<p>The proposed activity is located in a highly fragmented, rural landscape. Fragmentation of native vegetation and associated fauna habitats in the locality has previously occurred through clearing for agriculture, residences and farm buildings and construction of linear infrastructure (such as transmission lines and roads). These land uses have created barriers to movement for some fauna species, particularly those that are limited by dispersal abilities and habitat preferences. More mobile species, such as birds and bats, can more readily traverse this landscape.</p> <p>The temporary removal of 14.96 hectares of vegetation (mostly comprising exotic grassland or poor condition native vegetation) would cause displacement or mortality of less mobile fauna that are within the area to be cleared for the proposed activity at the time of construction activities.</p> <p>More mobile fauna, such as birds and bats would be displaced rather than killed. Some mortality of less mobile individuals, such as nestlings, old or sick animals may occur. The viability of these species would not be threatened, as similar habitat is found in surrounding areas, and most species that occur at the airport site have large distributions that cover a range of habitats.</p>
<ul style="list-style-type: none"> reduce or fragment available habitat for listed threatened species which is likely to displace a population, result in a long-term decline in a population, or threaten the viability of the species 	<p>Patches of native vegetation within the proposed activity location is highly fragmented and the temporary removal of mostly poor and low condition native vegetation could contribute to fragmentation at a local scale by removing patches of habitat, severing vegetated corridors.</p> <p>Highly mobile species such as the Grey-headed Flying-fox are expected to be less impacted by fragmentation and this species is well-adapted to accessing widely spaced habitat resources given its mobility and preference for seasonal fruits and blossom.</p> <p>Given the sedentary nature of the Cumberland Plain Land Snail and limited ability to colonise new areas, fragmentation would further limit the ability of this species to move through the landscape.</p> <p>All other threatened species recorded or likely to occur at the proposed activity location are highly mobile species. As such, fragmentation as a result of construction of the Stage 1 development is unlikely to result in a long-term decline in these populations, or threaten the viability of the species.</p>

Significance criteria	Assessment of impacts
<ul style="list-style-type: none"> introduce exotic species which will substantially reduce habitat or resources for native species, or 	Construction and demolition of underground cables and transmission lines respectively is unlikely to introduce new exotic species to the proposal activity location or surrounding habitats.
<ul style="list-style-type: none"> undertake large-scale controlled burning or any controlled burning in areas containing listed threatened species? 	The Stage 1 development would not result in large-scale controlled burning.

NSW listed biota

Table 4 Likely significance of impact on NSW-listed biota

Species/Threatened ecological community	TSC Act Status	Likelihood of occurrence in proposed activity location	Risk impact of	Quantum impact of	Significance of impact
Grey Box – Forest Red Gum grassy woodland on flats	Critically endangered ecological community	Present.	Certain. Direct impacts within a local occurrence of the community.	Temporary removal of up to 0.13 and 4.48 hectares of good and poor condition vegetation in a local occurrence of the community.	Unlikely
Forest Red Gum – Rough-barked Apple grassy woodland	Endangered ecological community	Present.	Certain. Direct impacts within a local occurrence of the community.	Temporary removal of up to 0.21 and 0.40 hectares of good and poor condition vegetation in a local occurrence of the community.	Unlikely
Spiked Rice-flower	Endangered	Present. 75 individuals recorded which comprise a larger population	Certain. Known and potential habitat will be temporarily disturbed and possibly cleared.	Temporary removal of up to 0.12 hectares of known habitat and 14.88 hectares of potential habitat.	Unlikely
Grey-headed Flying-fox	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely.

Species/Threatened ecological community	TSC Act Status	Likelihood of occurrence in proposed activity location	Risk impact of	Quantum impact of	Significance of impact
Cumberland Plain Land Snail	Endangered	Likely.	Moderate. Potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely
Little Eagle	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Little Lorikeet	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely
Scarlet Robin	Vulnerable	Possible.	Moderate. Potential foraging habitat and breeding habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Varied Sittella	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Black Bittern	Vulnerable	Possible.	Low. Small area of potential roosting habitat would be removed	Temporary removal of up to 0.21 hectares of potential roosting habitat in good condition Forest Red Gum- Grey Box Grassy Woodland	Unlikely
Dusky Woodswallow	Vulnerable	Possible.	Moderate. Potential foraging habitat and breeding habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
East Coast Freetail Bat	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely

Species/Threatened ecological community	TSC Act Status	Likelihood of occurrence in proposed activity location	Risk impact of	Quantum impact of	Significance of impact
Eastern False Pipistrelle	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Eastern Bentwing Bat	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Large-footed Myotis	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Greater Broad-nosed Bat	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Eastern Cave Bat	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Yellow-bellied Sheath-tail Bat	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Swift Parrot	Endangered	Possible.	Low. Small area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely
Powerful Owl	Vulnerable	Possible.	Low. Small area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely

Species/Threatened ecological community	TSC Act Status	Likelihood of occurrence in proposed activity location	Risk impact of	Quantum impact of	Significance of impact
Masked Owl	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Flame Robin	Vulnerable	Possible.	Moderate. Potential foraging habitat and breeding habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Hooded Robin	Vulnerable	Possible.	Moderate. Potential foraging habitat and breeding habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Diamond Firetail	Vulnerable	Possible.	Moderate. Potential foraging habitat and breeding habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Speckled Warbler	Vulnerable	Possible.	Moderate. Potential foraging habitat and breeding habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Black-chinned Honeyeater	Vulnerable	Possible.	Low. Small area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely
Gang-gang Cockatoo	Vulnerable	Possible.	Low. Small area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely

Species/Threatened ecological community	TSC Act Status	Likelihood of occurrence in proposed activity location	Risk impact of	Quantum impact of	Significance of impact
Glossy Black-cockatoo	Vulnerable	Possible.	Low. Small area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 0.34 hectares of potential habitat in good condition woodland	Unlikely
Barking Owl	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in regrowth woodland, grassland and good condition woodland	Unlikely
Square-tailed Kite	Vulnerable	Possible.	Low. Moderate area of potential foraging habitat would be temporarily disturbed.	Temporary removal of up to 14.96 hectares of potential habitat in good condition woodland	Unlikely

Conclusions of significance assessment

Based on the above considerations of the significant impact guidelines 1.2, the proposed activity is unlikely to have a significant impact on the environment. The proposed activity would result in:

- > temporary removal of 9.74 hectares of cleared land and exotic vegetation, 4.61 hectares of Cumberland Plain Woodland and 0.61 hectares of River-flat Eucalypt Forest
- > removal of up to 75 Spiked-Rice Flower individuals in 0.12 hectares of known habitat
- > removal and fragmentation of potential habitat for a range of threatened woodland birds, invertebrates and microchiropteran bat species listed under the TSC Act.

Appendix F – Submissions report



TransGrid

TransGrid Relocation Plan

**Western Sydney Airport
Transmission Line 39 Relocation**

December 2017

Executive summary

TransGrid proposes to relocate a 3.2 kilometre section of a single circuit, 330 kilovolt (kV) overhead transmission line (Transmission Line 39) that crosses Commonwealth land designated to be developed for the Western Sydney Airport (the proposed activity). The transmission line would be diverted generally around the edge and wholly within the airport site in the form of an underground cable.

This submissions report has been prepared to satisfy condition 4 (4)(a) of the Airport Plan for Western Sydney Airport under the *Airports Act 1996*. The condition requires the completion of an environmental assessment prior to the approval of the TransGrid Relocation Plan. The submissions report is to be read in conjunction with the *Western Sydney Airport Transmission Line 39 Relocation Environmental Assessment* (EA) prepared by GHD Pty Ltd on behalf of TransGrid (August 2017). The TransGrid Relocation Plan may be approved by the Infrastructure Minister or a Senior Executive Service Officer within the Department of Infrastructure and Regional Development (DIRD).

The EA was placed on public display on TransGrid's website for 20 business days between 18 August 2017 and 15 September 2017, so that the public and stakeholders could understand the proposed activity and provide their feedback. All stakeholders previously consulted as part of the preparation of the EA were notified in writing to inform them of the exhibition of the REF on TransGrid's website.

A total of three submissions from government agencies were received, with no submissions received from the public. This Submissions Report provides a summary of the issues raised in the submissions received and provides a response for each issue.

Issues raised by the government agencies

Submissions received in response to the proposed activity and the EA related to:

- > Environmental impacts – particularly relating to traffic, access and contamination
- > Licensing requirements.

Changes to the proposed activity

Since the exhibition of the EA and consideration of the three submissions received, TransGrid has reviewed the scope and the mitigation measures and made amendments to the proposed activity, these amendments include:

- > Clarification of the type of cable to be installed
- > The preferred construction method for The Northern Road crossing
- > Identification of additional laydown areas for transition sites including access to these locations
- > One additional dam crossing along the underground cable alignment.

Changes to the proposed activity are further described in Section 3, while an updated project description for the proposed activity is located in Section 4.1. Changes to the mitigation measures identified in the EA are outlined in Section 4.2. An updated summary of mitigation measures is also provided in Appendix A.

Additional assessment

The environmental impacts associated with the changes to the proposed activity have been reviewed against the nature and scale of impacts outlined in the EA (refer to Section 3). The environmental impacts associated with the proposed changes are considered to result in similar impacts to those described in the EA. In some instances, proposed changes to the proposed activity are considered to result in improved environmental outcomes/ reduced environmental impacts (e.g. the change in construction method for the crossing of The Northern Road).

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Document History

Revision No. and Date	Prepared By	Reviewed By
A – 9/10/2017	Ben James	Greg Marshall
B – 23/10/2017	Ben James	Greg Marshall
C – 31/10/2017	Ben James	Greg Marshall
D – 21/11/2017	Ben James	Greg Marshall
E – 24/11/2017	Ben James	Greg Marshall
F– 13/12/2017	Ben James	Greg Marshall

1. Introduction and background

1.1 Proposed activity

TransGrid proposes to relocate a 3.2 kilometre section of a single circuit, 330 kilovolt (kV) overhead transmission line (Transmission Line 39) that crosses Commonwealth land designated to be developed for the Western Sydney Airport (the proposed activity). The transmission line would be diverted generally around the edge and wholly within the airport site in the form of an underground cable.

The assessment of the proposed activity is documented in the *Western Sydney Airport Transmission Line 39 Relocation Environmental Assessment (EA)* prepared by GHD Pty Ltd on behalf of TransGrid (August 2017).

The proposed activity as outlined in the EA and placed on public exhibition consists of the following key activities:

- > Installation of an underground high voltage transmission cable
- > Construction of above ground to below ground transition points near the boundary of the airport site
- > Construction of a laydown area, access roads and watercourse crossing structures to facilitate construction as well as provide maintenance access
- > Removal of the existing above ground transmission line.

The location of the proposed activity is shown in Figure 4-1.

The TransGrid Relocation Plan (including the EA and this submissions report) may be approved by the Infrastructure Minister or a Senior Executive Service Officer within the Department of Infrastructure and Regional Development (DIRD).

1.2 Environmental Assessment display

The EA was publically displayed for 20 business days between 18 August to 15 September 2017 on TransGrid's website, in accordance with *TransGrid Consultation Protocol for Review of Environmental Factors (REFs) for Class 4 and 5 Activities* (March, 2016).

All stakeholders previously consulted as part of the preparation of the EA were notified in writing (i.e. letters) to inform them of the exhibition of the EA on TransGrid's website. Timeframe and details on how to make a submission on the proposed activity were included in the letter. A phone number and email address was provided in the letter and on the website to enable all stakeholders to contact TransGrid to find out more information.

1.3 Purpose of this report

This Submissions Report relates to the EA prepared for the *Western Sydney Airport Transmission Line 39 Relocation* and should be read in conjunction with that document. The EA was placed on public display and submissions relating to the proposed activity and the EA were received by TransGrid.

This report summarises the issues raised in the submissions and provides responses to each issue (refer to Section 2).

This Submissions Report also describes changes to the proposed activity since the public exhibition of the EA, and describes and assesses the changes to the proposed activity (it is noted that no additional assessments were considered necessary). Additionally, revisions have been made to the mitigation measures described in Section 4.2. Appendix A of this Submissions Report provides an updated summary of these mitigation measures.

This Submissions Report also fulfils the requirements of the *NSW Code of Practice for Authorised Network Operators* (the Code) through the documentation and the consideration of the submissions received.

2. Response to issues

2.1 Overview of responses

TransGrid received submissions from three respondents, which were accepted up until 15 September 2017.

All three submissions were from government agencies, with no submissions received from members of the public.

No submissions indicated objections to the proposed activity. Two submissions provided comment in relation to the impacts identified and assessed in Section 5 of the EA.

2.2 Overview of issues raised

The main issues raised in submissions relate to:

- > Environmental impacts – particularly relating to traffic, access and contamination
- > Licensing requirements.

Each submission has been examined individually to understand the issues raised. The issues raised in each submission have been extracted and collated, and responses to all issues have been provided. The issues raised and TransGrid's response to these issues forms the basis of this section of the report.

2.3 Response to issues

Table 1 provides the section of this report that addresses the issue/s from each respondent.

Table 1: Respondents

Respondent	Section where issue/s addressed
AirServices Australia	Section 2.3.1
Environment Protection Authority	Section 2.3.2
Roads and Maritime Services	Section 2.3.3

2.3.1 AirServices Australia

AirServices Australia did not identify any issues with the proposed activity from an environmental viewpoint that would be relevant to their role in the management of air traffic. This response has therefore been noted.

2.3.2 Environment Protection Authority

Table 2 outlines the issues raised by the Environment Protection Authority (EPA) in their submission and TransGrid's responses to these issues/comments.

Table 2: Environment Protection Authority submission and responses

Category	Issues Raised	Response
Proposed activity design/ materials	Cross Linked Poly-Ethylene (XLPE) cables are available as an alternative to fluid-filled cables which pose an environmental risk should they be damaged. EPA therefore does not support the installation of fluid-filled cables.	The design of proposed activity has been revised to specify the use of XLPE cables (refer Section 3.1). The project description has been revised in Section 4.1.

Category	Issues Raised	Response
Out of hours work	<p>EPA considers that 'out of hours' work, for example works to cross The Northern Road, should be avoided where possible and should only occur where it is appropriately justified. In the case of works at The Northern Road, EPA considers that underboring is a suitable construction method which would avoid the need to undertake work at night.</p>	<p>TransGrid is considering either trenching or underboring of the cable across The Northern Road.</p> <p>TransGrid acknowledge that underboring would minimise traffic related impacts along The Northern Road and potentially avoid the need for 'out of hours' work.</p> <p>If trenching of the cable across The Northern Road was to occur, it is anticipated that this would be undertaken across approximately two to three nights when traffic flows are low. The works would be performed under traffic control with one lane to remain open to allow for the passing of traffic.</p> <p>At the completion of each night of works, the excavation would be plated over to Roads and Maritime's standards, ready for full use during daylight hours. The remaining section of the trench would be performed on the following night(s) utilising the same method.</p> <p>TransGrid considers that undertaking 'out of hours' works for the purpose of trenching the cable across the Northern Road would not cause ongoing noise related impacts at nearby residents along Eaton Road as the works would likely only occur over two nights. If only two nights are permitted consecutively then two attempts of two nights will be required to trench across the road. Potentially affected residents would be notified of any 'out of hours' works in accordance with the revised mitigation measures outlined in Section 4.2.</p>

Category	Issues Raised	Response
Out of hours work	<p>Where 'out of hours' work, especially night work, is unavoidable, such works should only be carried out by such means that would ensure that:</p> <ul style="list-style-type: none"> > all feasible and reasonable noise mitigation and management measures are implemented to minimise noise impacts on nearby residences > no residence is subject to noise impacts arising from the proposed activity on more than 2 nights during any single week > the noisiest works (example: saw cutting, jack hammering, rock breaking and vibratory rolling) during any night of works would be undertaken early in the night and prior to an 11.00 pm curfew (or midnight where road occupancy is unavailable until after 8.00 pm). Where residences along the cable route are affected by noise from night works associated with other infrastructure projects in the locality, transmission cable night works are to be co-ordinated with those other night works > residences likely to be affected by night works are notified of upcoming night works not less than 5 days nor more than 14 days before those works are undertaken > a telephone complaints line operated by appropriately trained staff is available during all times at which work is being undertaken to receive complaints from members of the public who may have concerns about the manner in which the proposed activity works are being undertaken > community communication, consultation, and complaints investigation protocols and procedures are developed prior to any works and implemented in the context of a comprehensive Community Engagement Strategy. 	<p>Section 3.3.4 of the EA outlines the types of works proposed to be undertaken out of hours. The works to be undertaken out of hours has also been expanded to include works required to be undertaken during system outages in order to connect the new underground section to the existing overhead transmission line at the transition sites.</p> <p>The construction hours section of the EA (refer to Section 4.1.2) has been updated to include the measures which need to be implemented for any night works as detailed by the EPA. These measures have also been incorporated into the revised mitigation measures outlined in Section 4.2.</p>

Category	Issues Raised	Response
Water quality	<p>The proposed activity may cause significant water quality risks associated with crossing of waterways, clearing of vegetation, storage and handling of fuels and chemicals, erosion and sedimentation of stockpiles and management of water within open trenches. The following measures should be implemented to prevent water pollution:</p> <ul style="list-style-type: none"> > installation of erosion and sediment controls prior to excavation activities or site clearing > daily maintenance of erosion and sedimentation controls throughout the life of the proposed activity > storing all fuel and chemical in storage areas secured against unauthorised access. 	<p>The management of water quality impacts from the proposed activity would be minimised through the implementation of mitigation measures outlined in Sections 5.6.3 and 5.7.3 of the EA. These measures are considered sufficient in managing impacts on water quality which are likely to result from the construction of the proposed activity (refer to Section 5.7 of the EA).</p>
Notification requirements	<p>TransGrid should familiarise itself with its notification obligations concerning pollution incidents that cause material harm to the environment that is not of a trivial nature.</p>	<p>Noted. Pollution notification requirements under the <i>Protection of the Environment Operations Act 1997</i> are contained within mitigation measure EM5.</p>
Dust generation	<p>The management of dust during demolition, site preparation and construction should where possible minimise the generation of dust on site and prevent dust emissions off-site.</p>	<p>The mitigation measures outlined in the EA for air quality are considered to be sufficient to minimise and prevent dust generation on and off-site.</p>
Contamination due to decommissioning of existing line	<p>Some transmission line towers may be coated with lead-based paint or other chemicals of concern used to inhibit corrosion and that areas around these towers may have become contaminated. It is unclear whether assessment of this potential contamination has been undertaken as part of the environmental assessment. Prior to the demolition of towers, all towers and immediate soils should be assessed for the presence of hazardous materials including lead-based paint and other chemicals of concern.</p>	<p>There is potential that transmission structures to be demolished contain lead-based and/or asbestos containing paint. Consequently, each tower and surrounding soil would be tested for the presence of lead-based and asbestos containing paint and managed accordingly, should contaminants be identified. A mitigation measure has been included in Section 4.2 to reflect this.</p>

Category	Issues Raised	Response
Contamination due to decommissioning of existing line	Prior to its removal from site, all waste generated during the proposed activity should be assessed, classified and managed in accordance with the “ <i>Waste Classification Guidelines Part 1: Classifying Waste</i> ” (Department of Environment Climate Change and Water, December 2009). This includes assessment of the presence of any hazardous materials associated within the decommissioned transmission line towers.	As outlined in mitigation measure WA3 (refer Appendix A), all waste removed from site would be classified in accordance with the <i>Waste Classification Guidelines</i> (EPA 2014).

2.3.3 Roads and Maritime Services

Table 3 outlines the issues raised by the Roads and Maritime Services (Roads and Maritime) in their submission and TransGrid’s responses to these issues/comments.

Table 3: Roads and Maritime Services submission and responses

Category	Issues Raised	Response
Licencing requirements	Any development that proposes to use a Roads and Maritime controlled road corridor requires the approval of Roads and Maritime in accordance with section 138 of the <i>Roads Act 1993</i> . This is to ensure safety is maintained in accordance with the <i>Work Health and Safety Act 2011</i> and Austroad requirements.	As outlined in Section 4.4 of the EA and EM4, an approval under section 138 of the <i>Roads Act 1993</i> would be obtained for any works located within The Northern Road corridor.
Licencing requirements	Any development that proposes to use a non-RMS controlled road corridor requires the approval of the relevant council. In this case, this would apply to the access to the southern and northern transition sites at Willowdene Avenue/Vicar Park Lane and Anton Road/Adams Road.	As outlined in Section 4.4 of the EA, an approval from council is not required due to the application of Clause 2 of Schedule 2 of the <i>Roads Act 1997</i> which states that a network operator under the <i>Electricity Supply Act 1995</i> is not required to obtain approval for works within the corridor of unclassified roads (e.g. Willowdale Avenue, Anton Road and Adams Road). Vicar Park Road is no longer proposed to be used for access to the transition site. Access would be available via a access track through the airport site. Access to this track would be off The Northern Road near the proposed main laydown area.

Category	Issues Raised	Response
Licencing requirements	<p>Any access to assets that are within the road pavement or footway that requires a speed reduction, partial or full road closure, night works will be subject to obtaining a Road Occupancy Licence through Transport for NSW's Transport Management Centre (TMC). Roads and Maritime recommends that TransGrid consults with TMC separately. This also applies to any future maintenance access. It is noted that the road would need to be restored in accordance with Roads and Maritime's QA Specification M209 (Road Openings and Restorations).</p>	<p>The proposed activity would not require any access to assets within existing road pavements or footpaths other than the crossing of The Northern Road by the proposed activity, which may be trenched.</p> <p>TransGrid acknowledge that all works within the road corridor of The Northern Road would be undertaken in accordance with a Road Occupancy Licence to be obtained from Transport Management Centre. Damage to the road caused by trenching (if adopted) would be reinstated in accordance with the Roads and Maritime's QA Specification M209 (Road Openings and Restorations)</p> <p>If adopted, trenching across The Northern Road would require the closure of one lane over and would be undertaken over two nights. This would be undertaken under traffic control and any specific measures provided by the Transport Management Centre in the Road Occupancy Licence. Additionally, the de-stringing of the conductors and overhead earth wire (OHEW) on the section of Line 39 to be decommissioned would require a Road Occupancy Licence and would be undertaken in accordance with specific conditions imposed by the Transport Management Centre.</p>
Licencing requirements	<p>Method of decommissioning of the high voltage transmission lines over The Northern Road will need to be developed to consider traffic disruption. TransGrid to seek approval from TMC for closing the road or management techniques for the overhead conductor removal.</p>	<p>The finalised method of the de-stringing of the conductors and earth wires on the section of Line 39 to be decommissioned would be detailed in the application for the Road Occupancy Licence under Section 138 of the <i>Roads Act 1993</i>.</p> <p>Notwithstanding the above, it is anticipated that the de-stringing of the conductors and the overhead OHEW would be performed in a sequential manner. Prior to the de-stringing (likely the day before), the overhead conductors and the OHEW would be de-tensioned and</p>

Category	Issues Raised	Response
		<p>placed in rolling blocks fitted to the top of each structure. The following day, each conductor would be separately lowered to the ground surface, then cut and moved to each side of the road. The conductors would then be hauled via winch system from each transition site end in a controlled manner. The conductors would be de-energised during this process and would be performed under traffic control.</p>
Wiring heights	<p>Roads and Maritime has provided the proposed road level for The Northern Road Realignment (Eaton Road to Mersey Road). TransGrid are to ensure that the existing and future overhead conductor heights have suitable clearances to the finished road surface level, as well as suitability for construction of The Northern Road realignment.</p>	<p>The proposed activity involves the construction of an underground cable and does not result in any overhead conductors over the proposed realignment of The Northern Road</p>
Construction methods	<p>The construction of The Northern Road crossing using open trenching is not considered suitable. The use of underboring should be considered. A suitable level of protection of the cable should also be considered at this location.</p>	<p>TransGrid is still considering both underboring or trenching of the cable across The Northern Road. Whilst detailed design has yet to be completed, adequate protection of the cable would be incorporated into the design for public safety and protection from damage of the cable whether it be placed in trench or underbored.</p>
Compound access	<p>Access to the southern transition site has been nominated via an access from The Northern Road. TransGrid would be required to design this access and gain approval from TMC.</p> <p>Reference is made to a slip lane to be established along The Northern Road. Roads and Maritime notes that this was on the understanding that the slip lane is a temporary feature. TransGrid is to obtain approval for the design of the slip lane from the TMC. If the slip lane is proposed to become a permanent feature, a Works Agreement Deed with RMS will need to be established.</p>	<p>Access off The Northern Road to the proposed new access track, which provides construction vehicle access to the southern transition site has been assessed in the <i>Line 39 Sydney West to Western Sydney Airport Optical Ground Wire Installation – Summary Environmental Report</i> (TransGrid, 2017). The Summary Environmental Report (SER) was prepared under Part 5 of the <i>Environmental Planning and Assessment Act 1979</i> and included an assessment of the required works associated with the relocation of Line 39 occurring outside the Commonwealth land boundary. This included installation of optical ground wire and the construction of a slip lane off The</p>

Category	Issues Raised	Response
		<p>Northern Road.</p> <p>The design of the new slip lane was undertaken in consultation with The TMC and would address potential impacts on road safety and the flow of traffic along The Northern Road resulting from the movement of construction vehicles in and out of the airport.</p> <p>TransGrid would gain approval from TMC for the construction of the access road.</p>
Out of hours work	Approval for 'out of hours' works would be required from the TMC.	Any night works affecting the operation of The Northern Road and other roads would be undertaken in accordance with any approval from the TMC. This would include the delivery of any oversized equipment.
Aboriginal heritage	Roads and Maritime recently displayed the Environmental Impact Statement (EIS) for the upgrade of The Northern Road, from Mersey Road, Bringelly to Glenmore Parkway, Glenmore Park – part of which traverses through the Western Sydney Airport site. The Aboriginal Heritage Assessment identified a number of heritage sites that may be impacted by the TransGrid proposal. These sites were redacted from the EIS placed on public display to protect cultural heritage values.	<p>A review of the Aboriginal Cultural Heritage Assessment (ACHAR) for The Northern Road Upgrade identified the boundary of four sites listed on the Office of Environment and Heritage's Aboriginal Heritage Information Management System (AHIMS) as being potentially affected by the proposed activity. These four sites as mapped by Kelleher Nightingale (2017) in the ACHAR included 45-5-4795, 45-5-4791, 45-5-4798 and 45-5-4799. It is understood that these were not previously identified as part of the Western Sydney Airport EIS.</p> <p>These sites would be further investigated as part of the survey and salvage program to be developed and implemented by DIRD in accordance with mitigation measure AH1 in Appendix A.</p>

3. Changes to the proposed activity

Since the exhibition of the EA and progressions with the project design, TransGrid have made the following changes to the proposed activity in response to the submissions received and to incorporate requirements identified during the ongoing design and construction methodology of the proposed activity. The changes include:

- > Clarification of the type of cable to be used
- > Identification of additional laydown areas at transition sites
- > Inclusion of an additional dam crossing.

These changes are discussed in further detail below and the description of proposed activity has been modified to reflect these changes in Section 4.1.

3.1 Cable type and materials

3.1.1 Description of the change

The proposed activity described in the exhibited EA did not specify the type of cable or materials used in its manufacture. Cross Linked Poly-Ethylene (XLPE) cables would be used in the design of the underground cable.

The proposed activity description has been updated to confirm that XLPE cables would be used for the proposed activity.

3.1.2 Reasons for the change

The description was updated to clarify that XLPE cables would be used, which poses less environmental risk (e.g. contamination) compared to other cable types, such as oil filled cables.

3.1.3 Alternative options considered

An assessment of cable type options was not undertaken as the use of XLPE cables is already the preferred option over other cable types, such as oil filled cables, due to the environmental benefits of XLPE cables.

3.1.4 Additional environmental assessment and potential impacts

No further assessment is required to be undertaken.

3.2 Laydown areas for transition sites

3.2.1 Description of the change

Further progression of the project design and construction planning has identified the need for two laydown areas to support the works at the two transition sites. The laydown areas were not identified and assessed in the EA. These areas would be located adjacent to the transition sites in the locations shown in Figure 4-6 (within the revised proposed activity description section in Section 4.1).

The northern transition site laydown would be about 100 metres by 60 metres, while the southern transition site laydown would be about 60 metres by 60 metres. These areas would potentially include:

- > Demountable site offices
- > Toilet facilities
- > Vehicle parking
- > Storage areas for equipment, material and waste.

Access to the northern transition site and laydown would be provided via an access track off Anton Road. The access would be about six metres wide and would also provide access to the underground cable alignment. The alignment of this access is shown in Figure 4-6. It should be noted that the access track off Anton Road

to the northern transition site was assessed as part of the EA, however was absent from the figures in the EA. The track is now shown in Figure 4-1.

3.2.2 Reasons for the change

Further construction planning has been undertaken and it was determined that additional laydown areas are required. The establishment of additional sites also reduces the need for travel between the two transition site and laydown area adjacent to The Northern Road, as identified in the EA.

3.2.3 Alternative options considered

No alternatives to these locations have been investigated. The positioning of the sites were selected to be as close to the works as possible while ensuring that the site is relatively flat, located in previously cleared areas and is located outside of Aboriginal and non-Aboriginal heritage items identified in the EA.

Any further changes (or new laydown areas required) would be considered against the following principles:

- > Located more than 50 metres from a waterway, unless an erosion and sediment control plan is developed and implemented
- > Have ready access to the road network
- > Be located to minimise the need for heavy vehicles to travel on local streets and/or through residential areas
- > Be located on relatively level land
- > Be separated from the nearest residences by at least 200 metres, unless reasonable and feasible noise and light spill mitigation measures are implemented
- > Not require native vegetation clearing beyond that already required for the proposed activity
- > Not have any more than a minor impact on heritage items beyond those already assessed for the proposed activity
- > Not unreasonably affect the land use of adjacent properties external to the Western Sydney Airport site
- > Be above the five per cent annual exceedance probability flood level, unless a contingency plan to manage flooding is prepared and implemented
- > Provide sufficient space for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard daytime construction hours.

3.2.4 Additional environmental assessment and potential impacts

The proposed laydown areas are positioned within existing cleared areas and were identified in accordance with principles which would avoid impacts on sensitive areas and minimise environmental impacts generally. The use of these sites would not require any further clearance of vegetation, with the exception of some exotic grasses. The proposed laydown areas and additional accesses are not considered to result in any changes to the nature or scale of impacts assessed in the EA. After use of the sites is no longer necessary, the areas would be rehabilitated.

3.3 Change in dam crossing method for dam to remain

3.3.1 Description of the change

The EA assessed the construction of bridge structures over Dams 1, 2 and 3 as the filling in of these dams is not feasible due to the reliance of these dams for properties not within the airport site. It is now proposed that these crossing are to consist of large diameter culvert crossing in which the cable route would be installed. Figure 4-4 provide an example of the crossings to be installed.

3.3.2 Reason for the change

Ongoing design development has indicated that the construction of the culvert crossings is a more effective methods compared the construction of cable bridges. The establishment of culvert crossing has the following benefits:

- > Easier to construct than cable bridge structures
- > Provision of the culvert crossings would provide TransGrid full vehicular access along the easement whereas proposed cable bridges would not allow vehicular access and therefore some sections of the route would not be accessible by vehicles
- > Placing the cable belowground (under the culvert crossings) would have the following benefits:
 - improved safety of the cable during construction of the airport due to movement of vehicles in the vicinity of the cable route
 - improved safety of the cable during its operation as the risk of damage is reduced due to its positioning below ground, this includes any risk of damage during flood events
- > Costs to construct and maintain these crossings is reduced when compared to the cable bridges.

3.3.3 Alternative options considered

The proposed method was considered to be the alternative method to the method outlined in the EA. It was noted that filling in the dam was considered during early phases of the project however this alternative was not considered again due to the need for the dam to remain on site. No additional alternatives where therefore considered.

3.3.4 Additional environmental assessment and potential impacts

The proposed changes in the construction method of the dam crossing would result in some increased impacts as there is a need to drain the dams to enable the trenching of the cable and the installation of the culverts. The draining of these dams would result in some downstream impacts to properties which rely upon flows from these dams. Overall such impacts are considered to be short-term in nature, with the proposed culverts to allow flows to be maintained in the long term. Consultation would be undertaken with any downstream property owners to discuss the potential reduction in water availability. Alternative water supply options would be discussed if required.

Any impacts on biodiversity due to the draining of dams would be managed through the implementation of mitigation measures.

3.4 Additional dam crossing

3.4.1 Description of the change

An additional small dam is located within the proposed activity construction corridor. This crossing is located at Crossing 5 as shown in the revised figure in the updated proposed activity description (see Figure 4-1 in Section 4.1). Due to the small size of this dam, it is proposed for the dam to be filled and then trenched as part of the works.

3.4.2 Reasons for the change

Further survey information and review of the design identified that this small dam would be impacted by the proposed activity.

3.4.3 Alternative options considered

A number of potential crossing methods were considered for this additional dam crossing, these consisted of the following:

- > Filling the dam and trenching through the fill material
- > Draining and trenching beneath the dam

- > Underboring the dam
- > Installation of a cable bridge.

Due to the small size of the dam, filling and trenching of the dam was considered to be the preferred option.

3.4.4 Additional environmental assessment and potential impacts

Impacts to the dam would be similar to those described in the EA in relation to the other crossings proposed, although smaller because of the relative size of the dam. No further assessment is therefore considered necessary as the incremental impact would be minor. Draining and filling of dams would be included into the Erosion and Sediment Control Plan (ESCP) (mitigation measure GS1). No additional mitigation measures are necessary.

4. Updated proposed activity description and environmental management

4.1 Proposed activity description

The below sections outline the revised proposed activity description and construction methodology for the proposed activity, based on the changes outlined in Section 3 and due to ongoing development of the proposed activity.

Any additions to the proposed activity description are shown as underlined text, while any aspects of the proposed activity which have been altered are shown in ~~strike through text~~.

4.1.1 Detailed proposed activity scope

Section 3.5.2 of the Airport Plan authorises ~~outlines the need~~ for the relocation and removal of a range of existing utilities from the airport site to facilitate development for the Western Sydney Airport. Part 3 Section 3.10 outlines the conditions to be completed in accordance with subsection 96B(9) of the *Airports Act 1996*, including the need for TransGrid to undertake relocation of the transmission line in accordance with a TransGrid Relocation Plan.

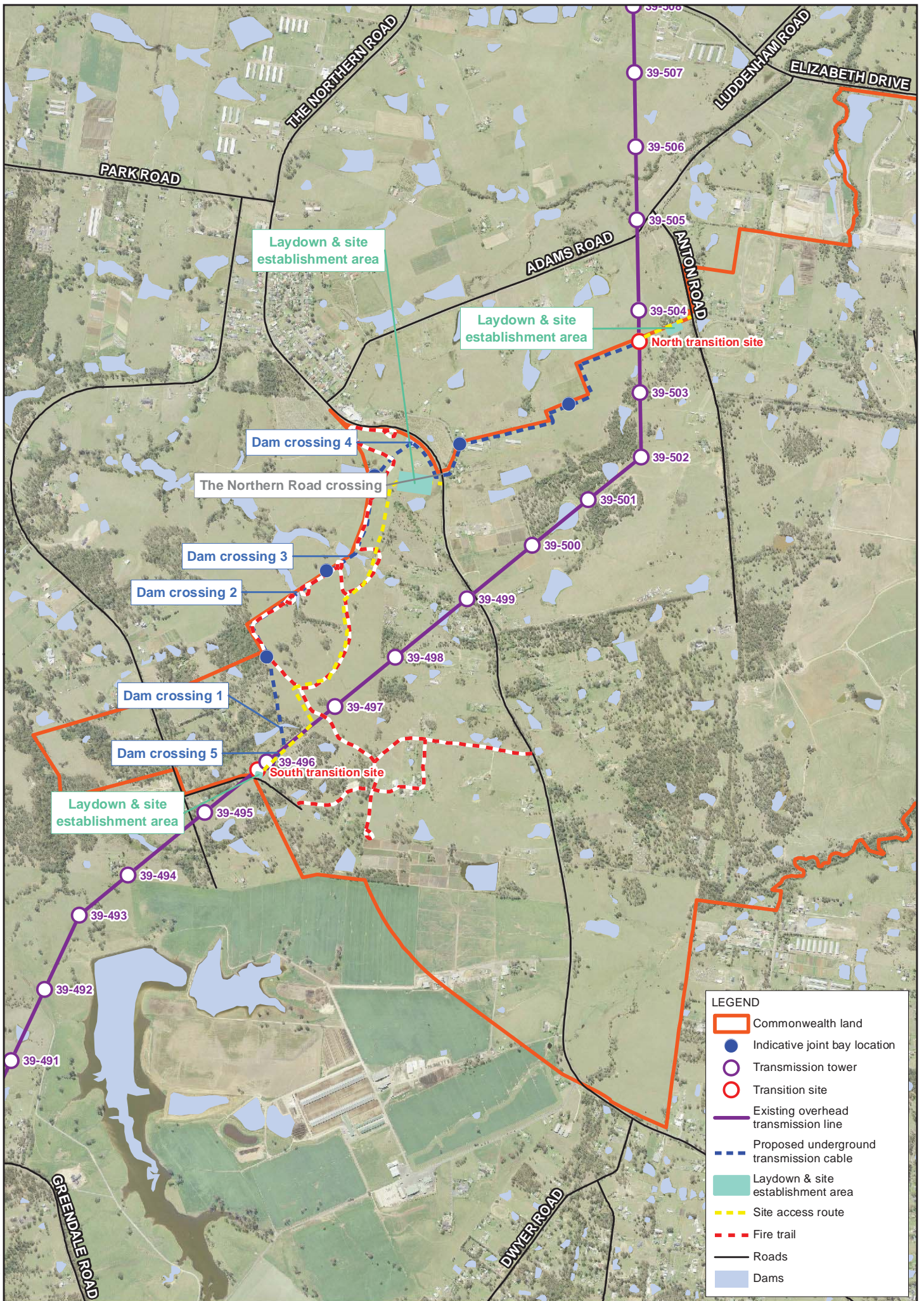
The proposed activity of works to relocate the TransGrid 330kV high voltage transmission line crossing the airport site, which would involve ~~consists of~~ the following key activities:

- > Installation of an underground high voltage transmission cable;
- > Construction of above ground to below ground transition points on the boundary of the airport site;
- > Construction of a laydown area, access roads and watercourse crossing structures to facilitate construction as well as provide maintenance access; and
- > Removal of the existing above ground transmission line.

The proposed underground cable and underground/overhead transition sites, existing overhead transmission line and temporary construction access tracks and laydown areas are shown in Figure 4-1.

The works will primarily be undertaken offline from the existing operational transmission line. Outages will however be required to allow the connection of the new underground cables to the existing transmission line at the two transition sites. Works for this connection will seek to minimise power outages wherever possible, with TransGrid's standard procedures to be applied for these works. Details of these outages are outlined in Table 4-2.

The proposed activity scope is detailed further in the below sections.



Data source: Aerial imagery - sixmaps 2016, General topo - NSW LPI DTDB 2012 & 2015, Transmission line data - TransGrid, Heritage - Navin Officer Heritage Consultations. Created by:jprice

Figure 4-1 Proposed activity

0 250 500 1,000

Metres



Underground/overhead transition sites

Transition sites would be established at the northern and southern ends of the underground cable to connect it to the existing overhead transmission line located outside the airport site. The location of the transition sites is shown in Figure 4-1.

Northern transition site

The northern transition site would be located within a fenced yard and will be approximately 37 metres wide by 52 metres long, including a seven metre buffer zone surrounding the physical infrastructure which would be approximately 20 metres by 40 metres. The transition site would include surge arrestors, current sensors, cable sealing ends, conductor supports and three concrete or steel landing poles about 20 metres tall.

The terminal tower for this transition site is located outside of the airport site and does not form part of the proposed activity.

Southern transition site

The southern transition site would be located within a fenced yard and will be 40 metres wide by 70 metres long, including all buffer zone for embankments and clearances for new terminal tower which would be approximately 35 metres by 40 metres. The transition site would include surge arrestors, current sensors, cable sealing ends, conductor supports and three concrete or steel landing poles about 20 metres tall.

The southern transition site would include the provision of a 30 metre high terminal tower to the north-east of the transition site.

Underground cable

Alignment

The proposed underground cable would be positioned within the airport site, however external to the airside operational areas of the airport. This results in the cable being positioned along the generally follow the airport site perimeter of the designated airport site (see Figure 4-1).

Cable arrangement and surface infrastructure within the easement

The underground cable is proposed to be constructed in a split trench arrangement which results in two separate parallel trenches each containing Cross Linked Poly-Ethylene (XLPE) cabling. The typical cross section of these trenches within the easement is shown in Figure 4-2.

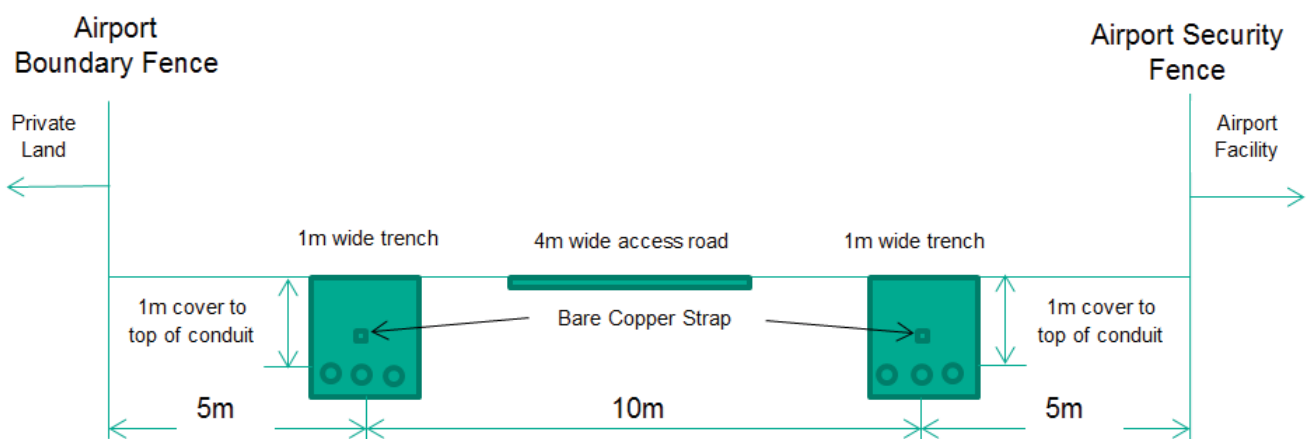


Figure 4-2: Typical cross section of proposed underground cable

Each trench would contain three cables which would be laid in conduits and buried at a minimum depth of one metre. The cable arrangement within each trench is shown in Figure 4-2. The cable trenches would be backfilled with thermal stabilised backfill, which would enhance the heat dissipation from the cables. This would allow the use of cables with the minimum possible cross sectional area to achieve the required ratings.

Each trench would also include communication cabling to assist TransGrid with the monitoring and management of the entire transmission line (including beyond the extent of the proposed activity).

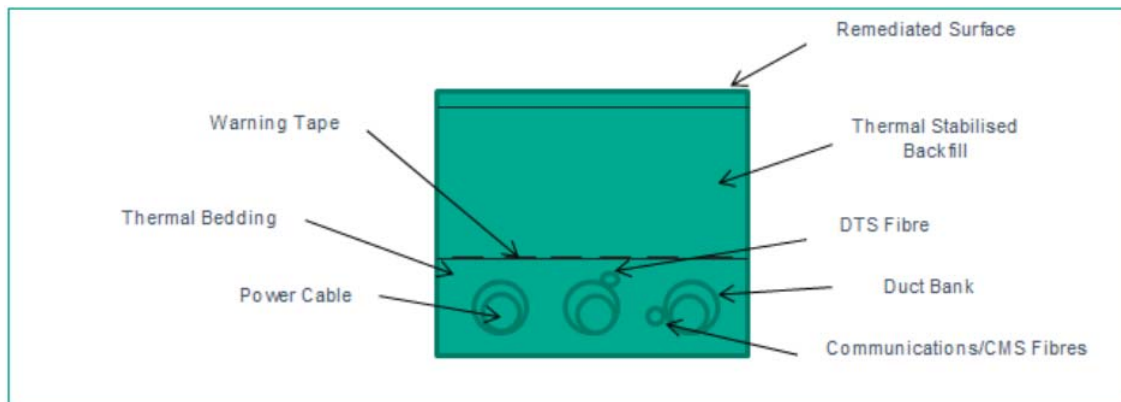


Figure 4-3: Typical cross section of proposed underground cable trench

Joint bays would be required to connect lengths of cable together along the proposed underground cable. It is estimated that about five bays would be required for each cable; these bays occur at the approximate locations shown in Figure 4-1. The actual location of the joint bays would be confirmed during detailed design. The positioning of joint bays would be avoided in some areas where they would interfere with the operation of the airport (e.g. at the end of runways). Cable joint bays would consist of a precast concrete structure (refer to Figure 4-5) where cables would be joined. These bays would be buried in sand to allow access when required during future maintenance activities (including during emergencies).

An access track would also be provided along the entire easement for maintenance purposes. This would be positioned between the two trenches as shown in Figure 4-2. The access track would be constructed of gravel or road base (to be confirmed during detailed design).

Dam crossings

The proposed underground cable would cross existing dams at the ~~four~~ five locations shown in Figure 4-1. All dam crossings are located within the airport site, however the boundary of Dam 2 and Dam 3 extend beyond the airport site.

The crossings at Dam 1, Dam 2 and Dam 3 would be established through the installation of a large diameter culvert crossing as shown in Figure 4-4. The crossing at Dam 4 and Dam 5 would be established via dewatering each dam, followed by infilling and reshaping the void, so it is level with the surrounding ground surface and topography.



Figure 4-4: Indicative diagram of a large diameter culvert crossing used for dam crossings



Figure 4-5: Joint bay

The Northern Road crossing

The proposed underground cable would cross The Northern Road at the location shown in Figure 4-1. The crossing would be either trenched or underbored, with the preferred method to be determined during detailed design by the appointed contractor under consultation with TransGrid, Roads and Maritime Services and potentially affected utility providers. All works within the road reserve would be undertaken in accordance with

a Road Occupancy Licence to be obtained from Roads and Maritime Services prior to the commencement of the cable crossing works. Detailed design of this crossing would be undertaken to determine the exact nature of this crossing particularly due to the presence of a number of existing utilities in the vicinity of the proposed crossing.

Rehabilitation of new transmission line easement corridor

All disturbed areas not required for future construction activities within the designated airport site, for or operation of the proposed underground cable would be rehabilitated and stabilised as soon as practicable after disturbance. Rehabilitation of the site would to a level which is consistent with the existing situation. The exception to this is where consultation with DIRD or WSA Co Western Sydney Airport Company have alternate conditions they wish the site to be left in.

Testing and commissioning

Following completion of construction activities, the cable would be tested, connected to the transmission line and energised. Once energised, the transmission line would be operational and the existing transmission line would be able to be demolished (refer to below section).

Overhead transmission line demolition and removal

Following the commissioning of the proposed underground cable, the existing overhead section of the transmission line within the designated airport site would be decommissioned and demolished.

Decommissioning and demolition would involve the removal of eight steel transmission structures and the associated conductors, fittings and earth wires; however the concrete footings would remain in-situ and later removed as part of the construction of Western Sydney Airport.

4.1.2 Construction activities

Construction methodology

Construction of the proposed activity would involve the following key stages:

- > Construction of access tracks
- > Establishment of laydown area/compound area
- > Construction of new transition sites
- > Construction of proposed underground cable
- > Testing and commissioning of new transmission line
- > Decommissioning and removal of existing transmission line
- > Site demobilisation.

Construction access tracks

Access to construction areas would be available via the following:

- > New access track to provide access to the northern transition site from Anton Road and to the south transition site from The Northern Road. The access track would also provide access to the cable easement and the laydown area
- > Along existing fire trails located on the airport site wherever possible
- > Along the proposed underground cable easement
- > Along the existing transmission line easement which can be accessed from either existing roads (e.g. The Northern Road) or via the new access track mentioned above.

These tracks would be wholly located within the airport site. The proposed new access track They would be constructed of gravel/road base and would provide improved wet weather access particularly for large equipment such as cranes. The track would be approximately four metres wide with the alignment shown in

Figure 4-1. It is anticipated that the new access track would remain in-situ to facilitate future construction activities within the airport site.

Some minor ground improvements (such as grading, temporary culverts or the placement of gravel or similar material) would be required to provide access along the existing transmission line easement in order to access the existing transmission towers. The need for any further tracks would be confirmed during detailed design or construction planning. Any additional tracks would be planned in consultation with WSA Co and/or the Commonwealth. The siting of any tracks would be guided using the following principles to minimise impacts on the environment:

- > Be located to minimise the need for heavy vehicles to travel on local streets and/or through residential areas once vehicles leave the site
- > Be located on relatively level land
- > Not require native vegetation clearing beyond that already required for the proposed activity
- > Not have any impact on heritage items beyond those already assessed for the proposed activity
- > Not unreasonably affect the land use of adjacent properties
- > Be above the five per cent annual exceedance probability flood level, unless a contingency plan to manage flooding is prepared and implemented.

Construction of laydown area

A construction laydown area would be established. ~~at~~ The indicative location is shown in Figure 4-1. This laydown area would be located west of The Northern Road near the proposed underground cable crossing. The laydown area would be about 170 465 metres by 100 65 metres in size. The laydown area would also function as a construction compound and would support the construction phase of the proposed activity. The primary purpose of the laydown area is for the storage of equipment and materials as they arrive to site. Materials would then be moved to where works are occurring along either the existing or new transmission line alignments.

The laydown area/compound would also potentially include the following facilities:

- > Demountable site offices
- > Toilet facilities
- > Vehicle parking
- > Storage areas for equipment, material and waste.

The laydown area /compound would be accessed via a new access track from The Northern Road.

Two smaller laydown areas would also be needed at the northern and southern transition sites. These would be about 100 metres by 60 metres and 60 metres by 60 metres respectively. The locations of each of these sites is shown in Figure 4-6.

The northern transition site would be accessed via a new track from Anton Road, while the southern site would be accessed via the new access track off The Northern Road (refer to Figure 4-6).

Figure 4-6 Northern and southern transition sites

Additional laydown areas or the modification of those identified above may be identified by the construction contractor. The siting of new laydown areas or modification of existing laydown areas would be guided using the following principles to minimise impacts on the environment:

- > Located more than 50 metres from a waterway, unless an erosion and sediment control plan is developed and implemented
- > Have ready access to the road network
- > Be located to minimise the need for heavy vehicles to travel on local streets and/or through residential areas
- > Be located on relatively level land
- > Be separated from the nearest residences by at least 200 metres, unless reasonable and feasible noise and light spill mitigation measures are implemented
- > Not require native vegetation clearing beyond that already required for the proposed activity
- > Not have any more impact on heritage items beyond those already assessed for the proposed activity
- > Not unreasonably affect the land use of adjacent properties external to the airport site
- > Be above the five per cent annual exceedance probability flood level, unless a contingency plan to manage flooding is prepared and implemented
- > Provide sufficient space for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard daytime construction hours.

Consultation with WSA Co or DIRD would also be undertaken and agreement obtained to ensure the locations any additional laydown areas does not interfere with any works being undertaken by other parties.

Construction of new transition sites

Works at the two transition sites would be undertaken within the proposed transition site areas. Works would generally involve the assembly and installation of prefabricated components with cranes and elevated work platforms. Clearing of vegetation would be required within the boundary of each transition site to facilitate construction.

Civil works at the transition sites would include bulk earthworks to establish a level bench at each transition site followed by the establishment of foundations for primary plant. Additionally, excavations for the new northern and southern termination tower footings would be established. It is anticipated that 169 and 773 cubic metres of spoil would be generated at the northern and southern transition sites respectively. The above numbers are considered to be worst-case should the spoil excavated not be suitable for reuse as part of rehabilitation works at these sites.

Construction of proposed underground cable

Preparation of the easement

To mark the alignment of the proposed underground cable, small concrete pegs would be installed along the easement. The pegs would be placed at about 50 metre intervals along the easement or at any change in direction of the transmission line. Cable markers would also be provided at The Northern Road crossing in the form of metallic plates on the kerb at either end of the road crossing.

The easement would be progressively cleared to allow for trenching. The clearance area would be delineated to ensure clearance activities are contained within the 20 metre wide easement. Topsoil would be stripped and stockpiled outside the easement for reuse along the easement once all excavation has been backfilled. The exact location of stockpiles would be determined in consultation with WSA Co and the Commonwealth.

All vegetation waste would be collected and disposed of at an appropriately licenced facility. Alternatively, vegetation would be mulched on site and stockpiled for potential reuse. All vegetation clearing would be undertaken in accordance with the prescribed mitigation measures as summarised in Appendix A.

Trenching, cable installation and backfilling

Construction activities associated with trenching would include:

- > Excavating trenches, including stockpiling spoil material on site for potential reuse in the filling of dams (subject to confirmation of suitability for this purpose)
- > Spreading granular bedding material such as sand or gravel along the base of the trench before cable laying
- > Installing the cable (further detail provided below)
- > Backfilling the trench with imported thermal stabilised backfill
- > Reuse of stockpiled topsoil to rehabilitate the surface.

Trenching methods would include both machine trenching and hand trenching. Trenching would generally be carried out using excavators and a small compactor. Rock breakers may also be required where bedrock is encountered during excavation. Hand trenching would only be used in areas where an excavator is unable to undertake the trenching works. Trenching would however potentially not be used for the crossing of The Northern Road as described below, with underboring to also be considered during detailed design.

The trench would be constructed in sections and would aim to minimise the time in which any one section of trench remains open. The above method would be repeated for each new section of the transmission line. Trench shoring would be provided to prevent collapse of the trench.

Approximately 12,000 cubic metres of soil is expected to be excavated for the proposed underground transmission cable. The cable trench would be backfilled with thermal stabilised backfill to enhance the heat dissipation from the cables to achieve operational requirements, resulting in surplus spoil. Where applicable, surplus spoil would be reused onsite as fill for the dams or stockpiled within the airport site (to be confirmed as part of construction planning for the airport) for future activities as part of the construction of the airport. Any spoil not suitable for reuse due to contamination or other issues would be removed from the airport site and disposed at an appropriately licenced facility.

Cable laying

The cables would be installed by pulling from the cable drum and winch sites. Pulling pits would also be required along the alignment to assist in moving the cable through the trench system, thus preventing damage to the cable sheath. Cable drum and winch sites and pulling pits would be required for each section of the proposed underground cable. The location of these sites and pits would be determined during detailed design. Once laid, the cable trenches would be backfilled.

Joint bays

During the construction of the joint bays, temporary joint bay huts would be erected over the joint bay to provide a safe and secure working environment during cable jointing activities. An example of a temporary joint bay hut is shown in Figure 4-7.



Figure 4-7: Temporary joint bay hut

Rehabilitation of corridor including new access track and cable markers

Following the rehabilitation of the land surface, the new access track would be constructed along the easement with the use of gravel/road base. All areas not forming part of the access track would be stabilised through seeding for grass. Reuse of topsoil would also provide a seed bank for grass to regrow.

Cable markers would then be driven into the surface to identify the location of the cables.

The Northern Road crossing

The construction of the cable across The Northern Road would likely be undertaken utilising either open trenching or underboring methods which would be further considered during detailed design in consultation with Roads and Maritime Services and potentially affected utility providers. The Northern Road north of Bringelly Road is a classified road controlled by Roads and Maritime and has a traffic volume of approximately 15,593 vehicles per day. All works occurring within the road reserve of The Northern Road would be undertaken in accordance with a Road Occupancy Licence to be obtained from Roads and Maritime Services prior to the commencement of the cable crossing works.

Underboring the cable would minimise traffic related impacts along The Northern Road as traffic flows would unlikely be affected. If trenching of the cable was to occur, it is anticipated that this would be undertaken across approximately two to three nights when traffic flows are low. The works would be performed under traffic control with one lane to remain open to allow for the passing of traffic. Additionally, any other conditions associated with the Road Occupancy Licence would also be implemented. At the completion of each night of works, the excavated road would be plated over to Roads and Maritime's standards, ready for full use during daylight hours. The remaining section of the trench would be performed on the following night(s) utilising the same method. At the completion of the crossing works, the road would be reinstated to Roads and Maritime Services standards.

Undertaking the cable crossing using the underboring method would involve the establishment of pits on either side of the roadway. The exact positioning of these pits would be determined during detailed design in consultation with Roads and Maritime Services. The pits would be contained within the 20 metre wide TransGrid easement. Boring would then be undertaken from one pit to the other beneath the road. These

pits would only be required for the construction phase of the proposed activity, with the pits to be backfilled and the land rehabilitated.

Undertaking the crossing using underboring methods would involve the establishment of pits on either side of the roadway. The exact positioning of these pits (if required) would be determined during detailed design in consultation with Roads and Maritime Services. The pits would be contained within 20 metre wide TransGrid easement. Boring would then be undertaken from one pit to the other. These pits would only be required for the construction phase of the proposed activity, with the pits to be backfilled and the land rehabilitated.

~~To minimise impacts on traffic along The Northern Road, works would likely be undertaken outside standard construction hours. Works would only affect part of the road with a full road closure not proposed. All requirements of these works would be confirmed with Roads and Maritime Services by consultation during detailed design.~~

~~Following trenching activities, the pavement of The Northern Road would be reinstated to Roads and Maritime Services specifications. Reinstatement would occur as soon as possible following completion of trenching.~~

~~Alternately, there is potential that the cable ducts may be thrust beneath The Northern Road.~~

Testing and commissioning of proposed underground cable

Prior to the removal of the existing transmission line, the underground cable would be tested and commissioned.

Decommissioning and removal of existing transmission line

Following the commissioning of the underground cable, the decommissioning and removal of the existing transmission line can commence. The removal of existing overhead transmission line infrastructure would involve:

- > Testing existing structure and surrounding soil to confirm the presence of asbestos or lead based paint
- > Removal of conductors and earthwires from transmission towers
- > De-stringing of transmission towers by controlled pulling and coiling
- > Staged disassembly of transmission towers and bundling of steel members (including appropriate management of asbestos and lead paint assets where required).

A number of temporary measures would be implemented during the removal of infrastructure for health and safety reasons including the installation of working earths, protection at road crossings and exclusion zones near towers.

Removal of the existing overhead transmission line would involve the use of cranes, elevated work platforms, winches and excavators. Depending on ground conditions, level construction benches (measuring about 10 metres by 10 metres) may be established at the base of transmission towers to support the safe operation of cranes, elevated work platforms and other plant and equipment. Prior to the removal of transmission line infrastructure, working earths would be placed on conductors for safety purposes. Conductors and earthwires would then be removed from transmission towers. Prior to de-stringing of the overhead conductors and the earthwires, they would be de-tensioned and placed in rolling blocks fitted to the top of each structure. The next day each conductor would be separately lowered to the ground surface, and then cut at the intersection point of The Northern Road. Once cut, each conductor and the overhead earth wire would be moved to each side of The Northern Road. The conductors would then be hauled via winch system from each transition site in a controlled manner. The de-stringing works would be undertaken under traffic control. Once conductors and earthwires are removed, the transmission towers would be disassembled.

Waste materials from the removal of the existing overhead transmission line would be transported to suitably licensed facilities using scrap trucks. Suitable materials such as wires or transmission tower members would be reused or recycled if practicable. TransGrid will report to WSA Co on the details of how this waste will be recycled or disposed in accordance with obligations to minimise waste.

Access to work areas along the transmission line corridor would be undertaken via the existing easement which would be accessed via neighbouring roads, existing access tracks and/or access tracks constructed as part of the proposed activity.

Construction plant and equipment

A range of plant and equipment would be required for construction/ demolition. The following is an indicative list of plant and equipment which would be required for the proposed activity:

- > Light vehicles
- > Four-wheel drives
- > Reticulated heavy vehicles
- > Excavators
- > Cranes (including up to 100 tonnes)
- > Elevated work platforms
- > Dump trucks
- > Brake and winch trucks
- > Cable drums
- > Timber shredder
- > Rock-breaker.

The proposed activity would require approximately 30 workers each day during the construction period.

Construction schedule

The indicative construction schedule for the proposed activity is summarised in Table 4-1.

Table 4-1: Indicative construction schedule

Proposed activity	Start date <u>(from)</u>	Approximate duration
Site preparation	December 2017	2 months
Southern transition site works	<u>January 2018</u> December 2017	3 months
Northern transition site works	<u>January 2018</u> March 2018	3 months
Construction and connection of proposed underground cable	<u>February 2018</u>	11 45 months
<u>Installation of underground cable</u>	<u>June 2018</u>	<u>7 months</u>
Demolition of existing overhead transmission line	June <u>May 2019</u>	1 month

Construction hours

Noise generating works would be limited to the recommended standard hours for construction work outlined in the *Interim Construction Noise Guideline* (DECC, 2009) which are:

- > Monday to Friday 7:00am to 6:00pm.
- > Saturday 8:00am to 1:00pm.
- > No works on Sundays or Public Holidays.

Work outside standard hours could include:

- > Delivery of materials outside standard hours requested by police or other authorities for safety reasons (i.e. drums of conductor)
- > Works crossing The Northern Road in line with any requirements of the Traffic Management Centre and Roads and Maritime Services, this includes both trenching and de-stringing activities
- > Emergency work to avoid the loss of lives and/or property
- > Outages to connect the underground section to the overhead transmission line (refer to below section).

If additional noise generating works outside standard construction hours are needed, they would require justification in accordance with the *Interim Construction Noise Guideline* (DECC, 2009) and the formal written consent from DIRD prior to occurring.

Any out of hours works would be undertaken to ensure that:

- > All feasible and reasonable noise mitigation and management measures are implemented to minimise noise impacts on nearby residences;
- > No residence is subject to noise impacts arising from the proposed activity on more than 2 nights during any single week;
- > The noisiest works (example: saw cutting, jack hammering, rock breaking and vibratory rolling) during any night of works would be undertaken early in the night and prior to an 11.00 pm curfew (or midnight where road occupancy is unavailable until after 8.00 pm); where residences along the cable route are affected by noise from night works associated with other infrastructure projects in the locality, transmission cable night works are co-ordinated with those other night works;
- > Residences likely to be affected by night works are notified of upcoming night works not less than 5 days nor more than 14 days before those works are undertaken;
- > A telephone complaints line operated by appropriately trained staff is available during all times at which work is being undertaken to receive complaints from members of the public who may have concerns about the manner in which the proposed activity is being undertaken; and
- > Community communication, consultation, and complaints investigation protocols and procedures are developed prior to any works.

Planned power outages

The proposed activity would require works on existing electricity assets (e.g. transmission line and towers) which when live are not safe for workers. For this reason, works are required to be undertaken during planned power outages (period when the line is de-energised) to ensure the safety of workers in the vicinity of the assets.

TransGrid's network can only tolerate a number of outages a year for maintenance or construction, and if these are not planned in advance they may be disallowed. The network is also constrained by periods of high demand (e.g. summer and winter periods).

The proposed activity would make use of a number pre-planned outages throughout the construction period. Table 4-2 outlines the indicative list of planned outages to be utilised for the works proposed activity. TransGrid would continue to develop this program of outages in line with the proposed construction program for the proposed activity and other outages located on the TransGrid network. Outages are unlikely to result in power loss to any properties as power would be rerouted via other transmission lines during these periods.

Table 4-2: Summary of indicative outages

<u>Outage</u>	<u>Timing</u>	<u>Duration</u>	<u>Works undertaken</u>	<u>Type of outage</u>
1	<u>March 2018 to March 2019</u>	<u>11 months</u>	<u>Construction of transition points</u>	<u>Daily outages possible</u>

<u>Outage</u>	<u>Timing</u>	<u>Duration</u>	<u>Works undertaken</u>	<u>Type of outage</u>
<u>2</u>	<u>February to March 2018</u>	<u>2 weeks</u>	<u>Tower 495A and 503A foundations</u>	<u>Daily outages</u>
<u>3</u>	<u>April 2019 to May 2019</u>	<u>7 weeks</u>	<u>Connection and commissioning of new cable alignment to transmission line</u>	<u>Continuous outage</u>

4.1.3 Operation and maintenance

The proposed underground cable would provide the same level of transmission as the existing overhead transmission line at 330 kV. Maintenance activities would include:

- > Routine inspection of the underground cable
- > Half-yearly inspection of cable bridges
- > Three yearly cable sheath and link testing.

If repairs to the proposed underground cable are required, they would typically involve mobilisation of the construction equipment discussed in Section 4.1.2. The section of the transmission line to be repaired would be excavated, removed, replaced, backfilled and remediated. Based on similar activities, repair and replacement of a section of transmission line would take about two months.

The installation of two separate cables in parallel trenches would provide a level of contingency in the event of a failure during operation and potential for continuation of service during maintenance activities.

Repairs and other maintenance activities would likely occur during the operation of Western Sydney Airport and would therefore comply with its operating rules. ~~including the obstacle limitation surface that would limit the height of construction equipment such as the crane.~~

4.2 Environmental management

Appendix A of the EA provided a consolidated list of mitigation measures for implementation to minimise any environmental impacts. The issues raised in the submissions have been considered in relation to the mitigation measures.

As a result of submissions, ongoing design development and the development and refinement of the construction methodology for the proposed activity, new measures have been proposed as well as some amendments to existing measures. Measures from the Airport EIS have also been included wherever relevant. Table 3 provide an overview of the changes to the measures outlined in Appendix A of the EA. Text underlined in Table 3 shows new text in the measures or a new measure, while text which is ~~strikethrough~~ has been removed from the measure. Measure ID in Table 3 represents the numbering outlined in the EA. Due to the deletion and addition of measures, the measure ID numbers have been renumbered, where the ID number has changes it is shown in brackets below and in Appendix A.

Table 3: Summary of revised or new mitigation measures

Measure code	Revised measure
EM2	<p>All workers are to be provided with an environmental induction prior to starting on site construction activities. This would include but not be limited to information on:</p> <ul style="list-style-type: none"> > The ecological values of the airport site > Protection measures and site procedures to be implemented to protect biodiversity during construction > The Aboriginal and non-Aboriginal heritage values of the airport site. <p>Training would be provided where appropriate. All workers shall be inducted regarding the CEMPs, site environmental conditions and environmental sensitivities and they should receive training as appropriate. Records shall be kept of any induction and training.</p>
EM4	<p>The following additional environmental approvals/licences/permits are required for the activity:</p> <ul style="list-style-type: none"> > Road Occupation Licence under <u>Section 138 of the Roads Act 1993</u> for works within the road reserve of The Northern Road. > Section 201 permit approval under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act).
EC2	<p>Where possible, impacts to known locations of the Spiked Rice-flower shall be minimised. to allow the completion of mitigation measures identified in the WSA EIS and required by the Airport Plan, including seed collection and flora propagation. The construction corridor shall be fenced off in the vicinity of locations containing the Spiked Rice-flower.</p>
EC3	<p>Weed control mitigation and management strategies shall be implemented. All herbicide use shall be in accordance with TransGrid requirements, and only TransGrid approved herbicides shall be used. Weed control strategies shall include:</p> <ul style="list-style-type: none"> • Vehicle check procedures, including wash/brush down if required, to reduce the spread of weeds via vehicles and machinery. • Target areas of potential new outbreaks including soil stockpiles, roadsides and any other disturbed areas. • Cleaning of vehicle tyres, undersides and radiator grills before leaving a property (as appropriate), cleaning of footwear and minimising soil movement between locations. • Mitigation strategies for of noxious and problematic weeds and pests should they be found at the activity site. • Working from clean area towards weedy area to reduce the spread of weeds into areas that are currently weed free (as appropriate).
EC4	<p>All hot works shall be undertaken in accordance with TransGrid's Hot Work <u>and Fire Risk Work Procedure</u>.</p>
New (EC6)	<p><u>Pre-clearance surveys for the Green and Golden Bell Frog (in suitable conditions were possible) to confirm that they are not present at the site (within any impacted dams). Such surveys are to be undertaken by a suitably qualified ecologist. Should this species be located during targeted surveys, a management plan would be prepared to provide detail on Green and Golden Bell Frog relocation and habitat management. Frog collection and relocation would need to be conducted by appropriately experienced ecologists.</u></p>
New (EC7)	<p><u>New waterway crossings or upgrades of existing crossings, if required on the airport site, will be designed and constructed to minimise potential impacts on watercourse functionality, in particular impacts on riparian and aquatic habitats and fish passage.</u></p>

Measure code	Revised measure
<u>New (EC8)</u>	<u>Pre-clearing surveys for larger birds nest, particularly the White-bellied Sea-eagles and Little Eagle.</u>
<u>New (EC9)</u>	<u>Any unexpected finds would be communicated to the DIRD and addressed in the translocation plan and/or Offset Delivery Plan as appropriate.</u>
<u>New (EC10)</u>	<p><u>The decommissioning or emptying of dams would be undertaken ensuring the following mitigation measures are implemented:</u></p> <ul style="list-style-type: none"> • <u>Progressively emptying dams over a number of days to allow fauna to relocate</u> • <u>Avoid undertaking works during nesting season wherever possible. A pre-removal survey would be conducted to identify any bird breeding locations.</u> • <u>Salvaging and relocation aquatic vertebrate fauna, including frogs, turtles and eels, to areas of suitable habitat retained at the airport site or nearby habitats, with regard to numbers and identification of suitable release sites.</u> • <u>Preventing the release of Eastern Gambusia (<i>Gambusia holbrooki</i>) and other noxious fish into local waterways as a result of the draining of farm dams. Eastern Cambusia will be eradicated from dams using humane methods.</u> • <u>Establishing protocols for the humane euthanasia of aquatic fauna, including fish.</u>
<u>New (EC11)</u>	<u>Works on the site will be undertaken in accordance with the bushfire management plan developed by the DIRD. This plan addresses current bushfire risk and identifies response actions. This plan would be reviewed to ensure any additional risks associated with the TransGrid Relocation Plan works are adequately covered in the plan.</u>
<u>AH1</u>	<p>Aboriginal heritage sites and high risk landscapes should be considered for inclusion when developing the initial survey and salvage program plan in relation to the carrying out of preparatory activities for the Stage 1 development. If identified sites based on targeted surveys cannot be avoided, these would be managed in accordance with the approved initial survey and salvage program plan and Aboriginal Cultural Heritage Construction Environmental Management Plan (CEMP).</p> <p>Until the Aboriginal Cultural Heritage CEMP has been approved, the management of Aboriginal cultural heritage would be undertaken in accordance with the Interim Protocol on the Discovery of Aboriginal Cultural Heritage Objects and Human Remains (unexpected finds protocol). In the even that an unexpected find is encountered, works shall cease at the location. The find shall be immediately reported to TransGrid, and the unexpected finds protocol complied with.</p>
<u>AH3</u>	<p>All TransGrid access tracks, work sites, stockpile sites and the powerline easement would be managed in accordance with the unexpected finds protocol. In the event that a site or artefact is identified during construction works (unexpected find), works would cease at the location, and the find reported in accordance with the protocol. No work would commence in the vicinity of the find until any procedures required under the protocol have been implemented.</p> <p>Training on the identification of Aboriginal cultural heritage items along with the implementation of the unexpected finds protocol, would be included as part of the induction to all construction staff. Records of the induction would be kept by the Construction Contractor in accordance with EM2.</p>

Measure code	Revised measure
NH1	In the event that a site or artefact of potential non-Aboriginal significance is identified during construction works (unexpected find), works shall cease at the location. The find shall be immediately reported to TransGrid, and <u>DIRD's Interim Protocol on the Discovery of European Heritage Items and Human Remains shall be complied with.</u>
TA3	<p>Traffic, transportation and access mitigation and management strategies shall be documented and implemented in accordance with the construction environmental management plans developed in accordance with the TransGrid Relocation Plan and updated as required. This shall include the following elements:</p> <ul style="list-style-type: none"> > <u>Management for the temporary closures of roads within the airport site</u> > <u>Ongoing consultation with Roads and Maritime Services, local councils and emergency services, as appropriate</u> > <u>Induction for drivers working on the project to cover safety measures particularly for night works</u> > <u>Review of speed environments along transport corridors</u> > <u>Restriction of construction traffic within the AM and PM peak periods, where required</u> > <u>Management of the transportation of construction materials to optimise vehicle loads in order to minimise vehicle movements</u> > <u>Traffic control measures to manage and regulate traffic movements during construction</u> > <u>Identification of potential disruptions to road users</u> > <u>Identification of any road closures and/or road upgrade that may be required</u> > <u>Construction vehicle routes, including the use of arterial roads, haulage routes, access to the proposed activity site and procedures of oversized and heavy vehicles</u> > <u>Measures to support and encourage sustainable travel for construction workers to and from the site, including public transport, shuttle buses, cycling, walking and car-sharing.</u> > <u>Identification of staff parking areas.</u> ● The management of the delivery of equipment and materials. ● Access to and from the site including nominated roads and site access tracks. ● Speed limits.
GS3	Soil stockpiles would be covered and stabilised with vegetation or mulch. Topsoil would be stockpiled at a maximum height of two metres, where practicable.
<u>New (GS9)</u>	Prior to the establishment and use of the site laydown areas, a suitably qualified contractor shall be engaged to delineate the area(s) subject to potential asbestos contamination associated with the occupancy of the former dwelling. Any identified asbestos containing material (ACM) shall be appropriately managed <u>in accordance with applicable regulatory requirement</u> to ensure the site is safe for use prior to occupation.
<u>New (GS10)</u>	<u>Stockpiling of topsoil and spoil should be limited to a maximum height of two metres, where practicable.</u>
<u>New (GS11)</u>	<u>Topsoil stockpiled on site shall be distributed and seeded over rehabilitation areas at the completion of the works.</u>

Measure code	Revised measure
New (GS12)	<p><u>Prior to the demolition of the transmission structures, each tower shall be tested for the presence of asbestos and lead based paint by a NATA accredited laboratory. Should asbestos and/or lead be identified on any of the towers, the redundant steel towers shall be handled by a suitably qualified contractor and disposed of at a facility licenced to receive those waste types.</u></p>
HW3	<p><u>Culvert crossings at dams Dam bridges would be designed to maintain downstream flows.</u></p>
HW5 (HW4)	<p><u>A dewatering procedure shall be developed to ensure that the release of water associated with drainage of dams or dewatering would be performed in a controlled manner that prevents pollution, erosion, sedimentation or scouring of receiving waterways. Where water is being discharged to the environment, the water would be treated to an appropriate quality prior to release with consideration to the receiving waterway and its classification under the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines and local standards under the Airports (Environment Protection) Regulations 1997 if applicable.</u></p> <p><u>Where water is being discharged to land or used in dust suppression, water shall be treated to meet the following requirements:</u></p> <ul style="list-style-type: none"> • <u>total suspended solids - ≤50 mg/l</u> • <u>no visual oil or grease</u> • <u>pH 6.5 to 8.5.</u> <p><u>As in-situ field tests for total suspended solids can be difficult, an empirical correlation should be established during the initial works between the in-situ measured turbidity and laboratory total suspended solids samples to confirm a Nephelometric Turbidity Units (NTU) measurement that will achieve 50mg/L.</u></p>
New (HW6)	<p><u>Prior to draining of dams the agreement of any downstream properties who rely upon water flowing through dams to be impacted would be obtained by Construction Contractor with the support of TransGrid. The agreement with affected downstream properties would include agreement on any alternative water supply during the period in which flows are impacted.</u></p> <p><u>The following steps would be undertaken with affected downstream properties as part of the agreement process:</u></p> <ul style="list-style-type: none"> • <u>All potentially affected landholders would be notified in writing at least two weeks prior to the draining of each dam seeking consent to undertake the dewatering works. The notification should clearly indicate how the landholder would be compensated in terms of replacing flows with alternative water supplies during the period where flows are affected.</u> • <u>No drainage of dams shall commence until the written consent of all potentially affected landholders is obtained.</u> • <u>In the event that consent from landowners is not provided, then TransGrid will use other methods to construct the causeways that would not affect downstream properties.</u>
NV2	<p>Work outside normal hours, on Sundays and public holidays, shall only comprise:</p> <ul style="list-style-type: none"> • The delivery of materials outside normal hours requested by police or other authorities for safety reasons (<u>i.e. drums of conductor</u>). • Emergency work to avoid the loss of lives and/or property. • <u>Outages to connect the underground section to the overhead transmission line.</u> • <u>Works crossing The Northern Road in line with any requirements of the Traffic Management Centre and Roads and Maritime Services, this includes both trenching and de-stringing activities.</u>

Measure code	Revised measure
NV3	<p>Other noise generating works outside of the standard construction hours shall require the formal written consent of the DIRD and require justification in accordance with the Interim Construction Noise Guideline (DECC, 2009). <u>Any out of hours works would be undertaken to ensure that:</u></p> <ul style="list-style-type: none"> > <u>All feasible and reasonable noise mitigation and management measures are implemented to minimise noise impacts on nearby residences;</u> > <u>No residence is subject to noise impacts arising from the proposed activity on more than 2 nights during any single week;</u> > <u>The noisiest works (example: saw cutting, jack hammering, rock breaking and vibratory rolling) during any night of works would be undertaken early in the night and prior to an 11.00 pm curfew (or midnight where road occupancy is unavailable until after 8.00 pm); where residences along the cable route are affected by noise from night works associated with other infrastructure projects in the locality, transmission cable night works are co-ordinated with those other night works;</u> > <u>Residences likely to be affected by night works are notified of upcoming night works not less than 5 days nor more than 14 days before those works are undertaken;</u> > <u>A telephone complaints line operated by appropriately trained staff is available during all times at which work is being undertaken to receive complaints from members of the public who may have concerns about the manner in which the proposed activity is being undertaken; and</u> > <u>Community communication, consultation, and complaints investigation protocols and procedures are developed prior to any works.</u>
AQ1	<p>If necessary, dust suppression techniques shall be implemented and incorporated into the ESCP as per the techniques outlined in the “Blue Book”, such as water spraying of surfaces and covering stockpiles. <u>Non-potable water sources are to be utilised where possible, this could include using water from dewatered dams.</u></p>
<u>New (AQ7)</u>	<p><u>Minimising drop heights of equipment and materials and using fine water sprays during such activities wherever appropriate.</u></p>
<u>New (AQ8)</u>	<p>Emissions from vehicles would be managed through implementation the following measures wherever possible:</p> <ul style="list-style-type: none"> > vehicles on site are to be switched off when not in use > avoid the use of diesel or petrol powered generators and instead use main electricity or battery powered equipment, where possible > consider appropriate vehicle speeds on sealed and unsealed roads.
<u>New (VA1)</u>	<p><u>Any night lighting required for construction works will be located as far as practicable from sensitive receivers with appropriate screening as required.</u></p>
WA2	<p>Soil to be reused onsite would be tested for contamination in accordance with the Waste Classification Guidelines (EPA, 2014). <u>National Environment Protection (Assessment of Site Contamination) Measure.</u></p>

A revised consolidated list mitigation measures including the amendments outlined in Table 3 for the proposed activity are located in Appendix A.

5. Conclusion and Next Steps

The conclusion as described in section 8 of the EA has not changed. Considering the information in the EA and this Submissions Report, it is concluded that this submissions report and the environmental assessment have been prepared to satisfy condition 4 (4)(a) of the Airport Plan for the Western Sydney Airport under the *Airports Act 1996*. The condition requires consideration of the environmental impacts of the TransGrid Relocation, in respect of any impacts that were not assessed within the Western Sydney Airport EIS in accordance with the legislation that would apply to the proposed activity, irrespective of the approval under the *Airports Act 1996*. Accordingly, the EA draws on the environmental assessment framework under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and substantially satisfies the environmental assessment requirements stipulated in the NSW Department of Planning & Environment's *NSW Code of Practice for Authorised Network Operators*.

The EA and submissions report provides a true and fair review of the activity in relation to its potential effects on the environment. The environmental assessment and submissions report supports the conclusion that the activity is not likely to have a significant impact on the environment, including threatened species, populations, ecological communities or their habitats and recognises that the proposed activity is contained within the indicative Construction Impact Zone of the Stage 1 Western Sydney Airport, as assessed and approved through the EIS and shown in Figure 2 of the determined Airport Plan.

Appendix A Revised summary of mitigation measures

Mitigation measures	
Environmental management	
EM1	Construction Environmental Management Plan (CEMP) shall be prepared, and submitted to TransGrid for review and endorsement prior to the commencement of works, including site establishment. The CEMP shall be prepared in accordance with the TransGrid Relocation Plan and TransGrid's procedure 'Preparation of a Construction Environmental Management Plan'. The CEMP shall be updated in line with changes to work plans and all workers shall be advised of changes.
EM2	All workers are to be provided with an environmental induction prior to starting on site construction activities. This would include but not be limited to information on: <ul style="list-style-type: none"> > The ecological values of the airport site > Protection measures and site procedures to be implemented to protect biodiversity during construction > The Aboriginal and non-Aboriginal heritage values of the airport site. Training would be provided where appropriate. Records shall be kept of this induction and training.
EM3	An Environmental Supervisor shall be included as part of the construction staff to oversee implementation of the CEMP and to ensure that all mitigation measures are being effectively applied. TransGrid shall appoint an Environmental Inspector to regularly check that the work is being carried out in compliance with all environmental approval and legislative conditions.
EM4	The following additional environmental approvals/licences/permits are required for the activity: <ul style="list-style-type: none"> > Road Occupation Licence under Section 138 of the Roads Act 1993 for works within the road reserve of The Northern Road. > Section 201 permit under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
EM5	All environmental incidents and near misses shall be reported to TransGrid. All pollution incidents that threatens or harms the environment shall be reported immediately to relevant authorities, and TransGrid, in accordance with the <i>Protection of the Environment Operations Act 1997</i> (POEO Act).
Ecology	
EC1	Disturbed sites shall be stabilised, and areas not required for operation shall be returned to as close to their original condition as soon as possible.
EC2	Where possible, impacts to known locations of the Spiked Rice-flower shall be minimised. The construction corridor shall be fenced off in the vicinity of locations containing the Spiked Rice-flower.

Mitigation measures

EC3	<p>Weed control mitigation and management strategies shall be implemented. All herbicide use shall be in accordance with TransGrid requirements, and only TransGrid approved herbicides shall be used. Weed control strategies shall include:</p> <ul style="list-style-type: none"> > Vehicle check procedures, including wash/brush down if required, to reduce the spread of weeds via vehicles and machinery. > Target areas of potential new outbreaks including soil stockpiles, roadsides and any other disturbed areas. > Cleaning of vehicle tyres, undersides and radiator grills before leaving a property (as appropriate), cleaning of footwear and minimising soil movement between locations. > Mitigation strategies for any noxious and problematic weeds and pests should they be found at the activity site.
EC4	<p>All hot works shall be undertaken in accordance with TransGrid's Hot Work and Fire Risk Work Procedure.</p>
EC5	<p>No fires or burning of materials shall occur on site.</p>
EC6	<p>Pre-clearance surveys for the Green and Golden Bell Frog (in suitable conditions were possible) to confirm that they are not present at the site (within any impacted dams). Such surveys are to be undertaken by a suitably qualified ecologist. Should this species be located during targeted surveys, a management plan would be prepared to provide detail on Green and Golden Bell Frog relocation and habitat management. Frog collection and relocation would need to be conducted by appropriately experienced ecologists.</p>
EC7	<p>New waterway crossings or upgrades of existing crossings, if required on the airport site, will be designed and constructed to minimise potential impacts on watercourse functionality, in particular impacts on riparian and aquatic habitats and fish passage.</p>
EC8	<p>Pre-clearing surveys for larger birds nest, particularly the White-bellied Sea-eagles and Little Eagle.</p>
EC9	<p>Any unexpected finds would be communicated to the DIRD and addressed in the translocation plan and/or Offset Delivery Plan as appropriate.</p>
EC10	<p>The decommissioning or emptying of dams would be undertaken ensuring the following mitigation measures are implemented:</p> <ul style="list-style-type: none"> > Progressively emptying dams over a number of days to allow fauna to relocate > Avoid undertaking works during nesting season wherever possible. A pre-removal survey would be conducted to identify any bird breeding locations. > Salvaging and relocation aquatic vertebrate fauna, including frogs, turtles and eels, to areas of suitable habitat retained at the airport site or nearby habitats, with regard to numbers and identification of suitable release sites. > Preventing the release of Eastern Gambusia (<i>Gambusia holbrooki</i>) and other noxious fish into local waterways as a result of the draining of farm dams. Eastern Gambusia will be eradicated from dams using humane methods. > Establishing protocols for the humane euthanasia of aquatic fauna, including fish.
EC11	<p>Works on the site will be undertaken in accordance with the bushfire management plan developed by the DIRD. This plan addresses current bushfire risk and identifies response actions. This plan would be reviewed to ensure any additional risks associated with the TransGrid Relocation Plan works are adequately covered in the plan.</p>

Mitigation measures

Aboriginal cultural heritage

AH1	Until the Aboriginal Cultural Heritage CEMP has been approved, the management of Aboriginal cultural heritage would be undertaken in accordance with the Interim Protocol on the Discovery of Aboriginal Cultural Heritage Objects and Human Remains (unexpected finds protocol). In the event that an unexpected find is encountered, works shall cease at the location. The find shall be immediately reported to TransGrid, and the unexpected finds protocol complied with.
AH2	The location of Aboriginal heritage sites B32 and B114 would be confirmed by an archaeologist on site prior to works commencing to determine an appropriate buffer and demarcation as a no go zone. The construction corridor is to be fenced off in the vicinity of known Aboriginal sites to ensure construction activities, vehicles and personnel do not impact on these sites. The location of these sites and an appropriate buffer is to be delineated in consultation with an appropriately qualified archaeologist as part of work for the development and approval of the initial survey and salvage program plan. If site impact is determined, after consultation, to be unavoidable, any mitigation will be in accordance with the approved initial survey and salvage programme plan, and once approved the Aboriginal Cultural Heritage Management Plan CEMP, which are being prepared by DIRD.
AH3	Training on the identification of Aboriginal cultural heritage items along with the implementation of the unexpected finds protocol, would be included as part of the induction to all construction staff. Records of the induction would be kept by the Construction Contractor in accordance with EM2.

Non-Aboriginal cultural heritage

NH1	In the event that a site or artefact of potential non-Aboriginal significance is identified during construction works (unexpected find), works shall cease at the location. The find shall be immediately reported to TransGrid, and DIRDs <i>Interim Protocol on the Discovery of European Heritage Items and Human Remains</i> shall be complied with.
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Traffic and access

TA1	Transportation and equipment delivery shall be in accordance with Roads and Maritime Services and Council requirements.
TA2	New access tracks required for the completion of the works shall be constructed in accordance with the approved plan of work that shall comply with the Soils and Construction Volume 2C Unsealed Roads (DECC, 2008).

Mitigation measures

TA3	<p>Traffic, transportation and access mitigation and management strategies shall be documented and implemented in accordance with the construction environmental management plans developed in accordance with the TransGrid Relocation Plan and updated as required. This shall include the following elements:</p> <ul style="list-style-type: none"> > Management for the temporary closures of roads within the airport site > Ongoing consultation with Roads and Maritime Services, local councils and emergency services, as appropriate > Induction for drivers working on the project to cover safety measures particularly for night works > Review of speed environments along transport corridors > Restriction of construction traffic within the AM and PM peak periods, where required > Management of the transportation of construction materials to optimise vehicle loads in order to minimise vehicle movements > Traffic control measures to manage and regulate traffic movements during construction > Identification of potential disruptions to road users > Identification of any road closures and/or road upgrade that may be required > Construction vehicle routes, including the use of arterial roads, haulage routes, access to the proposed activity site and procedures of oversized and heavy vehicles > Measures to support and encourage sustainable travel for construction workers to and from the site, including public transport, shuttle buses, cycling, walking and car-sharing. > Identification of staff parking areas.
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Land use

—	No mitigation measures proposed.
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Geology and soils

GS1	<p>An Erosion and Sediment Control Plan (ESCP) shall be prepared as part of construction environmental management plans to be developed in accordance with the TransGrid Relocation Plan. All erosion and sediment control measures shall be designed, implemented and maintained in accordance with relevant sections of “Managing Urban Stormwater: Soil and Construction Volume 1” (Landcom, 2004) (“the Blue Book”) (particularly Section 2.2) and “Managing Urban Stormwater: Soil and Construction Volume 2A – Installation of Services” (DECC, 2008)”. The ESCP shall apply to stockpiles, site boundaries, access tracks and laydown areas. Exposed surfaces shall be kept to a minimum to limit the potential for erosion.</p>
GS2	Cleared vegetation would be mulched for use in erosion control at construction sites.
GS3	<p>Any material or soil suspected of contamination shall be sampled and analysed by a NATA registered laboratory and managed in accordance with the Waste Classification Guidelines (EPA, 2014), the Guidelines on the Duty to Report Contamination (EPA, 2015) and the Contaminated Land Management Act 1997.</p>
GS4	<p>Providing excess spoil is free of contamination, it may be stockpiled within the airport site for future use as part of earthworks required for the Stage 1 development. The positioning of this material is to be confirmed with the DIRD. Stockpiles shall be stabilised in a manner as to prevent erosion in line with the Erosion and Sediment Control Plan.</p>

Mitigation measures

GS5	Construction plant and vehicles shall be cleaned of any mud or soils prior to access onto public roads. Vehicles and equipment shall be confined to existing roads and defined site access tracks.
GS6	Any imported fill shall be certified at source location (e.g. Quarrymaster or property owner) as pathogen and weed free Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM) in accordance with the NSW Protection of the Environment Operations Act 1997 (POEO Act) and the Protection of the Environment (Waste) Regulation 2014 (POEO Waste Regulation).
GS7	Environmental spill kits containing spill response materials suitable for the works being undertaken shall be kept on site at all times and be used in the event of a spill.
GS8	All chemicals or other hazardous substances shall be stored in bunded and weatherproof facilities away from drainage lines. The capacity of the bunded area shall be at least 130% of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s shall be shown on the Site Plans.
GS9	Prior to the establishment and use of the site laydown areas, a suitably qualified contractor shall be engaged to delineate the area(s) subject to potential asbestos contamination associated with the occupancy of the former dwelling. Any identified asbestos containing material (ACM) shall be appropriately managed in accordance with applicable regulatory requirement to ensure the site is safe for use prior to occupation.
GS10	Stockpiling of topsoil and spoil should be limited to a maximum height of two metres, where practicable.
GS11	Topsoil stockpiled on site shall be distributed and seeded over rehabilitation areas at the completion of the works.
GS12	Prior to the demolition of the transmission structures, each tower shall be tested for the presence of asbestos and lead based paint by a NATA accredited laboratory. Should asbestos and/or lead be identified on any of the towers, the redundant steel towers shall be handled by a suitably qualified contractor and disposed of at a facility licenced to receive those waste types.

Hydrology and water quality

HW1	Spoil shall be stockpiled in a manner so as to avoid the possibility of sediments entering waterways (including stormwater drains) or migrating off-site.
HW2	Any bulk fuel/herbicide or hazardous material transport vehicles shall be parked on level ground a minimum of 40 metres away from waterways (including drainage and irrigation channels). No refuelling or bulk herbicide preparation shall occur within 40 metres of a waterway or open site drains.
HW3	Culvert crossings at dams would be designed to maintain downstream flows.

Mitigation measures

HW4	<p>A dewatering procedure shall be developed to ensure that the release of water associated with drainage of dams or dewatering would be performed in a controlled manner that prevents pollution, erosion, sedimentation or scouring of receiving waterways. Where water is being discharged to the environment, the water would be treated to an appropriate quality prior to release with consideration to the receiving waterway and its classification under the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines and local standards under the Airports (Environment Protection) Regulations 1997 if applicable.</p> <p>Where water is being discharged to land or used in dust suppression, water shall be treated to meet the following requirements:</p> <ul style="list-style-type: none"> > Total suspended solids - ≤ 50 mg/l > No visual oil or grease > pH 6.5 to 8.5. <p>As in-situ field tests for total suspended solids can be difficult, an empirical correlation should be established during the initial works between the in-situ measured turbidity and laboratory total suspended solids samples to confirm a Nephelometric Turbidity Units (NTU) measurement that will achieve 50mg/L.</p>
HW5	<p>Draining and filling of dams would also be carried out in accordance with the Erosion and Sedimentation Control Plan (as per environmental issue GS1).</p>
HW6	<p>Prior to draining of dams the agreement of any downstream properties who rely upon water flowing through dams to be impacted would be obtained by Construction Contractor with the support of TransGrid. The agreement with affected downstream properties would include agreement on any alternative water supply during the period in which flows are impacted.</p> <p>The following steps would be undertaken with affected downstream properties as part of the agreement process:</p> <ul style="list-style-type: none"> • All potentially affected landholders would be notified in writing at least two weeks prior to the draining of each dam seeking consent to undertake the dewatering works. The notification should clearly indicate how the landholder would be compensated in terms of replacing flows with alternative water supplies during the period where flows are affected. • No drainage of dams shall commence until the written consent of all potentially affected landholders is obtained. • In the event that consent from landowners is not provided, then TransGrid will use other methods to construct the causeways that would not affect downstream properties.

Noise and vibration

NV1	<p>Noise generating works shall be in accordance with the Interim Construction Noise Guideline (DECC, 2009):</p> <ul style="list-style-type: none"> > 7:00am – 6:00pm Monday to Friday. > 8:00am – 1:00pm Saturdays. > No work on Sundays or Public Holidays.
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Mitigation measures

NV2	<p>Work outside normal hours, on Sundays and public holidays, shall only comprise:</p> <ul style="list-style-type: none"> > The delivery of materials outside normal hours requested by police or other authorities for safety reasons (i.e. drums of conductor). > Emergency work to avoid the loss of lives and/or property. > Outages to connect the underground section to the overhead transmission line. > Works crossing The Northern Road in line with any requirements of the Traffic Management Centre and Roads and Maritime Services, this includes both trenching and de-stringing activities.
NV3	<p>Other noise generating works outside of the standard construction hours shall require the formal written consent of the DIRD and require justification in accordance with the Interim Construction Noise Guideline (DECC, 2009). Any out of hours works would be undertaken to ensure that:</p> <ul style="list-style-type: none"> > All feasible and reasonable noise mitigation and management measures are implemented to minimise noise impacts on nearby residences; > No residence is subject to noise impacts arising from the proposed activity on more than 2 nights during any single week; > The noisiest works (example: saw cutting, jack hammering, rock breaking and vibratory rolling) during any night of works would be undertaken early in the night and prior to an 11.00 pm curfew (or midnight where road occupancy is unavailable until after 8.00 pm); where residences along the cable route are affected by noise from night works associated with other infrastructure projects in the locality, transmission cable night works are co-ordinated with those other night works; > Residences likely to be affected by night works are notified of upcoming night works not less than 5 days nor more than 14 days before those works are undertaken; > A telephone complaints line operated by appropriately trained staff is available during all times at which work is being undertaken to receive complaints from members of the public who may have concerns about the manner in which the proposed activity is being undertaken; and > Community communication, consultation, and complaints investigation protocols and procedures are developed prior to any works.
NV4	<p>Neighbouring properties to the north of the airport site shall be notified as to the timing and duration of the construction works and at least 7 days prior to commencing work.</p>

Air quality and climate change

AQ1	<p>If necessary, dust suppression techniques shall be implemented and incorporated into the ESCP as per the techniques outlined in the “Blue Book”, such as water spraying of surfaces and covering stockpiles. Non-potable water sources are to be utilised where possible, this could include using water from dewatered dams.</p>
AQ2	<p>All surplus soils and materials from excavations, which cannot be reused on site, shall be removed from site by covered trucks.</p>
AQ3	<p>Vehicles and equipment shall be maintained in accordance with the manufacturer’s specifications.</p>
AQ4	<p>Residual raw materials shall be returned to the supplier, resold or reused at another site at the end of the project or recycled.</p>

Mitigation measures	
AQ5	Materials shall be sourced from local suppliers, where feasible, to reduce the distance that materials need to be transported to the site.
AQ6	Air quality mitigation and management strategies shall be documented and implemented in accordance with the CEMP. This shall include: <ul style="list-style-type: none"> > Reducing vehicle speeds when in the vicinity of residences to minimise the generation of nuisance dust. > Progressively revegetating or otherwise rehabilitating disturbed areas as works are completed.
AQ7	Minimising drop heights of equipment and materials and using fine water sprays during such activities wherever appropriate.
AQ8	Emissions from vehicles would be managed through implementation the following measures wherever possible: <ul style="list-style-type: none"> > vehicles on site are to be switched off when not in use > avoid the use of diesel or petrol powered generators and instead use main electricity or battery powered equipment, where possible > consider appropriate vehicle speeds on sealed and unsealed roads.
Visual amenity	
VA1	All construction plant, equipment, waste and excess materials shall be contained within the designated boundaries of the work site and the construction laydown area and shall be removed from the site following the completion of construction.
VA2	Any night lighting required for construction works will be located as far as practicable from sensitive receivers with appropriate screening as required.
Waste	
WA1	Waste mitigation and management strategies shall be documented and implemented in accordance with the construction environmental management plans which would be developed in accordance with the TransGrid Relocation Plan, TransGrid Waste Procedures and associated Work Instructions. This shall include: <ul style="list-style-type: none"> > Waste management facilities on-site including their set-up, use, management removal and waste tracking documentation. > Waste hierarchy application including information demonstrating the reduction of the amount of waste produced and the maximised reuse and recycling opportunities utilised. > Appropriate waste management across all possible waste items produced.
WA2	Soil to be reused onsite would be tested for contamination in accordance with the National Environment Protection (Assessment of Site Contamination) Measure.
WA3	All waste, including surplus and contaminated soils, which cannot be reused shall be classified in accordance with the Waste Classification Guidelines (EPA, 2014), removed from the site and disposed of at a facility that can lawfully accept the waste in accordance with the POEO Act and POEO Waste Regulation.
WA4	Concrete trucks shall be permitted to flick wet wipe their discharge chutes with the effluent discharged into prepared bored holes, prepared excavations/formwork or a watertight receptacle for disposal (to be shown on the ESCP). No concrete washout is permitted. All surplus concrete shall be returned to the concrete suppliers for recycling and not be discharged on site.

Mitigation measures

WA5	Prior to the demolition of the transmission structures, each tower shall be tested for the presence of asbestos and lead based paint by a NATA accredited laboratory. Should asbestos and/or lead be identified on any of the towers, the redundant steel towers shall be handled by a suitably qualified contractor and disposed of at a facility licenced to receive those waste types.
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Electric and magnetic fields

EF1	All designs shall be in accordance with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to EMF (ICNIRP 2010).
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Socio-economic

—	No mitigation measures proposed.
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