# Appendix K

## PRELIMINARY SITE INVESTIGATION - CONTAMINATION

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TransGrid

# Potts Hill to Alexandria transmission cable project

## Preliminary Site Investigation - Contamination

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## Preliminary Site Investigation - Contamination

## Client: TransGrid

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# Glossary, acronyms and abbreviations

## Glossary

| Term | Definition |
|---|---|
| Acid sulfate soils | Naturally occurring soils, sediments or organic substrates (e.g. peat) that are formed under waterlogged conditions. These soils contain iron sulfide minerals (predominantly as the mineral pyrite) or their oxidation products. In an undisturbed state below the watertable, acid sulfate soils are benign. However if the soils are drained, excavated or exposed to air by a lowering of the watertable, the sulfides react with oxygen to form sulfuric acid. |
| Australian height datum (AHD) | The standard reference level used to express the relative height of various features. A height given in metres AHD is the height above mean sea level. |
| Bore | Constructed connection between the surface and a groundwater source, that enables groundwater to be transferred to the surface either naturally or through artificial means. |
| Bund | An embankment designed to retain fluids. |
| Busbar | A series of elevated metallic bars within an electrical substation which comprises a system of electrical conductors on which power is concentrated for high capacity distribution. |
| Cable bridges | A purpose-built bridge made typically of reinforced concrete structures, through which the transmission cables are integrated for support and protection. |
| Catchment | The land area draining through the main stream, as well as tributary streams, to a particular site. |
| Conduit | A protective tube or pipe system for individual electric cables. Sometimes referred to as a 'duct'. |
| Community | A group of people living in a specific geographical area or with mutual interests that could be affected by the project. |
| Construction | Includes all physical work required to construct the project and also includes construction planning such as the development of construction management plans. |
| Construction laydown areas | Areas required for temporarily storing materials, plant and equipment and providing space for other ancillary facilities, such as project offices, during construction. Some construction laydown areas would be used for stockpiling. |
| Detailed design | The stage of the project following concept design where the design is refined, and plans, specifications and estimates are produced, suitable for construction. |
| Directional drilling | The drilling of a horizontal bore to tunnel under existing infrastructure (such as watercourses, rail lines, major roadways) to facilitate the laying of cables. This is an alternative method to excavation and trenching or cable bridges. |
| Earthworks | All operations involved in loosening, excavating, placing, shaping and compacting soil or rock. |
| Easement | A 'right of way' around infrastructure that allows access to authorised personnel for inspections, repairs and maintenance. The establishment of an easement also restricts certain activities on the land that could endanger members of the public or impact on the safe operation of the infrastructure. |

| Term | Definition |
|---|---|
| Electrical conductivity | The measure of a material's ability to accommodate the transport of an electric charge. |
| Erosion | A natural process where wind or water detaches a soil particle and provides energy to move the particle. |
| Fill | The material placed in an embankment. |
| Flood | Relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami. |
| Flood prone land | Land susceptible to flooding by the probable maximum flood. Also known as flood liable land. |
| Floodplain | Area of land which is inundated by floods up to and including the probable maximum flood event (i.e. flood prone land). |
| Frac-out | A release of drill slurry at a fracture zone which has occurred on the surface through the building up of pressure in the borehole. |
| Geotechnical investigation | Below ground investigation including soil and bedrock logging and testing to report the physical properties of the subsurface to inform ground engineering decisions and design. |
| Greater Sydney area | The area generally from Penrith in the west to the east coast and from Hornsby in the north to Campbelltown in the south. |
| Hazard | A source of potential harm that can cause injury/loss of human life and/or damage to the environment or property. |
| Impact | Influence or effect exerted by a project or other activity on the natural, built and community environment. |
| Infiltration | The downward movement of water into soil and rock. It is largely governed by the structural condition of the soil, the nature of the soil surface (including presence of vegetation) and the antecedent moisture content of the soil. |
| inner Sydney | Includes the Sydney Central Business District (CBD) and eastern suburbs. |
| Joint bay | An enlarged section of excavated trench in which cables are joined together. |
| Key stakeholders | Government departments/agencies, local councils, utility and service providers. |
| Pollutant | Any measured concentration of solid or liquid matter that is not naturally present in the environment. |
| Pre-construction | All work prior to, and in respect of the state significant infrastructure, that is excluded from the definition of construction. |
| Probability | A statistical measure of the expected chance or likelihood of occurrence. |

| Term | Definition |
|---|---|
| Project area | The project area comprises the overall potential area of direct disturbance by the project, which may be temporary (for construction) or permanent (for operational infrastructure) and extend below the ground surface. The project area includes the location of operational infrastructure and construction work sites for:<br>• the transmission cable route (including the entire road reserve of roads traversed);<br>• special crossings of infrastructure or watercourses;<br>• substation sites requiring upgrades (noting that all works would be contained within the existing site boundaries); and<br>• construction laydown areas. |
| Roadway | Any one part of the width of a road devoted in particular to the use of vehicles, inclusive of shoulders and auxiliary lanes. |
| Road reserve | The area comprising roads, footpaths, nature strips and public transport infrastructure. |
| Secretary's Environmental Assessment Requirements (SEARs) | Requirements and specifications for an environmental assessment prepared by the Secretary of the NSW Department of the Planning and Environment under section 5.16 of the NSW *Environmental Planning and Assessment Act 1979*. |
| Sediment | Material, both mineral and organic, that is being or has been moved from its site of origin by the action of wind, water or gravity and comes to rest either above or below water level. |
| Sensitive receiver/receptor | Includes residences, educational institutions (including preschools, schools, universities, TAFE colleges), health care facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres, passive recreation areas (including outdoor grounds used for teaching), active recreation areas (including parks and sports grounds), commercial premises (including film and television studios, research facilities, entertainment spaces, temporary accommodation such as caravan parks and camping grounds, restaurants, office premises, retail spaces and industrial premises). |
| state significant infrastructure (SSI) | Infrastructure projects for which approval is required under Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979*. |
| Study area | The study area for this PSI report comprises the project area and a 200 metre buffer around the project area as shown on **Figure 3-1**. |
| Switch bay | Part of a substation within which the switch and control equipment relating to a given circuit are contained. |
| Thrust boring | This is a jack and bore drilling method typically used for installing a steel or concrete pipe casing beneath an existing surface where there is risk of trench collapse. Typically used to cross under major infrastructure such as railways and highways. |
| Transmission cable | An insulated wire that conducts an electrical current at voltages greater than 132 kV. |
| Underboring | This is a trenchless method for installing cables involving passing the conduits under infrastructure (such as a road or railway corridor) or a watercourse. Underboring could be via thrust boring (also known as micro tunnelling) or horizontal directional drilling. |

| Term | Definition |
|---|---|
| Work site | A specific section of the project area for carrying out project construction activities such as trenching and excavation, establishment of a joint bay, underboring or installing a cable bridge. The work site would be fenced off from public access and may include associated activities such as traffic management measures. |

## Abbreviations and acronyms

| Abbreviation/ Acronym | Definition |
|---|---|
| ACM | Asbestos containing material |
| AHD | Australian height datum |
| ANZECC | Australian and New Zealand Environment and Conservation Council |
| ANZAT | Australian and New Zealand and Australian State and Territory Governments |
| ASC NEPM | National Environment Protection (Assessment of Site Contamination) Measure 2013 |
| ASS | Acid sulfate soil |
| ASSMAC | Acid Sulfate Soils Management Advisory Committee |
| ASSMP | Acid sulfate soil management plan |
| bgl | Below ground level |
| BTEX | Benzene, toluene, ethylbenzene, xylenes |
| CEC | Cation exchange capacity |
| CEMP | Construction environmental management plan |
| CGS | Characteristic gas situation |
| CLM Act | *Contaminated Land Management Act 1997* |
| CoPC | Contaminant of potential concern |
| CSM | Conceptual site model |
| CSWMP | Construction soil and water management plan |
| DP | Deposited plan |
| DGI | Data Gap Investigation |
| DQOs | Data quality objectives |
| DQIs | Data quality indicators |
| EHC Act | *Environmentally Hazardous Chemicals Act 1985* |
| EIS | Environmental Impact Statement |
| EP&A Act | *Environmental Planning and Assessment Act 1979* |
| EPL | Environment protection licence |
| GDEs | Groundwater Dependant Ecosystems |
| GIL | Groundwater investigation level |
| HIL | Health investigation level |
| HSL | Health screening level |
| LEP | Local environmental plan |
| LGA | Local government area |
| LOR | Limit of reporting |
| NEPC | National Environment Protection Council |

| Abbreviation/ Acronym | Definition |
|---|---|
| NEMP | National Environmental Management Plan |
| NOW | NSW Office of Water |
| NSW | New South Wales |
| NSW DEC | NSW Department of Environment and Conservation |
| NSW DUAP | NSW Department of Urban Affairs and Planning |
| NSW EPA | NSW Environment Protection Authority |
| NSW OEH | NSW Office of Environment and Heritage |
| OCPs | Organochlorine pesticides |
| OPPs | Organophosphorus pesticides |
| PAHs | Polycyclic aromatic hydrocarbons |
| PCBs | Polychlorinated biphenyls |
| PFAS | Per- and poly- fluoralkyl substances |
| POEO Act | *Protection of the Environment Operations Act 1997* |
| RAP | Remedial Action Plan |
| SAR | Site Audit Report |
| SAS | Site Audit Statement |
| SAQP | Sampling, Analysis and Quality Plan |
| SEARs | Secretary's Environmental Assessment Requirements |
| SEPP 55 | State Environment Planning Policy No. 55 – Remediation of Land |
| SVOC | Semi-volatile organic compounds |
| SWL | Standing water level |
| TCLP | Toxic characteristic leaching procedure |
| TPH | Total petroleum hydrocarbons |
| TRH | Total recoverable hydrocarbon |
| VENM | Virgin excavated natural materials |
| VOC | Volatile organic compounds |

# Executive summary

## Introduction

TransGrid is the manager and operator of the major high-voltage electricity transmission network in New South Wales (NSW) and the Australian Capital Territory (ACT). TransGrid is seeking approval under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of a new underground transmission supply connection between the Rookwood Road substation in Potts Hill and the Beaconsfield West substation in Alexandria (the project).

The project comprises the following key components:

- cable works connecting Rookwood Road substation with the Beaconsfield West substation;
- special crossings of infrastructure or watercourses;
- upgrade works at the Rookwood Road and Beaconsfield West substations;
- conversion works at the Beaconsfield West and Sydney South substations; and
- temporary construction laydown areas to facilitate construction of the project.

The project construction would involve the excavation of open trenches and underbore drilling, mainly though public roads and some private properties and public parks. The total length of the trenches for the transmission cable route would be around 20 kilometres and would involve the excavation and off-site disposal of approximately 115,000 $m^3$ of material to a licenced landfill or re-use facility in accordance with its classification.

## Purpose

The purpose of this Preliminary Site Investigation (PSI) is to:

- identify areas of known or potentially contaminated land that may be encountered during the construction of the project;
- identify areas of acid sulfate soils (ASS) that may be encountered or impacted during the construction of the project;
- provide a qualitative assessment of ecological and human health risks posed by the above in the context of the construction and operation of the project;
- outline and describe the following requirements for the project:
    - further investigations to be undertaken prior to construction commencing (where required);
    - management measures for the identification, handling, transport and disposal of asbestos containing materials (ACM), acid sulfate soils, contaminated soil and water; and
- address the Secretary's Environmental Assessment Requirements (SEARs) for the project relevant to contaminated land and acid sulfate soils management.

## Transmission cable route

The PSI assessed the areas of relative risk based on the likely presence of contamination along the transmission cable route. Areas were assessed as low, medium and high risk. Sections of the transmission cable route assessed as low risk were generally located in residential areas where there were no identified current or historical contaminating activities. The sections of the transmission cable route assessed as medium contamination risk were mainly associated with historical and current potentially contaminating land uses located directly adjacent to the route. These land uses included service stations, dry cleaners, mechanical workshops, manufacturing sites and areas of historically filled land including Muir Road in Potts Hill and former landfills at Arlington Oval in Dulwich Hill, Marrickville Park and Henson Park in Marrickville.

The areas assessed as high contamination risk were located where the transmission cable route would intersect former landfills in Camdenville Park and Sydney Park, as well as a metal refinery site between Euston Road and Burrows Road. These are locations where there are either known landfill gas, soil or groundwater contamination present that will require management.

Three areas have been identified as having potential acid sulfate soil risk and require further investigation prior to construction. Contaminated soil disturbed during construction works along the transmission cable route could have potential to expose project workers and surrounding human and ecological receptors to contamination if not managed appropriately.

Landfill gases within Henson Park (if present), Camdenville Park and Sydney Park also have the potential to pose a health and safety risk to project workers and other users of the parks and surrounding area if not appropriately managed. Arlington Park and Marrickville Park are also in close proximity to the project area and have a potential to pose a risk if landfill gases are present and there is a complete pathway to the project area.

The management measures recommended for construction planning and during construction of the project would include:

- pre-construction investigations along the transmission cable route including in-situ waste classification and acid sulfate soils assessment;
- development and implementation of specific mitigation measures to manage any contamination to protect workers, the public and the surrounding environment;
- development and implementation of asbestos management plans (AMPs) for areas of known or suspected asbestos contamination;
- development and implementation of site-specific management plans for works within former landfills would specify construction safety and environmental controls for managing landfill gas, waste and leachate; and
- development and implementation of Acid Sulfate Soil Management Plans (ASSMPs) for relevant areas.

## Construction laydown areas

Construction laydown areas would be required for the project and are proposed at five locations in the project area. The construction laydown areas would be used to store spoil stockpiles, plant, equipment etc. and base ancillary facilities such as site offices.

Of the five locations identified as construction laydown areas, Beaconsfield West substation laydown area was assessed as low risk of disturbing/exposing existing contamination due to the existence of pavement covering the site. The other construction laydown areas were assessed as medium risk based on the potential for existing soil contamination associated with former land uses, and the potential for complete pathways between the contamination and sensitive human and ecological receptors.

Baseline pre-construction and post-construction assessments consisting of limited baseline soil investigations and site inspections would be undertaken for all construction laydown areas. The pre-construction report would specify mitigation or management works to be implemented prior to or during the use of the construction laydown areas for medium risk sites.

Where existing environmental management plans are in place to manage identified contamination, such as for Camdenville Park, the mitigation measures relevant to the project would be reviewed, adopted and implemented as required.

Activities undertaken within construction laydown areas such as the storage and use of fuels, oils and chemicals also have the potential to cause soil contamination from spills and leaks if appropriate management and mitigation measures are not implemented. Stockpiled contaminated soil also has the potential to contaminate site soil and surface water. Mitigation measures for spill prevention and emergency response plans and erosion and sediment controls for stockpile management would be included in the project Construction Environmental Management Plan.

# 1.0 Introduction

TransGrid is the manager and operator of the major high-voltage electricity transmission network in New South Wales (NSW) and the Australian Capital Territory (ACT). TransGrid is seeking approval under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of a new 330 kilovolt (kV) underground transmission cable circuit between the existing Rookwood Road substation in Potts Hill and the Beaconsfield West substation in Alexandria (the project).

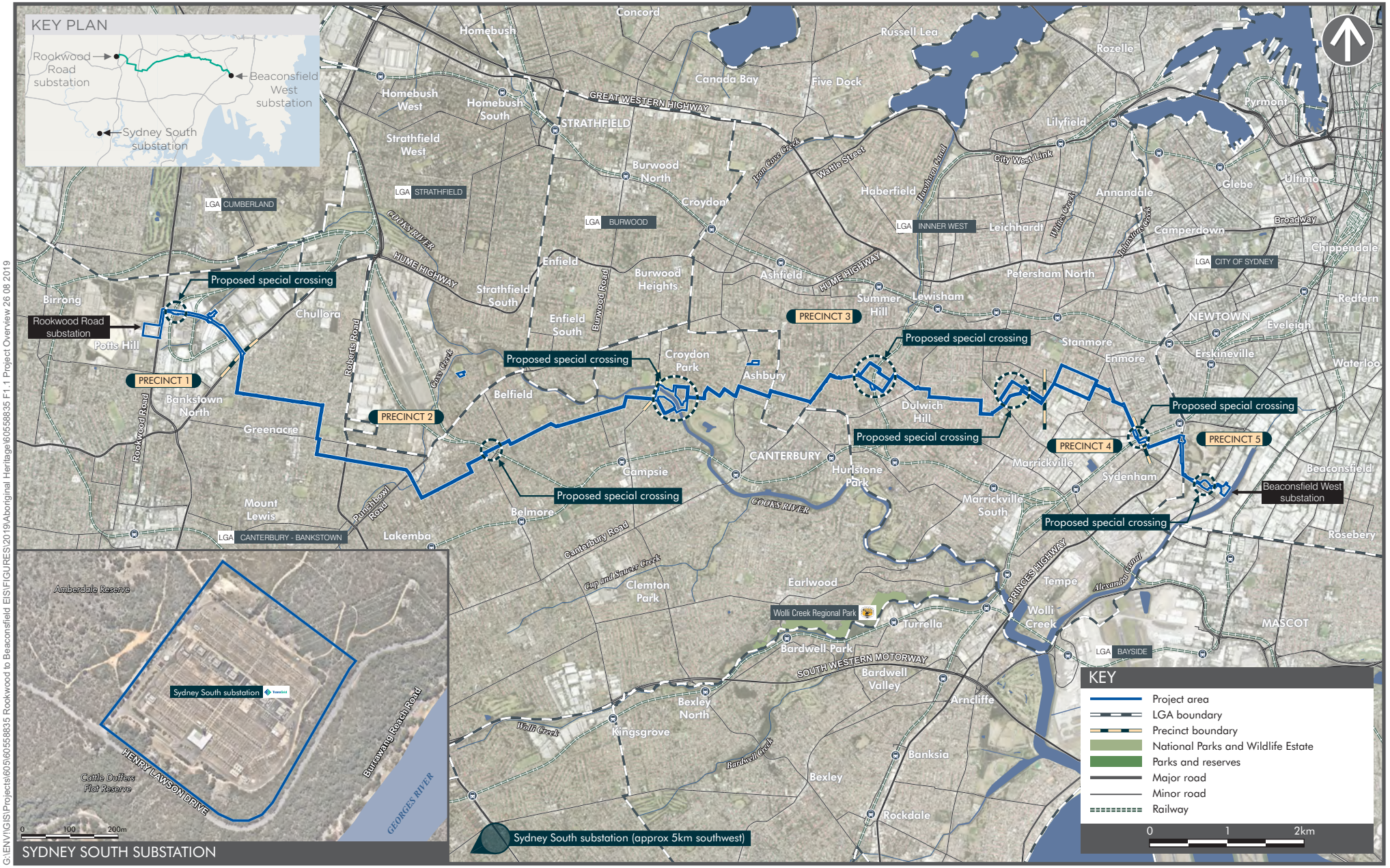
The project has been identified as a solution to address existing issues in the electricity supply network for inner Sydney, which is characterised by ageing and deteriorating electricity infrastructure and forecast increases in consumer demand.

As the project is state significant infrastructure under section 5.12 of the EP&A Act, an Environmental Impact Statement (EIS) has been prepared to assess the impacts of the project. This technical report has been developed in support of the EIS.

## 1.1 Project overview

The transmission cable circuit would be about 20 kilometres long and would generally be located within existing road reserves, at existing electrical infrastructure sites, within public open space and on previously disturbed areas as shown in **Figure 1-1**. The project would comprise the following key components:

- cable works connecting Rookwood Road substation with the Beaconsfield West substation;
- special crossings of infrastructure or watercourses;
- upgrade works at the Rookwood Road and Beaconsfield West substations;
- conversion works at the Beaconsfield West and Sydney South substations; and
- temporary construction laydown areas to facilitate construction of the project.

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# PROJECT OVERVIEW

Powering Sydney's Future

Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*
*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018)*

FIGURE 1-1

## 1.2 Purpose of this technical report

This technical report has been prepared in accordance with the revised Secretary's Environmental Assessment Requirements (SEARs) issued for the project on 20 August 2019 by the Planning Secretary of the NSW Department of Planning, Industry and Environment (DPIE).

The SEARs relevant to this technical assessment are presented in **Table 1-1**.

**Table 1-1 SEARs**

| SEARs | | Section addressed |
|---|---|---|
| Soils | • verification of the risk of acid sulfate soils (Class 1, 2 3 or 4 on the Acid Sulfate Soil Risk Map) along the project route and an assessment of the impacts of the project on acid sulfate soils (including impacts of acidic runoff off-site) in accordance with the current guidelines. | Verification of acid sulfate soils is discussed in **Section 4.1.2**.<br>Impacts are discussed in **Section 5.1.1.3**.<br>Management measures are described in **Section 6.2**. |
| | • identification, handling, transport and disposal of any asbestos containing material and other contamination encountered during the project, having regard to the ecological and human health risks posed by the contamination in the context of past, existing and likely (or potential) future land uses. Where assessment and/or remediation is required, document how the assessment and/or remediation would be undertaken in accordance with the current guidelines. | Identification of potential contamination is discussed in **Section 4.1.17**.<br>Assessment of impacts is described in **Section 5.1** and **Section 5.2**.<br>Management measures are presented in **Section 6.2**. |

# 2.0 Description of the project

## 2.1 Project components

Key components of the project are listed below. A detailed description of the project is provided in **Chapter 4 Project description** of the EIS:

- cable works connecting Rookwood Road substation with the Beaconsfield West substation comprising:
  - a 330 kV underground transmission cable circuit comprising three cables installed in three conduits;
  - another set of three conduits for a possible future 330 kV transmission cable circuit if it is required;
  - four smaller conduits for carrying optical fibres;
  - around 26-30 joint bays, per circuit, where sections of cable would be joined together, located approximately every 600-800 metres along the transmission cable route;
  - link boxes and sensor boxes associated with each joint bay to allow cable testing and maintenance;
  - optical fibre cable pits for optical fibre cable maintenance;
- seven special crossings of infrastructure or watercourses including two rail lines (at Chullora and St Peters), one freight line (Enfield Intermodal, Belfield), one light rail line (at Dulwich Hill), the Cooks River and its associated cycleway (at Campsie/Croydon Park), a playground (at Marrickville) and the southern wetland at Sydney Park (at Alexandria);
- upgrade works at the Rookwood Road and Beaconsfield West substations to facilitate the new 330 kV transmission cable circuit;
- conversion works at the Beaconsfield West and Sydney South substations to transition the existing Cable 41 from a 330 kV connection to a 132 kV connection; and
- five temporary construction laydown areas to facilitate construction of the project.

Associated works required to facilitate the construction of the project, such as potential utility relocations, have been considered. No major relocations are anticipated and where smaller services may need to be moved to accommodate the transmission cable circuit, this relocation would be restricted to within the project area assessed in this EIS.

The project does not include the cable pulling and jointing works for the possible future second transmission cable circuit. This activity, should it be required, would be subject to separate assessment and approval as per the requirements of the EP&A Act.

Several route options and alternative construction methods are being considered as part of the project. These are described further in **Section 2.4**.

## 2.2 Project location

The project would be located in the suburbs of Potts Hill, Yagoona, Chullora, Greenacre, Lakemba, Belmore, Belfield, Campsie, Croydon Park, Ashbury, Ashfield, Dulwich Hill, Marrickville, Newtown, St Peters, Alexandria and Picnic Point in the following local government areas (LGAs):

- City of Canterbury-Bankstown;
- Strathfield;
- Inner West; and
- City of Sydney.

The location of the project is shown on **Figure 1-1**.

The project would be located primarily within road reserves, at existing electrical infrastructure sites, within public open space and on previously disturbed areas. The project has been and would continue to be designed to avoid impacts to private property and open spaces where possible; however, there would be a need for both the use of public open space and easements over some private commercial properties due to significant existing constraints within the road reserve. Land uses adjacent to the road reserves in which the project would be located are mainly residential, with relatively short sections of commercial and mixed uses in the suburbs of Dulwich Hill and Petersham. The project would be located close to industrial areas at the western and eastern ends of the project around Potts Hill, Chullora, Greenacre, Marrickville, St Peters and Alexandria. The existing Sydney South substation at Picnic Point is surrounded by the George's River National Park.

The location of the proposed special crossings is provided in **Table 2-1**.

**Table 2-1 Location of proposed special crossings**

| Location | Crossing type | Infrastructure or watercourse crossed |
|---|---|---|
| Muir Road, Chullora | Cable bridge | Rail line |
| Enfield Intermodal, Belfield | Underbore | Freight rail line |
| Cooks River, Campsie/Croydon Park/Ashbury | Cable bridge or underbore (preferred) | Cooks River and cycleway |
| Arlington Light Rail Station, Dulwich Hill | Underbore | Dulwich Hill light rail line or station |
| Amy Street, Marrickville | Underbore | Playground near Henson Park |
| Bedwin Road, St Peters | Cable bridge | Rail line |
| Sydney Park, Alexandria | Underbore | Wetland |

## 2.3 The project area

The project area comprises the overall potential area of direct disturbance by the project, which may be temporary (for construction) or permanent (for operational infrastructure) and extend below the ground surface. It includes all options under consideration for the project, as described in **Section 2.4**.

The project area includes the location of operational infrastructure and construction work sites for:

- the transmission cable route (including the entire road reserve[1] of roads traversed);
- special crossings of infrastructure or watercourses;
- substation sites requiring upgrades (noting that all works would be contained within the existing site boundaries); and
- construction laydown areas.

While the boundaries of the project area represent the physical extent of where project infrastructure may be located, or construction works undertaken, it does not mean that this entire area would be physically disturbed or that indirect impacts would not be experienced beyond this area. Should the project be approved, the detailed design would aim to refine the location of project infrastructure and work sites within the boundaries of the project area assessed in this EIS.

There is a possibility that to minimise impacts on other utilities or transport corridors (roads and rail), that deviations from the assessed project area may be required. In this event, specific impacts of this approach would be assessed further. Future changes to the project may require additional

[1] Road reserve is defined as the area comprising roads, footpaths, nature strips and public transport infrastructure (including indented bus bays, bus shelters and bus stop signage).

assessment and approval as described in more detail in **Chapter 5 Statutory planning and approval process** of the EIS.

The location of joint bays and the location of the transmission cable circuit within the road reserve (e.g. kerbside or non-kerbside) is yet to be determined and is subject to detailed design.

## 2.4 Options under consideration

The project includes route options and alternative construction methods in locations as outlined below and shown in Figure 4-6 in **Chapter 4 Project description** of the EIS. As the project design develops, a preferred option would be selected for each location. However, approval may be sought for some options where further design and engineering information is required before a preferred option can be selected.

The project options are discussed below by geographical area, from west to east.

### 2.4.1 Cooks River

There are three options for the transmission cable route in the vicinity of the Cooks River at Campsie/Croydon Park and two options for special crossing methods, including:

- Option 1: the transmission cable route travels in a south-easterly direction along Cowper Street from the intersection with Brighton Avenue, Campsie and then east on Lindsay Street. At the cul-de-sac at the end of Lindsay Street, there are two special crossing options of the Cooks River into Lees Park before the transmission cable route continues on to Harmony Street, Ashbury:
  - Option 1a: construct a cable bridge parallel to and to the north of the existing Lindsay Street pedestrian bridge; or
  - Option 1b: install the conduits under the Cooks River via underboring (this is the preferred option); or
- Option 2: the transmission cable route travels in a north-easterly direction from Byron Street at the intersection with Brighton Avenue, Campsie, through Mildura Reserve. From this parkland, the conduits would be underbored beneath the Cooks River, surfacing in Croydon Park near the cul-de-sac of Croydon Avenue in Croydon Park. The transmission cable route then travels north along Croydon Avenue, east along Dunstan Street, and south along Hay Street, before continuing east along Harmony Street; or
- Option 3: the transmission cable route travels in an easterly direction from Byron Street at the intersection with Brighton Avenue, Campsie, then in a south-easterly direction through Mildura Reserve, between residences and the Cooks River until the cul-de-sac at Lindsay Street. From here, there are two special crossing options of the Cooks River into Lees Park before the transmission cable route continues on to Harmony Street, Ashbury, which are the same for Option 1:
  - Option 3a: construct a cable bridge parallel to and to the north of the existing Lindsay Street pedestrian bridge; or
  - Option 3b: install the conduits under the Cooks River via underboring.

A description of the cable bridge and underboring methods is provided in **Section 2.5**, with further detail in **Chapter 4 Project description** of the EIS.

### 2.4.2 Dulwich Hill light rail corridor

There are two options for the transmission cable route crossing of the Dulwich Hill Light Rail corridor in the vicinity of the Arlington Light Rail station, Dulwich Hill. This includes:

- Option 4a: the transmission cable route travels northeast along Windsor Road from the intersection with Arlington Street, then east on Terry Road. At the Terry Road cul-de-sac, the conduits would be underbored beneath the rail corridor, surfacing at the Hill Street cul-de-sac. From here the transmission cable route continues along Hill Street to Denison Road; or
- Option 4b: the transmission cable route travels southeast along Constitution Road from the intersection with Arlington Street, before crossing into the southern end of Johnson Park. From

here, the conduits would be underbored beneath the rail corridor near the Arlington light rail station. The transmission cable route then continues along Constitution Road and then north on Denison Road.

### 2.4.3 Henson Park

There are two options for the transmission cable route crossing in the vicinity of Henson Park, Marrickville including:

- Option 5a: the transmission cable route continues northeast on Centennial Street to a car park. From here it travels in an easterly direction through a grassed verge between the tennis courts and Henson Park oval to near the Amy Street playground. The conduits would be underbored beneath the playground, surfacing at Amy Street. The transmission cable route then turns east on to Horton Street; or
- Option 5b: the transmission cable route travels north on Sydenham Road from Centennial Street, turning northeast on to Neville Street, then southeast on Surrey Street to Amy Street before continuing along Charles Street.

### 2.4.4 Marrickville

There are two options for the transmission cable route in the vicinity of Addison Road, Marrickville. Note that the project may include one or both options at this location including:

- Option 6a: the transmission cable route travels north along Agar Street from the intersection with Illawarra Road, then east on to Newington Road and south down Enmore Road to the intersection with Scouller Street; and/or
- Option 6b: splitting the two circuits as there is insufficient space along Addison Road to accommodate both circuits. One circuit would travel along Newington Road (as for Option 6a) and one circuit would travel east on Addison Road from the intersection with Illawarra Road, then north on Enmore Road to the intersection with Scouller Street.

## 2.5 Construction works

Construction activities would be limited to the identified project area and include the activities summarised in **Table 2-2**. A substantial portion of the transmission cables would be installed using pre-laid conduits. The conduits would only require the excavation of short sections of trench at a time (an average of 20 metres at any one location), with backfilling occurring as soon as each section of the conduits has been installed. Depending on the overall construction program and associated number of work crews required, it is expected that trenching and excavation would occur concurrently at multiple work sites along the transmission cable route.

The project would involve the construction of seven special crossings that would involve either the installation of a cable bridge or underboring (i.e. an underground crossing). Works for these crossings would be undertaken in coordination with the relevant asset owner (e.g. road or rail authorities).

The construction of the project would require a number of work sites along the transmission cable route and at special crossings. Each work site represents an area of disturbance required to undertake the construction activity (e.g. trenching, cable bridge installation, underboring) and would be located within the project area.

**Table 2-2 Summary of construction activities**

| Construction activity | Description |
|---|---|
| Site preparation | • implementation of traffic management changes (such as safety barriers and road signage) to facilitate access and egress to/from the work sites;<br>• installation of environmental control measures (such as sediment barriers);<br>• vegetation clearing and tree removal, where required;<br>• establishing construction laydown areas and ancillary facilities including temporary offices and worker amenities, site fencing and provision of power/services; and<br>• delivery and storage of plant and equipment at construction laydown areas and work sites. |
| Trenching and excavation | • clearing of surface vegetation along excavation area if required;<br>• saw cutting of the road surface/pavement and lifting this material using a backhoe/front end loader. If rock is encountered, a rock breaker may be used to loosen the material;<br>• removal of material down to the base of the trench using an excavator and placement of spoil directly onto trucks to be transported to a licensed facility. The trench would typically be around 3 metres wide and 1.2 metres deep but could be deeper or shallower depending on the presence of utilities; and<br>• installation of shoring as a precaution against slump or collapse where necessary, particularly where deeper sections of trench are required (i.e. deeper than 1.4 metres). |
| Relocation of minor utilities/services | • use of non-destructive digging methods to expose buried services to guide the excavator; and<br>• minor relocations, if required, would occur within the road reserve and be subject to consultation with the relevant asset owner/operator. |
| Conduit installation and backfilling | • laying the transmission cable conduits on plastic spacers to provide the required clearance from the side walls and bottom of the trench;<br>• placing the optic fibre communication cable conduits into position;<br>• backfilling the trench with engineered backfill;<br>• laying of polymeric covers and warning tape, marked with appropriate warnings in case of accidental excavation; and<br>• installation of the road base and temporary restoration of the road surface to allow vehicles and other road users to travel across the area. |
| Excavation and establishment of joint bays | • excavation of joint bays via open trenching;<br>• installation of erosion and stormwater flow controls and barriers;<br>• erecting fencing or hard barriers as required;<br>• provision for vehicle access, worker amenities and equipment storage;<br>• temporary covering with steel plates to provide access to adjacent properties where required; and<br>• excavation of nearby pits to facilitate the installation of link and sensor boxes. |
| Cable pulling and jointing | • installation of a tent or demountable building over the joint bay to provide a controlled work environment and dry work site;<br>• pulling cables through the conduits which is fed from large drums holding 600-800 metres of cable; and<br>• connecting sections of cables at the joint bay. |

| Construction activity | Description |
|---|---|
| Permanent road restoration | • removing the temporary road surface;<br>• backfilling with road base up to surface level, where required;<br>• reinstating pavement; and<br>• reinstating the remaining areas that were excavated with spoil or other fill material to pre-construction levels and final finishing to match existing as appropriate (e.g. footpath and/or kerb and gutter) or as otherwise agreed with the relevant roads authority. |
| Cable markers | • once restoration activities have been completed, cable markers would be installed along the transmission cable route to give warning of the presence of the cables and the need to make enquiries before digging;<br>• markers may include:<br>- small signs attached to road kerbs;<br>- concrete marker posts (between 800-900 millimetres tall) along the transmission cable route in vegetated areas where surface markers would be difficult to see; or<br>- flush-markers constructed of concrete that are around 50-100 millimetres thick. |
| Cable bridges | • establishment of the work site and access including vegetation clearing (where required);<br>• boring and earthworks for the bridge piers;<br>• installation of the pre-cast cable bridge and steel cage (where required) by crane;<br>• integration with the conduits in the road reserve; and<br>• reinstatement of the work site. |
| Underboring | • underboring around 4 to 10 metres below the ground surface by either thrust boring or horizontal directional drilling (HDD):<br>• thrust boring would require a launch pit (at least 4 m metres deep) and associated work site of up to around 800 square metres and a receive pit and work site of about 100 square metres;<br>• HDD would require a work site at the drill launch area of up to around 800 square metres and a receive pit for the drill exit of around 1.5 metres deep; and<br>• work sites would be restricted to the road reserve and public open space areas where feasible and reasonable to limit the need for vegetation removal. |
| Substation upgrades | • site establishment;<br>• earthworks and excavations needed for cable entries and footings for new equipment;<br>• installation of new infrastructure (such as switchbays and busbars);<br>• removal of redundant infrastructure;<br>• installation and connection of new cables;<br>• commissioning of cables; and<br>• demobilisation. |

### 2.5.1 Staging and timing of construction activities

An indicative duration of construction activities is provided in **Table 2-3**. The timing is subject to detailed design and the final construction approach. For example, some works, such as trenching and excavation, would be undertaken by multiple work crews working along the transmission cable route. Staging of activities outside of certain hours would also influence the construction approach.

Should the project be approved, construction is planned to occur over 24 months, commencing in 2020. It is estimated that around 15 months would be required for civil construction works and conduit installation and about nine months for cable pulling and jointing, testing and commissioning. The transmission cable circuit is expected to be completed and commissioned in 2022/23.

**Table 2-3 Indicative timing of typical construction activities**

| Construction activity | Indicative duration |
|---|---|
| Excavation, conduit (pipe) installation and trench backfilling | Conduits for each 600-800 metre cable section would take up to eight weeks to install (with most properties exposed to around two weeks of trench excavation activity). |
| Joint bay construction | Each individual joint bay would take up to three weeks to establish (in addition to trenching works). Each joint bay contains one cable circuit. |
| Cable pulling | Cable pulling at each joint bay for each 600-800 metre cable section would typically take up to two weeks to complete. |
| Cable jointing | Cable jointing would typically take up to three weeks to complete at each joint bay. |
| Cable bridges | Each cable bridge crossing is expected to take around 10 weeks to complete in total, however works would be staged and not continuous over the 10 week period. |
| Underboring | Each underboring crossing is expected to take around eight to 10 weeks to complete in total, however works would be staged and not continuous over this period. |
| Substation works | Construction works at the Rookwood Road substation is expected to take around four to six months, while works at the Beaconsfield West and Sydney South substations are expected to take around six to nine months at each site. |

#### 2.5.1.1 Construction hours

Construction works would be undertaken during standard daytime construction hours as specified in the *Interim Construction Noise Guideline* (DECC, 2009) where reasonable and feasible to do so. However, it is expected that works outside standard construction hours would also be required, as described below.

Standard construction hours are:

- Monday to Friday 7am to 6pm;
- Saturday 8am to 1pm; and
- No work on Sundays and public holidays.

It is likely that construction works would be required at night time (after 10pm) due to the requirements of relevant road and rail authorities. These works could include, but are not limited to, works within major road reserves (i.e. on State and regional roads such as Rookwood Road and Old Canterbury Road), through signalised intersections, or at special crossings. Work outside standard construction hours may be required for safety reasons and/or to limit disruption to road traffic and rail services.

Cable jointing works at each joint bay would need to be undertaken continuously i.e. 24 hours. Some works at the substation sites may also need to be undertaken outside of standard construction hours due to outage constraints on the existing infrastructure (i.e. the need to maintain power supply to customers).

Cable bridges and underboring at rail corridors would be timed with other rail works to limit disruption to freight and/or passenger rail services. These works could be undertaken outside of standard construction hours including at night time or over weekends, subject to approval of the relevant rail authority.

Scheduled construction activities, work hours and duration would be further refined through consultation with relevant government agencies and would be outlined in the CEMP for the project.

### 2.5.2 Construction precincts

The transmission cable route has been divided into five construction precincts to aid the characterisation of the existing environment and assessment of project impacts. These precincts broadly align with similar land uses. A description of each precinct follows:

- **Precinct 1** includes the areas between the Rookwood Road substation and the Hume Highway, including the industrial area of Chullora along Muir Road;
- **Precinct 2** includes the areas between the Hume Highway and Brighton Avenue near the Cooks River including the residential areas of Greenacre, Lakemba, Belmore, Belfield and Campsie;
- **Precinct 3** includes the areas from the Cooks River to Illawarra Road including the residential areas of Croydon Park, Ashbury, Ashfield, Dulwich Hill and Marrickville;
- **Precinct 4** includes the area between Illawarra Road and the Bankstown rail line including the residential areas of Marrickville, Enmore and Newtown; and
- **Precinct 5** includes the areas between the Bankstown rail line and the Beaconsfield West substation including the residential areas of St Peters and the recreational area of Sydney Park in Alexandria.

### 2.5.3 Construction laydown areas

As part of the construction of the project, temporary construction laydown areas would be required to store materials, equipment, excavated spoil and provide space for other ancillary facilities such as site offices. Five locations have been investigated as potential construction laydown areas. The final number and location is subject to ongoing consultation with the relevant landowners and would be determined during detailed design.

Stockpiling of excavated spoil at the construction laydown areas would be ongoing for the duration of the civil works (around 15 months). Stockpiling would be managed by erosion and sediment controls in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) (The Blue Book).

While it is expected that construction would require the use of transportable roadside facilities for individual work sites, provision for temporary site offices would be located within construction laydown areas for the duration of construction (up to two years).

Construction laydown areas would be fenced and would have lighting for security and to facilitate night works.

Driveways may need to be created from gravel or similar material to enable heavy vehicles to enter/exit the site. At construction laydown areas at Cooke Park and Peace Park, extended driveways would be required to access the construction laydown area. The construction of these driveways would require ground disturbance and potentially tree removal.

Temporary infrastructure at the construction laydown areas, including noise mitigation controls (such as hoardings), driveways and stockpile areas, would involve minimal subsurface ground disturbance (i.e. excavation) and would be removed once construction is complete.

For works at the Rookwood Road and Sydney South substation sites, sufficient space exists at each location to store materials and equipment; therefore, no additional construction laydown areas would be required.

The proposed locations and area required for the five potential construction laydown areas are listed in **Table 2-4**.

**Table 2-4 Potential construction laydown areas**

| Potential construction laydown area | LGA | Potential area (hectares) |
|---|---|---|
| 12 Muir Road, Chullora | City of Canterbury-Bankstown | 0.48 |
| Cooke Park, Belfield | Strathfield | 0.37 |
| Peace Park, Ashbury | Inner West Council | 0.45 |
| Camdenville Park, St Peters | Inner West Council | 0.18 |
| Beaconsfield West substation, Alexandria | City of Sydney | 0.85 |

## 2.6 Cable operation and maintenance

Once the transmission cables have been installed, generally only visual inspections would be required. This would involve regularly driving along the transmission cable route to check for hazards or activities (such as excavation works in the vicinity) that could impact the underground cables or cable bridges. Ongoing physical access to the transmission cables is not required however ongoing monitoring of the cable for damage (missing/worn cable markers) and outages would occur. This would be through access to the link boxes and sensor boxes located near the joint bays. Optical fibre cables installed alongside the transmission cables would be monitored at the optical fibre cable pits.

Pits for link and sensor boxes and optical fibre cables would generally be located in the footpath/road verge but in some cases where there is insufficient space, they may be required in the roadway. Roadway access would be managed with standard traffic controls.

Regular checks of the pits would ensure they are accessible and that the pit does not contain water or tree roots. Cable bridge structures would be inspected to ensure structural integrity and aesthetics are being maintained.

## 2.7 Other relevant technical information

### 2.7.1 Waste minimisation

Approximately 115,000 cubic metres of spoil would be removed during excavation and trenching. The spoil would be characterised and, if acid sulfate soils or contaminated material is detected, managed in accordance with relevant legislation and guidelines. Excavated material would be transported to a disposal/reuse site based on its classification.

Sediment and erosion control devices would be installed and maintained to manage stormwater during the construction of the project. Standard pollution control measures would also be implemented to ensure that water leaving work sites is of a suitable quality for discharge to the environment. Runoff that does not meet the water quality requirements would be captured and sent for off-site treatment or disposal in accordance with the requirements of the *Protection of the Environment Operations Act 1997* (POEO Act).

### 2.7.2 Plant and equipment

The following typical plant and equipment are likely to be used during construction of the project:

- chainsaws;
- diamond saws;
- jackhammers;
- rock breakers;
- hand tools;
- hydraulic excavators;
- drill rig;
- spoil haulage trucks;

- mobile cranes and elevated working platforms;
- piling rigs;
- concrete trucks;
- winch trucks;
- low loaders;
- vacuum tankers/trucks;
- light vehicles;
- temporary generators;
- compressors;
- backhoes/front-end loaders;
- mixing plant;
- road millers;
- asphalt machine; and
- heavy rollers.

### 2.7.3 Site access and traffic movements

Access for heavy vehicles would be required throughout the project area. The standard of access along the transmission cable route would be sufficient to permit passage of excavators, spoil haulage trucks, concrete trucks, low loaders and mobile cranes. The estimated vehicle movements required for construction is outlined in **Table 2-5**. The vehicle numbers estimated do not include private vehicles used by the workforce to arrive at the work site, or traffic management vehicles. The vehicle numbers for the 'transmission cable route' assume four work crews operating concurrently at multiple locations within the project area. The final number of work crews, materials and vehicle movements would be determined during detailed design and construction planning.

**Table 2-5 Anticipated vehicle movements**

| Location | Activity | Number of vehicle movements per day |
|---|---|---|
| Construction laydown areas | Delivery/pickup of plant and materials, spoil transfer (at relevant sites) | Vehicle movements per construction laydown area, per day:<br>• Light: 3-4<br>• Heavy: 12 |
| Transmission cable route – trenching and joint bay excavation | Delivery of plant and materials, removal of spoil, general construction | Vehicle movements for four work sites, per day:<br>• Light: 16<br>• Heavy: 96 |
| Special crossings | Delivery of plant and materials, removal of spoil, general construction | • Light: 10-12<br>• Heavy: 8-10 |
| Substation upgrade – Rookwood Road | Delivery of plant and materials, removal of spoil | • Light: 3-4<br>• Heavy: 4 |
| Substation upgrade – Beaconsfield West | Delivery of plant and materials, removal of spoil | • Light: 3-4<br>• Heavy: 4 |
| Substation upgrade – Sydney South | Delivery of plant and materials, removal of spoil | • Light: 5-6<br>• Heavy: 6 |

Equipment and materials would be held in storage at the construction laydown areas until needed and delivered to the relevant work sites. Larger plant and cable materials may be delivered at night to avoid disrupting daytime traffic. Materials such as the cable drums may be temporarily stored near the trench and would be securely stored and barricaded.

Where the trench intersects another road or access to properties is required to enable construction works, vehicle and pedestrian passage would be restored as soon as possible after excavation has passed the intersection or access point.

# 3.0 Assessment methodology

## 3.1 Study area

The study area for this PSI report comprises the project area and a 200 metre buffer around the project area as shown on **Figure 3-1**.

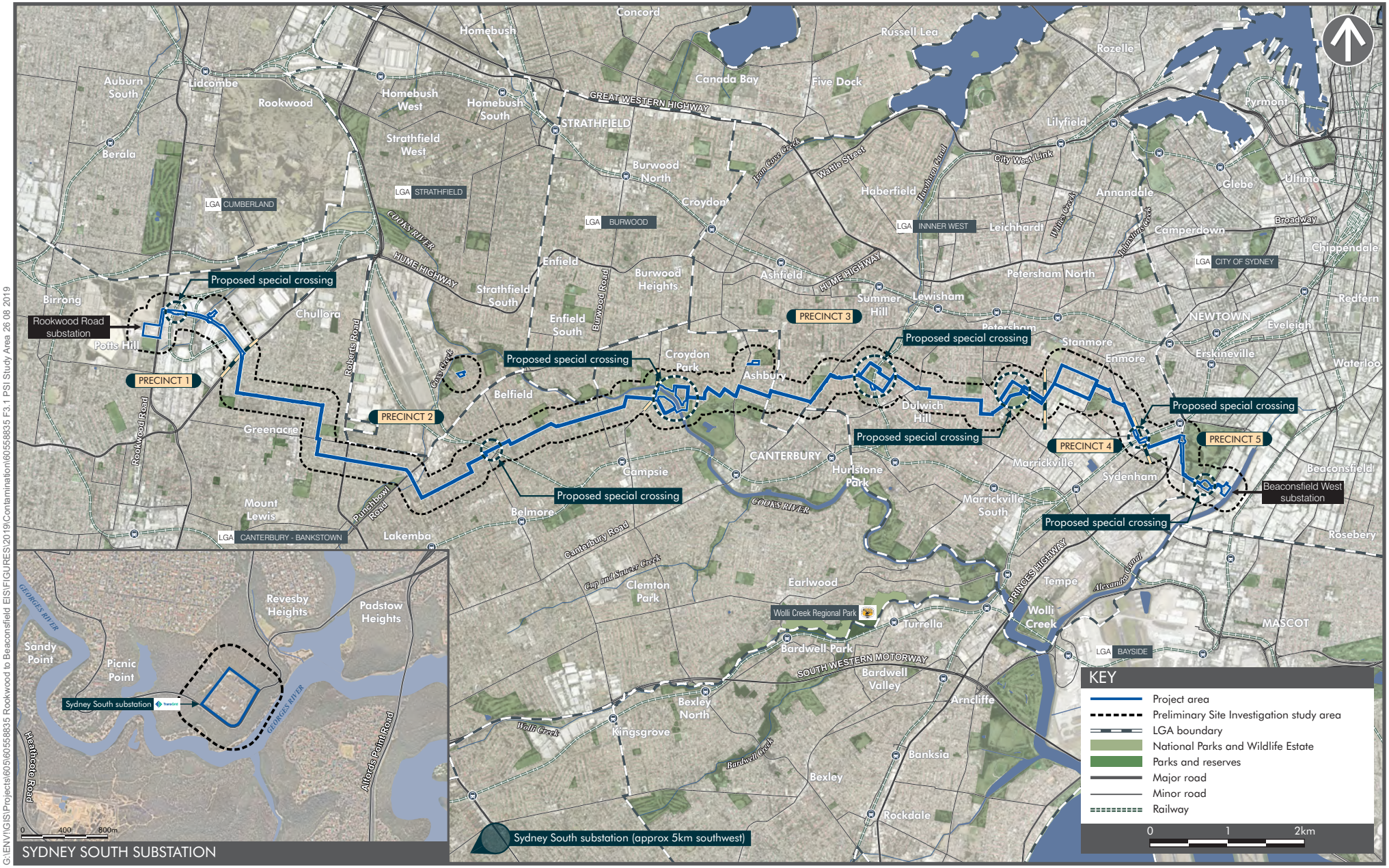
## 3.2 Statutory context, policy and guidelines

The relevant legislation and policies for contaminated land in NSW that have been considered during the preparation of this report include:

- *Contaminated Land Management Act 1997* (CLM Act);
- *Protection of the Environment Operations Act 1997* (POEO Act) and regulations under the POEO Act relevant to this report include:
  - *Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2018*
  - *Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2018 (Amendment Regulation)*
  - *UPSS The Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2014 (the UPSS Regulation)*
- *Environmentally Hazardous Chemicals Act 1985* (EHC Act); and
- *State Environment Planning Policy No 55 – Remediation of Land* (SEPP 55).

The following guidelines relevant to the assessment of potentially contaminated land in NSW that have been considered during the preparation of this report include:

- NSW Environment Protection Authority (NSW EPA) 2015, *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*;
- NSW EPA 2017, *Guidelines for the NSW Site Auditor Scheme* (3rd edition);
- NSW Department of Urban Affairs and Planning (DUAP) and NSW EPA 1998, *Managing Land Contamination, Planning Guidelines SEPP 55-Remediation of Land*;
- NSW Department of Environment and Conservation (DEC) 2007, *Guidelines for the Assessment and Management of Groundwater Contamination*;
- National Environment Protection Council (NEPC) 1999, *National Environment Protection (Assessment of site Contamination) Measure 2013* (ASC NEPM 2013);
- NSW EPA 2016, *Environmental Guidelines: Solid Waste Landfills*, Second Edition;
- NSW Office of Environment and Heritage (OEH) 2011, *Guidelines for Consultants Reporting on Contaminated sites*;
- NSW EPA 2012, *Guidelines for the Assessment and Management of sites Impacted by Hazardous Ground Gases*;
- Australian and New Zealand and Australian State and Territory Governments (ANZAST), 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality;
- Acid Sulfate Soils Management Advisory Committee (ASSMAC) 1998, *Acid Sulfate Soils Assessment Guidelines.* August 1998; and
- Heads of EPAs Australia and New Zealand (HEPA) (2018) PFAS National Environmental Management Plan, January (NEMP).







SYDNEY SOUTH SUBSTATION

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# PSI STUDY AREA

Powering Sydney's Future

Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*

*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018)*

FIGURE 3-1

## 3.3 Methodology

The construction of the transmission cable circuit and associated substation construction works would result in the disturbance and excavation of surface and subsurface soils. Surface soils would also be disturbed within construction laydown areas from the movement of plant and vehicles and storage of equipment. Groundwater may be encountered during trenching for the transmission cable circuit. It is therefore necessary to assess for the presence of potential contamination within all areas of the project.

The methodologies for evaluating the transmission cable route, construction laydown areas and substation sites which comprise the study area are summarised in the following sections.

### 3.3.1 Transmission cable route

The following methodology was undertaken to assess the existing environment in relation to contamination along the transmission cable route, including at the Rookwood Road and Beaconsfield West substations:

- a review of published geology, soils and acid sulfate soil risk maps;
- a review of the current land use (using current aerial imagery and zoning maps) and historical land use (using 1943 aerial imagery[2]) to identify areas of commercial/industrial land use and other potentially contaminating land sources (refer to **Section 4.1.8**);
- review of Lotsearch Pty Ltd (Lotsearch) reports for sections of the transmission cable route where current or historical commercial/industrial land use was identified based on review of current and 1943 aerial imagery (outlined in **Table 3-1**). The information reviewed within the Lotsearch reports included:
  - NSW EPA records (within 1 kilometre of the transmission cable route) for:
    - contaminated sites notified to the NSW EPA under Section 60 of the CLM Act 1997;
    - contaminated sites currently or formerly regulated by the NSW EPA (Record of Notices);
    - former gasworks sites;
    - EPA Per- and Poly-Fluoroalkyl Substances (PFAS) investigation program;
    - other sites with known contamination issues;
    - sites listed on the National Waste Management site database;
  - historical business activities from *Universal Business Directories (UBD) Business to Business Directory* including dry cleaners, motor garages and service stations (for the years 1991, 1986, 1982, 1978, 1975, 1970, 1965, 1961, 1950) within 50 metres of the transmission cable route;
  - historical aerial photographs for the years (2015, 2009, 2003, 1991, 1982, 1970, 1965, 1961, 1955, 1943);
  - historical topographic and parish survey maps;
  - registered groundwater wells within 2 kilometres of the transmission cable route;
  - geology, soils, acid sulfate soil risk and dryland salinity potential maps;
  - Local Environmental Plan (LEP) zones;
  - heritage items within 1 kilometre of the transmission cable route;

[2] https://maps.six.nsw.gov.au/

- review of relevant assessment reports:
  - Aargus 2009, *Phase II Environmental Site Assessment, 44-46 Burrows Road, Beaconsfield West*, NSW;
  - Aargus 2009, *Phase II Environmental Site Assessment, 48-62 Burrows Road, Beaconsfield West, NSW;*
  - Aargus 2009, *Phase II Environmental Site Assessment, 52 Burrows Road, Beaconsfield West, NSW;*
  - Douglas Partners 2012, *Report on Contamination Assessment – Transformer Bays 1 and 2 and Nature Strip, Beaconsfield West substation, 52 Burrows Road, St Peters*;
  - Douglas Partners 2017, *Report on Preliminary Geotechnical Investigation and Contamination Advice, Proposed Underground Cable Trench, Sydney Park, St Peters*;
  - EMM 2013, *Rookwood Road substation, Potts Hill, Supplementary Review of Environmental Factors*;
  - GHD 2013, *Remedial and Construction Environmental Action Plan Camdenville Park, May Street, St Peters, NSW*; and
  - Parsons Brinckerhoff 2005, *Phase 1 Environmental Site Assessment and Limited Sampling, Beaconsfield West substation, Alexandria, NSW*.

Following assessment of the existing environment, a preliminary conceptual site model (CSM) and qualitative risk assessment was used to inform the need for further investigations, management and mitigation measures for the project (refer to **Section 3.3.3**).

**Table 3-1 Relevant Lotsearch reports**

| Precinct | Lotsearch Reports | Report reference |
|---|---|---|
| 1 | Section 1: Rookwood Road substation (10 William Holmes Road, Potts Hill), Rookwood Road to Muir Road | Lotsearch, 2017a |
| 1 | Section 2: Muir Road to Hume Highway/Muir Road intersection, Chullora | Lotsearch, 2017b |
| 2 | Section 2A, Rawson Road, Greenacre, NSW 2190 | Lotsearch, 2019a |
| 2 | Section 3A, Wangee Road and Yangoora Road, Lakemba, NSW 2195 | Lotsearch, 2019b |
| 2 | Section 4A, Lucerne Street, Carter Street & Omaha Street, Lakemba, NSW 2195 | Lotsearch, 2019c |
| 3 | Section 5A, Cooks River Crossing, Campsie, NSW 2194 | Lotsearch, 2019d |
| 3 | Section 5B, Cheviot Street, Roslyn Street, King Street, Second Street & Holden Street, Ashbury NSW 2193 | Lotsearch, 2019e |
| 3 | Section 6A, Constitution Road, Denison Road, Hill Street and Terry Road, Dulwich Hill NSW 2203 | Lotsearch, 2019f |
| 3 | Section 6B, Pigott Street, Herbert Street & Pile Street, Dulwich Hill, NSW 2203 | Lotsearch, 2019g |
| 3 | Section 7A, Centennial Street & Horton Street, Marrickville, NSW, 2204 | Lotsearch, 2019h |
| 4 | Section 7B, Agar Street & Newington Road, Marrickville, NSW 2204 | Lotsearch, 2019i |

| Precinct | Lotsearch Reports | Report reference |
|---|---|---|
| 4 | Section 8A, Scouller Street, Juliett Street, Llewellyn Street & Edgeware Road, Marrickville | Lotsearch, 2019j |
| 5 | TransGrid Rookwood to Beaconsfield (Section 10) - Marrickville to St Peters, along Edinburgh Road, Bedwin Road and May St to Sydney Park | Lotsearch, 2017c |

### 3.3.2 Construction laydown areas and Sydney South substation

The following review of information was undertaken for the construction laydown areas and Sydney South substation:

- NSW EPA records detailing:
  - contaminated sites notified to the NSW EPA under Section 60 of the CLM Act 1997;
  - contaminated sites currently or formerly regulated by the NSW EPA (Record of Notices);
  - former gasworks sites;
  - other sites with known contamination issues;
  - sites listed on the National Waste Management site database;
- historical 1943 and recent aerial imagery (https://maps.six.nsw.gov.au/) and City of Sydney Historical Atlas of Sydney online maps (http://atlas.cityofsydney.nsw.gov.au/);
- geology, soil and acid sulfate soil risk maps; and
- LEP zones.

In addition to the above information, three construction laydown areas were included in the area covered by the Lotsearch reports which were used to inform the assessment of the transmission cable route (refer to **Section 3.3.2**). The relevant information from the Lotsearch reports was used to inform the assessment of the following construction laydown areas:

- 12 Muir Road;
- Peace Park; and
- Camdenville Park.

Following the review of information, the potential areas and contaminants of concern were identified and a preliminary CSM and qualitative risk assessment was used to inform the need for further investigations and management and mitigation measures for project construction works (refer to **Section 3.3.3**).

### 3.3.3 Conceptual site model and qualitative risk assessment

Potentially contaminated soil and groundwater and associated vapours have the potential to adversely impact human health and ecological receptors if not managed appropriately. A CSM is used to present and assess the linkage between potential contamination sources, exposure pathways[3], and receptors. As detailed in the ASC NEPM 2013, the development of a CSM is a key component of contaminated site assessments and provides the framework for identifying how potential receptors may be exposed to contamination.

A risk is considered to be posed to a receptor when the pathway between the receptor and a contamination source is ‘complete’ and the contamination is present at concentrations that could have a negative impact on the health of the receptor. Where there is no or insufficient quantitative analytical data to assess whether concentrations of contamination pose a risk, a qualitative risk assessment is used.

[3] An exposure pathway is the link from the source of contamination to the exposed population or environment e.g. direct contact, inhalation or ingestion by human receptors, transport in wind or groundwater migration (NEPC, 1999).

To assess the relative risk of existing land contamination during project construction, a CSM and a qualitative risk assessment was undertaken for the transmission cable route (for each precinct), Sydney South substation and the construction laydown areas. The matrix in **Table 3-2** was used to assign the risk assuming the absence of appropriate controls and mitigation measures.

**Table 3-2 Risk matrix for qualitative assessment of contamination risk**

| | | Presence of contamination at concentrations of concern | | |
|---|---|---|---|---|
| | | **Unlikely to be present** | **Potentially present** | **Known to be present** |
| **Exposure pathway between contamination source and receptor** | **Incomplete** | Low | Low | Low |
| | **Complete** | Low | Medium | High |

# 4.0 Description of the existing environment

## 4.1 Potts Hill to Alexandria transmission cable route

### 4.1.1 Soil landscapes

The *Soil Landscapes of the Sydney 1:100 000 Sheet* (Chapman and Murphy, 1989) characterises soil landscapes across the study area. The project would traverse three soil landscapes as shown in **Figure 4-1**.

- Blacktown (bt) – a residual landscape generally characterised by poor drainage and low soil fertility. Much of this soil landscape is covered by urban development which may include various pavement types or turf;
- Birrong (bg) – a fluvial landscape generally characterised by localised flooding, high soil erosion potential, saline subsoil, seasonal waterlogging and very low soil fertility. Most drainage lines of this landscape have been artificially lined with concrete; and
- Disturbed terrain (xx) – a disturbed landscape generally characterised by poor drainage and the potential for contamination, mass movement hazard, sources of sedimentation and groundwater contamination.

As the project area is located within an urban environment, landscape alteration is common and ranges from minor landscaping to extensive cut and fill activities associated with the construction of major buildings and infrastructure. The fill typically consists of locally excavated and imported materials. More substantial filling has occurred along low-lying areas such as the Cooks River and Alexandra Canal where some areas have been reclaimed from locally dredged river sediments.

The transmission cable route crosses the former infilled brick pits:

- Precinct 4: Henson Park, formerly Daley's brick pit quarry was filled in between 1914 and 1933, likely with municipal waste;
- Precinct 5: Camdenville Park was filled in with municipal waste and incinerator waste between early 1920s and 1950s; and
- Precinct 5: Sydney Park, formerly the Bedford Brick Works quarries were filled with municipal waste between 1948 and 1976.

The transmission cable route passes close to the former infilled brick pits:

- Precinct 3: Arlington Oval, former brick pit quarry filled prior to 1932, located about 40 metres south of the transmission cable route; and
- Precinct 3: Marrickville Park, former brick pit quarry filled prior to 1910 with municipal waste, located about 50 metres north of the transmission cable route.

Areas of mapped disturbed terrain are listed in **Table 4-1**.

**Table 4-1 Disturbed terrain**

| Precinct | Description |
|---|---|
| 1 | Disturbed terrain was mapped on the west side of Rookwood Road, along most of Muir Road (east side of the railway tracks intersecting Muir Road) and surrounding land to its north and south. |
| 5 | Disturbed terrain was mapped between the Princes Highway, St Peters and Alexandra Canal. |

### 4.1.2 Acid sulfate soils

ASS is the common name given to a range of soil types containing iron sulfides, the most common being pyrite. ASS may be present as actual ASS (AASS) or potential ASS (PASS).

PASS are sulfidic soils formed in coastal lowlands subject to tidal inundation or saline groundwater that have not been oxidised. PASS form where conditions are conducive for accumulation of iron sulfides in soils (e.g. source of sulfate, source of iron, reducing conditions, and stable low energy environment). When exposed to air due to drainage (watertable lowering/dewatering) or disturbance during earthworks, these soils produce sulfuric acid, often releasing toxic quantities of iron, aluminium and heavy metals. The heavy metals and acid can leach into soil and groundwater or impacted runoff can enter waterways and have negative impacts on water quality and aquatic ecosystems.

AASS occur where natural (e.g. groundwater level changes) or anthropogenic (e.g. land development, drainage works, etc.) activity has resulted in PASS to being exposed to air, resulting in releasing acidity and reaction products (iron, sulfate, calcium, magnesium, aluminium etc.).

NSW Office of Environment and Heritage (OEH, 2012) acid sulfate soil (ASS) risk maps show areas of ASS risk. The ASS classification is assigned based on the probability and depth of occurrence of ASS. The classes trigger when an acid sulfate soil management plan (ASSMP) should be prepared and are as follows:

- Class 1: Any works[4] require an ASSMP;
- Class 2: Works below the natural ground surface and/or works by which the watertable is likely to be lowered require an ASSMP;
- Class 3: Works more than 1 metre below the natural ground surface and/or works by which the watertable is likely to be lowered more than 1 metres below the natural ground surface require a ASSMP;
- Class 4: Works more than 2 metres below the natural ground surface or works by which the watertable is likely to be lowered more than 2 metres below the natural ground surface require an ASSMP; and
- Class 5: Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum, where the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land, require an ASSMP.

The ASS risk class within the project area is largely Class 5 (indicating no risk of intercepting acid sulfate soils for activities which do not lower the water table by more than 1 metre) with the exception of the areas listed in **Table 4-2** and **Figure 4-2**.

**Table 4-2 Acid sulfate soil risk and class**

| Precinct | Section of transmission cable route | Probability | Acid sulfate soil risk classification |
|---|---|---|---|
| 2 and 3 | Along Omaha Street east of Baltimore Street, Seventh Avenue Campsie to Hay Street/Harmony Street intersection in Canterbury (2.2 km length) | Low | Class 4 |
| 3 | Cooks River (35 metre length) | High | Class 1 |
| 3 | Centennial Street, Sydenham Road and Neville Street, Marrickville (130 metre length) | Low | Class 4 |
| 4 | Transmission cable route along Edgeware Road between Darley Street, Marrickville and May Street, St Peters (360 metre length) | Low | Class 2 |
| 5 | Princes Highway to Alexandra Canal (1.3 km length) | Low | Class 3 |

[4] Any works that disturb more than one tonne of soil or lower the watertable (OEH, 2012)

### 4.1.3 Geology

The regional geology of the study area is mapped in the Geological Survey of NSW Sydney 1:100,000 Geological Sheet 9130 (Herbert, 1983). The 1:100,000 geological maps are of regional scale and therefore the unit boundaries are approximate only and may extend beyond the mapped boundaries. Regionally, the study area is located within the Permo-Triassic Sydney Basin that is characterised by sub-horizontal lying sedimentary sequence of shale and sandstone. The geology of the study area is presented on **Figure 4-3**.

The geology within the study area is dominated by the Triassic aged Wianamatta Group that is overlain in part by Quaternary aged alluvium and marine deposits outcropping adjacent to major waterways. The Wianamatta Group includes Bringelly Shale (Rwb) and Ashfield Shale (Rwa) (Precincts 1-5). The Bringelly Shale is expected to underlie the Rookwood Road substation (Precinct 1). The residual soils derived from Bringelly Shale are generally between 3 metres and 6 metres thick and comprise medium to high plasticity clays. The Ashfield Shale comprises black to dark grey shale and laminite. The shale is underlain by the Hawkesbury Sandstone, a medium to coarse grained quartzose sandstone. The sandstone outcrops at the edge of the study area at Marrickville.

Quaternary alluvium (Qha) is mapped within the flood plains of the Cooks River (Precinct 3) and are composed of silty to peaty quartz sand, silt, and clay. Quaternary swamp deposits (Qhs) composed of peat, sandy peat, and mud are also mapped within the flood plains of the Alexandra Canal (Precinct 5). It is expected that about 550 metres of the transmission cable route is underlain by this unit in Precinct 5, between the southern end of Sydney Park to Alexandra Canal. There is a small area of also Quaternary marine deposits (Qhd) mapped within Sydney Park, comprised of medium to fine-grained marine sand with podsols. The majority of the Qhd unit in Sydney Park was formerly excavated during the former brick works and filled with municipal, demolition waste and imported soil. The Beaconsfield West substation is expected to be underlain by the Qhs unit along with about 500 metres of the transmission cable route. The Sydney South substation, located north of the Georges River, is expected to be underlain by weathered Hawkesbury Sandstone.

Igneous intrusions of Jurassic age including dykes are mapped within the study area. The cross-cutting dykes are composed of basalt, dolerite and volcanic breccia. The transmission cable route passes through these dykes in Dulwich Hill at Arlington Street, Constitution Road, Terry Road, Hill Street, Denison Road and Pigott Street.

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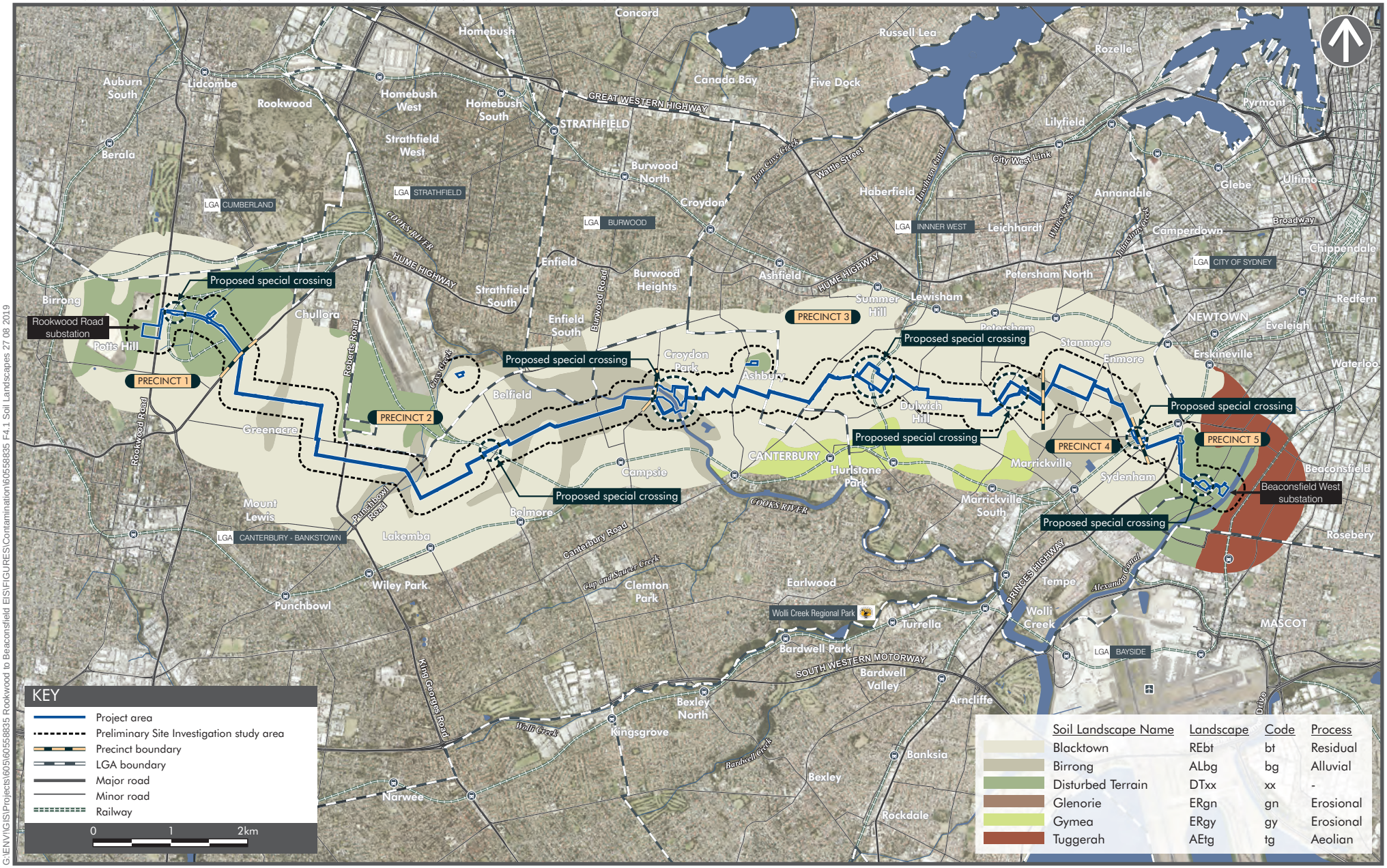


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# SOIL LANDSCAPES

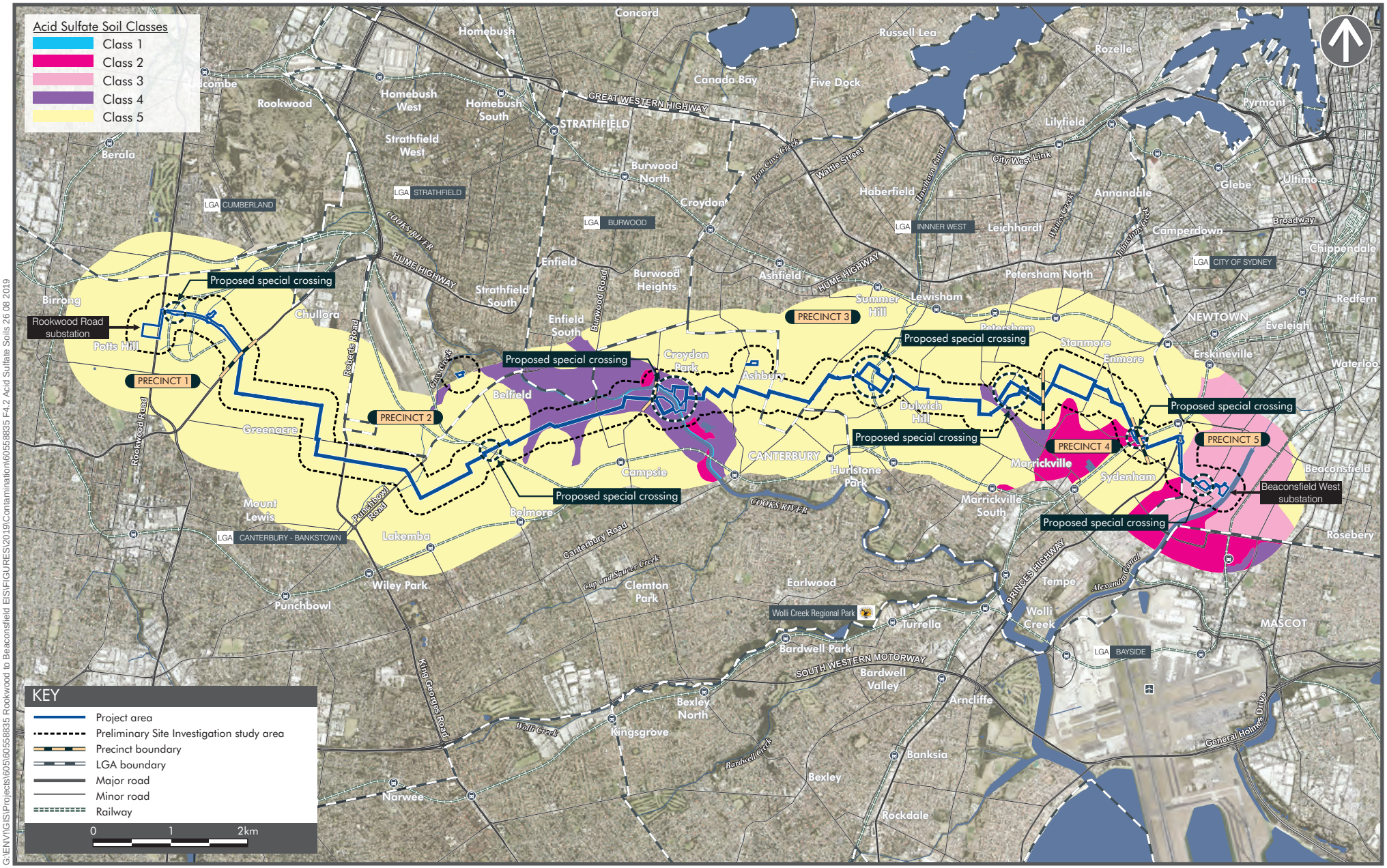
Powering Sydney's Future

Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*

*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018), Office of Environment and Heritage (OEH), 2008*

FIGURE 4-1

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# ACID SULFATE SOILS

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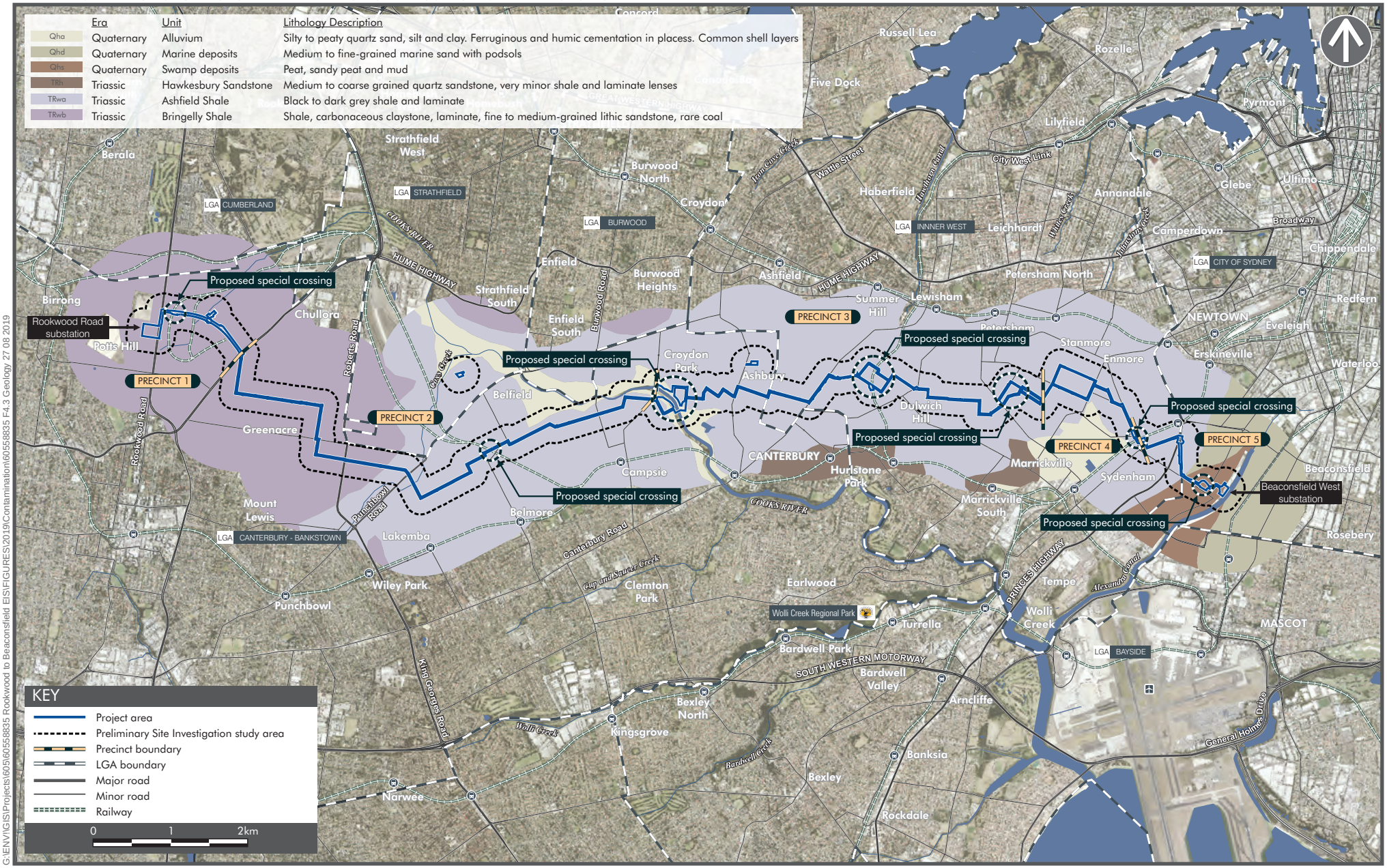
Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*

*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018), Office of Environment and Heritage (OEH), 2008*

FIGURE 4-2

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# GEOLOGY

Powering Sydney's Future

Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*

*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018), Department of Mineral Resources, 1983*

FIGURE 4-3

### 4.1.4 Drainage and topography

The project would cross the Cooks River, the main waterbody within the study area. Coxs Creek, a primary tributary of the Cooks River, would also be crossed by the project in the western portion of the study area. The Beaconsfield West substation is located adjacent to the Alexandra Canal, a highly modified waterway (formerly Shea's Creek) which also flows into the Cooks River.

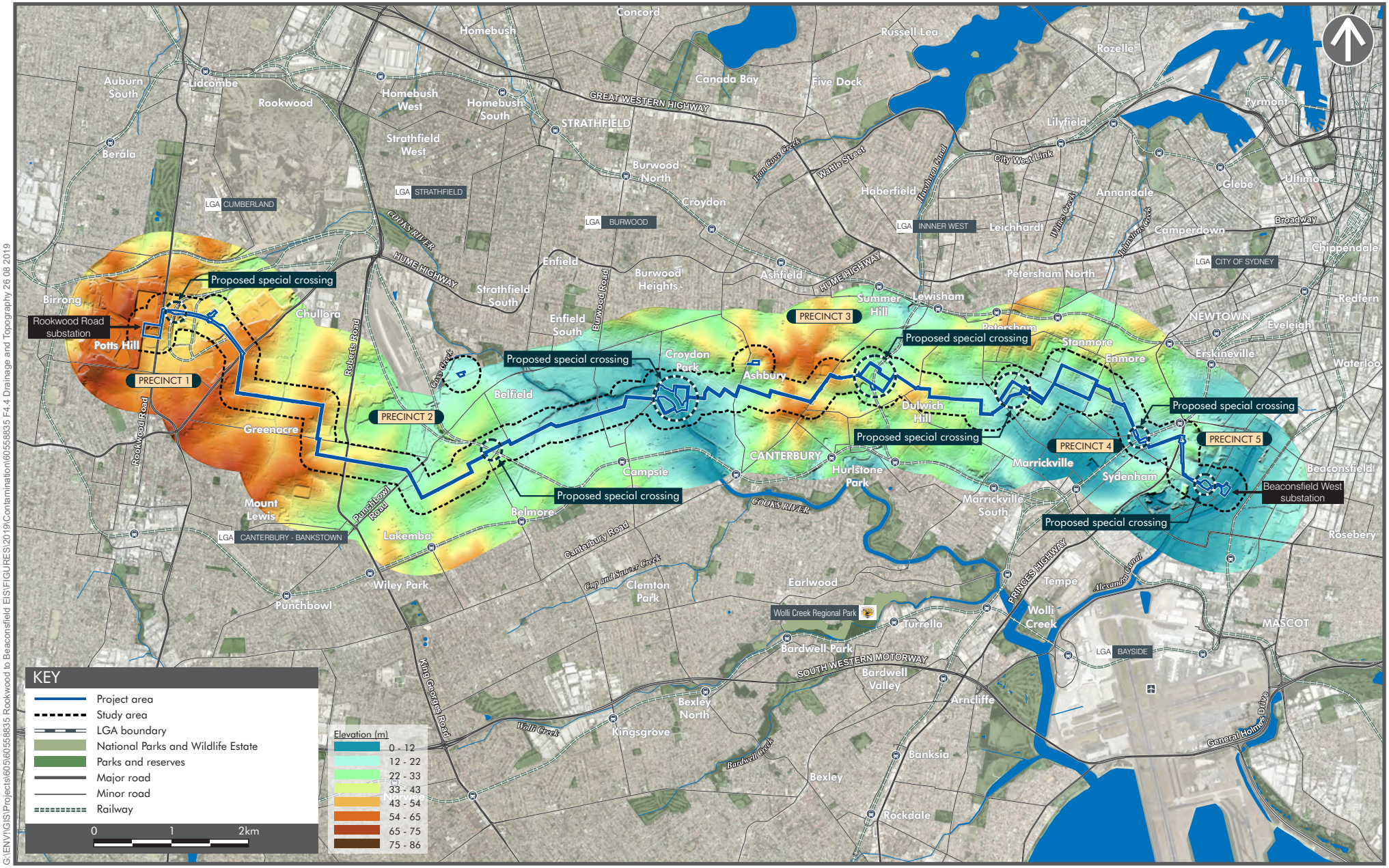
Surface water flows from the majority of land traversed by the project drains into these watercourses via local piped urban stormwater networks. Localised flooding is known to occur in some areas as a result of overflow to these networks. The transmission cable route crosses an artificial wetland in the southeast corner of Sydney Park.

The Cooks River and its tributaries comprise highly modified urban waterways which mainly take the form of concrete lined channels within the western portion of the study area and serve as part of the urban stormwater network. Within the eastern portion of the study area, while still influenced by urban development, the Cooks River widens and exhibits more natural stream characteristics including a mix of native and exotic riparian vegetation. A number of initiatives are underway to naturalise parts of the Cooks River catchment including replacement of sections of concrete lining and replanting with native species.

Topography and drainage across the study area are summarised in **Table 4-3** and shown on **Figure 4-4**. Drainage and surface water features are discussed further in **Appendix L** of the EIS (Surface Water and Flooding Report Technical Report).

**Table 4-3 Drainage and topography summary**

| Precinct | Elevation range | Drainage |
|---|---|---|
| 1 | 38-50 metres AHD, the highest point is at Rookwood Road substation and lowest in rail corridor beneath the Muir Road bridge. | The area drains into a tributary of the Cooks River which drains to the northwest into the Cooks River. |
| 2 | 6-50 metres AHD, the highest point is at the Hume Highway and lowest at Byron Street, Campsie. | Western portion drains into a tributary of the Cooks River which drains to the northwest into the Cooks River. Eastern portion drains into Coxs Creek which drains to the northwest into the Cooks River. |
| 3 | 1-45 metres AHD, the highest point is at the intersection of Old Canterbury Road and Arlington Street, Dulwich Hill and the lowest is at the Cooks River. | Drains to the Cooks River to the South. |
| 4 | 4-18 metres AHD, lowest point in Camdenville Park, highest at Princes Highway. | Drains into the Cooks River to the south. |
| 5 | 6-18 metres AHD, lowest in the eastern most and western most extent of the precinct, high point at King Street. | Drains into the Cooks River and Alexandra Canal. A flood detention basin is present in Camdenville Park and man-made wetlands are present within Sydney Park which harvest local stormwater. |

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# DRAINAGE AND TOPOGRAPHY

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Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*
*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018)*

FIGURE 4-4

### 4.1.5 Hydrogeology

Groundwater across the project area is present in the following three broad hydrostratigraphic units:

- fill, imported and local, used for the construction of infrastructure and waste infilling such as Sydney Park and Camdenville Park;
- alluvium around the edges of major water ways including Cooks River and Alexandra Canal; and
- bedrock aquifer of the Ashfield Shale and Hawkesbury Sandstone.

Shallow or perched groundwater could potentially be encountered in excavations (depths of less than 1.5 m bgl) in the following locations:

- Precinct 2 and 3: low lying areas around the Cooks River;
- Precinct 3: in the eastern section in Marrickville;
- Precinct 4: in the section in Camdenville Park; and
- Precinct 5: southern part of Sydney Park to Alexandra Canal.

Precinct 5 is within the Botany groundwater management zone 2 (implemented and managed by the NSW Office of Water), where there is a ban on using groundwater for domestic purposes due to known and potential groundwater contamination from a range of historical industries including tanneries, metal platers, service stations and depots, landfills, dry cleaners and wool scourers.

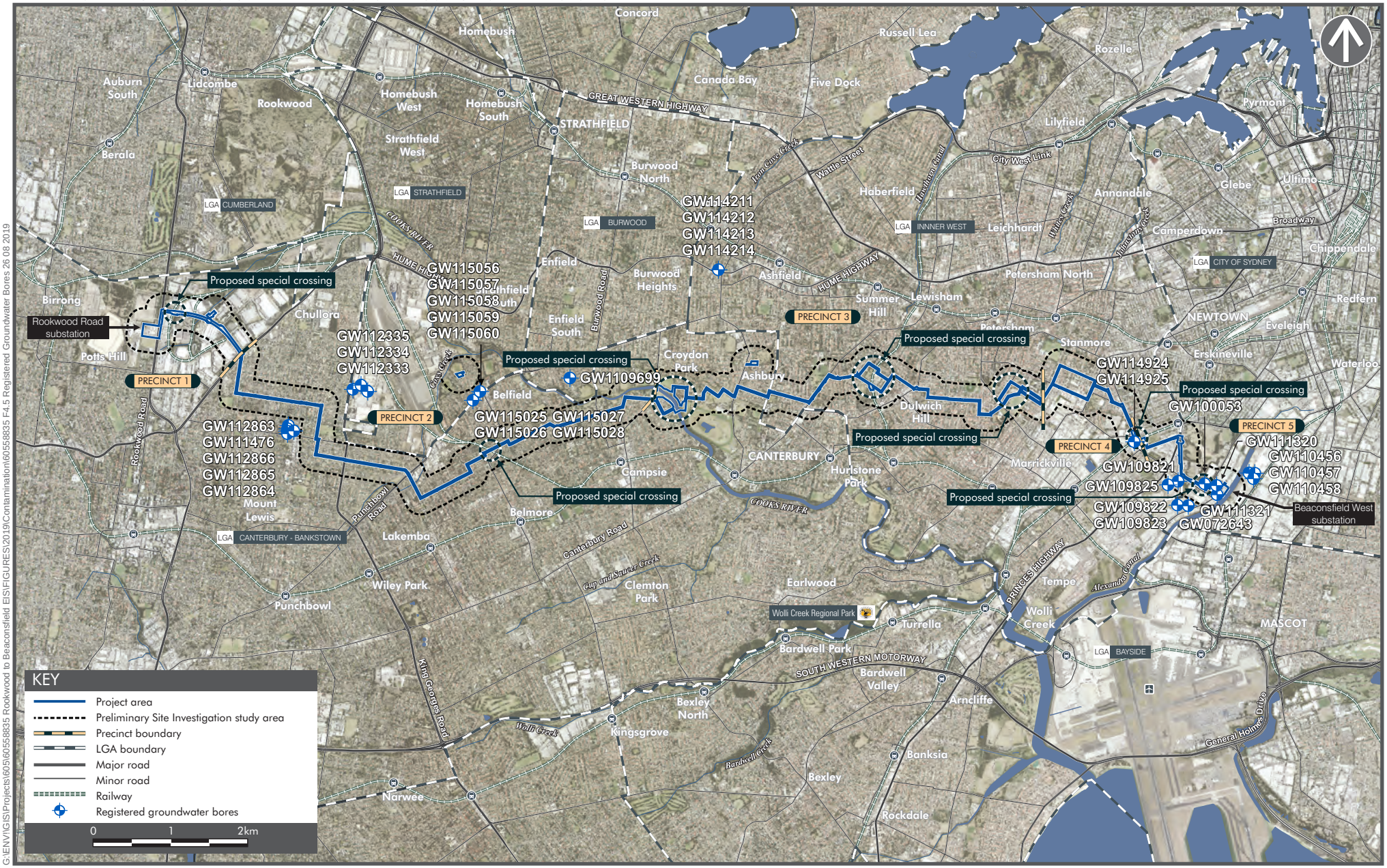
A summary of registered groundwater bores within each precinct within the study area is in **Table 4-4** and are shown in **Figure 4-5**.

Further description of hydrogeological conditions and assessment of groundwater impacts is presented in **Appendix N** (Groundwater Technical Report) of the EIS. Further site-specific information on groundwater conditions within Sydney Park, Australian Refined Alloys and the Beaconsfield West substation are included in the summary of previous contamination investigations in **Sections 4.1.16.2** and **Section 4.2.2** respectively.

**Table 4-4 Registered groundwater bores**

| Precinct | Registered groundwater bores |
|---|---|
| 1 | No registered groundwater bores were located within the study area. The closest registered groundwater bores are three monitoring bores located 640 metres east of the study area. They were installed between depths of 3.8 and 6 m bgl and did not have details of standing water levels (SWLs). |
| 2 | No registered groundwater bores were located within the study area. The nearest registered groundwater bore is over 60 metres from the study area.<br>Groundwater monitoring wells were located 10 metres east of the study area in Precinct 2 at Juno Parade, with SWLs of 3 to 4.9 m bgl. |
| 3 | Two registered groundwater monitoring bores installed in 2012 are located in Henson Park oval within the study area and 100 metres southeast of the transmission cable route:<br>• GW111686: SWL of 2.5 m bgl and total depth of 4.25 m bgl; and<br>• GW111687: SWL of 1.55 m bgl and total depth of 3.5 m bgl. |
| 4 | Two registered groundwater bores installed in 2012 near the corner of Lord Street and Edgeware Road, St Peters:<br>• GW114924: SWL of 7.6 m bgl and total depth of 9 m bgl; and<br>• GW114925: SWL of 2.8 m bgl and total depth of 6.1 m bgl |

| Precinct | Registered groundwater bores |
|---|---|
| 5 | Three registered groundwater monitoring bores were located in the eastern portion of the precinct:<br>• GW100053: SWL of 1.0 m bgl and total depth of 7 m bgl within Sydney Park (screened in alluvial soil);<br>• GW111320: SWL of 2.52 m bgl and total depth 5.2 m bgl within Australian Refined Alloys (screened in alluvial soil); and<br>• GW111321: SWL of 2.63 m bgl and total depth of 6 m bgl within Australian Refined Alloys (screened in alluvial soil).<br>Two registered groundwater monitoring bores were located within the Study Area, south of Campbell Road within the WestConnex St Peters Interchange:<br>• GW109821: SWL of 14.5 m bgl and total depth of 35 m bgl (screened in shale); and<br>• GW109825: SWL of 14.9 m bgl and total depth of 22 m bgl (screened in shale). |

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# REGISTERED GROUNDWATER BORES WITHIN THE STUDY AREA

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Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*

*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018), Department of Mineral Resources, 1983*

FIGURE 4-5

### 4.1.6 Current land use

Land zoning of locations along the transmission cable route are presented in **Table 4-5**. The transmission cable route is primarily located within road reserves (land which is not zoned) and land zoned SP2 (Infrastructure) under the relevant LEPs with the exception of sections listed in **Table 4-6**. The land use zones surrounding each substation are listed in **Table 4-7**.

**Table 4-5 Land use zones along the transmission cable route**

| Precinct | Transmission cable route land use zone | Study area (adjacent) land use zones | Relevant LEP |
|---|---|---|---|
| 1 | • B7 – Business park<br>• SP2 – Infrastructure<br>• IN1 – General industrial | • IN2 – Light industrial<br>• RE1 – Public recreation | • Bankstown LEP 2015 |
| 2 | • R2 – Low density residential<br>• SP2 – Infrastructure (road infrastructure facility, classified road and railway)<br>• R4 – High density residential<br>• R3 – Medium density residential<br>• RE1 – Public recreation | • B1 – Neighbourhood centre<br>• IN2 – Light industrial<br>• R4 – High density residential<br>• RE1 – Public recreation<br>• SP2 – Infrastructure (classified road, railway and educational establishment) | • Bankstown LEP 2015<br>• Canterbury LEP 2012 |
| 3 | • R3 – Medium density residential<br>• RE1 – Public recreation<br>• SP2 – Infrastructure (drainage, classified road)<br>• R2 – Low density residential<br>• B2 – Local centre | • B1 – Neighbourhood centre<br>• B4 – Mixed use<br>• B6 – Enterprise corridor<br>• R1 – General residential<br>• R2 – Low density residential<br>• R3 – Medium density residential<br>• R4 – High density residential<br>• RE1 – Public recreation<br>• RE2 – Private recreation<br>• SP2 – Infrastructure (educational establishment, classified road, rail infrastructure facilities) | • Ashfield LEP 2013<br>• Canterbury LEP 2012<br>• Marrickville LEP 2011 |

| Precinct | Transmission cable route land use zone | Study area (adjacent) land use zones | Relevant LEP |
|---|---|---|---|
| 4 | • R2 – Low density residential<br>• B1 – Neighbourhood centre<br>• IN2 – Light industrial<br>• B4 – Mixed use<br>• RE1 – Public recreation<br>• SP2 – Infrastructure (rail infrastructure facilities, railways) | • B1 – Neighbourhood centre<br>• B4 – Mixed use<br>• B5 – Business development<br>• B7 – Business park<br>• R1 – General Residential<br>• R2 – Low density residential<br>• R3 – Medium density residential<br>• R4 – High density residential<br>• RE1 – Public recreation<br>• RE2 – Private recreation<br>• SP2 – Infrastructure (Educational establishment) | • Marrickville LEP 2011 |
| 5 | • RE1 – Public recreation<br>• SP2 – Infrastructure (classified road)<br>• R1 – General residential<br>• B4 – Mixed use<br>• B5 – Business development<br>• IN2 – Light industrial | • B4 – Mixed use<br>• B5 – Business development<br>• R1 – General residential<br>• R2 – Low density residential<br>• RE1 – Public recreation<br>• SP2 – Infrastructure (classified road) | • Marrickville LEP 2011<br>• Sydney LEP 2012 |

Note:
1 Land uses based on aerial imagery sourced from Six Maps (http://maps.six.nsw.gov.au/), viewed 14 March, 31 May 23 November, 27 December 2018 and 13 May 2019.

**Table 4-6 Property details and land use zones for sections of the transmission cable route extending outside the road reserve and/or located in private allotments**

| Precinct | Location | Property details | Existing land use[1] | Transmission cable route land use zone | Study area (adjacent) land use zone |
|---|---|---|---|---|---|
| 1 | Transmission cable route through William Holmes Street | • Part Lot 102 DP1149790 | • Road for Potts Hill Business Park | • B7 – Business Park (Bankstown LEP 2015) | • IN1, IN2 – Infrastructure (Bankstown LEP 2015)<br>• RE1 – Public Recreation (Bankstown LEP 2015) |
| 1 | Cable bridge over a rail line on Muir Road, Chullora | • Part Lot 101 DP1067379<br>• Part Lot 102 DP1067379<br>• Part Lot 2 DP1227526 | • Railway line<br>• Vacant, vegetated industrial land | • IN1 – General industrial (Bankstown LEP 2015)<br>• IN1 – General industrial (Bankstown LEP 2015) | • SP2 – Infrastructure (Bankstown LEP 2015)<br>• B7 Business Park (Bankstown LEP 2015)<br>• IN1, IN2 – Infrastructure (Bankstown LEP 2015) |
| 2 | Underbore under freight rail line at Enfield Intermodal, Belfield | • Part Lot 16 DP1220197 | • Railway line<br>• Vacant, vegetated land | • SP2 – Infrastructure: Railways (Canterbury LEP 2012) | • SP2 – Infrastructure: Railways (Canterbury LEP 2012)<br>• R3 – Medium Density Residential (Canterbury LEP 2012) |
| 3 | Option 1: Proposed cable bridge over Cooks River and cycle way on Lindsay Street, Campsie | • Part Lot 1 DP 1161873<br>• Part Lot 2 DP 1159674<br>• Part Lot 7005 DP 93371<br>• Part Lot 15 DP 109776<br>• Part Lot 1 DP 1162030<br>• Part Lot 7049 DP 93378 | • Cooks River<br>• Vacant public recreation land<br>• Passive / active recreation (part of Lees Park) | • SP2 – Infrastructure: Drainage (Canterbury LEP 2012)<br>• RE1 – Public Recreation (Canterbury LEP 2012) | • R3 – Medium Density Residential (Canterbury LEP 2012)<br>• RE1 – Public recreation (Canterbury LEP 2012)<br>• SP2 – Infrastructure: Drainage (Canterbury LEP 2012) |

| Precinct | Location | Property details | Existing land use[1] | Transmission cable route land use zone | Study area (adjacent) land use zone |
|---|---|---|---|---|---|
| 3 | Option 2: Proposed underbore under Cooks River within Mildura Reserve/Croydon Park | • Part Lot 7315 and 7316 DP 1166291<br>• Part Lot 1 DP 126704<br>• Unidentified Parcel (Cooks River)<br>• Part Lot 7063 DP 93375 | • Cooks River<br>• Active recreation (part of Croydon Park)<br>• Passive recreation (part of Mildura Reserve) | • SP2 – Infrastructure: Drainage (Canterbury LEP 2012)<br>• RE1 – Public recreation (Canterbury LEP 2012) | • R3 – Medium density residential (Canterbury LEP 2012)<br>• RE1 – Public recreation (Canterbury LEP 2012)<br>• SP2 – Infrastructure: Drainage (Canterbury LEP 2012) |
| 3 | Option 1: Proposed underbore under light rail line at Terry Road, Dulwich Hill | • Part Lot 18 DP 1223949 | • Railway line, vegetated on both sides | • SP2 – Infrastructure: Rail infrastructure (Marrickville LEP 2011) | • SP2 – Infrastructure: Rail infrastructure (Marrickville LEP 2011)<br>• R1 – General Residential (Marrickville LEP 2011)<br>• R2 – Low Density Residential (Marrickville LEP 2011)<br>• R4 – High Density Residential (Marrickville LEP 2011) |
| 3 | Option 2: Proposed underbore under light rail line at Arlington Light Rail Station | • Part Lot 18 DP 1223949 | • Railway line and station (with landscaped and hardstand areas) | • SP2 – Infrastructure: Rail infrastructure (Marrickville LEP 2011)<br>• R2 – Low Density Residential (Marrickville LEP 2011)<br>• RE1 – Public recreation (Marrickville LEP 2011) | • R1 – General residential (Marrickville LEP 2011)<br>• R2 – Low Density Residential (Marrickville LEP 2011)<br>• RE2 – Public recreation (Marrickville LEP 2011)<br>• B4 – Mixed use (Marrickville LEP 2011)<br>• SP2 – Infrastructure: Rail infrastructure (Marrickville LEP 2011) |

| Precinct | Location | Property details | Existing land use[1] | Transmission cable route land use zone | Study area (adjacent) land use zone |
|---|---|---|---|---|---|
| 3 | Option 5a: Transmission cable route through Henson Park and underbore at Amy Street playground, Marrickville | • Part Lot 423 DP 1035319 | • Active recreation (Henson Park, sports field with hardstand areas) | • RE1 – Public Recreation (Marrickville LEP 2013) | • RE1 – Public Recreation (Marrickville LEP 2013)<br>• R2 – Low density residential (Marrickville LEP 2011) |
| 4 | Transmission cable route through Camdenville Park, St Peters | • Part Lot 9 DP879483<br>• Part Lot 1 DP 1056652 | • Passive recreation (Camdenville Park)<br>• Bridge | • RE1 – Public recreation (Marrickville LEP 2013)<br>• SP2 – Infrastructure (Sydney LEP 2012) | • R1 – General residential (Marrickville LEP 2011)<br>• R2 – Low density residential (Marrickville LEP 2011)<br>• B5 – Business development (Marrickville LEP 2011)<br>• IN1 – General industrial (Marrickville LEP 2011)<br>• SP2 – Infrastructure: Railways (Sydney LEP 2012) |
| 5 | Transmission cable route through Sydney Park car park, Princes Highway, Alexandria | • Part Lot 100 DP747948<br>• Part Lot 1 DP719002<br>• Part Lot 2 DP719002<br>• Part Lot C DP162399<br>• Part Lot 101 DP747948 | • Car park<br>• Road corridor | • RE1 – Public recreation (Sydney LEP 2012)<br>• SP2 – Infrastructure (Sydney LEP 2012) | • RE1 – Public recreation (Sydney LEP 2012)<br>• SP2 – Infrastructure (Sydney LEP 2012)<br>• B4 – Mixed use (Marrickville LEP 2011) |

| Precinct | Location | Property details | Existing land use[1] | Transmission cable route land use zone | Study area (adjacent) land use zone |
|---|---|---|---|---|---|
| 5 | Transmission cable route through Sydney Park, Alexandria | • Part Lot 2 DP627734<br>• Part Lot 6 DP810522<br>• Part Lot 1 DP995509<br>• Part Lot Y DP418181<br>• Part Lot 1 DP996048<br>• Part Lot D DP357837 | • Passive recreation | • RE1 – Public recreation (Sydney LEP 2012) | • RE1 – Public recreation (Sydney LEP 2012)<br>• B4 – Mixed use (Sydney LEP 2012)<br>• IN1 – General industrial (Sydney LEP 2012) |
| 5 | Transmission cable route through 54 Barwon Park Road | • Part Lot 101 DP543143 | • City of Sydney - Sydney Park Nursery Depot | • RE1 – Public recreation (Sydney LEP 2012) | • RE1 – Public recreation (Sydney LEP 2012)<br>• R1 – General residential (Sydney LEP 2012) |
| 5 | Transmission cable route through private property at: 182-190, 192-200 and 202-212 Euston Road, Alexandria and 53-57 Burrows Road, Alexandria | • Part Lot C DP162050<br>• Part SP45592<br>• Part SP45593 | • Industrial properties | • IN1 – General industrial (Sydney LEP 2012) | • IN1 – General industrial (Sydney LEP 2012)<br>• RE1 – Public recreation (Sydney LEP 2012) |

**Table 4-7 Land use zones surrounding the substations**

| Substation | Property details | Land use zone | Adjacent land use zones | Relevant LEP |
|---|---|---|---|---|
| Rookwood Road substation | • 10 William Holmes Street, Potts Hill<br>• Lot 101 DP1149790 | • B7 – Business park | • B7 – Business park<br>• RE1 – Public recreation<br>• SP2 – Infrastructure (road infrastructure facility and water supply system) | • Bankstown LEP 2015 |
| Beaconsfield West substation | • 48 Burrows Road, Alexandria<br>• Lot 102 DP791667 | • IN1 – General industrial | • IN1 – General industrial | • Sydney LEP 2012 |
| Sydney South substation | • 925A Henry Lawson Drive, Picnic Point<br>• Lot 1 DP440591 | • SP2 – Infrastructure (Electricity transmission or distribution network) | • E1 – National Park and Nature Reserves<br>• SP2 – Infrastructure (road infrastructure facility) | • Bankstown LEP 2015 |

### 4.1.7 Current potential contaminating activities

Existing businesses or land uses which undertake potentially contaminating activities within 50 metres of the transmission cable route include service stations, dry cleaners, workshops and industrial manufacturing sites. The sites are listed in **Table 4-8** and are shown on **Figure 4-6** to **Figure 4-9**.

**Table 4-8 Current potentially contaminating land uses**

| Precinct | Site name address | Land use/activity |
|---|---|---|
| 1 | Rookwood Road substation,<br>10 William Holmes Street Potts Hill | Substation |
| 1 | Galserv Galvanising Services,<br>153 Rookwood Road, Yagoona | Metal plating |
| 1 | BP Service Station, 155 Rookwood Road, Yagoona | Petrol station |
| 1 | Western Tank Services, 25 Muir Road, Yagoona | Industrial tank washing |
| 1 | Suez Chullora Resource Recovery Park,<br>19 Muir Road, Chullora | Waste processing |
| 2 | Budget Auto Parts, 24 Rawson Road, Greenacre | Mechanical workshop |
| 2 | Caltex Lakemba, 81 Wangee Road, Lakemba | Petrol station |
| 2 | Astor Industries, 512 Punchbowl Road, Lakemba | Electroplating |
| 2 | Belfield Service Centre, 4 Carter Street, Belfield | Mechanical workshop and former petrol station |
| 2 | Campsie Service Centre, 128 Brighton Avenue, Campsie | Petrol station |
| 3 | Viva Energy Pty Ltd (formerly Shell) high pressure oil pipeline along northern bank of the Cooks River | Fuel infrastructure |
| 3 | Tyrepower Dulwich Hill, 360 New Canterbury Road, Dulwich Hill | Mechanics and former petrol station |
| 3 | Dulwich Hill Laundry, 358 New Canterbury Road, Dulwich Hill | Dry cleaning |
| 4 | CarLovers – The Ultimate Carwash, 110 Addison Road, Marrickville | Oil/fuel waste |
| 4 | Metro Petroleum, 93-99 Addison Road,<br>Marrickville | Petrol station and mechanics |
| 4 | Cleopatra Laundrette, 103 Addison Road, Marrickville | Dry cleaning |
| 4 | Rasko Linen Services, 64-66 Addison Road, Marrickville | Dry cleaning |
| 4 | Unmarked business, 51 Addison Road,<br>Marrickville | Petrol station (vent pipes for underground storage tanks [USTs] on exterior wall, potential for USTs close to or beneath road) |
| 4 | Metro Petroleum service station, 383 Enmore Road,<br>Marrickville | Petrol station |
| 4 | NRMA Car Servicing Centre, 54 Smidmore Street,<br>Marrickville | Mechanical repair workshop |
| 4 | Metro Service Centre, 1 Edinburgh Road, Marrickville | Mechanical repair workshop/former petrol station |
| 5 | A&F Drive Shaft Repair, 49 May Street, St Peters | Engineering workshop |
| 5 | BP service station, 36 Princes Highway, St Peters | Petrol station |
| 5 | City of Sydney, Parks Depot, 54 Barwon Park Road St Peters | Depot and maintenance workshop |

| Precinct | Site name address | Land use/activity |
|---|---|---|
| 5 | Australian Refined Alloys, 202-212, Euston Road, Alexandria | Metal manufacturing |
| 5 | Beaconsfield West substation, 48 to 62 Burrows Road, Alexandria | Substation |

### 4.1.8 Historical aerial photograph review

Historical aerial photographs were also reviewed to identify any other potential contamination sources within the study area not previously identified in searches. Findings of the review are listed in **Table 4-9**.

**Table 4-9 Historical land use – historical aerial review**

| Precinct | Section | Description |
|---|---|---|
| 1 | Rookwood Road/Muir Road west | • Industrial development along the western side of Rookwood Road began in the 1950s. Rookwood Road was widened by 1982<br>• Industrial development began on the corner of Rookwood Road and William Homes Street between 1955 and 1961. The industrial development was cleared vacant land in 2009 prior to the development of the TransGrid substation<br>• Prior to the construction of Muir Road between 1991 and 2003, the land comprising Muir Road contained several railway lines and sidings leading to the WWII Chullora aircraft factory located 100 metres south. |
| 1 | Muir Road east | • There were factories on the north side of Muir Road related to military manufacturing for WWII<br>• An iron foundry factory was located at the location of the present-day TAFE building since 1955<br>• A migrant camp was located on the southern side of Muir Road between 1955 and 1961<br>• Muir Road east was partially built by 1982<br>• New factories on the south side of Muir road were constructed between 1970 and 1982<br>• Muir Road was constructed between 1991 and 2003<br>• Factories opposite the TAFE were constructed between 2003 and 2009<br>• Factories between the freight railway line and the TAFE were constructed between 2009 and 2015. |
| 2 | Hillcrest Avenue and Rawson Road | • Rawson Road was sparsely developed until the 1950s and extended past Waterloo Road in 1961<br>• Industrial factories were present 50 metres south of Rawson Street, just east of Action Street until the 1970s when they were redeveloped into medium density strata development<br>• Car wreckers were located 60 metres west of Hillcrest Avenue<br>• Corner shops were located on the corner of Rawson and Hillcrest Avenue and Waterloo Road and Rawson Road. |
| 2 | Maiden Street, Juno Parade, Acacia Avenue | • In 1943 the study area along these streets was largely undeveloped, residential or rural land. |

| Precinct | Section | Description |
|---|---|---|
| 2 | Wangee Road, Punchbowl Road and Yangoora Road | • Industrial and commercial development began after 1955 between Wangee Road, Punchbowl Road and Coxs Creek<br>• All other parts of the study area were residential land use except for:<br>- corner shops at Yangoora Road and Boorea Avenue intersection;<br>- a commercial property at 99 Yangoora Road; and<br>- corner shops at the Skyline Street and Wangee Road intersection. |
| 2 | Lucerne Street and Carter Street | • There appears to have been only residential development on either side of the railway line since 1943 with the exception of commercial buildings at the intersection of Yangoora Road and Knox Street (present form 1943).and a workshop at 4 Cater Street present form 1955. |
| 2 | Burwood Road, Omaha Street, Seventh Avenue, Beamish Street and Byron Street | • In the 1943 and current aerial photographs the land use along these streets has been low to medium density residential. |
| 3 | Brighton Avenue, Cowper Street and Cooks River Crossing | • A service station was visible on the southwest corner of Brighton and Byron Streets in 1943 with remainder residential land use and open space/recreation along the Cooks River<br>• A commercial building was located opposite the service station on the corner of Brighton and Byron Streets from 1955 until redeveloped into residential by 1982<br>• The ground surface appeared to change from irregular and uneven ground to more level ground in Mildura Reserve, Croydon Park and Lees Parks between the 1943 and 1950s aerials. |
| 3 | Cheviot Street, Roslyn Street, King Street, Second Street, Holden Street and Hanks Street | • All streets were residential land use with the exception of:<br>- Canterbury Park racecourse grounds to the south;<br>- a corner shop at Roslyn Street and King Street intersection;<br>- a corner shop at King Street and First Street intersection;<br>- a corner shop on the corner of Second Street and Holden Street;<br>- a corner shop at Holden Street and Hanks Street; and<br>- market gardens and/or a nursery at 33-41 Hanks Street from 1943 to 1991, redeveloped into strata housing by 2003. |
| 3 | Old Canterbury Road | • In the 1943 aerial Old Canterbury Road was residential on the eastern side and recreational open space (Yeo Park) and Trinity Grammar School on the western side<br>• Commercial properties were located 50 metres south of the intersection with hanks Street in 1943<br>• The current land use along either side of Old Canterbury Road has not changed extensively between 1943 and the present day. |

| Precinct | Section | Description |
|---|---|---|
| 3 | Arlington Street, Constitution Road, Windsor Road, Terry Road, Hill Street, Denison Road, Pigott Street, Herbert Street | • Industrial land use was formerly present in the following areas:<br>- the east side of Arlington Oval between Williams Parade, Constitution Road and the light rail until redevelopment into residential housing in the 1990s;<br>- the block of land between Constitution Road and Dennison Road until redevelopment into apartments between 2003 and 2009;<br>- the block of land between Grove Street and the current light rail line until between 2016 and 2018 when redeveloped into apartments; and<br>- the north side of Terry Road adjacent to the current light rail line;<br>• There has been commercial land use at the intersection of Pigott Street, New Canterbury Road and Herbert Street since the 1943 aerial. The apartments on the southern corner of the intersection were redeveloped from several commercial properties between 2009 and 2016<br>• There were commercial land uses up-gradient of the study area along New Canterbury Road including service stations and factory/workshop type buildings since 1943<br>• The remainder of the study area appeared to have been residential and open space land use. |
| 3 | Fairfowl Street, Pile Street, Livingstone Street, Hawke Hurst Street, Centennial Street | • All surrounding land use appeared to be residential or open space with the exception of the following:<br>- a corner shop at Wardell Road and Pile Street intersection;<br>- commercial/industrial buildings and/or shops at 128 to 134 Livingstone Road;<br>- a corner shop at 32 Petersham Road and Centennial Street intersections; and<br>- industrial factories and workshops within the current location of Marrickville High School until between 1965 and 1970, when the factories and surrounding houses were demolished and the high school constructed by 1982 (30 metres south of the transmission cable route). |
| 3 | Sydenham Road, Centennial Street, Neville Street, Henson Park, Surrey Street, Horton Street, Charles Street | • Since 1943 the majority of the study area and surrounding land comprised residential housing and Horton Park oval, with the exception of the following:<br>- a corner shop at the intersection of Sydenham Road and Centennial Street;<br>- industrial factories 100 metres west of Neville Street which were present until redevelopment into Wilkins Public School between 1970 and 1982;<br>- an army depot was present 50 metres north of Charles Street in the location of the present-day Addison Road Community Facility in 1943;<br>- corner shops were located at the intersection of Charles Street with Illawarra Road and Horton Street and Illawarra Road since 1943; and<br>- Marrickville industrial area was present 50 metres east of Illawarra Road since 1943. |

| Precinct | Section | Description |
|---|---|---|
| 4 | Illawarra Road, Addison Road, Agar Street, Newington Road, Enmore Road | • The majority of Illawarra Road has had residential housing on either side since 1943, with a former army depot located 50 metres to the west and industrial land use 50 to 100 metres to the east<br>• The land use along Agar Street has been residential with the exception of the commercial property on the eastern corner at Addison Road<br>• The majority of land use along Addison Road has been commercial/industrial on both sides since the 1943 aerial;<br>• The eastern end of Newington Road had industrial land use between Philpott Street and Fotheringham Lane until demolished by 1991 and redeveloped into medium density housing<br>• Enmore Road was residential on either side with the exception of commercial/industrial land use on the southern corner of Cowper Street and the western side of Enmore Road between Scouller Street and Newington Road. |
| 4 | Scouller Street, Julliett Street, Llewellyn Street and Edgeware Road | • Scouller Street and Julliet Street have been residential land use since 1943 aerial<br>• 22 to 30 Llewellyn Street and the property on the corner of Edgware Road appeared to be commercial, all others appeared residential land use since 1943<br>• A petrol station was located on Edgeware Road between 1961 and 2006, 15 metres north of the transmission cable route. |
| 5 | Bedwin Road, Camdenville Park, May Street, Barwon Park Road, Sydney Park, Euston Road, Burrows Road, Beaconsfield West substation | • The brick pit quarry in Camdenville Park was visible in the 1943 aerial photograph and filled in and levelled by 1955. Another brick pit quarry was located approximately 200 metres south of Bedwin Road in 1943<br>• Factories were present on the south side of Bedwin Road<br>• The land use along May Street appeared to be mainly residential in 1943 and developed into mainly commercial/industrial buildings over the following decades<br>• Five main brick pit quarry's were present within Sydney Park in 1943<br>• The brick manufacturing kilns and associated buildings along Barwon Park Road were demolished between 1965 and 1970 and the present day building within the City of Sydney Parks Services Depot constructed<br>• A shipping container terminal was located in the south west corner of Sydney Park in 1982<br>• The area of the current Sydney Park appears to have been subject to filling and levelling. The petrol station within the present-day carpark in Sydney Park at Princes Highway was demolished between 1982 and 1991. |

### 4.1.9 Historical maps and other information

Other information obtained from historical maps or other sources are listed in **Table 4-10**.

**Table 4-10 Historical land use – historical maps and other information**

| Precinct | Description |
|---|---|
| 1 | • The 1917 historical map showed the reservoirs west of Rookwood Road. Muir Road was not present and surrounding land was creek and bushland/scrub<br>• The 1949 and 1975 historical map showed the study area was part of the Chullora Railway Workshops. |
| 2 | • The 1917 and 1936 historical maps showed that the study area between the Hume Highway and Punchbowl Road was sparsely developed residential and rural land<br>• The 1917 and 1936 historical map showed a quarry covering most of Arlington Park within the Study Area. |
| 3 | • The 1917 historical map illustrated a brick works in Henson Park and the 1936 historical map showed a quarry pit extending across Henson Park. According to an article in The Daily Telegraph in 1937[5], '*100,000 tonnes of spoil gathered from all over the metropolitan area was dumped in the crater'*<br>• Marrickville Park located 68 metres north of the transmission cable route in Pile Street was also a former brick pit quarry that was filled with municipal waste by the early 1900s. The Daily Telegraph reported Marrickville council meeting minutes from the 12 June 1893. A resident raised a concern about vapours arising from the tip at the corner of Livingstone Road and Fraser Street and asked how the council intended to address the problem[6]. |
| 4 | • The 1938-1950 Civic Survey map showed Bradford Cotton Mills located approximately 50 metres east of Edgeware Road (between Alice and Laura streets) |
| 5 | The 1949 historical survey map illustrates that Sydney Park and the area to the south, formerly Alexandria Landfill, formerly comprised clay/brick pits. The 1938-1950 Civic Survey map showed the following along the location of the transmission cable route:<br>• Water filled clay pit and incinerator depot within Camdenville Park;<br>• Modern Motors (garage) was located in Sydney Park near intersection of Barwon Park Road and Princes Highway;<br>• Carrington Brick Works kilns within Sydney Park on Barwon Park Road;<br>• Department of Works and Housing stores depot was located in the southeast corner of Sydney Park;<br>• Hibbard Motors Pty Ltd on the south side of Campbell Road;<br>• Australian Bitumen Products Pty Ltd was located between Euston Road and Burrows Road (on north side transmission cable route); and<br>• Papyrus Pty Ltd paper and cardboard manufacturing and a sandblasting and metallising service were located within Beaconsfield West substation.<br>The Council of the City of Sydney 1949-1972 Building Surveyors Detail Sheets showed the same as the 1949 map with the exception of:<br>• St Peters Car Sales in the location of the former Modern Motors garage;<br>• T. Carr and Co (unknown industrial business) in the location of the present-day City of Sydney Parks Depot; and<br>• City of Sydney Disposal Depot and Imperial Chemical Industries of Australia and New Zealand Ltd within the southwest portion of Sydney Park. |

### 4.1.10 Historical businesses

Parts of the study area that are currently or historically have been used for commercial/industrial purposes were further investigated by reviewing UBD business listings in Lotsearch reports (Lotsearch 2017a to b and Lotsearch 2019a to j) within 50 metres of the transmission cable route. Sites with

[5] The Daily Telegraph, Sat 10 Jul 1937, *Brick Pit Now Fine Oval* (page 19).
[6] The Daily Telegraph, Tue 13 June 1893, *Municipal – Marrickville* (page 7)

potentially contaminating activities are listed in **Table 4-11**. The locations are shown on **Figure 4-6** to **Figure 4-9**.

**Table 4-11 Historical land use – UBD business directory records**

| Precinct | Address | Activity[1] |
|---|---|---|
| 1 | 127 Rookwood Road, Yagoona | Builders suppliers, plastic container (M/D) (Galintel Pty. Ltd) |
| 1 | 135 Rookwood Road, Yagoona | Pipe and/or pipe fittings (M/D), steel products (M/D) (Proplant Ind. Pty. Ltd) |
| 1 | 137-147 Rookwood Road, Yagoona | Galvanising and/or tinning, welding (Galserv Galvanising) |
| 1 | 151 Rookwood Road, Yagoona | Barbeque and incinerator (M/D) (Spic 'N' Span Corporation Pty. Ltd) |
| 1 | 153 Rookwood Road, Yagoona | Motor garage and/or engineer and/or service station (S.Dixon) |
| 1 | 155-165 Rookwood Road, Yagoona | Motor garage and service station (BP Potts Hill) |
| 1 | 157 Rookwood Road, Yagoona | Carriers and/or cartage contractors, road transport services |
| 1 | 159 Rookwood Road, Yagoona | Carriers and/or cartage contractors |
| 1 | Unknown location (road match), Rookwood Road, Yagoona | • Solo Motor garage and/or engineers and/or service station<br>• Hospital supplies and equipment (M/D)<br>• Brunker Road Service Station<br>• White's Service Centre (motor garage)<br>• Sheet metal workers |
| 1 | Unknown location (road match) | • Chullora Iron Foundry |
| 2 | 237-241 Hume Highway, Greenacre | Motor Wreckers (Ace Motor Wreckers/ Bernies Auto Wreckers) |
| 2 | 101 Wangee Road, Greenacre | Motor spare parts/wreckers (Greenacre Spares) |
| 2 | 77 Wangee Road, Greenacre | Motor bus services (Red Top Transport Services) |
| 2 | 39-79 Hampden Road, Lakemba | Tannery and manufacturing site (Dehn Bros Tannery and B.S Toland Pty Ltd manufacturing) |
| 2 | 97 Yangoora Road, Lakemba | Pickering Joinery Works |
| 2 | 46 Knox Street, Belmore | Motor garage and service station (S. Nicholson & Sons motor garage) |
| 2 | 8 Knox Street, Belmore | Dry cleaners (G Clark dry cleaners) |
| 2 | 2a Yangoora Road, Belmore | Dry cleaners (National Dry Cleaning & Dyers) |
| 2 | Carter Street, Belfield | Belfield Service Centre (former service station) |
| 2 | 126 Brighton Avenue, Campsie | Motor garage and service station (Simon's Garage) |
| 3 | Corner Brighton Avenue & Wentworth Street Croydon Park | Motor garage and service station (Palms Service Station) |
| 3 | 39 King Street, Ashbury | Motor garage and service station (Ashbury Service Station) |
| 3 | 35 Hank Street, Ashfield | Sprys Nurseries Pty Ltd |
| 3 | 46 Constitution Road, Dulwich Hill | Motor garage and service station (Five Ways Service Station) |

| Precinct | Address | Activity[1] |
|---|---|---|
| 3 | Terry Road, Dulwich Hill | Flour manufacturing (Great Western Milling Co/Waratah Flour Mill) |
| 3 | 9 Hill Street, Dulwich Hill | Meat exporters (Andrews Meat (Export) Pty. Ltd) |
| 3 | 22 Grove Street, Dulwich Hill | Tyre manufacturing (Walker Radial) and cement manufacturers (Sydney & North Sydney Lime Burners) |
| 3 | Williams Parade, Dulwich Hill | Pump/windmill/irrigation manufacturing (Sidney Williams & Co. Pty. Ltd. Manufacturing) |
| 3 | Williams Parade, Dulwich Hill | Demolition/haulage contractors (Kasadelis Bulk Tipper Haulage) |
| 3 | 115 Constitution, Dulwich Hill | Tyre manufacturing (Co Pty Ltd/Former Tyre Recapping)<br>Chemical Manufacturing/disinfectants/detergent/electroplating supplies/polish (Former Pall Mall Manufacturing) |
| 3 | 207A Denison Road Dulwich | Motor garage/service stations/petrol (Stevenson's, DJ Crawley, McCarthy Motors) |
| 3 | 67 Union Street, Dulwich Hill | Tyre manufacturing (Former Dunlop X-Press Tyre Services Pty. Ltd/Dunlop Olympic) |
| 3 | 529 New Canterbury Road, Dulwich Hill | Motor service stations/petrol (Bel Air Service Station) |
| 3 | 444 New Canterbury Road, Dulwich Hill | Motor service stations/petrol (Reliance Garage/Prichard and Jefferies) |
| 3 | 60 New Canterbury Road, Dulwich Hill. | Motor service stations/petrol (Ampol Dulwich Hill Service Station) |
| 3 | 475 New Canterbury Road, Dulwich Hill | Dry cleaners (Dulwich Hill Laundrette) |
| 3 | 416 New Canterbury Road, Dulwich Hill | Dry cleaners (Former Service Station - Clouting & Son) |
| 3 | 410 New Canterbury Road, Dulwich Hill | Dry cleaners (Spotless Dry Cleaners) |
| 3 | 417 New Canterbury Road, Dulwich Hill | Dry cleaners (Joan Library Dry Cleaners) |
| 3 | 405 New Canterbury Road, Dulwich Hill | Dry cleaners (California Dry Cleaners) |
| 3 | 360 New Canterbury Road, Dulwich Hill | Tyrepower - Former Service Station - Roys/Laurence Motors/Menser Motors |
| 3 | 128 Livingstone Road, Marrickville | Die Casters (Foundry) (Smith and Chesney) |
| 4 | 2 Yabsley Avenue, Marrickville | Engineers-general and manufacturing and mechanical (Western Service Engineering, Chromecraft Electroplating Co Pty Ltd, Forest Boot Factory, Factories) |
| 4 | 284 Sydenham Road, Marrickville | Motor service stations/petrol (Livingstone Park Service Station) |
| 4 | 71 Illawarra Road, Marrickville | Manufacturing (Swedish Wood Working Co, Wermut Woodworking) |
| 4 | 163 Addison Road, Marrickville | Dry cleaners (Jack & Jill - Dry Cleaners) |
| 4 | 119a Addison Road, Marrickville | Motor service stations/petrol (Senior Service Station) |

| Precinct | Address | Activity[1] |
|---|---|---|
| 4 | 48 Addison Road, Marrickville | Motor service stations/petrol (Caltex Service Station) |
| 4 | 7 Addison Road, Marrickville | Dry cleaners (Lustre Dry Cleaning) |
| 4 | 12 Addison Road, Marrickville | Road signs (M/D), enamellers, industrial spray painters, motor garage (Road Signs, Marrickville Spray Painting Pty. Ltd, Lustreglo Pty. Ltd) |
| 4 | 14-15 Addison Road, Marrickville | Printers (Morrison & Bailey Pty. Ltd) |
| 4 | 19 Addison Road, Marrickville | pump (M/D), pump repairs (Engineering Enterprises) |
| 4 | 20 Addison Road, Marrickville | Plastic and rubber mould (M), die and press tool makers (Kam, G. Precision Engineering) |
| 4 | 22 Addison Road, Marrickville | Chemical manufacturers (paint/enamel/varnish/stain/disinfectant) (Tomlin Chemical Industries) |
| 4 | 22a Addison Road, Marrickville | Joinery (M) (Tomlin Chemical Industries) |
| 4 | 23 Addison Road, Marrickville | Metal workers, metal products (M/S), insecticide (M), oil burner (M), metal pressers and stampers, motor wreckers (Henderson Shaw Pty. Ltd) |
| 4 | 31 Addison Road, Marrickville | Shoe polish and cleaner (M) (Siesta Frames) |
| 4 | 43 Addison Road, Marrickville | Screen printers, plastic goods (M), leather products (M) (Vogue Displays (N.S.W.) Pty Ltd) |
| 4 | 48 Addison Road, Marrickville | Motor service stations-petrol/service station (Caltex) |
| 4 | 1/48 Addison Road, Marrickville | Electrical switchboard (M/D) |
| 4 | 51 Addison Road, Marrickville | Plastic goods (M/D), plastic coatings specialists (Bridge J) |
| 4 | 55 Addison Road, Marrickville | Motor panel beaters/spray painters, carriers/cartage contractors (Pullin, H. G. Pty. Ltd) |
| 4 | 55-58 Addison Road /1 Denby Street, Marrickville | Detergent, disinfectant, cleaning products (M/D) (Pullin, H. G. Pty. Ltd) |
| 4 | 60 Addison Road, Marrickville | Sheet metal workers (A.E, Wybrow) |
| 4 | 65 Addison Road, Marrickville | Printers (Addison Printery) |
| 4 | 68 Addison Road, Marrickville | Printers, lithographic plate makers, wire products (M/D) (Manufactures Supplies Pty. Ltd) |
| 4 | 80 Addison Road, Marrickville | Die and press tool makers (Colour Scanners Pty. Ltd) |
| 4 | 71 Addison Road, Marrickville | Tanners, leather (M) (Sammy) |
| 4 | 72 Addison Road, Marrickville | Printers (Blake & Hargreaves Pty. Ltd) |
| 4 | 80 Addison Road, Marrickville | Printers (Colour Scanners Pty. Ltd) |
| 4 | 379 Enmore Road, Marrickville | Motor garages and service stations (PB Newington, Newington Service Station, Express Garage and Service Station) |
| 4 | 5 Black Street, Marrickville | Motor Garages & Engineers (S.W Roberts motor garage) |
| 4 | 22 Llewellyn Street, Marrickville | Dry cleaners (Lawrence Dry Cleaners) |
| 4 | 211 Edgeware Road, Marrickville | Motor painters, motor rustproofing specialists, motor wreckers (Hope's Motor Body Works) |
| 5 | 2B/1 Unwins Bridge Road, St Peters | Printers (Lister Blackstone Pty. Ltd) |

| Precinct | Address | Activity[1] |
|---|---|---|
| 5 | 2D/1 Unwins Bridge Road, St Peters | Welders (Lister Blackstone Pty. Ltd) |
| 5 | 2/1 Unwins Bridge Road, St Peters | Motor trimmers (Lister Blackstone Pty. Ltd) |
| 5 | 1 Unwins Bridge Road, St Peters | Foundry engineers, pipe/pipe fittings (M/D), electric conduit/wiring accessories (M), galvanising and tinning (Lister Blackstone Pty. Ltd) |
| 5 | 15 May Street, St Peters | Plastic goods (M/D) (Monotype Corp. of Aust. Pty. Ltd) |
| 5 | 21 May Street, St Peters | Industrial gas burners (M/D), chemicals – adhesives, rustproofing, lubricating oils, polish, disinfectants, wax (M/D) (Corium Chemicals Division) |
| 5 | 24 May Street, St Peters | Metal pressers/stampers (Kelen Metal Goods Pty. Ltd) |
| 5 | 26 May Street, St Peters | Electronic equipment (M/D), paint/enamel/varnish/stain (M) (W.J. Electromation Pty. Ltd) |
| 5 | 30 May Street, St Peters: | Knife and abattoir machinery (M/S) (Gustav Emil Em Australia Pty. Ltd) |
| 5 | 35 May Street, St Peters | Waterproof clothing (M/S), electric cleaners (M/D) (Fadaral Product Pty. Ltd) |
| 5 | 36 May Street, St Peters | Printers (Cutting Formes Pty. Ltd) |
| 5 | 44 May Street, St Peters | Medical supplies, hospital equipment (M/I/D) (Sherwood Medical Industries Pty. Ltd) |
| 5 | 49 May Street, St Peters | Sign writers, screen process printers (Hartland & Hyde Platemaking) |
| 5 | 51 May Street, St Peters | Lime/cement merchants (Botany Bay Productions Pty. Ltd) |
| 5 | 58 May Street, St Peters | Printers, cleanser/cleaning preparations (M/D), disinfectants and insecticides (M/D), rubber goods (M/D) (Sea Foam Latex Pty. Ltd) |
| 5 | 68 May Street, St Peters | Electric motor winding/rewinding, industrial electronics control equipment (M) (A.B. Electric Motors Pty. Ltd) |
| 5 | 70 May Street, St Peters | Asbestos removal contractors, commercial refrigerator (M) (Olympic Hood Pty. Ltd) |
| 5 | 82 May Street, St Peters | Distilleries (Harradence A.E & Co. Pty. Ltd) |
| 5 | 90 May Street, St Peters | Electronic industrial control equipment (M), electric equipment repairs/servicing, machinery (M) (Power Installations Pty. Ltd) |
| 5 | 96 May Street, St Peters | Printers (Andrews, W. Printing Co. Pty. Ltd) |
| 5 | 100 May Street, St Peters | Electrical switchboard (M/D) (Age Gold Stamping & Silk Screening Pty. Ltd) |
| 5 | 102 May Street, St Peters | Printers, sheet metal workers (Bryant & Green Office Supplies) |
| 5 | 100B / 104 May Street, St Peters | Firefighting equipment (M/D), electrical switchboard (M/D), concrete contractors (Sydney Office Interiors Pty. Ltd) |
| 5 | 3 Applebee Street, St Peters | Printers (A.C.P. Manufacturers Pty. Ltd) |

| Precinct | Address | Activity[1] |
|---|---|---|
| 5 | 7 Applebee Street, St Peters | Cleanser/cleaner preparations (M/D) (Wilbro Hardware Pty. Ltd) |
| 5 | 211 Edgeware Road, Marrickville | Motor painters, motor rustproofing specialists, motor wreckers (Hopes Motor Body Works) |
| 5 | 9 Hutchinson Street, St Peters | Leather goods (M/S) (Norma Leather Goods) |
| 5 | 23 Hutchinson Street, St Peters | Plastic goods (M) (Glo International) |
| 5 | 49 Hutchinson Street, St Peters | Printers (Harold Murray Pty. Ltd) |
| 5 | 51 Hutchinson Street, St Peters | Motor panel beaters/spray painters (BA Eagle Smash Repairs) |
| 5 | 75 Hutchinson Street, St Peters | Welders, wrought iron workers (Digasa Metal Fabrications Constr. Co. Pty. Ltd) |
| 5 | 95 Hutchinson Street, St Peters | Steel treatment specialists (Keith, John R. Pty. Ltd) |
| 5 | 47 Campbell Street, St Peters | Waste collection and disposal contractors (Associated Pulp & Paper Pty. Ltd) |
| 5 | Lord Street (not numbered), St Peters | Commercial refrigerators (M) (Gordon Bros Industries Pty. Ltd) |
| 5 | Corner Lord Street and Edgeware Road, St Peters | Ammonia compressor (M), air conditioning units and machinery (M), refrigerator units (M) (Gordon Bros. Pty. Ltd) |
| 5 | 179 Lord Street, St Peters | Welders, motor painters (R.H Byrnes) |
| 5 | 1 Princes Highway, St Peters | Ferrous founders, brick/pipe/tile and machinery (M) (Foster, G. & Sons Pty. Ltd) |
| 5 | 2A Princes Highway (also 694 King St), St Peters (now Sydney Park car park) | Service station (Esso St Peters) |
| 5 | 21 Princes Highway, St Peters | Chemicals (M/D) (Swintons Industries Pty. Ltd) |
| 5 | 671 King Street, St Peters | Motor electricians (R, J Fern) |

Note:

1 M/I/D/S: manufacturing (M) and/or import (I) and/or distribution (D) and/or sales (S).

#### 4.1.11 NSW EPA record of notices

Four sites are listed on the NSW EPA record of notices within the study area:

- Precinct 1:
  - Galserv Galvanising Services, 117-153 Rookwood Road, Yagoona;
- Precinct 5:
  - Sydney Park, Alexandria;
  - Former Tidyburn Facility, 53 Barwon Park Road, St Peters; and
  - Alexandra Canal.

Galserv Galvanising Services is directly adjacent to the transmission cable route (refer to **Figure 4-6**). Galserv Galvanising Services was declared a remediation site (number 21095) in 2006. The NSW EPA declared the site was contaminated in such a way as to present a significant risk of harm to human health and the environment for the following reasons:

- *'groundwater in the eastern part of the site is contaminated with high concentrations of metals (including zinc, lead, cadmium, copper, nickel and arsenic) and ammonia. In addition, the low pH of the groundwater is likely to further mobilise some metal contaminants and may influence the toxicity of ammonia'*;

- *'there is a risk that contaminated groundwater has migrated offsite and reached a tributary of the Cooks River'*;
- *'some of the contaminants found in high concentrations in groundwater, such as zinc and lead, are bio-accumulative, persistent and can be toxic in the environment'*; and
- *'Asbestos, a human carcinogen, has been found in the unsealed area at the south of the site'.*

Groundwater is expected to flow to the east of Rookwood Road due to the topography and drain towards the Cooks River, therefore the potential for groundwater impacts within Rookwood Road from the Galserv site is considered to be low. Groundwater in the vicinity of Muir Road (likely to be encountered at depths greater than 3 m bgl) may be impacted by contaminated groundwater migrating from the Galserv site. Depending on the concentrations of ammonia and preferential pathways, there could be a potential for subsurface ammonia vapours from groundwater in the vicinity of Rookwood Road. No data or reports were available for review for the Galserv site.

Sydney Park was declared significantly contaminated land by the NSW EPA on 25 February 2019 due to methane and carbon dioxide concentrations in ground gas from former use as a landfill. The declaration states that:

- the concentrations of methane and carbon dioxide measured in subsurface monitoring wells at the perimeter of the park are high compared to nominated assessment criteria;
- while the gas flow rates indicate a low to very low risk classification, there is potential for off-site migration via preferential pathways; and
- refinement of exposure pathways, more accurate calculations of flow rates and ongoing management is required to better define and manage risks.

The transmission cable route would pass through Sydney Park along the eastern and southern perimeter. The landfill gas risk will require management during design and construction. Landfill gas is further discussed in the **Appendix F** (Air Quality Impact Assessment) of the EIS.

The Former Tidyburn Facility was located on the corner of Barwon Park Road and Campbell Road, 15 metres west and topographically up-gradient of the transmission cable route (refer to **Figure 4-9**). The property was formerly declared to contain polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylene (BTEX) contamination in soil and naphthalene and TPH in groundwater that presented a significant risk of harm to human health and the environment. The property was subsequently remediated and redeveloped into high density residential apartments. A site audit statement was issued in February 2015 and the NSW EPA remediation order was repealed in June 2015. The property is therefore not considered to be a current source of contamination to soil and groundwater within the study area.

The NSW EPA declared the Alexandra Canal a remediation site in August 2000 and issued a remediation order to Sydney Water Corporation for the Alexandra Canal sediments in March 2012 due to the presence of chlorinated hydrocarbon, organochlorine pesticide, polychlorinated biphenyl and metal contamination in sediments along the canal. The order prevents activities that would result in the disturbance of the bed sediments.

### 4.1.12 NSW EPA notified sites

Sites that were listed on the NSW EPA record of notified sites within the study area are detailed in **Table 4-12** and shown on **Figure 4-6** to **Figure 4-9**.

**Table 4-12 NSW EPA notified sites**

| Precinct | Site name and address | Description of notification | Proximity to transmission cable route |
|---|---|---|---|
| 1 | BP Service Station Potts Hill, 155 Rookwood Road, Yagoona | 'Service station' on NSW EPA Contaminated Land list. Regulation under CLM Act not required. | < 5 metres |
| 2 | Caltex Service Station, 81 Wangee Road, Lakemba | 'Service station' on NSW EPA Contaminated Land list. Regulation under CLM Act not required. | < 5 metres |
| 3 | Denison Road Playground, 194 Denison Road, Dulwich Hill | 'Landfill', on NSW EPA Contaminated Land list. Regulation under CLM Act not required. | < 5 metres |
| 3 | Former Tyre Recapping, 115-117 Constitution Road, Dulwich Hill | 'Other industry' on NSW EPA Contaminated Land list. Regulation under CLM Act not required. | < 5 metres |
| 4 | Camdenville Park, May Street, St Peters | 'Other industry' on NSW EPA Contaminated Land list. Regulation under CLM Act not required. | Transmission cable route transects |
| 5 | BP Express, Service Station, 2 Princes Highway, St Peters | 'Service station' on NSW EPA Contaminated Land list. Regulation under CLM Act not required. | <10 metres |
| 5 | Australian Refined Alloys, 202-212 Euston Road, Alexandria | 'Other industry' on NSW EPA Contaminated Land list. Regulation under CLM Act not required. | Transmission cable route transects this site |

### 4.1.13 NSW EPA licensed and delicensed sites

Sites that are currently or have historically been licensed by the NSW EPA under the POEO Act 1997 within the study area are detailed in **Table 4-13**. A review of NSW EPA licensed sites provides an indication of where potentially contaminating activities may be occurring, which could potentially impact the condition of soil and groundwater intercepted during the project. Sites are shown on **Figure 4-6** to **Figure 4-9**.

**Table 4-13 NSW EPA licensed sites**

| Precinct | Site name and address | Description of licence | Proximity to project area |
|---|---|---|---|
| 1 | Australian Rail Track Corporation Ltd railway site | Railway systems activities | Within |
| 1 | Suez Recycling & Recovery Pty Ltd, Muir Rd, Chullora | Non-thermal treatment of general waste, composting, general recovery of waste, waste storage (hazardous, restricted solid, liquid, clinical, asbestos waste, tyres and other) | ~10 m |
| 1 | Galvanising Services Pty Ltd, 135 Rookwood Rd, Yagoona | Metal coating | ~10 m |
| 1 | The Royal Society for the Prevention of Cruelty to Animals (RSPCA) NSW, 201 Rookwood Road, Yagoona | Hazardous, industrial or Group A waste generation or storage | ~10 m |

| Precinct | Site name and address | Description of licence | Proximity to project area |
|---|---|---|---|
| 1 | Landcom Potts Hill Reservoir Lands, Brunker St and Cooper St, Potts Hill | Land-based extractive activity | ~10 m |
| 1 | Western Earthmoving Pty Ltd, 146 Rookwood Rd, Potts Hill | Land-based extractive activity | ~10 m |
| 1, 2, 3, 4 | Sydney Trains railway site | Railway systems activities | Within |
| 1, 2, 3 | Luhrmann Environment Management Pty Ltd/Robert Orchard/Sydney Weed & Pest Management/Auburn Council/Bankstown City Council, various waterways throughout NSW including Cooks River and Coxs Creek | Application of herbicides | Within |
| 4 | John Holland Pty Ltd, Sydney Metro City & Southwest tunnels and excavation works, between Chatswood and Sydenham railway stations | Concrete works, railway systems activities | Within |
| 5 | Australian Refined Alloys Pty Ltd 202-212 Euston Road, Alexandria NSW | Non-thermal treatment of hazardous and other waste, non-ferrous metal production (scrap metal), recovery of hazardous and other waste, waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste | Within |
| 5 | Lendlease Engineering Pty Limited, Westconnex (between M4 East at Haberfield And the New M5 At St. Peters), Marrickville, NSW 2204 | Road construction | Within |
| 5 | Alexandria Recycling Centre, 10-16 Albert Street, St Peters | Recovery of general waste (surrendered license) | ~50 m |
| 5 | CPB Contractors Pty Limited 10-16 Albert Street, NSW 2044 | Crushing, grinding or separating Road construction (former Alexandria Landfill) | ~ 50 m |

#### 4.1.14 Former gas works sites

There are no former gas works listed on the NSW EPA database that are within the study area.

#### 4.1.15 PFAS investigation program

There are no sites within the study area that are a part of the NSW EPA investigation program to assess the legacy of PFAS use across NSW. The closest PFAS investigation site was the Greenacre Fire and Rescue NSW site 600 metres to the northwest and topographically down-gradient of the study area in Precinct 2.

### 4.1.16 Previous reports

#### 4.1.16.1 Precinct 5 – Camdenville Park

A Remedial and Construction Environmental Management Action Plan was prepared for Camdenville Park, May Street, St Peters by GHD (GHD, 2013). The report contained the following information:

- the property was used for clay/shale quarrying and the production of bricks from 1800s to 1930, followed by waste incineration operations from about 1922 to 1955;
- the property was considered to be contaminated by waste materials used to infill the former clay pits, which lack engineered walls or a capping layer;
- glass, brick, wire and slag were reported within fill material, which was reported to be up to 18 metres deep;
- impacts primarily included lead and petroleum hydrocarbons in fill material, as well as petroleum hydrocarbons and light non-aqueous phase liquids in the east of the detention basin;
- elevated methane concentrations were reported, believed to be migrating laterally to the north and east, however results from the railway corridor to the west did not detect methane;
- the property comprised a publicly accessible recreational facility as well as fenced flood detention basin; and
- the report details methodology for remedial works comprising installation of capping to be undertaken in association with Marrickville Council's upgrade works at the park and implementation of a long term environmental management plan. It appears that remedial works have yet to commence as of July 2018. It was announced in a Marrickville Council community newsletter[7] in May 2016 that remedial and upgrade works were on hold due to the lease of the southern part of the park to WestConnex for a construction laydown area and modifications to the detention basin in the park.

The location of Camdenville Park is shown on **Figure 4-9**.

#### 4.1.16.2 Precinct 5 – Sydney Park

Douglas Partners Pty Ltd (Douglas Partners) prepared a preliminary geotechnical investigation and contamination advice report for the proposed transmission cable route through Sydney Park in Alexandria (Douglas Partners, 2017) (refer to **Figure 4-9**).

The report provided information on the history and previous investigations within Sydney Park, summarised as follows:

- Sydney Park was used for several purposes including clay and shale quarrying, brick manufacturing, industrial activities;
- following closure of the brick manufacturing works the quarries were landfilled by council with waste until the 1970s;
- the pits extended to depths in excess of 30 metres in some areas and were close to the park boundaries at Sydney Park Road and Barwon Park Road;
- a layer of soil and building (inert) waste was placed across Sydney Park, covering the landfill material and was developed into the park in the early 1990s;
- previous investigations by Douglas Partners indicated the inert waste layer was variable in nature and depth comprising primarily sand and clay matrices with varying quantities of gravel;
- landfilling comprised the backfilling of the quarry pits with municipal waste which extended close to the park boundaries (most notably Sydney Park Road and Barwon Park Road);
- the waste cells across the park generally reflect the locations of the brick pits;

[7] Marrickville Council, 2016. Your Say Marrickville, Camdenville Park Upgrade – Community Newsletter 3, May 2016 (https://www.yoursayinnerwest.com.au/camdenville-park-upgrade)

- investigations extended back to the 1980s, with various investigations and monitoring events ongoing within the park;
- the park contains high concentrations of landfill gases, in particular methane, both within and outside of the landfill cells; and
- no consistent engineered cap is evident.

Intrusive investigations were undertaken for a former alignment of the transmission cable route through the middle of Sydney Park. The intrusive scope undertaken for the report included:

- drilling of four large diameter (300 millimetre) auger boreholes to 2 metres depth along the previously proposed transmission cable route within Sydney Park;
- screening for landfill gases (LFG) during drilling, the open borehole (for five minutes) and reinstatement works using a landfill gas analyser for measurement of methane, carbon dioxide, hydrogen sulfide and carbon monoxide concentrations;
- analysis of 12 soil samples collected for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); BTEX; total recoverable hydrocarbons (TRH); PAH; organochlorine pesticides (OCP); organophosphorus pesticides (OPP); polychlorinated biphenyls (PCB); phenols, asbestos, pH and cation exchange capacity (CEC); and
- comparison of the soil results heath and ecological investigation, screening and maintenance levels for recreational public open space (Recreational C criteria) as set out in Schedule B1 of the ASC NEPM 2013 and NSW EPA (2014a) Waste Classification Guidelines.

The following findings were made:

- filling was highly likely to be present for the full length of the excavation depth across most of the transmission cable trench;
- the fill is likely to be variable, but typically comprises sand and gravel, with variable amounts of building waste (bricks, glass, concrete, ceramic, metal), sandstone gravel and cobbles, and variable amounts of clay;
- domestic waste, or fill including domestic waste would be encountered within the excavation depth in some areas;
- LFG screening recorded very low to negligible detections in each borehole with the only gas above the GA5000 detection limits being carbon dioxide with a maximum concentration of 2 ppm recorded, however based on other investigations, LFG is known to be present at high concentrations;
- all results were less than the ASC NEPM 2013 adopted assessment criteria for open space land use; and
- all results for waste classification (off-site disposal) were within the general solid waste assessment criteria.

Groundwater was not encountered in the locations sampled and generally not expected to be within the proposed excavation depth, based on past observations. The following recommendations were made by Douglas Partners in regard to contamination and landfill related issues within Sydney Park:

- short-term management during excavation works, long-term management during operation due to potential accumulation of LFG in pits (e.g. joint bays), and design and construction measures would need consideration;
- measures would need to limit LFG migration through the constructed trench, in particular near the boundaries of the park to limit potential off-site migration and where the capping depth and/or low permeability characteristics are compromised; and
- depth and nature of capping layers, excavation conditions, and suitability of, materials for reuse and waste classification for disposal of excess material from the park would need to be considered.

#### 4.1.16.3 Precinct 5 – Australian Refined Alloys 202-212 Euston Road

A Remedial Action Plan (RAP) was prepared for Enirgi Metals Group Pty Ltd (Enirgi) for their property operating as Australian Refined Alloys at 202-212 Euston Road, Alexandria (ERM, 2017). The transmission cable route would pass through the western and northern part of the property between Euston Road and Burrows Road. The RAP contained the following relevant information:

- the property has been used as a lead-acid battery recycling plant since 1978 and prior to this it was used as a council and roads depot;
- the property was formerly notified to the NSW EPA under the duty to report requirements and was assessed by the NSW EPA as not requiring regulation;
- existing plant and buildings at the property are planned to be demolished and the property remediated to an extent that will make it suitable for ongoing industrial land use without the requirement for a long-term environmental management plan;
- previous soil and groundwater investigations had been undertaken at the property between 2004 and 2016;
- the RAP divided the area into Areas A to E based on the remedial strategy and areas of concern – the transmission cable route would be located wholly within Area E;
- based on the previous investigations, the contaminant of potential concern (CoPC) for the property were asbestos, heavy metals, PAHs, OCPs, PCBs, TRH, BTEX, acidity and volatile organic compounds (VOCs);
- the subsurface in Area E was described as comprising fill consisting of sandy gravel, sandstone gravels with brick and other construction debris between 0.2 to 1.0 m bgl and natural sand from 0.5 to 1.4 m bgl in the western half of the property. In the eastern half the fill extended to depths down to 1.5 m bgl and included concrete, tiles glass, nails and other construction debris throughout;
- groundwater levels gauged between 2006 and 2016 ranged between 1.5 and 2.8 m bgl;
- concentrations of copper (0.007 to 0.027 mg/L), lead (0.112 mg/L) and zinc (0.04 to 0.057 mg/L) in groundwater exceeded the ANZECC (2000)[8] 80% marine trigger values in monitoring wells MW01 and ERMMW02 within Area E;
- limited soil sampling previously undertaken within Area E showed one exceedance of the adopted assessment criteria (NEPM 2013 – HIL D, HSL D and management limits). The exceedance was of the HIL D criteria for lead of 1,500 mg/kg (1,940 mg/kg at 0.8 m bgl in SB26) in the northeast corner of Area E;
- friable ACM was detected in SB26 at 0.8 m bgl in the northeast corner of Area E; and
- the remedial strategy proposed for Area E was to undertake further grid-based test pit sampling to assess whether remediation was required.

ERM undertook a Data Gap Investigation (DGI) at the property in 2018 (ERM, 2018). The overall objective for the DGI was to reduce uncertainty relating to known and potential environmental impacts on soil and groundwater. The scope and findings relevant to the project (Area E) include:

- selected soil samples from four test pits (named TP01, TP03, TP04 and TP06) were sampled and analysed for asbestos, heavy metals, PAHs, OCPs, PCBs, TRH and BTEX;
- groundwater sampling and analysis from MW01 and ERMMW02 for:
    - strong tar like odours within fill was logged between 0.4 and 2.4 m bgl in TP03 and 1.6 and 2.6 m bgl in fill in TP04 (both located in the eastern half of Area E);

[8] Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000 *Water Quality Guidelines* (replaced in 2018 by the Australian and New Zealand and Australian State and Territory Governments (ANZAST), 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*).

- concentrations of TRH $C_{10}$-$C_{16}$ and TPH $C_{16}$-$C_{34}$ exceeded the NEPM 2013 management limits for commercial/industrial land (coarse grained soils) at concentrations of 3,500 mg/kg and 16,000 mg/kg respectively at a depth of 2 m bgl in TP03;
- concentrations of total PAHs in soil from TP03 exceeded the threshold criteria for general solid waste at 1 m bgl and restricted solid waste at 2 m bgl and the concentration of TPH $C_{10}$-$C_{36}$ at 2 m bgl exceeded the general solid waste threshold criteria;
- TCLP concentrations of lead and benzo(a)pyrene were less than the TCLP threshold criteria for general solid waste; and
- concentrations of lead in groundwater exceeded ANZECC (2000) 80% trigger values of 0.0094 mg/L at concentrations between 0.018 and 0.15 mg/L in the two monitoring wells.

### 4.1.17 Potential areas and contaminants of concern

The potential areas and CoPC for the transmission cable route identified by the review of information in the previous sections are summarised by construction precincts in **Table 4-14**. Only sources or activities that are within, adjacent or topographically up-gradient and within 50 metres of the transmission cable route have been considered as potential areas and sources of contamination. The locations are shown on **Figure 4-6** to **Figure 4-9**.

**Table 4-14 Potential sources, areas and contaminants of concern**

| Source or area | Site located within or outside of proposed excavation area | CoPC |
|---|---|---|
| **Precinct 1** | | |
| Rookwood Road substation | Within | Heavy metals (aluminium, arsenic, copper, cadmium, chromium, nickel, lead, zinc and mercury), petroleum hydrocarbons, asbestos, PCBs, phenols, and OCPs. |
| Galserv Galvanising Services, 117-153 Rookwood Road (EPA regulated site) | Outside | Heavy metals (zinc, lead, cadmium, copper, nickel and arsenic), pH, ammonia, cyanide, PFAS |
| Service station (BP Potts Hill, 155 Rookwood Road, Yagoona) | Outside | Petroleum hydrocarbons, lead |
| Disturbed terrain/filled land along Muir Road | Within and outside | Heavy metals, asbestos, hydrocarbons, pesticides |
| Former railways under Muir Road | Within | Heavy metals, asbestos, creosote, hydrocarbons |
| Suez Recycling & Recovery Pty Ltd, Muir Rd, Chullora | Outside | Heavy metals, hydrocarbons, pesticides |
| Various historical manufacturing industries | Outside | Heavy metals, hydrocarbons, volatile and semi-volatile organic compounds (VOCs and SVOCs), PFAS |
| Herbicide application along waterways | Outside | Herbicides |
| **Precinct 2** | | |
| Budget Auto Parts (workshop) 24 Rawson Road, Greenacre | Outside | Petroleum hydrocarbons, lead |
| Service stations and workshops (Lakemba and Belmore) | Outside | Petroleum hydrocarbons, lead, solvents |

| Source or area | Site located within or outside of proposed excavation area | CoPC |
|---|---|---|
| Former Dehn Bros tannery in Lakemba | Outside | Chromium III and VI, manganese, aluminium, ammonium sulfate, ammonia, ammonium nitrate, arsenic phenolics, formaldehyde, sulfide, tannic acid |
| **Precinct 3** | | |
| Service stations (Cooks River crossing and Dulwich Hill) | Outside | Petroleum hydrocarbons, lead |
| Viva Energy high pressure oil pipeline at Cooks River | Within | Petroleum hydrocarbons |
| Potential filling from unknown source | Within | Heavy metals, asbestos, hydrocarbons, pesticides |
| Dry cleaners (Dulwich Hill) | Outside | Chlorinated and petroleum hydrocarbons |
| Former landfill (Arlington Oval and Marrickville Park) | Outside | Landfill gases, heavy metals, nutrients, asbestos, hydrocarbons, pesticides, PFAS |
| Former landfill (Henson Park) | Within | |
| Foundries (Dulwich Hill and Marrickville) | Outside | Heavy metals, phenols, PFAS |
| Various historical manufacturing industries (Dulwich Hill) | Outside | Heavy metals, hydrocarbons, volatile and semi-volatile organic compounds (VOCs and SVOCs), PFAS |
| **Precinct 4** | | |
| Former and current service stations in Addison Road and east end of Edgeware Road | Outside | Petroleum hydrocarbons, lead |
| Various current and former dry cleaners in Addison Road and Llewellyn Street | Outside | Chlorinated and petroleum hydrocarbons |
| Various historical manufacturing industries (Marrickville) | Outside | Heavy metals, hydrocarbons, volatile and semi-volatile organic compounds (VOCs and SVOCs), PFAS |
| **Precinct 5** | | |
| Numerous existing and former petroleum service stations and mechanical workshops | Outside and within | Petroleum hydrocarbons, lead |
| Various historical manufacturing sites | Outside and within | Heavy metals, hydrocarbons, volatile and semi-volatile organic compounds, PFAS |
| Disturbed terrain/fill | Outside and within | Heavy metals, asbestos, petroleum hydrocarbons, pesticides |
| Former landfills: Camdenville Park<br>Sydney Park | Outside and within | Landfill gases, heavy metals, nutrients, asbestos, petroleum hydrocarbons, pesticides, PFAS |
| Beaconsfield West substation | Within | Petroleum hydrocarbons, asbestos, PCBs, heavy metals |

| Source or area | Site located within or outside of proposed excavation area | CoPC |
|---|---|---|
| **Precincts 1 to 5 (general road reserve area)** | | |
| Imported fill for road construction/maintenance or service trenches | Within | Heavy metals, asbestos, petroleum hydrocarbons, pesticides |
| Underground services | Within | Asbestos and pesticides |
| Road accidents | Within | Petroleum hydrocarbons |

Note:
Petroleum hydrocarbons include total recoverable hydrocarbons (TRH), polychlorinated hydrocarbons (PAH) and monocyclic aromatic hydrocarbons (benzene, toluene, ethylbenzene, and total xylenes [BTEX]).

### 4.1.18 Receptors

Human receptors within the study area are mainly local residents, members of the public and workers in surrounding businesses. Sensitive receptors include day care centres, pre-schools, primary schools and high schools located within the study area and in close proximity to the transmission cable route.

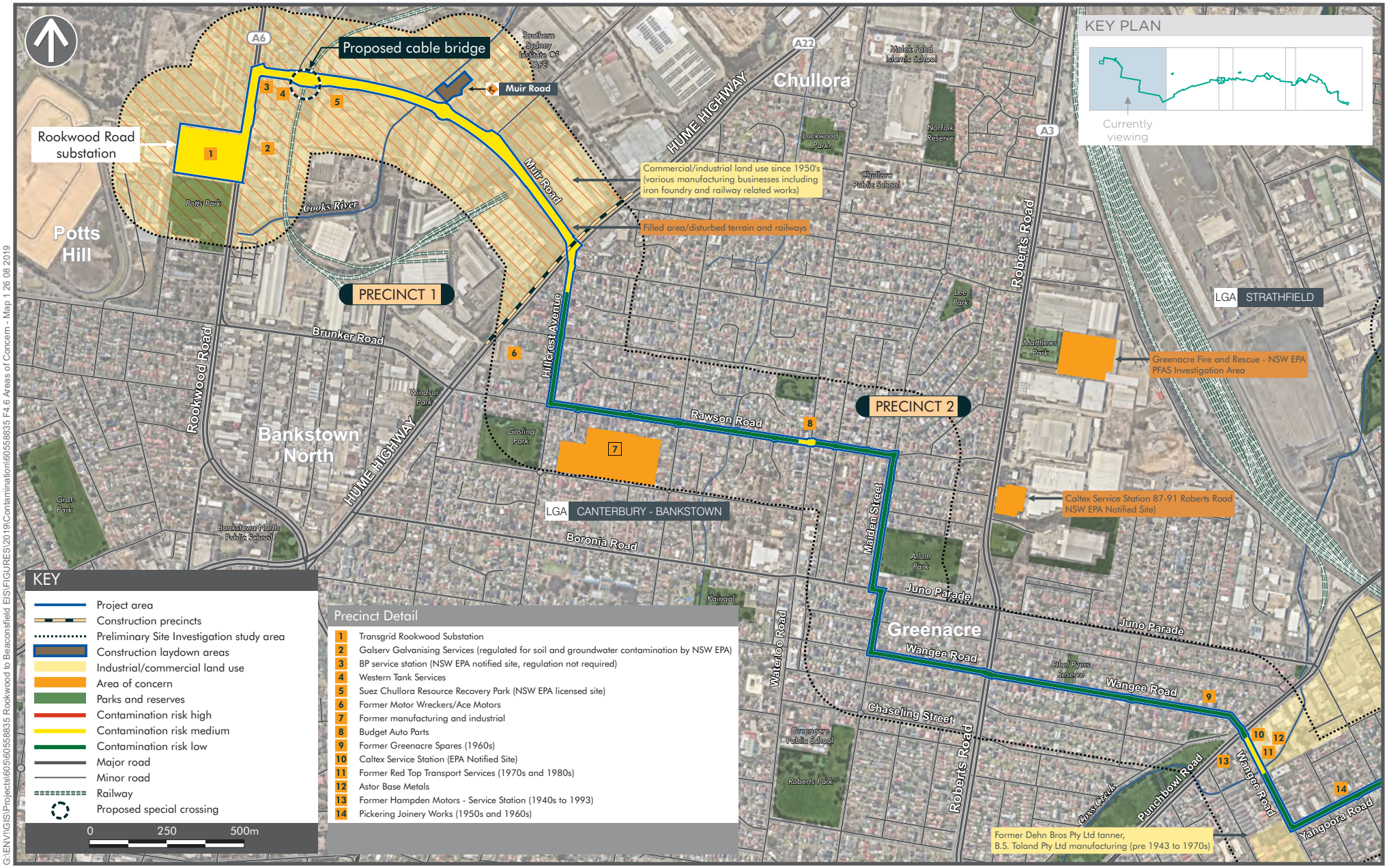
Human receptors during construction would also comprise project personnel, construction workers and workers at waste receiving facilities.

Ecological receptors that are down-gradient or within the study area are:

- Cooks River (Precinct 1 to 5), which drains into Botany Bay to the east;
- Coxs Creek (Precinct 2) which drains into Cooks River at Strathfield South;
- Alexandra Canal (Precinct 5) which drains into the lower reaches of the Cooks River; and
- Terrestrial ecological receptors, particularly within parks.

Groundwater Dependant Ecosystems (GDEs) were identified in **Appendix N** (Groundwater Technical Report) of the EIS. The closest high priority GDEs identified are the Botany Wetlands or Lachlan Swamps located in Centennial Park. These wetlands are effectively groundwater windows in the Botany Sands aquifer that support ecosystems. Since the wetlands are located approximately 4 kilometres northeast of the eastern most extent of the project area and east of Alexandra Canal, it is considered unlikely that the GDEs would be impacted by temporary dewatering due to the project.

A search of the GDE Atlas (Bureau of Meteorology, accessed 28 May 2019) for high priority GDEs indicated that there are no ecosystems within the study area that are likely to be dependent on groundwater. In low lying areas, there could be ecosystems with some degree of groundwater dependence. The project is not expected to change availability of water for plants due to the low permeability of the clayey soils, frequent rainfall events and as GDEs are located at points of recharge.

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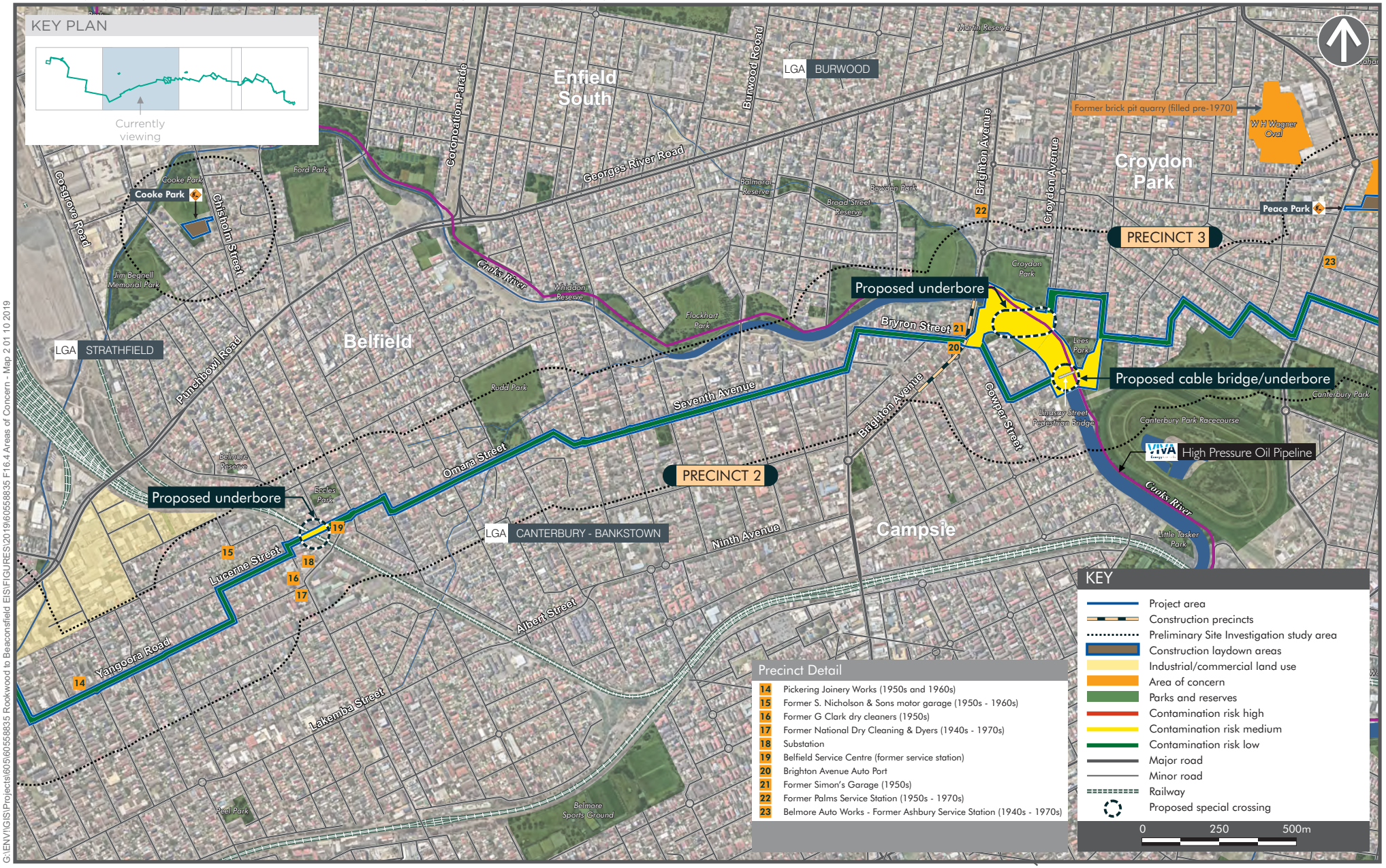
# AREAS OF CONCERN - CONSTRUCTION PRECINCTS 1 TO 2

Powering Sydney's Future
Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*
*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018)*

FIGURE 4-6

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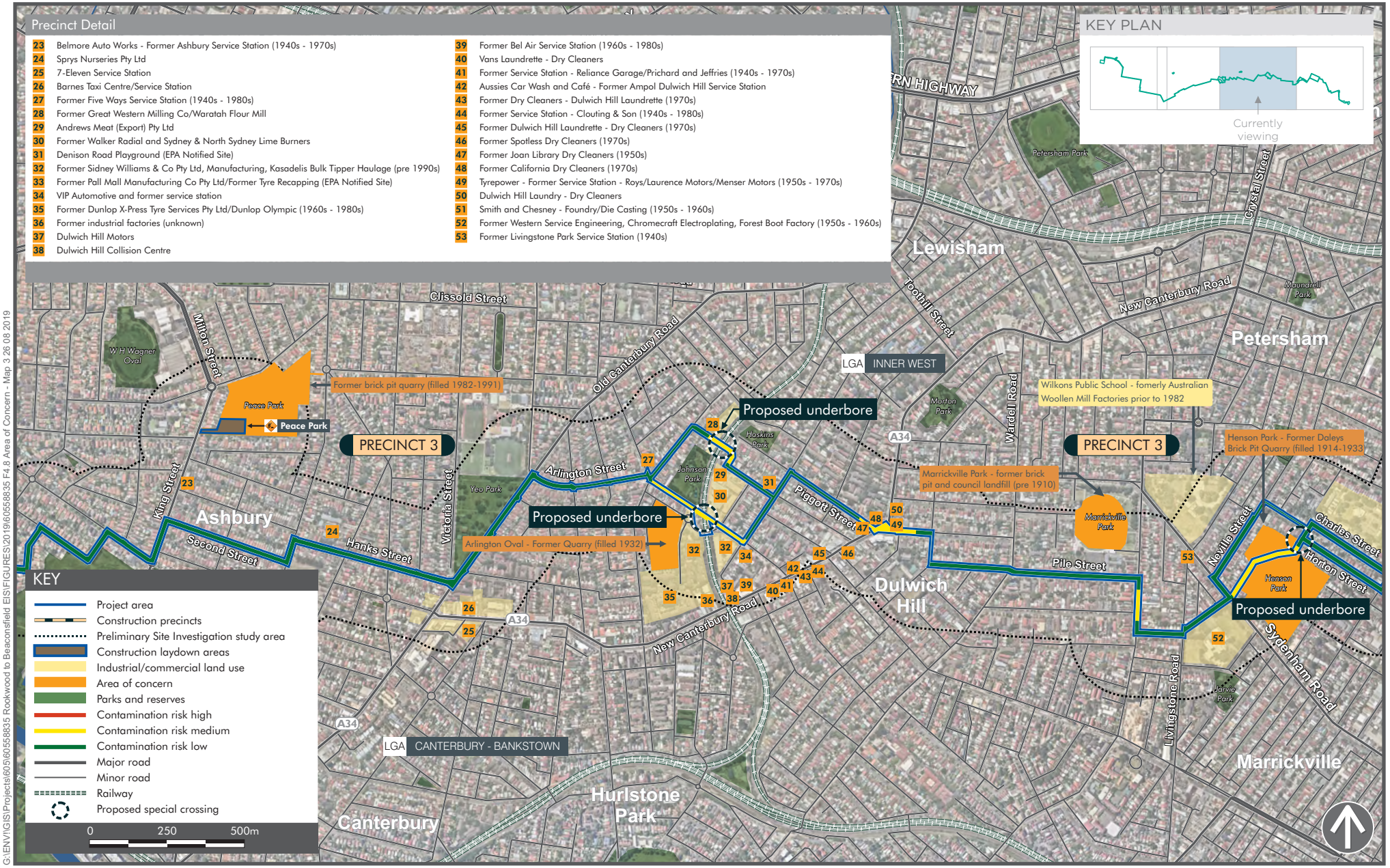
# AREA OF CONCERN - CONSTRUCTION PRECINCT 2 to 3

Powering Sydney's Future
Potts Hill to Alexandria Transmission Cable Project

FIGURE 4-7

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*
*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018),*

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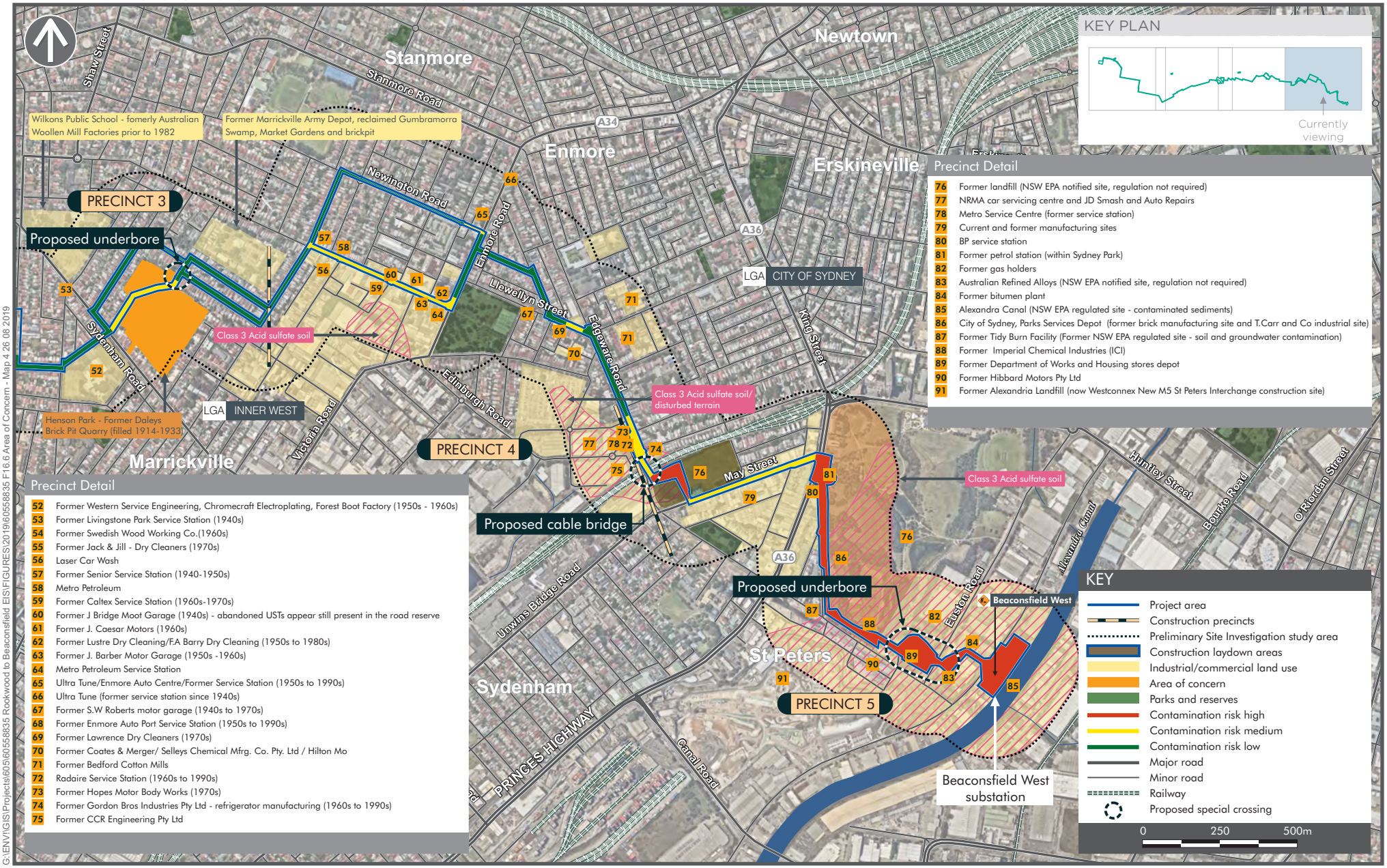
# AREAS OF CONCERN - CONSTRUCTION PRECINCT 3

Powering Sydney's Future
Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*
*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018)*

FIGURE 4-8




## KEY PLAN




## Precinct Detail

52 Former Western Service Engineering, Chromecraft Electroplating, Forest Boot Factory (1950s - 1960s)
53 Former Livingstone Park Service Station (1940s)
54 Former Swedish Wood Working Co.(1960s)
55 Former Jack & Jill - Dry Cleaners (1970s)
56 Laser Car Wash
57 Former Senior Service Station (1940-1950s)
58 Metro Petroleum
59 Former Caltex Service Station (1960s-1970s)
60 Former J Bridge Moot Garage (1940s) - abandoned USTs appear still present in the road reserve
61 Former J. Caesar Motors (1960s)
62 Former Lustre Dry Cleaning/F.A Barry Dry Cleaning (1950s to 1980s)
63 Former J. Barber Motor Garage (1950s -1960s)
64 Metro Petroleum Service Station
65 Ultra Tune/Enmore Auto Centre/Former Service Station (1950s to 1990s)
66 Ultra Tune (former service station since 1940s)
67 Former S.W Roberts motor garage (1940s to 1970s)
68 Former Enmore Auto Port Service Station (1950s to 1990s)
69 Former Lawrence Dry Cleaners (1970s)
70 Former Coates & Merger/ Selleys Chemical Mfrg. Co. Pty. Ltd / Hilton Mo
71 Former Bedford Cotton Mills
72 Radaire Service Station (1960s to 1990s)
73 Former Hopes Motor Body Works (1970s)
74 Former Gordon Bros Industries Pty Ltd - refrigerator manufacturing (1960s to 1990s)
75 Former CCR Engineering Pty Ltd

## Precinct Detail

76 Former landfill (NSW EPA notified site, regulation not required)
77 NRMA car servicing centre and JD Smash and Auto Repairs
78 Metro Service Centre (former service station)
79 Current and former manufacturing sites
80 BP service station
81 Former petrol station (within Sydney Park)
82 Former gas holders
83 Australian Refined Alloys (NSW EPA notified site, regulation not required)
84 Former bitumen plant
85 Alexandra Canal (NSW EPA regulated site - contaminated sediments)
86 City of Sydney, Parks Services Depot (former brick manufacturing site and T.Carr and Co industrial site)
87 Former Tidy Burn Facility (Former NSW EPA regulated site - soil and groundwater contamination)
88 Former Imperial Chemical Industries (ICI)
89 Former Department of Works and Housing stores depot
90 Former Hibbard Motors Pty Ltd
91 Former Alexandria Landfill (now Westconnex New M5 St Peters Interchange construction site)

## KEY

- Project area
- Construction precincts
- Preliminary Site Investigation study area
- Construction laydown areas
- Industrial/commercial land use
- Area of concern
- Parks and reserves
- Contamination risk high
- Contamination risk medium
- Contamination risk low
- Major road
- Minor road
- Railway
- Proposed special crossing

0 250 500m

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# AREAS OF CONCERN - CONSTRUCTION PRECINCT 4 to 5

Powering Sydney's Future
Potts Hill to Alexandria Transmission Cable Project

*Note: The project area is confined to the roadway reserve with the exception of parks and existing substations*
*Source: Department of Finance, Services and Innovation - Spatial Services (2018), Nearmap (2018),*

FIGURE 4-9

## 4.2 Substations

### 4.2.1 Rookwood Road substation

The description of the Rookwood Road substation and the review of potential or known contamination issues are detailed in **Table 4-15**. There have been previous investigations, remediation works, a Site Audit Report (SAR) and a Site Audit Statement (SAS) completed for the Rookwood Road substation prior to its development as a substation, with the following available reports reviewed by AECOM:

- Coffey 2009, *Remediation and Validation Report, Former Metallising Yard, Zone 7 Potts Hill Reservoir.* March; and
- ERM 2009*, Site Audit Report, Proposed lot 1010 & Part Lot 102, Former Metallising Yard, Potts Hill*. June.

Sydney Water commissioned the SAR (ERM, 2009) and it included the following relevant information:

- The property was formerly used for grit blasting and the application of protective coatings to metallic items;
- The contaminants of concern identified, based on the site history review undertaken by Coffey (2009) were heavy metals (aluminium, arsenic, copper, cadmium, chromium, nickel, lead, zinc and mercury) petroleum hydrocarbons (TPH and PAH), BTEX, asbestos, PCBs, phenols, and OCPs;
- The southern section of the property was previously surfaced with varying concentrations of grit which was removed during remediation works in 2008;
- Remediation was undertaken by removal of shallow contaminated soils to the extent practical by Coffey in 2008;
- Residual grit remained along the eastern and southern margins of the property where mature vegetation constrained excavation and was not considered to present a risk to human health or the environment; and
- The SAS stated the site was suitable for commercial/industrial land use without a requirement for a long term environmental management plan (EMP).

It was recommended in the SAR (ERM, 2009) and the Remediation and Validation Report (Coffey, 2009) that during further excavation works at the property, if materials are encountered that have observable odours, discoloration or staining, an assessment should be made by a qualified environmental consultant and implementation of an unexpected finds protocol should be undertaken during any future development works.

Based on the review of information, the CoPC for the Rookwood Road substation are heavy metals (aluminium, arsenic, copper, cadmium, chromium, nickel, lead, zinc and mercury), petroleum hydrocarbons (BTEX, TPH and PAH), asbestos, PCBs, phenols, and OCPs.

**Table 4-15 Rookwood Road substation – description and review of existing environment**

| Item | Description |
|---|---|
| Current zoning | B7 – Business Park |
| Surrounding commercial or industrial land use within 200 metres | Potts Hill Business Park commercial properties comprising warehouses and NSW Police Facility are located up-gradient of the site. All other commercial and industrial land uses are located down-gradient of the Rookwood Road substation, including Galserv Galvanising Services located on the opposite side of Rookwood Road. Refer to **Figure 4-6**. |
| Historical land use from review of aerial imagery | The 1943 aerial photograph showed that the site of the Rookwood Road substation was vacant and unused. The landform in 1943 within the site boundary appears to have been altered from the natural state. The 1961 aerial photograph showed industrial buildings, trucks and other indistinguishable industrial items within the site. The site appeared to be used for the same industrial purpose until 2003. In the 2009 aerial photograph, all buildings had been demolished, the surface graded/levelled, and the site was vacant. The Rookwood Road substation had been constructed in the 2015 aerial photograph. |
| History from ERM, 2009 report | Sydney Water formally used the Rookwood Road substation property as a metallising Depot between 1961 and 1980s. Grit blasting and application of protective coatings was undertaken, which used paints, metal oxides, copper furnace slag and zinc and aluminium coating powders. PCB containing transformers had also been previously used on the property. Investigations and soil remediation works were undertaken by various consultants between 1995 and 2008. A SAS was issued for the property for commercial/industrial land use without an EMP. |
| NSW EPA notified or listed sites within 200 metres | Galserv Galvanising Services located down-gradient of the substation site is regulated by the NSW EPA for groundwater contamination. For further detail refer to **Section 4.1.12**. There were no records for sites located up-gradient or adjacent to the substation site. |
| NSW EPA current licenced sites under the POEO Act 1997 within 200 metres | There were no licensed sites up-gradient of the substation site. |
| Soils | Disturbed Soil Landscape: original soils have been removed, greatly disturbed or buried. Filling likely to have occurred. Refer to **Figure 4-1**. |
| Acid sulfate soils | Low probability of acid sulfate soils, no mapped acid sulfate soil risk class. Refer to **Figure 4-2**. |
| Geology | The geology is underlain by Bringelly Shale which consists of shale, carbonaceous claystone, laminate, fine to medium grained lithic sandstone and rare coal. Refer to **Figure 4-3**. |
| Surrounding sensitive receptors | A tributary creek of the Cooks River is located 190 metres to the south. Refer to **Figure 4-4**. |

### 4.2.2 Beaconsfield West substation

A Phase 1 Environmental Site Assessment (ESA) with limited sampling was undertaken by Parsons Brinckerhoff in 2005 for TransGrid's Beaconsfield West substation (PB, 2005). The Phase 1 ESA comprised a desktop review of potential contamination at the property, as well as the collection of soil samples from three locations. No exceedances of the adopted commercial/industrial criteria were reported.

Phase II Environmental Site Assessments were undertaken by Aargus Pty Ltd (Aargus) in 2009 (Aargus 2009a, Aargus 2009b and Aargus 2009c) of the Beaconsfield West substation. The reports are summarised as follows:

- 44-46 Burrows Road (Aargus, 2009a):
  - The area has had a commercial land use since the 1950s, and the property was previously a mechanical workshop;
  - Groundwater was encountered at depths of between 1.5 - 2.5 m bgl;
  - Twelve primary soil samples were collected from fill and natural material at the property;
  - Results were compared with the NEPM 1999 Health Investigation Level (HIL) F and NSW EPA Service Station guidelines from the time, with exceedances of lead at 0.3 m bgl in one location and TPH C10-C36 at two locations at 0.4 - 0.5 m bgl;
  - The 95% upper confidence limit of the data was found to be below the adopted criteria;
  - Asbestos was reported in every fill sample except one. Waste classification of fill material was completed based on these results;
  - Samples collected from underground stormwater tanks at the property were below the ANZECC (2000)[9] water quality guidelines with the exception of copper and zinc;
  - Risks to human health and the environment associated with soil contamination at the property were concluded to be 'medium';
- 48-62 Burrows Road (Aargus, 2009b):
  - The property was occupied by a commercial building from 1951 to 2008;
  - 16 primary soil samples were collected from fill material at the property. Results were compared with the NEPM 1999 health investigation levels for commercial/industrial land use (HIL F) and NSW EPA 1994 Service Station Guidelines from the time, with exceedances of TPH C10-C36, benzo(a)pyrene and total PAH at 0.2 m bgl in one location and lead at 0.4 m bgl in a second location;
  - Asbestos was reported in the majority of locations sampled. Waste classification of fill material was completed based on these results;
  - Risks to human health and the environment associated with soil contamination at the property were concluded to be 'medium to high';
- 52 Burrows Road (Aargus, 2009c):
  - The property was used for commercial purposes from the 1940s and purchased by the Electricity Commission of NSW in 1972 for use as a substation;
  - 34 primary soil samples were collected from fill and natural material at the property. Results were compared with the NEPM 1999 HIL F and NSW EPA Service Station guidelines from the time, with exceedances of TPH C10-C36 in three locations between 0.1 and 1.0 m bgl;
  - Groundwater encountered while drilling was sampled, with results below the ANZECC (2000) water quality guidelines with the exception of TPH C10-C36 and toluene in one well;
  - Soil and groundwater impacts were attributed to leaks from Transformers No.1 and No.2; and
  - Risks to human health and the environment associated with soil and groundwater contamination at the property were concluded to be 'low/medium' in the context of the continued use of the site as an electrical substation.

[9] Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000 *Water Quality Guidelines (*replaced in 2018 by the Australian and New Zealand and Australian State and Territory Governments (ANZAST), 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*).

A further contamination assessment was undertaken in 2012 in relation to proposed works for transformer bays 1 and 2 within the Beaconsfield West substation and the nature strip between Burrows Road and the substation boundary (Douglas Partners, 2012). The report is summarised as follows:

- soil samples were collected from 13 locations by Transformer Bay 1, Transformer Bay 2 and the adjacent nature strip; and
- medium to heavy fraction hydrocarbon exceedances were reported at Transformer Bay 1 as well as in the nature strip adjacent to the substation.

It is understood based on information provided by TransGrid that some remediation works were completed as a result of the findings.

The description of the Beaconsfield West substation and the review of potential or known contamination issues are detailed in **Table 4-16**. Based on the review of information the CoPC for the Beaconsfield West substation are asbestos, heavy metals, hydrocarbons and PCBs.

**Table 4-16 Beaconsfield West substation – description and review of existing environment**

| Item | Description |
|---|---|
| Current zoning | IN1 – General Industrial |
| Surrounding commercial or industrial land use within 200 metres | Fulton Hogan Alexandra Asphalt Plant is located on the south side of the substation, Australian Refined Alloys and various commercial units are located to the west on the opposite side of Burrows Road, Admiral International logistics centre is located on the north side of the site. Refer to **Figure 4-9**. |
| Historical land use from review of 1943 imagery | The site contained industrial buildings along the Burrows Road frontage with a chimney stack in the southwest corner of the site. Industrial land use was also present adjacent to the north and south sides of the site. |
| Historical land use from historical maps | The City of Sydney Civic Survey 1950 map showed the site was a paper manufacturing site (Papyrus Pty Ltd) and cardboard manufacturing site (Bernard Lawrence Pty Ltd). Aquilla Street Co-op, Martin Furnace and Engineering Pty Ltd, J. Curtin and Son Stove manufacturing and Australian Bitumen Products Pty Ltd were located on the opposite side of Burrows Road from the site. Sandblasting and Metalizing Service and Crown Chemical Co. were located on the south side of the site. |
| NSW EPA notified or listed sites within 200 metres | Australian Refined Alloys, located opposite and up-gradient of the site on Burrows Road, was listed as a NSW EPA notified site. The NSW EPA assessed the site as not requiring regulation.<br>Alexandra Canal, adjacent to the site, is regulated by the NSW EPA, with a remediation order issued for sediments contaminated with chlorinated hydrocarbons, organochlorine pesticides (chlordane, total DDT and dieldrin), polychlorinated biphenyls (PCBs) and metals. |
| NSW EPA current licenced sites under the POEO Act 1997 within 200 metres | Australian Refined Alloys is licenced for non-thermal treatment of hazardous and other waste, non-ferrous metal production (scrap metal), recovery of hazardous and other waste and waste storage (hazardous, restricted solid, liquid, clinical and related waste and asbestos waste). |
| Underground storage tanks (USTs) and aboveground ground storage tanks (ASTs) | Based on information provided by TransGrid, there are three 20 Litre oil USTs and three 300 Litre oil ASTs located within the Beaconsfield West substation. |
| Soils | Disturbed Soil Landscape: original soils have been removed, greatly disturbed or buried. Filling likely to have occurred. Refer to **Figure 4-1**. |
| Acid sulfate soils | Mapped as Class 3 in acids sulfate soil risk map. High probability of acid sulfate soils at depths 1 to 3 m bgl. Refer to **Figure 4-2**. |

| Item | Description |
|---|---|
| Geology | The site is underlain by quaternary alluvium consisting of silty to peaty quartz sand, silt and clay with ferruginous and humic cementation in places and common shell layers. Refer to **Figure 4-3**. |
| Surrounding sensitive receptors | Alexandria Canal is located on the eastern boundary of the site. Refer to **Figure 4-4**. |

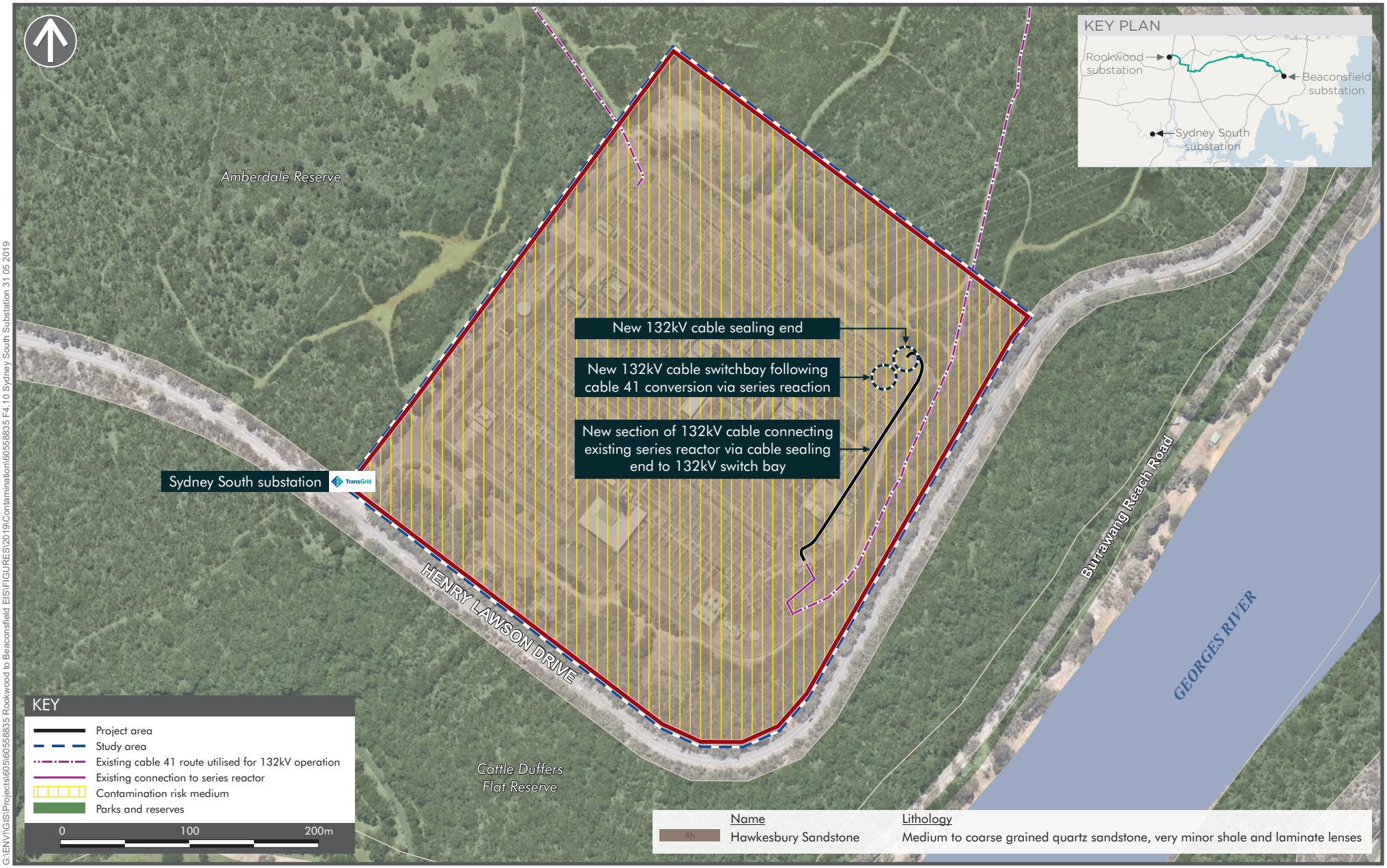
### 4.2.3 Sydney South substation

The description of the Sydney South substation and the review of potential or known contamination issues are detailed in **Table 4-17**. Based on the review of the information, the potential existing contaminating activities are related to the use of the site as a substation. CoPC are heavy metals, petroleum hydrocarbons, asbestos and PCBs. The Sydney South substation is shown on **Figure 4-10**.

**Table 4-17 Sydney South substation – description and review of existing environment**

| Item | Description |
|---|---|
| Address | 925A Henry Lawson Drive, Picnic Point. |
| LGA | Canterbury-Bankstown Council. |
| Lot and DP | Lot 1 DP 440591. |
| Current zoning | SP2 Infrastructure. |
| Current land use | The current site use is an electricity substation. |
| Surrounding commercial or industrial land use within 200 metres | No. |
| Historical land use from review of 1943 imagery and TransGrid provided information | The 1943 historical aerial photograph showed that the site contained dry sclerophyll forest with several dirt tracks leading to a central earth mound near the western boundary of the present-day substation. Quarries were located further to the west. There was no other surrounding development within 200 metres of the site. TransGrid confirmed the substation was constructed in 1961 and has been in use for that purpose since that time. |
| Other | The site was formerly the Picnic Point Remote Receiving Station during WWII[10]. |
| NSW EPA notified or listed sites within 200 metres | No records. |
| NSW EPA current and formerly licenced sites under the POEO Act 1997 within 200 metres | The site was formerly licensed for hazardous, industrial or Group A waste generation or storage (>100-500 tonnes) (Licence 11360). The licence ceased to be in force in March 2009. |
| Soils | The majority of the site consists of Lucas Heights residual soils, with Hawkesbury colluvial soils along the south eastern boundary. |
| Acid sulfate soils | Mapped as Class 5 in acid sulfate soil risk maps and not located within 500 metres of land mapped as Class 1 to 4. |
| Geology | The geology of the site consists of Hawkesbury Sandstone. |
| Surrounding sensitive receptors | The Georges River is located 200 metres to the southeast of the site. |

[10] https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5060252

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# SYDNEY SOUTH SUBSTATION

Powering Sydney's Future

Rookwood to Beaconsfield West

FIGURE 4-10

## 4.3 Construction laydown areas

The description of the existing environment for each construction laydown area and the review of potential or known contamination issues are summarised in **Annexure B**. The construction laydown areas are shown on existing environment and area of concern figures (**Figure 4-1** to **Figure 4-9**). Based on the review, the potential contaminating activities and/or sources of contamination within each construction laydown area and CoPC are listed in **Table 4-18**.

**Table 4-18 Construction laydown areas - summary of areas and contaminants of concern**

| Construction laydown areas | Potential contaminating activities and/or sources | CoPC |
|---|---|---|
| 12 Muir Road, Chullora | Infilling of former Cooks River tributary and Muir Road construction | Heavy metals, asbestos, hydrocarbons, PCBs |
| | Chullora iron foundry | Heavy metals, hydrocarbons, asbestos |
| | Herbicide application along waterway of the Cooks River drainage line and associated ponds | Herbicides |
| | Former railway activities when formerly part of Chullora Railway Workshops/ WWII aircraft and ammunitions factories | Heavy metals, hydrocarbons, creosote asbestos |
| Cooke Park, Belfield | The centre of the park formerly contained a quarry pit that was filled | Heavy metals, hydrocarbons, asbestos and landfill gas |
| Peace Park, Ashbury | Uncontrolled filling and landfill. Part of the park is under investigation due to asbestos in soils | Heavy metals, hydrocarbons, asbestos and landfill gas |
| | Recreational parkland – potential herbicide application | Herbicides |
| Camdenville Park, St Peters | Uncontrolled filling/landfill | Heavy metals, hydrocarbons, asbestos and landfill gas |
| | Recreational parkland | Herbicides |
| Beaconsfield West substation | Potential uncontrolled filling, former industrial manufacturing and substation | Asbestos, heavy metals, hydrocarbons and PCBs |

# 5.0 Assessment of potential impacts

## 5.1 Construction impacts

### 5.1.1 Transmission cable route and substation works

#### 5.1.1.1 Impacts from existing soil and groundwater contamination

It is estimated that up to 115,000 $m^3$ of spoil would be excavated during construction of the project. Excavated material would be transported to an appropriately licensed disposal/reuse site based on its classification. Virgin excavated natural materials (VENM) would likely be used to backfill excavations. Opportunities to reuse spoil generated by the project within the project area would be investigated further during detailed design and construction planning.

Based on the review of the existing environment, the construction works are likely to encounter some areas of contaminated soil, groundwater, soil vapour and landfill gas along the transmission cable route. The potential impacts from the works are:

- Excavation of existing contaminated soil and extraction of shallow contaminated groundwater potentially resulting in:
  - exposure of project workers and surrounding human receptors to contamination;
  - generation of contaminated surface water runoff from contaminants and/or potential acid sulfate soils which could discharge to waterways or surrounding land; and
  - generation of solid and liquid waste requiring disposal to landfill or a liquid waste facility.
- Importing or backfilling of excavations with spoil which could result in exposure of project workers and surrounding human and ecological receptors to contamination if the spoil happened to be contaminated (i.e. not or incorrectly classified as VENM).

The preliminary CSM and risk assessment for the construction works is presented in **Annexure C**. This CSM has been used to identify existing known sources and areas of contamination, associated potential impacts on human health and ecological receptors and to identify exposure source, pathway and receptors linkages. Areas of low, medium and high risk identified are also shown on **Figure 4-6** to **Figure 4-9**. The methodology to assign these risk ratings is described in **Section 3.3.3**.

Sections of the transmission cable route were assessed as low risk where no current or historical contaminating activities were identified and the surrounding land use was primarily residential. Sections of the transmission cable route were assessed as medium contamination risk where historical and current potentially contaminating land uses were located in close proximity to the route. Areas were assessed as high contamination risk where the transmission cable route intersects known contaminated areas.

#### 5.1.1.2 Impacts to soil and groundwater

Other construction activities that could result in contamination include spills of fuels when refuelling plant and equipment and hydraulic oil spills. Spills could contaminate soil or enter surface water runoff, the stormwater system and ultimately a local waterway.

One option for the transmission cable route at the Cooks River crossing is to install the conduits via underboring. The transmission cable route would therefore pass under or over the Viva Energy high pressure oil pipeline running along the northern side of the Cooks River. Damage to the pipeline during construction could result in a release which would impact surrounding soil, groundwater and the Cooks River.

Horizontal direction drilling (HDD) for underboring could cause a frac-out of drilling slurry. A frac-out is a release of drilling slurry at the ground surface through an underground pathway (e.g. tree root or underground service). The frac-out drilling slurry could potentially contain elevated concentrations of CoPC exceeding ecological or human health-based criteria due to contact with subsurface contamination. The frac-out could contaminate surface soils or enter stormwater if not contained. Specific potential contamination sources at each underbore location are:

- Enfield Intermodal, Belfield: the drilling slurry could be potentially contaminated by groundwater from nearby former dry cleaners and former petrol station/ current mechanical workshop;
- Cooks River, Campsie/Croydon Park: the drilling slurry could be potentially contaminated by groundwater contaminated from nearby current and former petrol stations, uncontrolled filling and Cooks River sediments;
- Arlington Light Rail Station, Dulwich Hill: the drilling slurry could be potentially contaminated with groundwater contaminated by leachate from Arlington Park filled brick pit/former landfill and surrounding former industry;
- Amy Street, Marrickville: the drilling slurry could be potentially contaminated with leachate from Henson Park filled brick pit/potential former landfill; and
- Sydney Park, Alexandria: the drilling slurry would be contaminated by leachate from Sydney Park former landfill and groundwater contaminated by surrounding industrial sources.

#### 5.1.1.3 Acid sulfate soils

Based on review of the acid sulfate soil risk and classification maps and proposed construction works, there is a risk of ASS within Precincts 2, 3, 4 and 5.

**Precinct 2**

- Transmission cable route along Omaha Street east of Baltimore Street, Seventh Avenue Campsie to Hay Street/Harmony Street intersection in Canterbury (2.2 kilometres length) (Class 4). PASS are likely to be found beyond 2 m bgl in areas mapped as Class 4.

**Precinct 3**

- Cooks River crossing (Class 1). AASS or PASS is likely to be found from the surface in areas mapped as Class1.

**Precinct 4**

- Transmission cable route along Edgeware Road between Darley Street, Marrickville and May Street, St Peters (Class 2). PASS or AASS is likely to be found from below the natural ground surface in areas mapped as Class 2.

**Precinct 5**

- Transmission Cable route between Princes Highway to Alexandra Canal and Beaconsfield West substation (1.3 kilometres length) (Class 3). PASS are likely to be found beyond 1 m bgl in areas mapped as Class 3.

If AASS or PASS are not managed appropriately during excavation, there is a potential for adverse impacts to surrounding groundwater and nearby waterways, Cooks River and Alexandra Canal. Heavy metals and acid can leach into soil and groundwater or impacted stormwater runoff can enter waterways and have negative impacts on water quality and aquatic ecosystems.

Impacts during construction would be caused by excavation of PASS or AASS during trenching if not managed appropriately. There would also be localised lowering of the water table at underboring launch/receive pits at the Cooks River and Sydney Park (Precinct 5), due to the temporary dewatering required. The lowering of the water table has the potential to cause PASS to oxidise. Given the localised and temporary dewatering that would be required, there would not expected to be impacts to surrounding soil and groundwater.

### 5.1.2 Construction laydown areas

#### 5.1.2.1 Impacts from existing soil and groundwater contamination

Construction laydown areas would be used for the storage of plant and equipment and some of the laydown areas would be used to stockpile spoil from trenching and excavation activities.

Potential contamination impacts from the use of construction laydown areas would be primarily associated with the disturbance of existing contamination in surface soils from plant and vehicle movements and from stockpiling spoil. This may result in mobilisation of contaminants and exposure to workers or off-site receptors, from erosion and transport of sediment (including through site runoff) from surface soils. To assess the relative risk during project construction from existing contamination within construction laydown areas and whether further investigation or mitigation measures are required, a preliminary CSM was developed and a qualitative risk assessment undertaken in **Annexure C**. Based on the CSM identifying a medium risk, management and mitigation measures have been developed for the construction laydown areas and are presented in **Section 6.0**.

It is noted that there were no pathways identified between existing groundwater contamination and receptors associated with construction laydown areas. This is because no excavations where vapours from contaminated groundwater could be expected to accumulate are proposed in these areas, and there are no activities where groundwater would be extracted or directly contacted by workers.

#### 5.1.2.2 Impacts to soil and groundwater

The use of the construction laydown areas could result in soil or groundwater contamination from spills of oils, fuels and other chemicals used within the construction laydown area, if appropriate management and mitigation measures are not implemented. Stockpiling of contaminated spoil at construction laydown areas has the potential to contaminate the soil beneath and surrounding the stockpile or be mobilised off-site, if not managed by appropriate handling, storage and sediment and erosion controls.

#### 5.1.2.3 Acid sulfate soils

None of the construction laydown areas are located within Class 1 or 2 mapped land and therefore ASS would not be anticipated to be encountered in surface soils. The construction laydown areas would not be used to treat and stockpile excavated ASS from the project. As the works within the construction laydown areas are not proposed to include any excavation or ground disturbance below 1 m bgl, there would not be impacts associated with ASS.

## 5.2 Operational impacts

### 5.2.1 Potential issues from existing contamination

The potential impacts from existing contamination during operation of the project would be from emissions and migration of landfill gas and migration of leachate in Sydney Park and Camdenville Park. Arlington Oval, Marrickville Park and Henson Park are also formerly filled brick pits and the potential presence and extent of landfill gases at these locations is unknown. Assessment would need to be undertaken prior to the commencement of construction as part of site investigations. Site investigations would include assessment for the presence and risk of subsurface landfill gas by sampling ground gas following the *Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases* (NSW EPA, 2012). One transmission cable route option (Option 5a) passes directly through the former filled pit within Henson Park. An alternate transmission cable route option (Option 5b) passes within 20 to 50 meters of both Arlington Oval and Marrickville Park. Further assessment would be required to assess the risk posed by potential landfill gases at these locations.

Following completion of the project, there is a potential for landfill gas migration in to link and sensor pits due to there being a subsurface void where landfill gas could accumulate. This could occur if the pits are located close to or within former landfills. The risk would be the potential exposure of workers accessing the pits for maintenance to vapours or a potentially explosive atmosphere. This could result in injury to workers or nearby members of the public from the inadvertent ignition of gas.

If capping is not installed over the backfilled trenches within landfilled areas, this could create a pathway for surface water infiltration into the underlying waste. This could contribute to the generation of additional leachate.

### 5.2.2 Potential contamination sources

Following completion of the project there are not expected to be new contaminant sources or additional activities that could result in further land contamination as a result of the operation of the project.

# 6.0 Environmental management and mitigation measures

## 6.1 Management objectives

The objectives of the management approach for contamination are:

- demonstrate that the construction works will be undertaken in accordance with relevant requirements of the CLM Act, POEO Act, EHC Act and SEPP 55;
- prevent significant impacts to project workers and surrounding human and ecological receptors from the disturbance of contaminated soils; and
- prevent significant impacts to surrounding watercourses and aquatic ecological receptors from the excavation of acid sulfate soils.

## 6.2 Environmental management and mitigation measures

In order to meet the management objectives outlined above, management outcomes have been developed. The outcomes and the recommended approach to achieve these outcomes are summarised in **Table 6-1**.

**Table 6-1 Environmental management outcomes and approach**

| Management outcome | Approach |
|---|---|
| Prevent exposure of workers and members of the public to soil contamination | The following will be undertaken:<br>• soil investigations (prior to construction commencing) within areas of medium and high contamination risk to assess level of controls required (PPE, air monitoring, odour suppression, exclusion zones and decontamination);<br>• include procedures for identifying and managing unexpected contamination and finds such as USTs in the project Construction Environmental Management Plan (CEMP);<br>• develop site-specific asbestos management plans; and implement controls to prevent and reduce the risk of exposure;<br>• removal and validation of three ASTs within the Beaconsfield West substation<br>• removal and validation of USTs if identified within the transmission cable route that pose an obstruction in accordance with relevant NSW EPA guidelines;<br>• approval would be sought from the NSW EPA to exhume landfill waste along the transmission cable route at:<br>- Camdenville Park;<br>- Sydney Park; and<br>- Henson Park (if investigations find that the park is a former landfill as there is currently limited information other than the brick pit was filled with spoil from all over Sydney). |

| Management outcome | Approach |
|---|---|
| Prevent exposure of workers and members of the public to landfill gas | Develop and implement site-specific management measures and plans for the works within Sydney Park and Camdenville Park where the potential to encounter landfill gas has been identified.<br>Further investigation will be carried out along the transmission cable route at:<br>• Henson Park: the transmission cable route option and underbore within Henson Park including adjacent road route and option if required based on initial investigation within Henson Park;<br>• Arlington Oval: the transmission cable route within Constitution Road and underbore (light rail crossing) location adjacent to Arlington Oval; and<br>• Marrickville Park: the transmission cable route within Pile Street adjacent to Marrickville Park to assess for the presence of landfill gases that may have migrated into the road reserve. |
| Minimise risk of contaminated water and groundwater discharging to Coxs Creek, Cooks River, Alexandra Canal or Georges River | The following will be undertaken:<br>• surface water and groundwater management measures as detailed in **Appendix L** (Surface Water and Flooding Technical Report) and **Appendix N** (Groundwater Technical Report) of the EIS; and<br>• procedures for the prevention of erosion and management of potentially contaminated stormwater runoff would be detailed in the CEMP and construction soil and water management plan (CSWMP) included as an appendix to the CEMP. |
| Prevent ASS leachate impacting surface water and soils | The following will be undertaken:<br>• test soils within areas identified as having an acid sulfate risk during soil investigations pre-construction; and<br>• prepare and implement an ASSMP. |
| Avoid inappropriate disposal or reuse of contaminated soil | The following will be undertaken:<br>• all soil will be classified in accordance with the *Waste Classifications Guidelines* (*NSW EPA 2014a)* or applicable Resource Recovery exemption and order;<br>• all soil and liquid will be disposed of at an NSW landfill or facility licensed to receive the waste in accordance with its classification; and<br>• all waste will be tracked and reconciled. |
| Prevention of soil and surface water contamination | The following will be undertaken within construction laydown areas and at work sites:<br>• plant and equipment will be maintained and serviced within hardstand areas equipped with adequate spill response kits;<br>• chemicals, oils and fuels would be handled and stored in appropriately bunded areas equipped with adequate spill response kits;<br>• stockpiles within construction laydown areas will be managed with appropriate and adequate erosion and sediment controls; and<br>• emergency response plans clean up and reporting procedures would be developed.<br>The above would be detailed in the CSWMP in the CEMP. The detailed design and construction planning for the transmission cable route around the Viva Energy high pressure oil pipeline along the Cooks River would be undertaken in consultation with the asset owner, Viva Energy Australia Pty Ltd, to avoid impacts to the pipeline. |

The environmental management and mitigation measures to be undertaken during the project to manage potential contamination issues and achieve the management objectives and outcomes are presented in **Table 6-2**.

**Table 6-2 Environmental management and mitigation measures**

| No. | Impact/ issue | Environmental management and mitigation measures | Timing |
|---|---|---|---|
| CT1 | Assessment of excavation areas | Soil investigations will be undertaken prior to construction along the project area to:<br>• assess the presence of contamination and risks posed to project workers and the environment, so that appropriate controls can be implemented during construction;<br>• chemically classify the soil *in-situ,* for potential re-use or off-site disposal to licensed landfill or re-use facility in accordance with the applicable land use criteria, Waste Classification Guidelines (NSW EPA, 2014a) or applicable Resource Recovery exemption and order; and<br>• assess for the presence of acid sulfate soils and liming rates, so ASSMPs can be prepared and waste classified in accordance with Waste Classification Guidelines (NSW EPA, 2014a).<br>A Sampling, Analysis and Quality Plan (SAQP) will be prepared for soil investigation in accordance with the NEPM (ASC NEPM 2013). The SAQP will detail:<br>• data quality objectives (DQOs) and data quality indicators (DQIs);<br>• justification of the number, density and location of sampling locations based on the potential for contamination, excavation extent and quantities requiring off-site disposal;<br>• the sampling locations would target areas of concern and provide lineal coverage of the transmission cable route;<br>• analytical suite and schedule, including contaminants of concern;<br>• assessment criteria for on-site reuse or off-site disposal (waste classification); and<br>• sampling and laboratory methodologies, field and laboratory quality assurance and control.<br>Following the completion of the soil investigations a report will be prepared for each construction precinct providing conclusions on waste classification and recommendations for health and environmental controls during construction. The reports will provide clear commentary on the classification of the waste in accordance with the Waste Classification Guidelines (NSW EPA, 2014a). | Construction |
| CT2 | Assessment of imported Virgin Excavated Natural Material (VENM) | Prior to the backfilling of trenches during construction with VENM, the VENM source(s) will be identified and assessed against the definition of VENM in the Waste Classification Guidelines (NSW EPA 2014a) and POEO Act. The VENM source(s) will be assessed by an appropriately qualified contaminated land consultant, which will entail:<br>• identifying whether the current and past activities at the source site that had potential to contaminate the land, whether AASS or PASS is present and that the site is not within an area mapped as containing naturally occurring asbestos; and<br>• undertaking chemical assessment to ascertain that the material is not contaminated. | Construction |

| No. | Impact/ issue | Environmental management and mitigation measures | Timing |
|---|---|---|---|
| | | The NSW EPA VENM certificate will be completed and signed by the consultant (or supplier) and provided to TransGrid proponent prior to importation and use of the VENM. The VENM would also be inspected at the work site to check the imported VENM is from the same source assessed. | |
| CT3 | Construction laydown areas | Limited baseline soil investigations and site inspections will be undertaken for each construction laydown area to manage identified risks during construction. The investigations will include limited sampling to identify and assess contamination in surface soil. A baseline report will be prepared for each construction laydown area. Where contamination is identified, a site-specific management plan will be implemented prior to construction to inform the management of asbestos or chemical contamination in soil while the construction laydown area is in use.<br>Following demobilisation of the construction laydown area a post–construction report would be prepared for each construction laydown area. The post-construction report would compare to the baseline report and confirm whether or not conditions are the same and if remedial works are required to clean up contamination from the project works within the construction laydown areas. | Construction |
| CT4 | Contaminated soil management during construction | Protocols for the management of contaminated soil during construction will be included in the CEMP for all construction works and would:<br>• detail requirements for safety controls including the following where required:<br>- air monitoring;<br>- exclusion zones and decontamination;<br>- excavation ventilation;<br>- dust suppression and containment;<br>- odour suppression and monitoring;<br>- personnel protective equipment;<br>- training and supervision;<br>• detail requirements for environmental controls including the following:<br>- sediment and erosion control;<br>- management of surface water runoff around the excavation areas and prevention of surface water entering excavations;<br>- stockpile management and separation; and<br>- materials tracking and records.<br>Sediment and erosion mitigation measures that will be implemented are detailed in **Chapter 17 Surface water and flooding** of the EIS. | Construction |
| CT5 | Spoil waste management and transport | Spoil which has been assessed as not suitable for reuse or cannot be reused will be classified in accordance with the Waste Classification Guidelines (NSW EPA 2014a). The spoil would be transported to an appropriate waste disposal facility licensed to receive such waste. Approval would be obtained from the respective landfill facility prior to transport and would require an estimate of the likely volume of waste to be disposed.<br>The following material handling requirements will be | Construction |

| No. | Impact/ issue | Environmental management and mitigation measures | Timing |
|---|---|---|---|
| | | implemented for trucks transporting materials off-site:<br>• a licensed transporter will be used to transport material to an appropriately licensed NSW EPA waste facility;<br>• all truck loads will be filled to the correct level and not over filled;<br>• trucks carrying waste materials will be covered prior to exiting the work site and would remain covered until authorised to unload at the destination (NSW EPA licensed waste facility);<br>• trucks will be fitted with seals to ensure that the movement of potentially saturated materials is undertaken appropriately. The integrity of the seals would be inspected and tested prior to commencement of each day's haulage works;<br>• in the event that materials are tracked or spilt outside of the construction zone, soil will be immediately cleaned up in a way that prevents contamination of land, the stormwater or waterways; and<br>• all truckloads and landfill waste tickets/dockets will be tracked and a register completed to reconcile and check spoil has been lawfully disposed.<br>Temporary spoil stockpiles may be stored at select construction laydown areas. As all spoil will be classified in-situ prior to excavation, the stockpiled material will already be classified in accordance with NSW EPA (2014a). Stockpiles will be kept separate based on their classification. All stockpiles will be tracked in accordance with protocols within the CEMP for material tracking. Stockpiles will be managed with appropriate sediment and erosion controls at all times (refer to **Chapter 17 Surface water and flooding**). | |
| CT6 | Asbestos management | An Asbestos Management Plan (AMP) will be developed for areas identified during pre-construction investigations as containing Asbestos Containing Materials ACM (ACM), areas suspected of containing ACM and to address unexpected finds of ACM during construction. Specifically, protocols will be stipulated for separation, monitoring, validation and clearance of asbestos.<br>The AMP and associated Standard Work Procedures will satisfy the requirements of:<br>• Work Health and Safety Regulation 2011;<br>• the Safe Work Australia Asbestos Codes of Practice and Guidance Notes:<br>- Code of Practice: How to Manage and Control Asbestos in the Workplace;<br>- Code of Practice: How to Safely Remove Asbestos; and<br>- Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibre, 2nd Edition [NOHSC: 3003 (2005)].<br>An Occupational Hygienist (Hygienist) will be on-site for the duration of the excavation works where ACM has been identified from pre-construction or where unexpected finds of ACM are encountered. The Hygienist would:<br>• undertake air monitoring for asbestos during excavation;<br>• provide on-site visual inspection, identification of | Construction |

| No. | Impact/ issue | Environmental management and mitigation measures | Timing |
|---|---|---|---|
| | | asbestos impacted material and clearance of non-asbestos impacted surfaces; and<br>• supervise works to ensure compliance with the AMP and NSW regulatory requirements for asbestos containing material management and disposal.<br>In the event that friable asbestos is detected, a suitably licensed Asbestos Removal Contractor (licensed to undertake friable asbestos (Class A) removal) will be required to undertake and oversee all the asbestos removal and disposal works outlined in the AMP.<br>All persons performing the works will be required to undertake a suitable risk assessment and develop a Safe Work Method Statement (SWMS) for all of their work activities prior to commencing work in ACM impacted areas.<br>Identified ACM would be segregated, managed and disposed of as Special Waste and transported and disposed in accordance with Protection of the Environment Operations (Waste) Regulation (2014a). Where more than 100 kg of asbestos waste or more than 10 square metres of asbestos sheeting is transported, the NSW EPA online tool WasteLocate will be used. The handling and disposal of asbestos waste will be tracked and recorded. | |
| CT7 | Acid sulfate soils | ASSMPs will be prepared in accordance with the ASSMAC (1998) guidelines based on the results of the pre-construction investigations for locations within Precinct 2, 3, 4 and 5. The ASSMPs will incorporate the following procedures:<br>• soil will be treated with lime in accordance with the ASSMP where PASS is not able to be loaded and transported to a landfill licensed to receive untreated PASS within 24 hours of excavation or if AASS are identified and excavated;<br>• exposure of PASS material within an excavated trench or excavation site will be minimised to reduce the potential for oxidation and acid leachate generation;<br>• excavation will be done under dry conditions, where possible using a truck and shovel (tracked excavator) operation and the watertable will be lowered within excavation areas, as part of excavation dewatering;<br>• excavated fill will be monitored for colour and leachate quality;<br>• no PASS material will be placed and left at the surface untreated;<br>• soil will be placed into an appropriately bunded treatment area (pads) and treated with a neutralising agent (e.g. lime). Leachate water from the PASS material will be managed and treated to ensure no acid is released to the environment;<br>• leachate generated during the ASS treatment operations will be captured. Any water potentially affected by leachate collecting within the excavation will be treated with hydrated lime or equivalent prior to discharge. Water potentially affected by leachate accumulating within the work site will not be discharged until it meets acceptable water quality standards or | Construction |

| No. | Impact/ issue | Environmental management and mitigation measures | Timing |
|---|---|---|---|
| | | collected and disposed at a licensed liquid waste treatment facility; and<br>• PASS materials will be kept separate from non-PASS materials at all times to reduce the volume of material requiring treatment. Acid is transported by water; therefore, excavation works in PASS will be conducted during dry periods (where practical) to minimise the risk of overflow associated with sudden or heavy rain and to allow better control of treated waters for discharge. | |
| CT8 | Unexpected finds | An unexpected finds procedure will be included in the CEMP. An unexpected find is potential contamination that was not previously identified during this PSI or pre-construction investigations. Project workers will be trained in identifying the following:<br>• soil that appears to be contaminated based on visual and olfactory (odour) observations;<br>• ACM (i.e. either bonded or friable asbestos);<br>• groundwater that appears to be contaminated based on visual and olfactory (odour) observations (including potential hydrocarbon sheens on the water surface, free phase liquids such as petroleum fuel, discolouration etc.);<br>• drums or USTs; and<br>• fill containing wastes (e.g. slag, refuse, demolition materials).<br>In the event of an unexpected find:<br>• excavation works will temporarily be suspended at the location of the unexpected find, the environment manager contacted and the area of concern appropriately isolated;<br>• the area will be inspected by a contaminated land consultant and if required, appropriate sampling and analysis would be undertaken, the sampling works will be documented in a report;<br>• the requirement for additional controls will be assessed by the consultant and implemented by the proponent; and<br>• workplace health and safety and environmental protection requirements will be reviewed, depending on the type of unexpected finds encountered. | Construction |
| CT9 | Historic landfill management | Specific management plans will be required for Sydney Park and Camdenville Park. Potentially plans may also be required for Henson Park and works in proximity to Arlington Oval and Marrickville Park, following the outcome of investigations (see CT1).<br>The development of the plans would include consultation with City of Sydney (CoS) Council for Sydney Park and Inner West Council for Camdenville Park. Approval will be sought from the NSW EPA in all areas where exhumation of landfill waste is required in accordance with Clause 110A of *the Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2014.*<br>Where there are existing environmental management plans, such as for Camdenville Park, site specific mitigation measures outlined in these plans will be reviewed and | Construction |

| No. | Impact/ issue | Environmental management and mitigation measures | Timing |
|---|---|---|---|
| | | implemented as required.<br>The plan will be prepared by a contaminated land consultant and occupational hygienist. The plan will specify:<br>• an excavation plan specifying areas classified as per in-situ waste classification and suitability for reuse;<br>• trench ventilation during excavation to prevent the accumulation of landfill gases within the trench;<br>• ambient and in-trench monitoring for landfill gases (methane, carbon dioxide, hydrogen sulfide and carbon dioxide), ammonia and volatile organic compounds;<br>• action levels for evacuation of the work zone where health and lower explosive limit (LEL) levels are exceeded and additional controls to allow work to re-commence once implemented;<br>• exclusion zone around the work site on either side of the trench, including fully fenced security chain mesh fences with bracing, where required;<br>• geotechnical considerations for the base of the trench to mitigate the risk of subsidence of the installed cable;<br>• final capping layer above the concrete cable conduit casing as per the Environmental Guidelines Solid Waste Landfills (NSW EPA, 2016), unless otherwise specified or agreed by with City of Sydney Council and Inner West Council:<br>- compacted clay layer at least 600 mm thick, with an in situ saturated hydraulic conductivity of less than 1 x 10–9 metres/s (where subsurface waste either side of the trench is less than;<br>- a revegetating layer from the top of the capping layer to the surface comprising clean soils with 200 mm of topsoil (in landscaped areas); and<br>• the construction of joint bays, link boxes and sensor pits within former landfill areas will be designed to prevent the accumulation of landfill gases. Inner West Council and City of Sydney Council will be consulted on the design, monitoring and location of the pits within Sydney Park, Camdenville Park and Henson Park (if required). | |
| CT10 | Sydney Park | TransGrid will undertake additional investigations at Sydney Park on leachate and methane risks prior to or during construction and will report these findings to the City of Sydney. | Detailed design and construction |
| CT11 | Drilling slurry | TransGrid will investigate and adopt good practice measures for the management of drilling slurry during horizontal directional drilling, where used, taking into consideration the volume of slurry that will be generated. Refer to **Chapter 19 Waste management**. | Detailed design and construction |

# 7.0 Conclusion

## 7.1 Construction works

This preliminary assessment identified the areas of relative risk from contamination during construction as:

- low risk for sections of Precinct 2 to 3 shown on **Figure 4-6** to **Figure 4-8**;
- medium risk for:
  - Precinct 1: all of the project area, including Rookwood Road substation shown on **Figure 4-6**;
  - Precinct 2: following sections shown on **Figure 4-6**:
    - Rawson Road at Section at 24 Rawson Road, Greenacre;
    - Wangee Road between Punchbowl Road and Yangoora Road, Lakemba;
    - Special crossing location between Walker Street, Belmore and Carter Street, Belfield;
  - Precinct 3: following sections shown on **Figure 4-7** and **Figure 4-8**:
    - Cooks River crossing location in Campsie, Croydon Park and Ashbury;
    - Parts of Constitution Road, Terry Road, Dennison Road, Hill Street, Dulwich Hill;
    - Intersection between Pigott Street, New Canterbury Road and Herbett Street, Dulwich Hill;
    - Livingstone Road at section at 26 Livingstone Road, Marrickville;
    - Henson Park, Marrickville;
  - Precinct 4: following sections shown on **Figure 4-9**:
    - Intersection of Illawarra Road, Addison Road and Agar Street to Enmore Road, Marrickville;
    - Newington Road between Philpott Street and Enmore Road, Marrickville;
    - Llewellyn Street between Juilett Street and Edgeware Road, Marrickville;
    - Edgeware Road between Smidmore Street to Illawarra Railway, Marrickville;
  - Precinct 5: Bedwin Road and May Street, St Peters;
  - Sydney South substation; and
- high risk within:
  - Precinct 5: section of the transmission cable route through Camdenville Park, and Sydney Park to and including Beaconsfield West substation shown on **Figure 4-9**.

Sections of the transmission cable route were assessed as low risk based on no current or historical contaminating activities being identified and the surrounding land use being primarily residential. Sections of the transmission cable route were assessed as medium contamination risk based on historical and current potentially contaminating land uses located in close proximity to the route. These land-uses included service stations, dry cleaners, mechanical workshops, manufacturing sites, areas of historically filled land including Muir Road in Chullora and potential former landfills at Arlington Oval, Marrickville Park and Henson Park.

The areas assessed as high contamination risk were where the transmission cable route intersects former landfills in Camdenville Park and Sydney Park, as well as the land between Sydney Park and Beaconsfield West due to known contamination identified from previous site investigations

There are also areas of acid sulfate soil risk in areas of Precinct 2 to 5 that will be investigated prior to construction.

The management measures for the construction would include:

- pre-construction investigations along the transmission cable route including in-situ waste classification and acid sulfate soil assessment;
- precinct specific mitigation measures to manage any contamination to protect workers, public and surrounding environment;
- development and implementation of asbestos management plans (AMPs) for areas of known or suspected asbestos contamination;
- site specific management plans for works within Sydney Park and Camdenville Park (and other areas were required based on pre-construction investigations), which would specify construction safety and environmental controls for managing landfill gas, waste and leachate; and
- development and implementation of ASSMPs.

There would be a potential operational risk to link pits within or in close proximity to former landfills due to the risk of accumulation of landfill gases. This would be managed through the design and location of the pits to prevent the accumulation of gases. If the management measures for construction are implemented, the impacts and risks to human and environmental receptors during the construction works are low.

## 7.2 Construction laydown areas

As previously described, temporary construction laydown areas would be required to store materials, spoil and equipment as well as provide space for other ancillary facilities such as site offices. The construction laydown areas would be used to stockpile material from trenching and excavation activities. Stockpiling would be ongoing for the duration of the trenching and excavation works. Stockpiling activities would be managed by adopting appropriate erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction (Landcom, 2004) (The Blue Book).

Beaconsfield West substation was assessed as low risk due to the existence of pavement covering the site. All other sites were assessed as medium risk based on the potential for existing contamination from former industrial land use and/or historical filling and potential for complete pathways between potential soil contamination and sensitive receptors.

Camdenville Park is a former landfill known to have soil and groundwater contamination issues and landfill gas. Camdenville Park is planned to be remediated by Inner West Council in the future by installation of capping and a long-term management plan implemented. The remediation works within Camdenville Park have not commenced.

Potential contamination impacts from the use of construction laydown areas would be primarily due to the disturbance and mobilisation of existing contamination in surface soils from plant and vehicle movements and minor ground disturbance for construction works such as the installation of driveways and noise mitigation controls (such as hoardings). This may result in exposure to workers or off-site receptors from erosion and transport of sediment (including through site runoff) from surface soils.

The use of the construction laydown areas could also result in new soil or groundwater contamination from spills of chemicals or stockpiled spoil if management and mitigation measures are not implemented.

Baseline pre-construction and post-construction assessments consisting of limited baseline soil investigations and site inspections would be undertaken for medium risk construction laydown areas. The pre-construction report would specify specific mitigation or management works to be implemented prior to or during the use of the construction laydown areas. The post-construction assessment would replicate and compare to the baseline assessment.

None of the construction laydown areas have been identified as having a risk of potential acid sulfate soils at or near (< 1 m) the surface. As such ASSMPs are not required for the works within construction laydown areas.

Where there are existing environmental management plans provided by landowners, such as Camdenville Park, mitigation measures as relevant to the works would be reviewed and implemented as required.

# 8.0 References

Acid Sulfate Soils Management Advisory Committee (ASSMAC) (1998) Acid Sulfate Soils Assessment Guidelines. August 1998.

AECOM, 2017 Preliminary Environmental Assessment, Powering Sydney's Future – Rookwood Road to Beaconsfield West Transmission Cable Project. 23 June 2017.

Australian and New Zealand and Australian State and Territory Governments (ANZAST), 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

Aargus, 2009 Phase II Environmental Site Assessment, 44-46 Burrows Road, Beaconsfield West, NSW.

Aargus, 2009 Phase II Environmental Site Assessment, 48-62 Burrows Road, Beaconsfield West, NSW.

Aargus, 2009 Phase II Environmental Site Assessment, 52 Burrows Road, Beaconsfield West, NSW.

Chapman GA and Murphy CL, (1989); Soil Landscapes of the Sydney 1:100,000 Sheet report, Department of Conservation and Land Management, Sydney.

Coffey, 2009. Remediation and Validation Report, Former Metallising Yard, Zone 7 Potts Hill Reservoir. March.

Douglas Partners, 2012 Report on Contamination Assessment – Transformer Bays 1 and 2 and Nature Strip.

Douglas Partners, 2017 Report on Preliminary Geotechnical Investigation and Contamination Advice, Proposed Underground Cable Trench Sydney Park, St Peters, December 2017.

ERM, 2009. Site Audit Report, Proposed lot 1010 & Part Lot 102, Former Metallising Yard, Potts Hill. June.

ERM, 2017. Australian Refined Alloys, 202-212 Euston Road, Alexandria, Remedial Action Plan. June 2017.

ERM, 2018. Australian Refined Alloys, 202-212 Euston Road, Alexandria, Data Gaps Investigation. November 2018.

GHD, 2013 Remedial and Construction Environmental Construction and Environmental Action Plan Camdenville Park, May Street, St Peters, NSW.

Heads of EPAs Australia and New Zealand (HEPA) (2018) PFAS National Environmental Management Plan, January.

Herbert C, 1983 Sydney 1:100 000 Geological Sheet 9130, 1st edition, Geological Survey of New South Wales, Sydney.

Lotsearch, 2017a Environmental Risk and Planning Report, TransGrid Rookwood to Beaconsfield (Section 1). 24 November 2017.

Lotsearch, 2017b Environmental Risk and Planning Report, TransGrid Rookwood to Beaconsfield (Section 2). 25 November 2017.

Lotsearch, 2019a Lotsearch Enviro Professional, Section 2A, Rawson Road, Greenacre, NSW 2190.

Lotsearch, 2019b Section 3A, Wangee Road and Yangoora Road, Lakemba, NSW 2195.

Lotsearch, 2019c Section 4A, Lucerne Street, Carter Street & Omaha Street, Lakemba, NSW 2195.

Lotsearch, 2019d Section 5A, Cooks River Crossing, Campsie, NSW 2194.

Lotsearch, 2019e Section 5B, Cheviot Street, Roslyn Street, King Street, Second Street & Holden Street, Ashbury NSW 2193.

Lotsearch, 2019f Section 6A, Constitution Road, Denison Road, Hill Street and Terry Road, Dulwich Hill NSW 2203.

Lotsearch, 2019g Section 6B, Pigott Street, Herbert Street & Pile Street, Dulwich Hill, NSW 2203.

Lotsearch, 2019h Section 7A, Centennial Street & Horton Street, Marrickville, NSW, 2204.

Lotsearch, 2019i Section 7B, Agar Street & Newington Road, Marrickville, NSW 2204.

Section 8A, Scouller Street, Juliett Street, Llewellyn Street & Edgeware Road, Marrickville.

Lotsearch, 2017c. Environmental Risk and Planning Report, TransGrid Rookwood to Beaconsfield (Section 10). 30 November 2017.

Parsons Brinckerhoff, 2005 Phase 1 Environmental Site Assessment and Limited Sampling.

NSW Government Spatial Services, Sixmaps, https://maps.six.nsw.gov.au/

NSE EPA (2014a) Waste Classification Guidelines.

NSW EPA (2014b) Technical Note: Investigation of Service Station Sites.

NSW Environment Protection Authority (NSW EPA) (2015). Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997.

NSW EPA (2016) Environmental Guidelines Solid waste landfills, second edition.

NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd edition) October.

NSW Department of Urban Affairs and Planning (DUAP) and NSW EPA (1998). Managing Land Contamination, Planning Guidelines SEPP 55-Remediation of Land.

NSW Department of Environment and Conservation (DEC) (2007) Guidelines for the Assessment and Management of Groundwater Contamination.

National Environment Protection Council (NEPC) (1999) National Environment Protection (Assessment of Site Contamination) Measure 2013 (ASC NEPM 2013).

NSW EPA (2016) Environmental Guidelines: Solid Waste Landfills, Second Edition.

NSW Office of Environment and Heritage (OEH) (2011) Guidelines for Consultants Reporting on Contaminated sites.

NSW EPA (2012) Guidelines for the Assessment and Management of sites Impacted by Hazardous Ground Gasses.

NSW OEH, 2012; NSW Office of Environment and Heritage. Acid sulfate soil risk maps. http://data.environment.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c/resource/b4cc78fa-fa1d-4407-af80-ba1d4f9c2861.

# Annexure A

## Construction laydown areas – existing environment

| Item | 12 Muir Road, Chullora | Cooke Park, 112 Madeline Street, Belfield | Peace Park, Ashbury | Camdenville Park, St Peters | Beaconsfield West Substation |
|---|---|---|---|---|---|
| **Lot and DP** | Part of Lot 2 in DP1007364 | Lots 14, 13, 12, 11, 10 and 9 in DP18185, Part Lot 27 in DP18185, Lot A DP357501 | Lot 1 in DP566982 | Part Lot, 9 DP 879483 and Part Lot 1, DP1056652 | Lot 101 and 102, DP791667 |
| **Current zoning** | IN1 General Industrial | RE1 Public Recreation | R2 - Low density Residential | RE1 – Public recreation and SP2 - Infrastructure | IN1 – General Industrial |
| **Current land use** | Open space within Chullora TAFE College. | Recreation/open space | Open space and recreation – Peace Park | Construction laydown site | Substation |
| **Surrounding commercial or industrial land use within 200 m** | The property is part of the Chullora TAFE which is within Chullora industrial area. The property is surrounded by commercial and industrial properties. | General industrial to the west and down-gradient of the site. | Immediate surrounding land use is low density residential and remainder of Peace Park. Closest industrial property is a factory 150 m northwest at 165-171 Milton Street, Ashbury. | General industrial land use located 20 m to the west and 50 m to the west. The rail corridor is located along the north western boundary. | Fulton Hogan Alexandra Asphalt Plant is located on the south side of the substation, Australian Refined Alloys and various commercial units are located to the west on the opposite side of Burrows Road, Admiral International logistics centre is located on the north side of the site. |
| **Historical land use from review of historical 1943 imagery and online sources** | Undeveloped land in 1943 with Cooks River formerly running through this property as a natural channel. A state heritage item, a pressure tunnel runs through the northern portion of the property. Infilling of land on the tributaries of Cooks river has occurred. The Chullora TAFE buildings adjoining to the east, appeared to be the former Chullora Iron Foundry. Muir Road to the south was constructed between 1970 and 1982. | A large quarry excavation in the centre of the property can be observed in the 1943 aerial. It appears that the property has been used as parkland from circa 1982. | This 1945 aerial photograph shows that Peace Park was formerly a brick pit quarry and brick manufacturing site. The brick pit quarry didn't appear to extent under the proposed laydown area and was approximately 50-60 m to the northeast. The brick pit extended into the laydown area by 1970. The brick pit appeared to be filled between 1982 and 1991 and was developed into a park between 1991 and 2003. The immediate surrounding land was residential with the exception of another brick quarry and brick manufacturing site 150 m northwest (now W.H. Wagner Oval).<br>The Daily Telegraph (16 April 2018) reported that the discovery of asbestos led to the sudden closure of the dog park within Peace Park. Canterbury Bankstown Council reportedly cordoned off the off-leash grounds at after a resident discovered bonded asbestos at the site on 23 February 2018. | The property was used for clay/shale quarrying and the production of bricks from 1800s to 1930, followed by waste incineration operations from about 1922 to 1955. The property was considered to be contaminated by waste materials used to infill the former clay pits, which lacked engineered walls or a capping layer. Impacts primarily included lead and petroleum hydrocarbons in fill material, petroleum hydrocarbons and light non aqueous phase liquids in groundwater in the detention basin area and landfill gases. | The site contained industrial buildings along the Burrows Road frontage with a chimney stack in the southwest corner of the site. Industrial land use was also present adjacent to the north and south sides of the site. The City of Sydney Civic Survey 1950 map showed the site was a paper manufacturing site (Papyrus Pty Ltd) and cardboard manufacturing site (Bernard Lawrence Pty Ltd). Aquilla Street Co-op, Martin Furnace and Engineering Pty Ltd, J. Curtin and Son Stove manufacturing and Australian Bitumen Products Pty Ltd were located on the opposite side of Burrows Road from the site. Sandblasting and Metalizing Service and Crown Chemical Co. were located on the south side of the site. |
| **NSW EPA notified or listed sites within 200 m** | No records within 200 m. | No records within 200 m. | No records within 200 m. | The laydown area is within Camdenville Park which is listed on the register of contaminated sites notified to the NSW EPA. The site was assessed by the NSW EPA as not requiring regulation by the NSW EPA. | Australian Refined Alloys, located opposite and up-gradient of the site on Burrows Road, was listed as a NSW EPA notified site. The NSW EPA assessed the site as not requiring regulation.<br>Alexandra Canal, adjacent to the site, is regulated by the NSW EPA, with a remediation order issued for sediments contaminated with chlorinated hydrocarbons, organochlorine pesticides (chlordane, total DDT and dieldrin), polychlorinated biphenyls (PCBs) and metals. |
| **NSW EPA current licenced sites under the POEO Act 1997 within 200 m** | Four sites within 200 m:<br>- Australian Rail Track Corporation, current licence for Railway systems activities, 107 north east (down-gradient).<br>- Sydney Trains - Recovery of general waste and waste storage, ballast recycling depot,107 north east (down-gradient).<br>- Suez recycling and recovery, current licence for non-thermal treatment of general waste, composting, waste recovery, waste storage, 54 m to the southwest (up-gradient).<br>- P & M quality small goods (Primo), current licence for general animal products production, 194 m east. (up-gradient). | No records within 200 m. | No records within 200 m. | No records within 200 m. | Australian Refined Alloys is licenced for non-thermal treatment of hazardous and other waste, non-ferrous metal production (scrap metal), recovery of hazardous and other waste and waste storage (hazardous, restricted solid, liquid, clinical and related waste and asbestos waste). |

| Item | 12 Muir Road, Chullora | Cooke Park, 112 Madeline Street, Belfield | Peace Park, Ashbury | Camdenville Park, St Peters | Beaconsfield West Substation |
|---|---|---|---|---|---|
| **Soils** | Disturbed Soil Landscape: Original soils have been removed, greatly disturbed or buried. Filling likely to have occurred.<br>Disturbed terrain was reported along the current Muir Road and surrounding land to its north and south, as well as along the railway tracks on either side of Punchbowl Road.<br>1917 and 1949 historical maps indicate that two tributaries of Cooks River formerly meandered through different portions of the current Muir Road whereas currently only one branch crosses Muir Road. This is indicative of the filling of one of these waterways, which appears to be located within Muir Road along the eastern boundary of the TAFE property. | Blacktown Residual Soils: Chief soils are hard acidic residual soils with hard neutral and acidic yellow mottled soils on lower slopes. | Soil Landscape classed as Disturbed terrain, comprises terrain extensively disturbed by human activity. There are variable reliefs and slopes and may include areas used as tips and landfill. Original soil material has been removed, greatly disturbed or buried. Landfill including soil and waste material may have been added. | Birrong Soils: a fluvial landscape generally characterised by localised flooding, high soil erosion potential, saline subsoil, seasonal waterlogging and very low soil fertility. Most drainage lines of this landscape have been artificially lined with concrete. | Soil Landscape classed as Disturbed terrain, comprises terrain extensively disturbed by human activity. There are variable reliefs and slopes and may include areas used as tips and landfill. Original soil material has been removed, greatly disturbed or buried. Landfill including soil and waste material may have been added. |
| **Acid sulfate soils** | Mapped as extremely low probability of occurrence and acid sulfate soil risk class 5. | Mapped as low and extremely low probability of occurrence of acid sulfate soils and acid sulfate soil risk class 4 and 5. | Mapped as extremely low probability of occurrence of acid sulfate soils and acid sulfate soil risk class 5. | Mapped as low probability of occurrence of acid sulfate soils and acid sulfate soil risk class 3. | Mapped as low probability of occurrence of acid sulfate soils and acid sulfate soil risk class 3. |
| **Geology** | Bringelly Shale of the Wianamatta Group, comprised of shale, carbonaceous claystone, laminate, fine to medium grained lithic sandstone, rare coal. | Ashfield Shale of the Wianamatta Group, comprised of black to dark grey shale and laminate. | Ashfield shale of the Wianamatta group, comprised of black to dark grey shale and laminate | Ashfield shale of the Wianamatta group, comprised of black to dark grey shale and laminate | Quaternary alluvial sediment. |
| **Surrounding sensitive receptors** | Cooks river drainage channel runs along the western boundary to a series of stormwater retention ponds and pollution traps. Chullora TAFE campus adjoining to the east, light commercial estates to the east, south and west. | Residential, parkland and Coxs Creek to the north. | Residential land use and remainder of Peace Park immediately surrounding the laydown area. The closest water body is Cooks River over 1 km to the southwest. | The property is located within a recreational area with playing fields. The closest residential properties are 50 m to the southwest and 45 m to the north. | The property is within an industrial area with the closest residential properties 300 m west and closest recreational area, Sydney Park, 160 m to the west. Alexandra Canal is located on the eastern boundary of the laydown area. |

# Annexure B

# Conceptual Site Model and Qualitative Risk Assessment Tables

**Table B-1 Preliminary conceptual site model and risk assessment – transmission cable route and substations**

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| Precinct 1 and Rookwood Road substation | All (special crossing location) | Sources: Filled land, various former and current industrial sites including Galserv Galvanising Services and a service station could potentially have resulted in soil and groundwater contamination within the transmission cable route.<br><br>CoPC: Heavy metals, TRH, BTEX, ammonia, cyanide, pH, PCBs, SVOCs[1], VOCs[2], PFAS and asbestos. | Potentially present in soil, soil vapour and groundwater | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |
| Precinct 2 | 24 Rawson Road, Greenacre (15 metre length) | Source: Budget Auto Parts (workshop), 24 Rawson Road, Greenacre could potentially have resulted in soil and groundwater contamination within the transmission cable route.<br><br>CoPC: Lead, TRH, BTEX | Potentially present in soil, groundwater and soil vapour | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | | and PAHs. | | Surface water runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | Wangee Road between Punchbowl Road to Yangoora Road, Lakemba | Source: Caltex Service Station, former Red Top Transport Services and Astor Base Metals and Former Hampden Motors Service Station and former tannery within Hampden Park Public School.<br><br>CoPC: Heavy metals (including hexavalent chromium), TRH, BTEX, SVOCs[1] and VOCs[2] | Potentially present in soil, groundwater and soil vapour | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Coxs Creek and Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater from excavations | Cooks River (including recreational users and aquatic | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | | | | (dewatering) and discharge to surface water | ecology) | | |
| | Walker Street, Belmore Street and Carter Street, Belfield (special crossing location) | Source: Dry cleaners up-gradient of Walker Street and former petrol station and current mechanical workshop in Carter Street.<br><br>CoPC: Heavy metals, TRH, BTEX, PAHs and VOCs | Potentially present in soil, soil vapour and groundwater | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Construction workers | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | Remainder of Precinct 2 | Source: No specific point source identified. Mainly surrounding low to medium density residential land use. General road construction, maintenance and road use may have resulted in soil contamination[3]. | Unlikely present | Direct contact, inhalation or ingestion | Construction workers | Yes | Low |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | | CoPC: Heavy metals, petroleum hydrocarbons, OCPs and asbestos | | Surface water runoff | Construction workers | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |
| Precinct 3 | Cooks River Crossing | Sources: Current and former petrol stations at the intersection of Brighton Street and Byron Street, potential uncontrolled filling in reserves either side of the Cooks River and Viva Energy high-pressure oil pipeline on the north side of the Cooks River.<br><br>CoPC: Heavy metals, TRH, BTEX, PCBs, SVOCs[1], VOCs[2], and asbestos. | Potentially present in soil, soil vapour and groundwater | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Coxs Creek and Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | Constitution Road between Arlington Road intersection and Denison Road, Dulwich Hill (special crossing location)<br><br>West end of Terry Road, west end of Hill Street, Dulwich Hill<br><br>Denison Road Playground, Dulwich Hill<br><br>Pigott Street, New Canterbury Road and Herbert Street intersection, Dulwich Hill | Sources: Former manufacturing sites, service stations, dry cleaners and Arlington Oval former landfill.<br><br>CoPC: Heavy metals, TRH, BTEX, ammonia, cyanide, pH, PCBs, SVOCs1, VOCs2, PFAS and asbestos. | Potentially present in soil vapour or groundwater. Potentially present in soil in special crossing area outside of road reserve. | Direct contact, inhalation or ingestion | Construction workers | Yes | Low |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | 128 Livingstone Road, | Source: Former foundry<br><br>CoPC: Heavy metals, | Potentially present in groundwater | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | Marrickville | phenols | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater and leachate from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | Henson Park | Source: Former brick pit quarry filled with spoil of unknown sources across Sydney.<br><br>CoPC: Heavy metals, TRH, BTEX, PCBs, SVOCs1, VOCs2, PFAS, asbestos, ammonia, pH, and landfill gases. | Potentially present in soil, soil vapour (landfill gas) and groundwater | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Cooks River (including | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | | | | | recreational users and aquatic ecology) | | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | Remainder of Precinct 3 | Source: No specific point source identified. Mainly surrounding low to medium density residential land use. General road construction, maintenance and road use may have resulted in soil contamiation[3].<br><br>CoPC: Heavy metals, petroleum hydrocarbons, OCPs and asbestos | Unlikely present | Direct contact, inhalation or ingestion | Construction workers | No | Low |
| | | | | Transport via wind as dust | Construction workers, public | No | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | No | |
| | | | | Surface water runoff | Cooks River, Hawthorne Canal (including recreational users and aquatic ecology) | No | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface | Cooks River, Hawthorne Canal (including recreational users and aquatic ecology) | No | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | | | | water | | | |
| Precinct 4 | Addison Road/Illawarra Road/Agar Street intersection to Enmore Road/Addison Road intersection, Marrickville<br><br>Newington Road between Philpott Street and Enmore Road, Marrickville<br><br>Llewllyn Street between Juliett Street and Edgeware Road, Marrickville<br><br>Edgeware Road between Smidmore Street and Illawarra Railway, | Sources: Existing and former petroleum service stations, filled land, dry cleaners, industrial businesses and manufacturing.<br><br>CoPC: Heavy metals, TRH, BTEX, PCBs, SVOCs[1], VOCs[2], PFAS and asbestos.<br><br>Acid sulfate soils | Potentially present in soil, soil vapour and groundwater | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | Marrickville | | | | | | |
| | Remainder of Precinct 4 | Source: No specific point source identified. Mainly surrounding low to medium density residential land use. General road construction, maintenance and road use may have resulted in soil contamiation[3].<br><br>CoPC: Heavy metals, petroleum hydrocarbons, OCPs and asbestos | Unlikely present | Direct contact, inhalation or ingestion | Construction workers | No | Low |
| | | | | Transport via wind as dust | Construction workers, public | No | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | No | |
| | | | | Surface water runoff | Cooks River (including recreational users and aquatic ecology) | No | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | No | |
| Precinct 5 and Beaconsfield West substation | Within Camdenville Park | Sources: Camdenville Park former landfill<br><br>CoPC: Heavy metals, TRH, BTEX, PCBs, SVOCs[1], VOCs[2], PFAS, asbestos, | Known to be present in soil, groundwater and landfill gas | Direct contact, inhalation or ingestion | Construction workers | Yes | High |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by | Construction | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | | ammonia, pH, and landfill gases. | | vehicles onto roads and disposal to landfill | workers, public, landfill workers | | |
| | | | | Surface water runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | Bedwin Road and May Street | Sources: Camdenville Park former landfill, existing and former petroleum service stations, historical manufacturing sites and filled land.<br><br>CoPC: Heavy metals, TRH, BTEX, PCBs, SVOCs[1], VOCs[2], PFAS, asbestos, nutrients, ammonia, pH, and landfill gases. | Potentially present in groundwater, soil and soil vapour | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Alexandria Canal | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| | | | | | (including recreational users and aquatic ecology) | | |
| | | | | Discharge of contaminated groundwater and leachate from excavations (dewatering) and discharge to surface water | Alexandria Canal (including recreational users and aquatic ecology) | Yes | |
| | Princes Highway to Beaconsfield West substation though Sydney Park | Sources: Sydney Park former landfill, Australian Refined Alloys, widespread historical industrial land use and disturbed terrain (filled land)<br><br>CoPC: Heavy metals, TRH, BTEX, PCBs, SVOCs[1], VOCs[2], PFAS, asbestos, nutrients, ammonia, pH, and landfill gases. | Known to be present in soil, groundwater and landfill gas | Direct contact, inhalation or ingestion | Construction workers | Yes | High |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Alexandra Canal | Yes | |
| | | | | Discharge of contaminated groundwater and leachate from excavations (dewatering) and discharge to surface water | Alexandra Canal | Yes | |

| Precinct/ substation | Section of precinct | Summary of existing sources of and CoPC (see Table 4-14 for further detail) | Likelihood of presence of contamination within transmission cable route | Potential pathway between existing contamination and receptor | Receptors | Potential complete pathway | Qualitative risk |
|---|---|---|---|---|---|---|---|
| Sydney South substation | - | Sources: Transformers within substation could have resulted in soil and groundwater contamination within the project area. The substation was formerly the location of a radio communications site (also known as Picnic Point remote receiving station) during WWII which could have used hazardous building materials.<br><br>CoPC: Heavy metals, petroleum hydrocarbons, asbestos and PCBs. | Potentially present | Direct contact, inhalation or ingestion | Construction workers | Yes | Medium |
| | | | | Transport via wind as dust | Construction workers, public | Yes | |
| | | | | Transport of spoil by vehicles onto roads and disposal to landfill | Construction workers, public, landfill workers | Yes | |
| | | | | Surface water runoff | Georges River (including recreational users and aquatic ecology) | Yes | |
| | | | | Discharge of contaminated groundwater from excavations (dewatering) and discharge to surface water | Georges River (including recreational users and aquatic ecology) | Yes | |

Notes:
1 SVOCs – includes a range of common semi-volatile organic compounds including OCPs, OPPs, PAHs and phenols,
2 VOCs – includes a range of common volatile organic compounds including monoaromatic substances (MAH), fumigants, halogenated aliphatic compounds and oxygenated compounds.
3 There were no specific sources of contamination identified, however there is a potential for areas of localised contaminated soil or fill to be present associated with the use of contaminated spoil during historical road construction, in backfilling of service trenches, use of ACM for services, use of pesticides in service trenches or spills of fuel, oil or chemicals from road accidents.

**Table B-2 Preliminary conceptual site model and risk assessment – construction laydown areas**

| Construction laydown area | Summary of existing sources of soil or groundwater contamination and CoPC | Potential pathway | Receptor | Potential pathway complete | Qualitative risk |
|---|---|---|---|---|---|
| 12 Muir Road | Source: Chullora iron foundry and filled land within the construction laydown area could have potentially caused soil and groundwater contamination.<br><br>CoPC: Heavy metals, hydrocarbons, asbestos, SVOCs, PCB | Direct contact, inhalation and ingestion from disturbance or erosion of surface soils | Workers | Yes | Medium |
| | | Erosion of soil and transport via wind as dust | Workers, public | Yes | |
| | | Erosion of soil –entering surface runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | Movement of vehicles transporting soil off-site | Public, Cooks River (including recreational users and aquatic ecology) | Yes | |
| Cooke Park | Source: Filled quarry pit within the park could have caused soil and groundwater contamination.<br><br>CoPC: Heavy metals, hydrocarbons, asbestos and landfill gas. | Direct contact, inhalation and ingestion from disturbance or erosion of surface soils | Workers | Yes | Medium |
| | | Erosion of soil and transport via wind as dust | Workers, public | Yes | |
| | | Erosion of soil –entering surface runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | Movement of vehicles transporting soil off-site | Public, Cooks River (including recreational users and aquatic ecology) | Yes | |

| Construction laydown area | Summary of existing sources of soil or groundwater contamination and CoPC | Potential pathway | Receptor | Potential pathway complete | Qualitative risk |
|---|---|---|---|---|---|
| Peace Park | Source: Filled land within the construction laydown area could have caused soil and groundwater contamination.<br><br>CoPC: Heavy metals, hydrocarbons, asbestos, SVOCs, PCB | Direct contact, inhalation and ingestion from disturbance or erosion of surface soils | Workers | Yes | Medium |
| | | Erosion of soil and transport via wind as dust | Workers, public | Yes | |
| | | Erosion of soil –entering surface runoff | Cooks River | Yes | |
| | | Movement of vehicles transporting soil off-site | Public, Cooks River (including recreational users and aquatic ecology) | Yes | |
| Camdenville Park | Source: Soil and groundwater contamination known to be present from historical filling of quarry with waste. Landfill gases known to be present in subsurface.<br><br>CoPC: Heavy metals, hydrocarbons, asbestos, SVOCs, PCB, landfill gases | Direct contact, inhalation and ingestion from disturbance or erosion of surface soils | Workers | Yes | Medium |
| | | Erosion of soil and transport via wind as dust | Workers, public | Yes | |
| | | Erosion of soil –entering surface runoff | Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | Movement of vehicles transporting soil off-site | Public, Cooks River (including recreational users and aquatic ecology) | Yes | |
| | | Diffusion of landfill gases to the surface | Workers | Yes | |

| Construction laydown area | Summary of existing sources of soil or groundwater contamination and CoPC | Potential pathway | Receptor | Potential pathway complete | Qualitative risk |
|---|---|---|---|---|---|
| Beaconsfield West substation | Source: Soil and groundwater contamination known to be present from historical filling, substation use and past industrial land use on the site and surrounds.<br><br>CoPC: Heavy metals, hydrocarbons, asbestos, PCBs. | Direct contact, inhalation and ingestion from disturbance or erosion of surface soils | Workers | No[1] | Low |
| | | Erosion of soil and transport via wind as dust | Workers, public | No[1] | |
| | | Erosion of soil –entering surface runoff | Alexandra Canal | No[1] | |
| | | Movement of vehicles transporting soil off-site | Public, Alexandra Canal (including recreational users and aquatic ecology) | No[1] | |

1 Assumes that the construction laydown area at Beaconsfield West substation would be covered by existing hardstand or bitumen surface and no surface soils would be exposed.