

# Elizabeth Drive - West Upgrade

## Phase 1 Contamination Assessment

08-Sep-2023  
Phase 1 Contamination Assessment

# Elizabeth Drive – West Upgrade

Phase 1 Contamination Assessment - ED West

Client: Transport for NSW

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08-Sep-2023

Job No.: 60641411

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## Quality Information

Document Elizabeth Drive - West Upgrade

Ref 60641411

Date 05-Aug-22

Prepared by Stephen Randall

Reviewed by Jonathan Ho, Catherine Brady

### Revision History

| Rev | Revision Date | Details                           | Authorised  |           |
|-----|---------------|-----------------------------------|---|-----------|
|     |               |                                   | Name/Position   | Signature |
| 0   | 1-Jul-2022    | Final for client submission       | Tessa Drayson<br>Senior<br>Environmental<br>Scientist | TDrayson  |
| 1   | 22-Jul-2022   | Draft for client review           | Tessa Drayson<br>Senior<br>Environmental<br>Scientist | TDrayson  |
| 2   | 5-Aug-2022    | Draft for client review           | Tessa Drayson<br>Senior<br>Environmental<br>Scientist | TDrayson  |
| 3   | 3-Jul-2023    | Final draft for Gateway<br>review | Tessa Drayson<br>Senior<br>Environmental<br>Scientist | TDrayson  |
| 4   | 08-Sep-2023   | Final for client submission       | Tessa Drason<br>Senior<br>Environmental<br>Scientist  | TDrayson  |

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## Executive summary

Elizabeth Drive is the main east-west corridor between Liverpool and surrounding suburbs. Currently, between The Northern Road, Luddenham and Badgerys Creek Road, Badgerys Creek, Elizabeth Drive is predominantly a two lane undivided road with no footpath and no median.

Transport for NSW (Transport) proposes to upgrade about 3.6 kilometres (km) of Elizabeth Drive from The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek, where it would connect with the future M12 Motorway (the Proposal). This upgrade is required to support future traffic demand associated with the Western Sydney Airport (WSA) and other planned land releases.

This Phase 1 Contamination Assessment (P1CA) has been prepared as part of the Review of Environmental Factors (REF) for the proposal. The primary objective of this P1CA is to assess the potential risks to the proposal from contamination identified within the study area. This report also assesses whether further detailed site investigations (Phase 2 contamination assessment) and / or remediation would be required for the proposal.

The specific objectives of this P1CA are:

- Identify Areas of Potential Environmental Concern (APECs) through a review of past and present land uses that may have resulted in contamination of soils and groundwater within the study area
- Establish a preliminary Conceptual Site Model (CSM) to evaluate potential risks to human health and the environment relative to proposed construction work and ongoing land uses within the study area
- Provide recommendations for further assessment should any high risk properties be identified.

For the purposes of this P1CA, the construction and operational footprint of the proposal shown in Figure 1-1 is referred to as 'the construction footprint'. The 'study area' includes a 1,000 metre buffer from the construction footprint, to assess for potential off-site contamination sources that may impact the footprint.

The scope of this P1CA comprised:

- Desktop review of available information
- Site inspection on 31 May 2022
- Identification of APECs based on information gathered during the desktop review and site inspection
- Development of a CSM
- Identification of safeguards and management measures to address contamination risks identified in the P1CA.

This P1CA did not identify any specific areas of concern that may indicate potential contamination. A total of three APECs were identified within the construction footprint. These APECs relate to the potential presence of contaminated fill; fly tipped waste (if present); and areas of current and former agricultural land.

The following data gaps were also identified in this P1CA that require further assessment:

- The extent of potentially contaminated fill along the proposal alignment
- The potential for fly tipped waste to be present within the construction footprint
- The presence of contaminated soils and groundwater associated with current and former agricultural land.

It is recommended that a Phase 2 Contamination Assessment is carried out for the proposal to address the data gaps identified in this P1CA. This assessment would include the collection of soil samples to characterise the APECs identified.

## 1.0 Introduction

Elizabeth Drive is the main east-west corridor between Liverpool and surrounding suburbs. Between The Northern Road, Luddenham and Badgerys Creek Road, Badgerys Creek, Elizabeth Drive is predominantly a two lane undivided road, with no footpath and no median.

Future projected and planned growth in this region of Western Sydney is expected with the planned development of the Western Sydney Airport (WSA). It is projected that an expansion of industrial and commercial precincts would be prompted in response to the development of the Western Sydney Aerotropolis, as well as related planned land releases for residential precincts and employment zones in the area.

This projected growth would require the upgrade of Elizabeth Drive to provide increased capacity between the existing and planned road corridors in the surrounding area, and to support the projected and planned development of the Western Sydney Aerotropolis.

### 1.1 Proposal overview

Transport for NSW (Transport) proposes to upgrade about 3.6 kilometres of Elizabeth Drive between The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek, where it would connect with the future M12 Motorway (the proposal). The proposal would be carried out within the Penrith Local Government Area (LGA) and the Liverpool LGA.

The location and extent of the proposal is provided in Figure 1-1.

**FIGURE 1-1:  
LOCATION OF THE PROPOSAL**



**Legend**

- Construction footprint
- Operational footprint
- LGA boundary
- Road design
- Primary road
- Local road

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## 1.2 Purpose of this technical report

This Phase 1 Contamination Assessment (P1CA) has been prepared as part of the Review of Environmental Factors (REF) for the proposal. It contributes to fulfilling the requirements of Section 5.5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) which requires that Transport examines and takes into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The primary objective of this P1CA is to assess the potential risks to the proposal from contamination identified within the study area. This report also assesses whether further detailed site investigations (Phase 2 contamination assessment) and / or remediation would be required for the proposal.

## 2.0 Proposal description

Key features of the proposal (subject to detailed design) would include:

- Upgrade of Elizabeth Drive from a two-lane rural road, to a four-lane road (two lanes in each direction) with provision of a central median to allow for future upgrade to six lanes
- A new culvert at Cosgroves Creek to carry eastbound and westbound traffic
- Upgrades to two intersections along Elizabeth Drive: Luddenham Road and Adams Road
- Active transport provision along the full corridor with the inclusion of shared paths along both sides of Elizabeth Drive corridor
- Inclusion of public transport infrastructure with bus priority at intersection and bus stops facilities
- New stormwater drainage infrastructure
- Property acquisitions and adjustments on both sides of Elizabeth Drive and some side roads.
- Relocation/adjustment of existing utilities.

Subject to detailed design and construction planning, construction of the proposal is anticipated to take about 48 months to complete.

The following three temporary construction ancillary facilities would be established to support construction of the proposal:

- The Northern Road (construction ancillary facility 1) – located at the north-eastern corner of the Elizabeth Drive and The Northern Road intersection
- Luddenham Road (construction ancillary facility 2) – located at the north-western corner of the Elizabeth Drive and Luddenham Road intersection
- M12 Motorway tie in (construction ancillary facility 3) – located west of Badgerys Creek Road on the northern side of Elizabeth Drive. Subject to detailed design and construction planning, it is anticipated that this construction ancillary facility would operate as the main site office during construction of the proposal.

Construction ancillary facilities 1 and 2 would be located on private land acquired or leased by Transport. Construction ancillary facility 3 would be located on land that is currently being used to support construction of the M12 Motorway.

Each construction ancillary facility may include the following:

- Establishment of site office/s, amenities, and temporary infrastructure, such as fencing and car parking areas
- Laydown and storage areas, and delivery of plant, equipment and materials
- Secure and bunded storage areas for re-fuelling and chemical storage
- Concrete batching plant
- Material crushing



- Stockpiling areas and spoil management (topsoil, excavated natural material, contaminated material). Stockpile locations would be determined during subsequent design stages using the criteria set out in the Stockpile Management Guideline (RMS, 2015).

Construction of the proposal would involve the following general activities:

- Site establishment including set up of construction ancillary facilities and installation of environmental protection controls, including around creek areas
- Utility adjustments, relocations and replacements, where required
- Demolition of existing buildings/structures
- Property adjustments (eg adjustments to fencing)
- Vegetation removal
- Earthworks and drainage work
- Adjustments to existing farm dams within the construction footprint, including dewatering and re-shaping where required
- Culvert work over Cosgroves Creek, including installation of temporary diversion (if required) and temporary creek crossing, construction of new culvert and demolition/removal of the existing culvert
- Elizabeth Drive upgrade roadwork, including intersections with local roads and walking and cycling infrastructure
- Landscaping and finishing work.

### 3.0 Objectives

The primary objective of this Phase 1 Contamination Assessment (P1CA) is to assess the potential risks to the proposal from contamination identified within the study area. This report also assesses whether further detailed site investigations (Phase 2 contamination assessment) and / or remediation would be required for the proposal.

The specific objectives of this P1CA are to:

- Identify Areas of Potential Environmental Concern (APECs) through a review of past and present land uses that may have resulted in contamination of soils and groundwater within the study area
- Establish a preliminary Conceptual Site Model (CSM) to evaluate potential risks to human health and the environment relative to proposed construction work and ongoing land uses within the study area
- Provide recommendations for further assessment should any high risk properties be identified.

### 4.0 Study area

For the purposes of this P1CA, the construction and operational footprint of the proposal shown in Figure 1-1 is referred to as 'the construction footprint'. The 'study area' includes a one kilometre buffer from the construction footprint, to assess for potential off-site contamination sources that may impact the footprint.

## 5.0 Scope of work

### 5.1 Method of assessment

The scope of this P1CA comprised:

- A desktop review of the following information:
  - LotSearch (2022) Enviro-Lite report (refer to Appendix A) generated on 31 January 2022. LotSearch (2022) summarises a range of environmental aspects potentially informing the contamination status of the study area, including historical aerial imagery, surrounding industrial activities, title searches and a range of databases and registers, as listed in Table 5-1
  - Available previous investigations and reports relating to contamination within the study area, comprising:
    - The Northern Road Upgrade Mersey Road to Glenmore Parkway Stage 1 Contamination Assessment (Jacobs, 2017)
    - M12 Motorway Environmental Impact Statement Appendix O – Soils and Contamination assessment report October 2019
    - Elizabeth Drive – M7 Motorway to Northern Road Preliminary Environmental Investigation (Aurecon, 2018)
    - MR35 Upgrade Contaminated Land Risk Review (Aurecon, 2020)
  - Past and current activities in the study area and other potential on-site/offsite sources of contamination
  - Legal site descriptions and land use zoning information
  - Historical aerials from 1949 to 2021 (about one aerial photograph every five years was reviewed)
  - NSW Environmental Protection Authority (EPA) databases on the contaminated land record and NSW EPA's *Protection of the Environment Operations Act 1997* (POEO Act) licences for the site and Liverpool LGA and Penrith LGA
  - Geology, soil, topography, and registered groundwater bore maps
  - Acid sulfate soil (ASS) and salinity risk maps
  - Department of Defence unexploded ordnance (UXO) risk mapping
  - The NSW EPA priority per- and polyfluoroalkyl substances (PFAS) investigation risk sites within 10 km of the proposal extents/sites
- A site inspection on 31 May 2022, limited to a visual inspection along the Elizabeth Drive alignment. The inspection intended to identify obvious signs of contamination and ground truth the desktop review, taking photographs and notes accordingly
- Identification of APECs based on information gathered during the desktop review and site inspection
- Development of a CSM
- Identification of safeguards and management measures to address contamination risks identified in the P1CA.

**Table 5-1 Summary of Database Searches**

| <b>Dataset Name</b>   | <b>Custodian</b>                                    |
|---|---|
| Cadastre Boundaries   | Department of Finance, Services & Innovation (DFSI) |
| Topographic Data  | DFSI  |
| List of NSW contaminated sites notified to EPA  | EPA   |
| Contaminated Land Records of Notice   | EPA   |
| Former Gasworks   | EPA   |
| National Waste Management Facilities Database   | Geoscience Australia                                |
| National Liquid Fuel Facilities   | Geoscience Australia                                |
| EPA Per and Polyfluoroalkyl Substances (PFAS) Investigation Program   | EPA   |
| Defence PFAS Investigation & Management Program – Investigation Sites   | Department of Defence (DoD)                         |
| Defence PFAS Investigation and Management Program – Management Sites  | DoD   |
| Airservices Australia National PFAS Management Program  | Airservices Australia                               |
| Defence Three Year Regional Contamination Investigation Program   | DoD   |
| EPA other sites with Contamination Issues   | EPA   |
| Licensed Activities under the Protection of the Environment Operations (POEO) Act 1997  | EPA   |
| Delicensed POEO Activities still Regulated by the EPA   | EPA   |
| Former POEO Licensed Activities now revoked or surrendered  | EPA   |
| United Book Distributors (UBD) Business Directories (Premise & Intersection Matches)  | Hardie Grant  |
| UBD Business Directories (Road & Area Matches)  | Hardie Grant  |
| UBD Business Directory Dry Cleaners & Motor Garages / Service Stations (Premise & Intersection Matches & Road & Area Matches) | Hardie Grant  |
| Points of Interest  | DFSI  |
| Tanks (Areas & Points)  | Department of Customer Service – Spatial Services   |
| Major Easements   | DFSI  |
| State Forest  | Forestry Corporation NSW                            |

| Dataset Name   | Custodian  |
|--|--|
| NSW National Parks and Wildlife Service Reserves                         | NSW Office of Environment and Heritage (OEH)                               |
| Hydrogeology Map of Australia  | Commonwealth of Australia (Geoscience Australia)                           |
| Temporary Water Restriction (Botany Sands Groundwater Source Order 2018) | Department of Planning and Environment (DPE)                               |
| Groundwater Boreholes  | NSW Department of Primary Industries – Water<br>Commonwealth of Australia  |
| Geological Units and Structures 1:100,000                                | DPE  |
| Naturally Occurring Asbestos Potential                                   | NSW Department of Industry, Resources and Energy                           |
| Atlas of Australian Soils  | Australian Bureau of Agriculture and Resource Economics and Sciences       |
| Soil Landscapes of Central and Eastern NSW                               | DPE  |
| Atlas of Australian Acid Sulfate Soils                                   | CSIRO  |
| Dryland Salinity – National Assessment and potential for Western Sydney  | DPE  |
| Mining Subsidence Districts  | Department of Customer Service – Subsidence Advisory NSW                   |
| Current and Historic Mining Titles and Applications                      | Department of Industry   |
| Environmental Planning Instrument – Land Zoning                          | DPE  |
| Bushfire Prone land  | NSW Rural Fire Service   |
| Remnant Vegetation of the Cumberland Plain                               | NSW OEH  |
| Ramsar Wetlands of Australia   | Australian Government Department of Agriculture, Water and the Environment |
| Groundwater Dependent Ecosystems and Inflow Dependent Ecosystems         | Bureau of Meteorology  |
| NSW Bionet Species Sightings   | NSW OEH  |

## 5.2 Guidance documents

This P1CA has been prepared in accordance with the following guidance documents:

- Contaminated Land Management Guidelines for the NSW Site Auditor Scheme, 3<sup>rd</sup> Edition, 2017
- NSW Environmental Protection Authority (EPA) Consultants reporting on contaminated land, Contaminated Land Guidelines 2020
- National Environment Protection Council *National Environment Protection (Assessment of Contamination) Measure 1999*, amended 2013 (ASC NEPM), 2013

- Standards Australia, 4482.2-1999 Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 2: Volatile Substances (Standards Australia AS4482.2-1999)
- Standards Australia AS4482.1 Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds, 2005.

## 6.0 Study area description

### 6.1 Study area identification

Study area identification details are presented in Table 6-1.

**Table 6-1 Study area details**

| Item  | Description   |
|---|---|
| Study area                                    | The study area includes the construction footprint (construction and operational footprint) and surrounding land uses within a 1,000 m buffer area.   |
| Study area features                           | <ul style="list-style-type: none"> <li>The Western alignment contains a two lane road and is entirely surfaced with asphalt.</li> <li>The alignment gently slopes to the east lowering from about 90 m AHD to about 60 m AHD</li> <li>A number of intersecting roads join Elizabeth Drive within the Western alignment boundaries: <ul style="list-style-type: none"> <li>Luddenham Road</li> <li>Adams Road</li> </ul> </li> </ul> |
| Local Government Area                         | Liverpool City Council and Penrith City Council   |
| Current land use and zoning                   | Elizabeth Drive is currently used as a two lane road zoned SP2 – Infrastructure.  |
| Current surrounding land use (1,000 m buffer) | <p>A number of land use zonings surround the road including:</p> <ul style="list-style-type: none"> <li>Environment and Recreation (ENZ) – Primarily to the north and south</li> <li>Enterprise (ENT) – Primarily to the north</li> <li>Infrastructure (SP2) – Primarily to the south-east</li> <li>Agribusiness (AGB) – Primarily to the south-west.</li> </ul>  |
| Registered groundwater bores (2,000 m buffer) | <p>18 registered groundwater bores located within a 2,000 metres radius of the proposal, as summarised in Table 6-2.</p> <p>Three of the 18 bores had a purpose relating to water supply. The closest of these three bores is located about 90 metres north of the construction footprint</p>   |

| Item                 | Description   |
|----------------------|---|
| Ecological Receptors | <ul style="list-style-type: none"> <li>• Cosgrove and Oaky Creeks cross the road alignment near the intersection of Elizabeth Drive and Adams Road</li> <li>• Farm dams located within and immediately bounding the construction footprint</li> <li>• Terrestrial GDE's mapped within a 2,000 m buffer from the construction footprint include: <ul style="list-style-type: none"> <li>- Cumberland River Flat Forest – High potential GDE located to the north, south, east and south-west of the construction footprint in isolated areas and along Cosgroves Creek and Oaky Creek, that transect the proposal, and Badgerys Creek to the east</li> <li>- Cumberland Shale Hills Woodland – Moderate potential GDE located to north, south and east</li> <li>- Cumberland Shale Plains Woodland – Low potential GDE located to the north and south of the construction site.</li> </ul> </li> </ul> |

## 6.2 Topography

The study area slopes to the east from an initial elevation of about 90 m AHD and reaches about 60 m AHD at the eastern boundary of the proposal.

## 6.3 Geology and soils

LotSearch (2022) indicates that the study area is underlain by Middle Triassic Bringelly shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff. Overlying this is Quaternary aged fine-grained sand silt and clay.

According to the Penrith 1:100,000 Soil Landscape Map (Bannerman, S. M and Hazelton, P. A, 1990), there are three different soil types within the study area.

- Blacktown (bt): Residual soils located in gently undulating terrain on Bringelly Shale between creek channels which are moderately erodible
- Luddenham (lu): Erosional soils located on the undulating to rolling low hills on Bringelly Shale within the western portion of the proposal
- South Creek (sc): Alluvial deposits located within the drainage depressions of Cosgrove and Oaky Creek with high to very high erodibility.

A review of LotSearch (2022) shows that the study area has an extremely low probability of occurrence of acid sulfate soils. However, an area about 600 metres west of the construction footprint has a high probability of occurrence of acid sulfate soils. This location appears to be near a large water line connecting a number of dams. It is not anticipated that any construction would take place at this location as it is well outside the construction footprint.

A review of online resources (eSPADE, 2022) shows the soils within the western portion of the construction footprint generally have a moderate to high overall salinity hazard and soils within the eastern portion of the proposal, including the regions of Cosgrove and Oaky Creeks, have a very high overall salinity hazard.

## 6.4 Hydrology and hydrogeology

The proposal lies within the Lower Nepean River Management Zone of the Hawkesbury-Nepean Catchment. A large portion of the Hawkesbury-Nepean Catchment is protected in national parks and water catchment reserves; however, the proposal is part of the South Creek sub-catchment which has been extensively modified and disturbed due to land clearing for agriculture and increasing

urbanisation. The Hawkesbury River is the ultimate downstream receiving environment and is located about 29 kilometres north-west of the proposal.

The following is noted with regard to hydrology and hydrogeology:

- The closest water bodies include Cosgrove Creek and Oakey Creek which cross the alignment near Adams Road. Surface water is collected along drainage lines present on either side of Elizabeth Drive and likely flow into Cosgrove and Oakey creeks
- A number of farm dams are also present in the surrounding area
- Regional groundwater is inferred to flow in a westerly direction towards the Nepean River and Warragamba Dam located over 6 km from the site
- A search of the WaterNSW Realtime Data online database and the BoM Australian Groundwater Explorer (BoM, 2022a) undertaken in March 2022 indicated that there are 18 registered groundwater bores located within a 2 km radius of the proposal, as summarised in Table 6-2.
- Three of the 18 bores (GW102305, GW106198 and GW100136) had a purpose relating to water supply (ie irrigation, stock and domestic, water supply or commercial/industrial) and based on reported bore depth and bore logs, at least two of these three bores (GW102305 and GW100136) are inferred to be accessing the Bringelly Shale groundwater system. The closest of these three bores (GW100136), relating to water supply, is located about 90 metres north of the construction footprint.

**Table 6-2 Summary of registered groundwater bores within the study area**

| Bore ID  | Date installed | Purpose         | Status  | Bore depth (m) | Standing water level (mbgl) | Screened lithology |
|----------|----------------|-----------------|---------|----------------|-----------------------------|--------------------|
| GW102305 | 7/04/1998      | Stock           | Unknown | 61             | 12                          | Shale              |
| GW106198 | 11/07/2005     | Stock, domestic | Current | Unknown        | Unknown                     | Unknown            |
| GW100136 | 27/11/1991     | Stock           | Current | 110.7          | 23.8                        | Shale              |
| GW111838 | 12/01/2009     | Monitoring      | Current | 30             | Unknown                     | Shale              |
| GW111840 | 19/01/2009     | Monitoring      | Unknown | 30.7           | Unknown                     | Shale              |
| GW111839 | 15/01/2009     | Monitoring      | Unknown | 30.4           | Unknown                     | Shale              |
| GW112168 | 28/08/1992     | Monitoring      | Unknown | 26.5           | Unknown                     | Unknown            |
| GW112169 | 8/03/1993      | Monitoring      | Unknown | 16.55          | Unknown                     | Unknown            |
| GW112166 | 21/08/1992     | Monitoring      | Unknown | 32.34          | Unknown                     | Unknown            |
| GW112167 | 5/03/1993      | Monitoring      | Unknown | 20.6           | Unknown                     | Unknown            |
| GW112116 | 9/11/1995      | Monitoring      | Unknown | 23.4           | Unknown                     | Unknown            |
| GW112171 | 23/07/1991     | Monitoring      | Unknown | 32             | Unknown                     | Unknown            |
| GW112170 | 19/07/1991     | Monitoring      | Unknown | 26.9           | Unknown                     | Unknown            |
| GW112173 | 10/03/1993     | Monitoring      | Unknown | 24             | Unknown                     | Unknown            |
| GW072774 | 26/10/1994     | Exploration     | Unknown | 30             | Unknown                     | Unknown            |
| GW112174 | 15/07/1991     | Monitoring      | Unknown | 22             | Unknown                     | Unknown            |
| GW112165 | 26/08/1992     | Monitoring      | Current | 34.95          | Unknown                     | Unknown            |
| GW112172 | 17/07/1991     | Monitoring      | Unknown | 36.5           | Unknown                     | Unknown            |

## 6.5 Site inspection observations

The site inspection carried out on 31 May 2022 was limited to the road alignment as AECOM was not permitted entry to properties along the proposal. Observations were made of the land bordering the road within the study area and photos and notes were taken accordingly.

The field team stopped at various points along the alignment to look for any obvious signs of contamination through staining or odours. To the south of the proposal, construction associated with the WSA is taking place; however, the construction footprint for the airport is beyond the operational / construction footprint of this investigation and is unlikely to be affected by it. To the north, including in areas of proposed construction staging areas, the land is predominately farmland, dotted with vegetation and farm dams (refer to Figure 6-1). Due to the recent heavy rainfall the farm dams were at capacity and the surrounding area saturated. No obvious signs of contamination were observed within the study area.



Figure 6-1 Farmland and dams typically present along the western alignment



## 7.0 Desktop review

### 7.1 Historical Aerial photography

A 500 m dataset radius from the proposal was used to review historical aerial photographs of the study area between 1949 to 2021 (refer to Appendix A). A summary is provided in Table 7-1 below.

**Table 7-1 Historical Aerial Photograph Review**

| Photograph Details | Description  |
|--------------------|--|
| 1949               | <p>Elizabeth Drive is clearly visible in the photos, however it is unclear whether the road is paved or is a dirt road. However due to its appearance it is likely to be a dirt road. Trees line the road and no business or other properties appear to border the road. Both Cosgrove and Oakey Creeks are visible running across the alignment as they appear today.</p> <p>Within the dataset radius (500 m), immediately north, south, east and west of the site, the area comprises vacant farmland with no structures visible.</p> |
| 1955, 1956         | <p>The study area appears similar to its appearance in the 1949 historic photograph. The surrounding area appears generally unchanged compared with the 1949 photograph except for a number of structures clearly visible to the south of the alignment, and the widening of farm dams to the north of the alignment.</p>  |
| 1961, 1965         | <p>The study area appears similar to its appearance in 1949, however the road appears to have been paved by 1960.</p> <p>The surrounding area appears to see an expansion of farmland. Multiple areas to the north and south show land clearing and clearly marked fields. Additional farm dams are visible to both the north and south. More structures are visible to the south of the alignment.</p>  |
| 1970, 1978         | <p>The study area appears unchanged to its appearance in 1961, 1965 photos. The surrounding area continues to show significant expansion of structures, dams and farmland.</p>   |
| 1982, 1986         | <p>The study area appears unchanged, and the photos are in colour. There are few trees lining the road since the previous photo and due to the colouring, it is easier to discern that the road appears to be paved and is no longer a dirt road.</p> <p>The rest of the surrounding area continues to expand with business and farmland clearly visible in the surrounding area.</p>  |
| 1991, 1994         | <p>The study area appears to remain unchanged.</p> <p>The area within the dataset radius appears generally unchanged, however in the 1994 photo the land looks distinctly brown and farm dams appear smaller indicating a period of drought during this time.</p>  |
| 2005, 2011         | <p>Between 2005 and 2011 the study area remains largely unchanged, with the exception of more commercial and residential properties present along the road alignment.</p> <p>The area within the dataset radius (500 m) appears generally unchanged, more structures are present and land clearing continuing.</p>   |
| 2016               | <p>The study area appears unchanged with the exception of fewer trees bordering the road. The area within the dataset radius (500 m) appears generally unchanged.</p>  |

| Photograph Details | Description  |
|--------------------|--|
| 2021               | <p>The study area appears unchanged.</p> <p>The area within the dataset radius appears to show significant land clearing to the south of the road alignment with grass stripped and land modification apparent with heavy machinery. Numerous structures present in 2016 to the south of the construction footprint have now been removed.</p> |

The aerial photographs date from 1949 and appear to show a dirt road lined with trees with the road paved circa 1960. The photographs suggest site configuration remained largely unchanged between 1949 and 2021.

Further to this, the surrounding area appears to have originally been vacant farmland. It does appear to change significantly between 1949 and 2021 through land clearing, construction of farm dams and built structures. Development appears to intensify during the 1970s, where increases in land clearing and construction of commercial and residential properties occur. Between 2016 and 2021 the development of WSA commences and it is clear a number of farms, farm structures and farm dams have been cleared for the development to commence. The predominant land use in the area to this day remains as rural / agricultural.

## 7.2 Previous owners and land use

As noted in the aerial photos dating back to 1949, the site has always been used as a roadway owned and maintained by the various state government agencies over the years. The alignment of the road does not appear to have altered significantly since 1949; therefore, it is unlikely any other site uses would have been present along or directly adjacent to the alignment since its construction.

## 7.3 Historical and current business activities of surrounding area

There are no sites within the construction footprint on the contaminated land public register (as outlined in the LotSearch (2022) report presented in Appendix A). There is one registered Waste Management and Liquid Fuel facility noted in the study area – Sita Australia Pty Ltd which includes a landfill and is located about 925 m east of the construction footprint and not within the operational or construction footprint. No PFAS investigation or management program sites are within the dataset buffer.

There are three licensed activities under the *Protection of the Environment Operations Act 1997* (POEO Act) noted as being within the study area. These include:

- Road construction activities undertaken by CPB Contractors, located within the construction footprint at the junction of the Northern Road and Elizabeth Drive. The POEO license is listed as 'surrendered' as the activity has been completed and the activity is not considered to have been potentially contaminating
- Broiler farming, with a listed activity of bird accommodation undertaken by Baiada Poultry Pty Ltd, located about 120 m west of the construction footprint
- Crushing, grinding or separating operations undertaken by Luddenham Operations Pty Ltd, located about 205 m south of the construction footprint.

In addition, there are a number of former licensed activities listed under the POEO Act 1997 located in proximity to the study area, which are now revoked or surrendered. This includes extraction and waste storage activities undertaken by Epic Mining Pty at 275 Adams Road Luddenham which is outside the study area. A number of activities listed as 'application of herbicides' undertaken by organisations such as Liverpool City Council and Sydney Weed and Pest Management Pty Ltd were also identified as listed revoked license activities, likely relevant to the management and maintenance of the roadway.

Historical business directory records between 1950-1991 in the LotSearch report in Appendix A, shows 24 separate businesses located on the Northern Road which merges into Elizabeth Drive and are outside the study area.

In summary, the desktop review did not identify specific properties within the study area that would require further investigation due to potentially contaminating activities. However, a site inspection was required to primarily ground truth the desktop review, as outlined in Section 6.5.

## 7.4 Previous Investigations

AECOM has reviewed the following reports relating to contamination in the study area.

### 7.4.1 The Northern Road Upgrade Mersey Road to Glenmore Parkway Stage 1 Contamination Assessment (Jacobs, 2017)

Transport commissioned Jacobs to prepare an Environmental Impact Statement (EIS) for The Northern Road Upgrade project. As part of the EIS, Jacobs prepared a Stage 1 contamination assessment report (the report) detailing the results of the contamination desktop investigation which included a review of publicly available information and historical aerial photos, a site inspection and identification of Areas of Environmental Interest (AEIs).

The report identified twenty-one AEIs relevant to the project and ranked them either low or moderate. The majority of moderate AEIs related to either service stations, miscellaneous stockpiles or agricultural land use and the report recommended further investigations through a Phase 2 intrusive assessment of the moderate AEIs. All AEIs identified in this report are not in the vicinity of the construction footprint of this project and are therefore not relevant to this investigation.

### 7.4.2 M12 Motorway Environmental Impact Statement Appendix O – Soils and contamination assessment report (NSW Government, 2019)

Transport sought approval to construct and operate the M12 Motorway project, to provide direct access between WSA and Sydney's motorway network. The *Soils and contamination assessment report* (the report) contains an assessment of the potential soils and contamination impact associated with the construction and operation of the project.

The report outlined a number of Areas of Environmental Interest (AEIs) relevant to the project and classified the risk as 'low', 'moderate' or 'high'. A 'high' risk ranking was given to areas containing fill potentially related to historical uncontrolled earthworks and building structures containing asbestos previously demolished, and areas of illegally dumped material. Although specific locations may differ, these AEIs are considered relevant to the proposal, and have been considered accordingly in this P1CA.

The report concluded that contamination, if not managed appropriately could potentially impact upon project elements. Contaminated soils, asbestos and hazardous building materials present a risk of impacting the project construction, as well as the potential to be released into the environment during construction activities. Groundwater from identified AEIs poses a low risk to construction of the project given that the volumes of groundwater expected to interact with project features during project construction are negligible or are not expected to require management. Further investigations were carried out in AEIs of moderate to high risk in the form of a Phase 2 Detailed Site Investigation.

### 7.4.3 Elizabeth Drive – M7 Motorway to Northern Road Preliminary Environmental Investigation (Aurecon, 2018)

Aurecon undertook a Preliminary Environmental Investigation (PEI) in 2018 to identify initial environmental constraints and issues for the project that may influence the development of design options and to inform future environmental impact assessments.

The report included a broad review of environmental issues such as biodiversity, noise and vibration and did not focus on contamination, with the exception of a small section within the Geology and Soils section.

The report identified two sites notified to the EPA at the time, namely the Caltex service stations in Kemps Creek and Luddenham. It also listed a number of activities that had current licenses with the EPA, all of which are outside the study area for this proposal, with the closest being about 200 m west.

The report concluded that industrial and agricultural properties had the potential to affect contamination at the site but did not identify specific properties. The PEI recommended further contamination assessment to confirm the presence of contamination in areas of concern.

#### 7.4.4 MR35 Upgrade Contaminated Land Risk Review (Aurecon, 2020)

The MR35 Upgrade Contaminated Land Risk Review (Aurecon, 2020) (the report) was prepared to develop an understanding of areas of potential contamination risk along the Elizabeth Drive road corridor (both East and West sections) and provided estimates of potential costs to address land contamination for the Elizabeth Drive Upgrade.

Following review of the report, AECOM provided the following recommendations to Transport . The recommendations included:

- Carry out a desktop contamination review of publicly available material (eg aerial photos, search of public databases, titles, previous environmental reports)
- Undertake a site inspection of the study area, focussing on properties identified as areas of 'medium' and 'high' contamination risk, as outlined in the Aurecon report (2020)
- Design and prepare a Sampling Analysis and Quality Plan (SAQP) for relevant medium and high risk properties (in the context of the road design and volume of excavated material in proposed cut areas) and other potentially contaminated properties identified as part of the site inspection, as part of a phase one assessment (this P1CA)
- Carry out intrusive site investigations in accordance with the SAQP
- Prepare a P1CA for inclusion in the REF.

This P1CA documents the findings of the desktop review and site inspection to inform the creation of the SAQP for a detailed intrusive investigation in areas of the study area where high risks have been identified.

## 8.0 Areas of Potential Environmental Concern

Although no obvious signs of contamination were detected during the desktop review and site inspection, it is assumed that the fill material used to construct the road and road shoulder of Elizabeth Drive would likely comprise general fill material and/or topsoil sourced locally from other construction works or imported fill material. Fill material may have also been used in areas such as farm dams, and other areas across existing farm properties and there is the potential for historic land filling, although no obvious instances were detected during this desktop review. This is considered 'uncharacterised fill'.

Although not observed during the site inspection there is the potential for fly tipped waste to be present which may represent a contamination source, although the risk is considered low as it would unlikely be widespread. The land associated with agricultural land use may also be impacted with Organochlorine pesticides (OCP) and organophosphate pesticides (OPP) pesticides which may represent a contamination source. Based on the desktop review, source areas of potential contamination were identified within the study area associated with the uncharacterised fill, fly tipped waste and areas of former and current agricultural land described above.

For these source areas, contaminants of potential concern (CoPCs) were identified, based on likely composition of material. A likelihood for risk of contamination was then assigned for the source area. Table 8-1 outlines the AEPCs and each ones' contamination risk likelihood.

**Table 8-1 Area of Potential Environmental Concern and likelihood of risk**

| Source area   | Source area located within or outside study area | CoPC                                | Likelihood for risk of contamination  |
|---|--|-------------------------------------|---|
| Uncontrolled fill within the construction footprint | Within the construction footprint                | Asbestos, heavy metals, OCP and OPP | High – There is the potential for contaminated fill which could potentially be widespread. More information is required through the collection of samples to characterise this potential source |

| Source area  | Source area located within or outside study area | CoPC  | Likelihood for risk of contamination   |
|--|--|---|--|
| Contaminated material produced from fly tipping                                    | Within the construction footprint                | Asbestos, heavy metals, OCP and OPP                         | Low – No obvious signs of fly tipping were observed during the site inspection. Any instances of fly tipping are unlikely to be widespread.                          |
| Areas of former and current agricultural land including former building structures | Within the construction footprint                | Asbestos, heavy metals, OCP and OPP, petroleum hydrocarbons | High – There is the potential for contamination to be present based on past or current agricultural land use and past demolition practises of any former structures. |

## 9.0 Preliminary Conceptual Site Model

A CSM is a qualitative description of the mechanisms by which potential and/or complete exposure pathways may exist between known or potential sources of site impacts, and human or environmental receptors. In order for a human receptor to be exposed to a contaminant derived from the site, a complete exposure pathway must exist. An exposure pathway may include the following elements:

- A source and mechanism of chemical release
- A retention or transport medium (or media where contaminants are transferred between media)
- A point of potential human contact with the contaminated media
- An exposure route (eg ingestion, inhalation) at the point of exposure.

Where one or more of the above elements is missing, the exposure pathway is considered to be incomplete and therefore, there is considered to be no direct risk to the receptors. Where this is identified, the exposure pathway does not warrant further assessment. Where a plausible linkage may exist or has the potential to exist, the exposure pathway is considered further in terms of risk assessment.

Based on the results of this P1CA and in accordance with the Assessment of Site Contamination (ASC) National Environment Protection Measure (NEPM), a preliminary CSM has been developed for the site. The results of the CSM are outlined in the sections below.

### 9.1 Sources

No obvious sources of contamination have been identified. This however does not necessarily mean that contamination may not be encountered during construction or operation of the proposal, as it is a large area and small localised occurrences of contamination may be encountered. At this preliminary stage, the likely source of any contamination encountered would be the nature of the fill that is present along the alignment, the potential for fly tipped waste and the areas of former and current agricultural land use as outlined in Section 8.0. Uncontrolled fill, fly tipped waste and current / former agricultural land may contain CoPC such as the following:

- Asbestos
- Heavy metals (lead)
- OCP and OPP
- Petroleum hydrocarbons.

## 9.2 Potential human receptors and exposure pathways

Following the review of available information with regard to the current and proposed use of the proposal, the following human receptors have been identified:

- On site intrusive (ie ground excavation) maintenance workers (eg demolition contractors)
- Off site residents
- Off site groundwater bore users
- Off site recreational users
- Off site intrusive maintenance workers.

The following human exposure pathways may apply:

- i. Dermal contact and incidental ingestion of soil
- ii. Inhalation of soil derived dust in indoor and/or outdoor air
- iii. Dermal contact and incidental ingestion of surface water
- iv. Inhalation of soil vapours in outdoor air
- v. Inhalation of soil (dust) within a trench.

CoPC associated with potential sources of contamination and the exposure pathways that may be relevant to each CoPC are presented in **Table 9-1**.

**Table 9-1 CoPC and Relevant Pathways**

| CoPC  | Relevant Pathways |
|---|-------------------|
| Heavy metals (Lead), petroleum hydrocarbons and OCP/OPP | i, ii, iii, iv, v |
| Asbestos  | ii, v             |

## 9.3 Potential ecological receptors and exposure receptors

Ecological receptors along the alignment are likely restricted to grass patches along the border of the road. These receptors are unlikely to be affected by groundwater, given the depth of groundwater across the study area and the limited extent of vegetation; however, shallow fill may occur across the study area. It is understood that subterranean biota may pass through the layer; however, it would not be considered a typical habitat. As such, it is not considered that the presence of the fill layer would cause a negative impact on the overall ecological properties of the site.

Additional potential sensitive ecological receptors located within the study area include:

- Cosgrove and Oakey Creeks which cross the alignment near Adams Road
- Private dams located on various properties that border the alignment.

Terrestrial GDE's mapped within a 2,000 m buffer from the construction footprint include:

- Cumberland River Flat Forest – High potential GDE located to the north, south, east and south-west of the construction footprint in isolated areas and along Cosgroves Creek and Oaky Creek, that transect the proposal, and Badgerys Creek to the east
- Cumberland Shale Hills Woodland – Moderate potential GDE located to north, south and east
- Cumberland Shale Plains Woodland – Low potential GDE located to the north and south of the construction site.

## 10.0 Potential data gaps

Following a historical review of ownership, photos and business activities and review of previous investigations carried out within the study area and the identification of APECs, three key data gaps were identified as requiring further investigation. These comprise:

- The extent of potentially contaminated fill along the proposal alignment
- The potential for fly tipped waste to be present within the construction footprint
- The presence of contaminated soils and groundwater associated with current and former agricultural land.

## 11.0 Recommendations

Given the APECs identified in Section 8.0 and associated data gaps identified in Section 10.0 the following recommendations for supplementary investigation are as follows:

- Completion of Phase 2 Contamination Assessment, which would include the collection of a number of samples of fill material, fly tipped waste (if present) and areas of current and former agricultural land via test pitting along the alignment and at areas known to be construction staging areas or ancillary facilities to characterise the material. Given the length of the alignment, samples collected should focus on any areas that may indicate signs of potential contamination as well as area coverage.
- As outlined in Section 7 of the REF, a Construction Environmental Management Plan (CEMP) would be prepared for the proposal. The CEMP would identify environmental controls required including but not limited to noise, erosion, dust, waste, unexpected finds including potentially contaminated fill. This document would provide the information and management required should unexpected contamination be encountered

## 12.0 Conclusions

The historical review of ownership, photos and business activities and review of previous investigations carried out at the site, identified no specific areas of concern that may indicate potential contamination.

A total of three APECs were identified within the construction footprint. These APECs relate to the potential presence of contaminated fill; fly tipped waste (if present) and areas of current and former agricultural land.

The following data gaps were identified that require further assessment:

- The extent of potentially contaminated fill along the proposal alignment
- The potential for fly tipped waste to be present within the construction footprint
- The presence of contaminated soil and groundwater associated with current and former agricultural land.

It is recommended that a Phase 2 Contamination Assessment is carried out for the proposal to address the data gaps identified in this P1CA. This assessment would include the collection of soil samples to characterise the APECs identified.

## 13.0 References

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# Appendix A

LotSearch results



# LOTSEARCH

LOTSEARCH ENVIRO LITE

**Date: 31 Jan 2022 12:57:09**

**Reference: LS028681 EL**

**Address: Elizabeth Drive West, Kemps Creek, NSW 2178**

**Disclaimer:**

The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features. You should obtain independent advice before you make any decision based on the information within the report. The detailed terms applicable to use of this report are set out at the end of this report.

## Dataset Listing

Datasets contained within this report, detailing their source and data currency:

| Dataset Name  | Custodian  | Supply Date | Currency Date | Update Frequency | Dataset Buffer (m) | No. Features On-site | No. Features within 100m | No. Features within Buffer |
|---|--|-------------|---------------|------------------|--------------------|----------------------|--------------------------|----------------------------|
| Cadastre Boundaries   | NSW Department of Finance, Services & Innovation   | 04/01/2022  | 04/01/2022    | Quarterly        | -                  | -                    | -                        | -                          |
| Topographic Data  | NSW Department of Finance, Services & Innovation   | 25/06/2019  | 25/06/2019    | Annually         | -                  | -                    | -                        | -                          |
| List of NSW contaminated sites notified to EPA  | Environment Protection Authority   | 10/12/2021  | 09/12/2021    | Monthly          | 1000m              | 0                    | 0                        | 0                          |
| Contaminated Land Records of Notice   | Environment Protection Authority   | 11/01/2022  | 11/01/2022    | Monthly          | 1000m              | 0                    | 0                        | 0                          |
| Former Gasworks   | Environment Protection Authority   | 07/01/2022  | 11/10/2017    | Quarterly        | 1000m              | 0                    | 0                        | 0                          |
| National Waste Management Facilities Database   | Geoscience Australia   | 12/05/2021  | 07/03/2017    | Annually         | 1000m              | 0                    | 0                        | 1                          |
| National Liquid Fuel Facilities   | Geoscience Australia   | 15/02/2021  | 13/07/2012    | Annually         | 1000m              | 0                    | 0                        | 0                          |
| EPA PFAS Investigation Program  | Environment Protection Authority   | 24/01/2022  | 14/07/2021    | Monthly          | 2000m              | 0                    | 0                        | 0                          |
| Defence PFAS Investigation & Management Program - Investigation Sites                                 | Department of Defence  | 28/01/2022  | 28/01/2022    | Monthly          | 2000m              | 0                    | 0                        | 0                          |
| Defence PFAS Investigation & Management Program - Management Sites                                    | Department of Defence  | 28/01/2022  | 28/01/2022    | Monthly          | 2000m              | 0                    | 0                        | 0                          |
| Airservices Australia National PFAS Management Program  | Airservices Australia  | 06/01/2022  | 06/01/2022    | Monthly          | 2000m              | 0                    | 0                        | 0                          |
| Defence 3 Year Regional Contamination Investigation Program   | Department of Defence  | 06/01/2022  | 06/01/2022    | Quarterly        | 2000m              | 0                    | 0                        | 0                          |
| EPA Other Sites with Contamination Issues   | Environment Protection Authority   | 02/02/2021  | 13/12/2018    | Annually         | 1000m              | 0                    | 0                        | 0                          |
| Licensed Activities under the POEO Act 1997   | Environment Protection Authority   | 19/01/2022  | 19/01/2022    | Monthly          | 1000m              | 3                    | 3                        | 11                         |
| Delicensed POEO Activities still regulated by the EPA   | Environment Protection Authority   | 19/01/2022  | 19/01/2022    | Monthly          | 1000m              | 0                    | 0                        | 0                          |
| Former POEO Licensed Activities now revoked or surrendered  | Environment Protection Authority   | 19/01/2022  | 19/01/2022    | Monthly          | 1000m              | 8                    | 8                        | 8                          |
| UBD Business Directories (Premise & Intersection Matches)   | Hardie Grant   |             |               | Not required     | 150m               | 0                    | 0                        | 0                          |
| UBD Business Directories (Road & Area Matches)  | Hardie Grant   |             |               | Not required     | 150m               | -                    | 24                       | 24                         |
| UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches) | Hardie Grant   |             |               | Not required     | 500m               | 0                    | 0                        | 0                          |
| UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)            | Hardie Grant   |             |               | Not required     | 500m               | -                    | 7                        | 7                          |
| Points of Interest  | NSW Department of Finance, Services & Innovation   | 19/08/2021  | 19/08/2021    | Quarterly        | 1000m              | 0                    | 0                        | 6                          |
| Tanks (Areas)   | NSW Department of Customer Service - Spatial Services  | 19/08/2021  | 19/08/2021    | Quarterly        | 1000m              | 0                    | 0                        | 0                          |
| Tanks (Points)  | NSW Department of Customer Service - Spatial Services  | 19/08/2021  | 19/08/2021    | Quarterly        | 1000m              | 0                    | 1                        | 1                          |
| Major Easements   | NSW Department of Finance, Services & Innovation   | 19/08/2021  | 19/08/2021    | Quarterly        | 1000m              | 2                    | 2                        | 5                          |
| State Forest  | Forestry Corporation of NSW  | 25/02/2021  | 14/02/2021    | Annually         | 1000m              | 0                    | 0                        | 0                          |
| NSW National Parks and Wildlife Service Reserves  | NSW Office of Environment & Heritage   | 22/01/2021  | 11/12/2020    | Annually         | 1000m              | 0                    | 0                        | 0                          |
| Hydrogeology Map of Australia   | Commonwealth of Australia (Geoscience Australia)   | 08/10/2014  | 17/03/2000    | As required      | 1000m              | 1                    | 1                        | 1                          |
| Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018                              | NSW Department of Planning, Industry and Environment   | 26/10/2020  | 21/02/2018    | Annually         | 1000m              | 0                    | 0                        | 0                          |
| Groundwater Boreholes   | NSW Dept. of Primary Industries - Water NSW; Commonwealth of Australia (Bureau of Meteorology) | 24/07/2018  | 23/07/2018    | Annually         | 2000m              | 0                    | 0                        | 17                         |

| Dataset Name   | Custodian  | Supply Date | Currency Date | Update Frequency | Dataset Buffer (m) | No. Features On-site | No. Features within 100m | No. Features within Buffer |
|--|--|-------------|---------------|------------------|--------------------|----------------------|--------------------------|----------------------------|
| Geological Units 1:100,000   | NSW Department of Planning, Industry and Environment                           | 20/08/2014  |               | Annually         | 1000m              | 2                    | 2                        | 2                          |
| Geological Structures 1:100,000                                    | NSW Department of Planning, Industry and Environment                           | 20/08/2014  |               | Annually         | 1000m              | 1                    | 2                        | 3                          |
| Naturally Occurring Asbestos Potential                             | NSW Dept. of Industry, Resources & Energy                                      | 04/12/2015  | 24/09/2015    | Unknown          | 1000m              | 0                    | 0                        | 0                          |
| Atlas of Australian Soils  | Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES)  | 19/05/2017  | 17/02/2011    | As required      | 1000m              | 2                    | 2                        | 2                          |
| Soil Landscapes of Central and Eastern NSW                         | NSW Department of Planning, Industry and Environment                           | 14/10/2020  | 27/07/2020    | Annually         | 1000m              | 3                    | 3                        | 3                          |
| Environmental Planning Instrument Acid Sulfate Soils               | NSW Department of Planning, Industry and Environment                           | 07/01/2022  | 17/12/2021    | Monthly          | 500m               | 0                    | -                        | -                          |
| Atlas of Australian Acid Sulfate Soils                             | CSIRO  | 19/01/2017  | 21/02/2013    | As required      | 1000m              | 1                    | 1                        | 2                          |
| Dryland Salinity - National Assessment                             | National Land and Water Resources Audit  | 18/07/2014  | 12/05/2013    | None planned     | 1000m              | 1                    | 1                        | 1                          |
| Dryland Salinity Potential of Western Sydney                       | NSW Department of Planning, Industry and Environment                           | 12/05/2017  | 01/01/2002    | None planned     | 1000m              | 2                    | 2                        | 11                         |
| Mining Subsidence Districts  | NSW Department of Customer Service - Subsidence Advisory NSW                   | 19/08/2021  | 05/08/2021    | Quarterly        | 1000m              | 0                    | 0                        | 0                          |
| Current Mining Titles  | NSW Department of Industry   | 07/01/2022  | 07/01/2022    | Monthly          | 1000m              | 1                    | 1                        | 2                          |
| Mining Title Applications  | NSW Department of Industry   | 07/01/2022  | 07/01/2022    | Monthly          | 1000m              | 0                    | 0                        | 0                          |
| Historic Mining Titles   | NSW Department of Industry   | 07/01/2022  | 07/01/2022    | Monthly          | 1000m              | 10                   | 10                       | 13                         |
| Environmental Planning Instrument SEPP State Significant Precincts | NSW Department of Planning, Industry and Environment                           | 15/11/2021  | 07/12/2018    | Monthly          | 1000m              | 0                    | 0                        | 0                          |
| Environmental Planning Instrument Land Zoning                      | NSW Department of Planning, Industry and Environment                           | 15/11/2021  | 05/11/2021    | Monthly          | 1000m              | 5                    | 9                        | 31                         |
| Commonwealth Heritage List   | Australian Government Department of the Agriculture, Water and the Environment | 18/05/2021  | 20/11/2019    | Annually         | 1000m              | 0                    | 0                        | 0                          |
| National Heritage List   | Australian Government Department of the Agriculture, Water and the Environment | 18/05/2021  | 20/11/2019    | Annually         | 1000m              | 1                    | 1                        | 1                          |
| State Heritage Register - Curtilages                               | NSW Department of Planning, Industry and Environment                           | 19/08/2021  | 25/06/2021    | Quarterly        | 1000m              | 0                    | 0                        | 0                          |
| Environmental Planning Instrument Local Heritage                   | NSW Department of Planning, Industry and Environment                           | 07/01/2022  | 17/12/2021    | Monthly          | 1000m              | 2                    | 2                        | 2                          |
| Bush Fire Prone Land   | NSW Rural Fire Service   | 31/01/2022  | 08/12/2021    | Weekly           | 1000m              | 4                    | 4                        | 4                          |
| Remnant Vegetation of the Cumberland Plain                         | NSW Office of Environment & Heritage   | 07/10/2014  | 04/08/2011    | Unknown          | 1000m              | 4                    | 4                        | 6                          |
| Ramsar Wetlands of Australia                                       | Australian Government Department of Agriculture, Water and the Environment     | 24/02/2021  | 19/03/2020    | Annually         | 1000m              | 0                    | 0                        | 0                          |
| Groundwater Dependent Ecosystems                                   | Bureau of Meteorology  | 14/08/2017  | 15/05/2017    | Annually         | 1000m              | 2                    | 2                        | 4                          |
| Inflow Dependent Ecosystems Likelihood                             | Bureau of Meteorology  | 14/08/2017  | 15/05/2017    | Unknown          | 1000m              | 3                    | 3                        | 9                          |
| NSW BioNet Species Sightings                                       | NSW Office of Environment & Heritage   | 31/01/2022  | 31/01/2022    | Weekly           | 10000m             | -                    | -                        | -                          |

# Site Diagram

Elizabeth Drive West, Kemp's Creek, NSW 2178



|  |  |  |  |                       |
|--|--|--|--|-----------------------|
| <p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px solid magenta; margin-right: 5px;"></span> Site Boundary</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px solid magenta; margin-right: 5px;"></span> Internal Parcel Boundaries</li> </ul> | <p><b>Total Area:</b> 431865m<sup>2</sup></p> <p><b>Total Perimeter:</b> 8.79km</p> <p>Disclaimers:</p> <p>Measurements are approximate only and may have been simplified or smaller lengths removed for readability.</p> <p>Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.</p> | <p><b>Scale:</b></p> <p>Data Source Aerial Imagery:<br/>© Aerometrex Pty Ltd</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Coordinate System:<br/>GDA 1994 MGA Zone 56</td> <td style="width: 50%;">Date: 31 January 2022</td> </tr> </table> | Coordinate System:<br>GDA 1994 MGA Zone 56 | Date: 31 January 2022 |
| Coordinate System:<br>GDA 1994 MGA Zone 56   | Date: 31 January 2022  |  |  |                       |

# Contaminated Land

Elizabeth Drive West, Kemps Creek, NSW 2178

## List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

| Map Id | Site                 | Address | Suburb | Activity | Management Class | Status | Location Confidence | Dist | Direction |
|--------|----------------------|---------|--------|----------|------------------|--------|---------------------|------|-----------|
| N/A    | No records in buffer |         |        |          |                  |        |                     |      |           |

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

| EPA site management class   | Explanation   |
|---|---|
| Contamination being managed via the planning process (EP&A Act)         | The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment. |
| Contamination currently regulated under CLM Act                         | The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.   |
| Contamination currently regulated under POEO Act                        | The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.  |
| Contamination formerly regulated under the CLM Act                      | The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.   |
| Contamination formerly regulated under the POEO Act                     | The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).  |
| Contamination was addressed via the planning process (EP&A Act)         | The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).   |
| Ongoing maintenance required to manage residual contamination (CLM Act) | The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.   |
| Regulation being finalised  | The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.  |
| Regulation under the CLM Act not required                               | The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.   |
| Under assessment  | The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.                          |

NSW EPA Contaminated Land List Data Source: Environment Protection Authority  
 © State of New South Wales through the Environment Protection Authority

## Contaminated Land

Elizabeth Drive West, Kemps Creek, NSW 2178

### Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

| Map Id | Name                 | Address | Suburb | Notices | Area No | Location Confidence | Distance | Direction |
|--------|----------------------|---------|--------|---------|---------|---------------------|----------|-----------|
| N/A    | No records in buffer |         |        |         |         |                     |          |           |

Contaminated Land Records of Notice Data Source: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority  
Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit  
<http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm>

### Former Gasworks

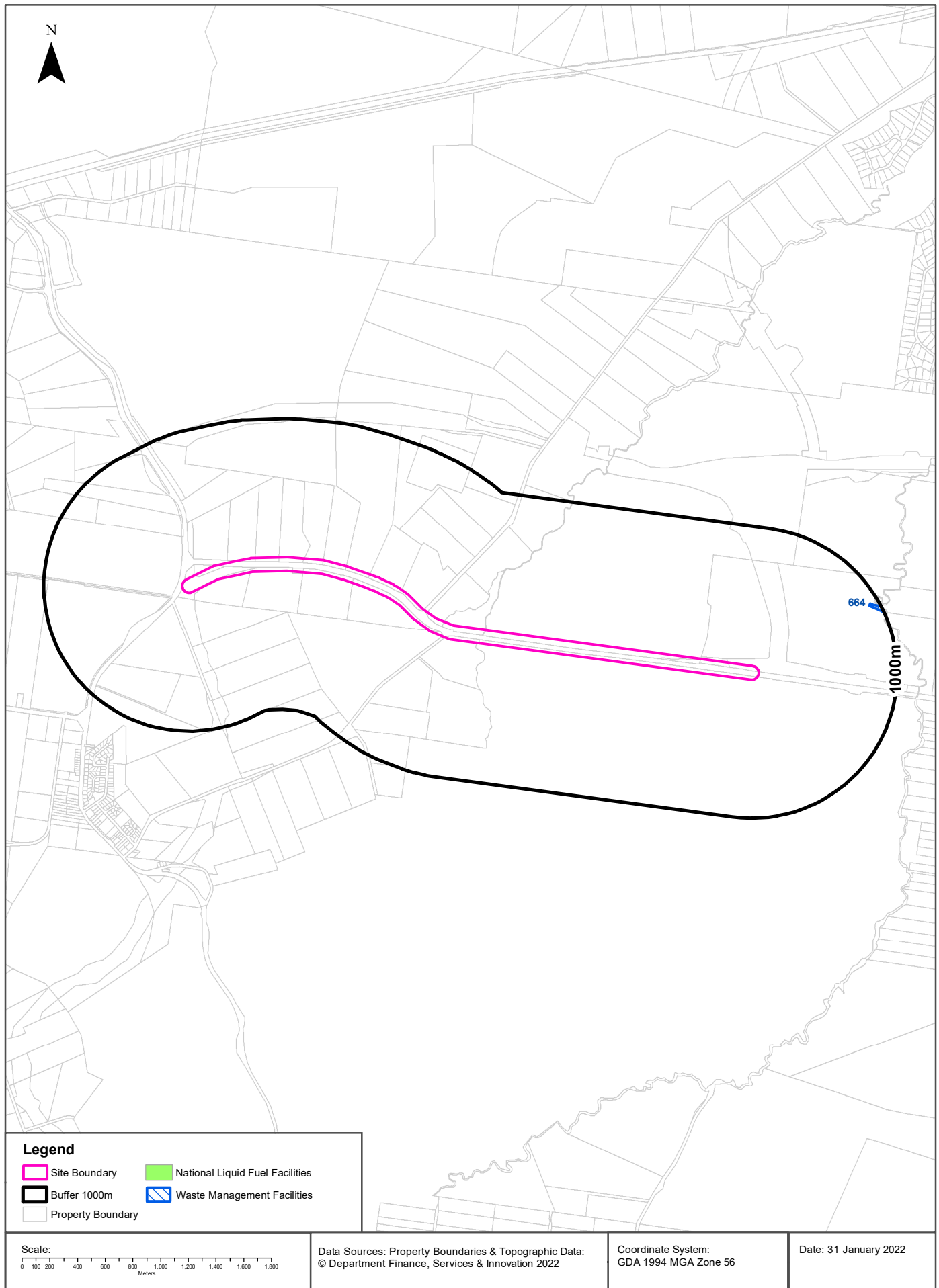
Former Gasworks within the dataset buffer:

| Map Id | Location             | Council | Further Info | Location Confidence | Distance | Direction |
|--------|----------------------|---------|--------------|---------------------|----------|-----------|
| N/A    | No records in buffer |         |              |                     |          |           |

Former Gasworks Data Source: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority

# Waste Management & Liquid Fuel Facilities

Elizabeth Drive West, Kemps Creek, NSW 2178





# Waste Management & Liquid Fuel Facilities

Elizabeth Drive West, Kemps Creek, NSW 2178

## National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

| Site Id | Owner                  | Name                     | Address         | Suburb      | Class    | Landfill    | Reprocess | Transfer | Comments | Loc Conf      | Dist  | Direction |
|---------|------------------------|--------------------------|-----------------|-------------|----------|-------------|-----------|----------|----------|---------------|-------|-----------|
| 664     | Sita Australia Pty Ltd | Elizabeth Drive Landfill | Elizabeth Drive | Kemps Creek | Landfill | Operational |           |          |          | Premise Match | 927 m | East      |

Waste Management Facilities Data Source: Geoscience Australia

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## National Liquid Fuel Facilities

National Liquid Fuel Facilities within the dataset buffer:

| Map Id | Owner                | Name | Address | Suburb | Class | Operational Status | Operator | Revision Date | Loc Conf | Dist | Direction |
|--------|----------------------|------|---------|--------|-------|--------------------|----------|---------------|----------|------|-----------|
| N/A    | No records in buffer |      |         |        |       |                    |          |               |          |      |           |

National Liquid Fuel Facilities Data Source: Geoscience Australia

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# PFAS Investigation & Management Programs

Elizabeth Drive West, Kemps Creek, NSW 2178

## EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

| Map ID | Site                 | Address | Loc Conf | Dist | Dir |
|--------|----------------------|---------|----------|------|-----|
| N/A    | No records in buffer |         |          |      |     |

EPA PFAS Investigation Program: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority

## Defence PFAS Investigation Program

Sites being investigated by the Department of Defence for PFAS contamination within the dataset buffer:

| Map ID | Base Name            | Address | Loc Conf | Dist | Dir |
|--------|----------------------|---------|----------|------|-----|
| N/A    | No records in buffer |         |          |      |     |

Defence PFAS Investigation Program Data Custodian: Department of Defence, Australian Government

## Defence PFAS Management Program

Sites being managed by the Department of Defence for PFAS contamination within the dataset buffer:

| Map ID | Base Name            | Address | Loc Conf | Dist | Dir |
|--------|----------------------|---------|----------|------|-----|
| N/A    | No records in buffer |         |          |      |     |

Defence PFAS Management Program Data Custodian: Department of Defence, Australian Government

## Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

| Map ID | Site Name            | Impacts | Loc Conf | Dist | Dir |
|--------|----------------------|---------|----------|------|-----|
| N/A    | No records in buffer |         |          |      |     |

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

## Defence Sites

Elizabeth Drive West, Kemps Creek, NSW 2178

### Defence 3 Year Regional Contamination Investigation Program

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

| Property ID | Base Name            | Address | Known Contamination | Loc Conf | Dist | Dir |
|-------------|----------------------|---------|---------------------|----------|------|-----|
| N/A         | No records in buffer |         |                     |          |      |     |

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

## EPA Other Sites with Contamination Issues

Elizabeth Drive West, Kemps Creek, NSW 2178

### EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasminco Lead Abatement Strategy Area

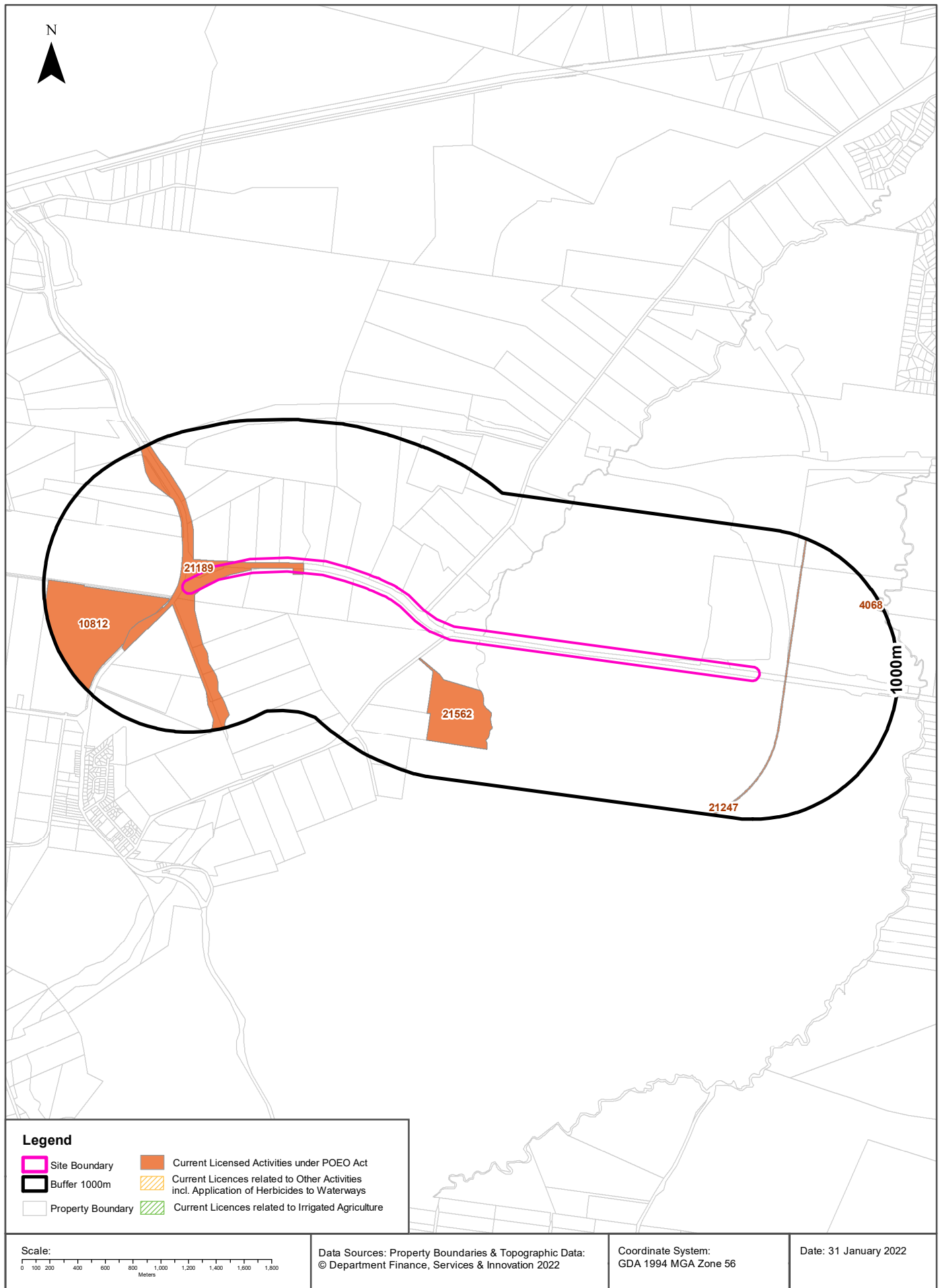
Sites within the dataset buffer:

| Site Id | Site Name            | Site Address | Dataset | Comments | Location Confidence | Distance | Direction |
|---------|----------------------|--------------|---------|----------|---------------------|----------|-----------|
| N/A     | No records in buffer |              |         |          |                     |          |           |

EPA Other Sites with Contamination Issues: Environment Protection Authority  
© State of New South Wales through the Environment Protection Authority

# Current EPA Licensed Activities

Elizabeth Drive West, Kempas Creek, NSW 2178



## EPA Activities

Elizabeth Drive West, Kemp's Creek, NSW 2178

### Licensed Activities under the POEO Act 1997

Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

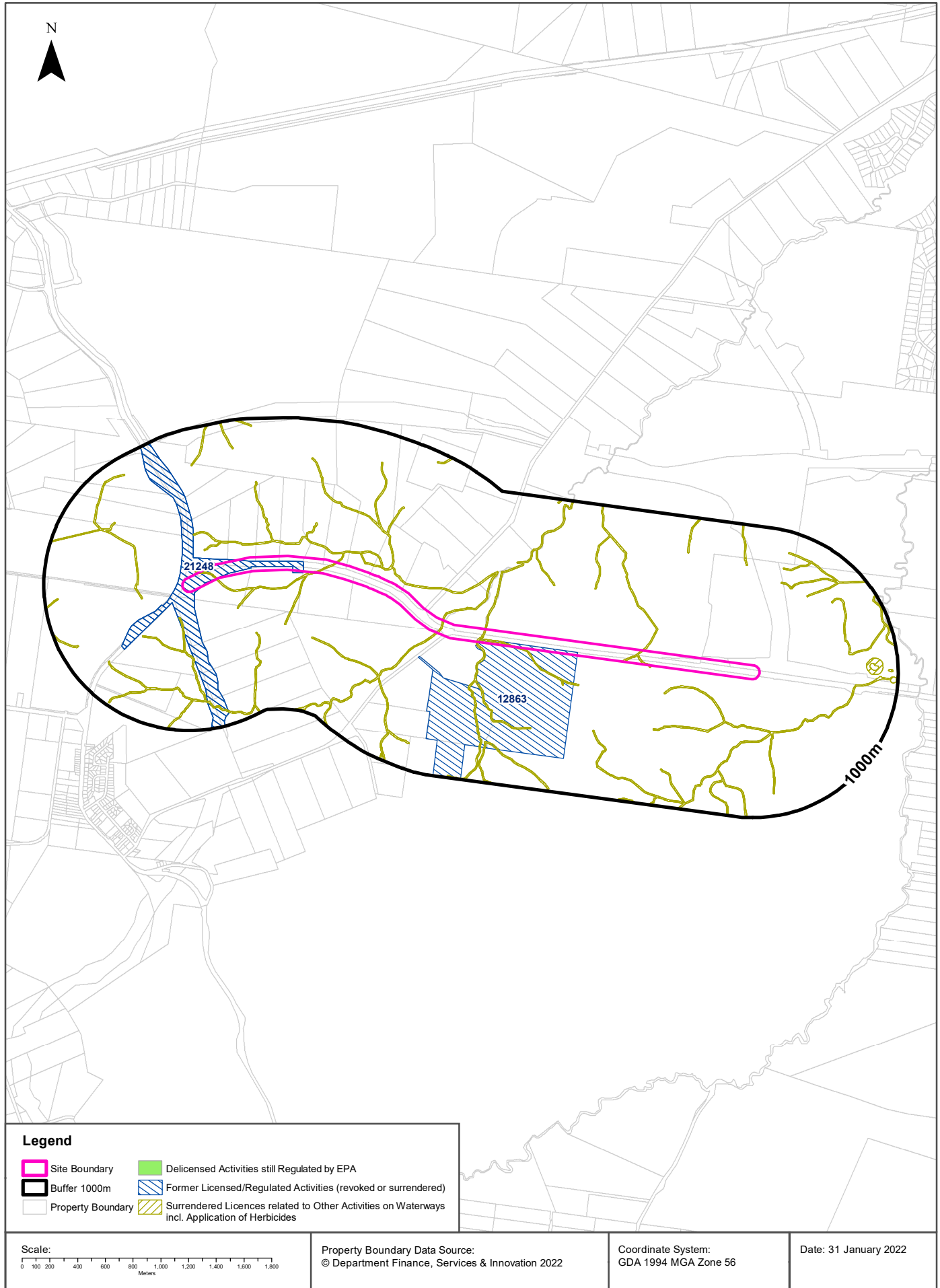
| EPL   | Organisation                 | Name                              | Address   | Suburb      | Activity                                | Loc Conf            | Distance | Direction |
|-------|------------------------------|-----------------------------------|---|-------------|---|---------------------|----------|-----------|
| 21189 | CPB CONTRACTORS PTY LIMITED  |                                   | BETWEEN EATON ROAD, LUDDENHAM AND GLENMORE PARKWAY, ORCHARD HILLS, NSW 2748 |             | Road construction                       | Road Match          | 0m       | On-site   |
| 21189 | CPB CONTRACTORS PTY LIMITED  |                                   | BETWEEN EATON ROAD, LUDDENHAM AND GLENMORE PARKWAY, ORCHARD HILLS, NSW 2748 |             | Land-based extractive activity          | Road Match          | 0m       | On-site   |
| 21189 | CPB CONTRACTORS PTY LIMITED  |                                   | BETWEEN EATON ROAD, LUDDENHAM AND GLENMORE PARKWAY, ORCHARD HILLS, NSW 2748 |             | Cement or lime handling                 | Road Match          | 0m       | On-site   |
| 10812 | BAIADA POULTRY PTY LIMITED   | LUDDENHAM BROILER FARM            | 2907 THE NORTHERN ROAD  | LUDDENHAM   | Bird accommodation                      | Premise Match       | 120m     | West      |
| 21247 | Metro Trains Sydney Pty Ltd  |                                   | SYDNEY METRO, ROUSE HILL, NSW 2155  |             | Railway systems activities              | Network of Features | 181m     | East      |
| 21562 | LUDDENHAM OPERATIONS PTY LTD |                                   | 275 ADAMS ROAD, LUDDENHAM, NSW 2745   |             | Crushing, grinding or separating        | Premise Match       | 204m     | South     |
| 21562 | LUDDENHAM OPERATIONS PTY LTD |                                   | 275 ADAMS ROAD, LUDDENHAM, NSW 2745   |             | Extractive activities                   | Premise Match       | 204m     | South     |
| 21562 | LUDDENHAM OPERATIONS PTY LTD |                                   | 275 ADAMS ROAD, LUDDENHAM, NSW 2745   |             | Mining for minerals                     | Premise Match       | 204m     | South     |
| 4068  | CLEANAWAY PTY LTD            | ELIZABETH DRIVE LANDFILL FACILITY | 1725 ELIZABETH DRIVE  | KEMPS CREEK | Generation of electrical power from gas | Premise Match       | 927m     | East      |
| 4068  | CLEANAWAY PTY LTD            | ELIZABETH DRIVE LANDFILL FACILITY | 1725 ELIZABETH DRIVE  | KEMPS CREEK | Waste disposal by application to land   | Premise Match       | 927m     | East      |
| 4068  | CLEANAWAY PTY LTD            | ELIZABETH DRIVE LANDFILL FACILITY | 1725 ELIZABETH DRIVE  | KEMPS CREEK | Waste storage - other types of waste    | Premise Match       | 927m     | East      |

POEO Licence Data Source: Environment Protection Authority

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# Delicensed & Former Licensed EPA Activities

Elizabeth Drive West, Kemp's Creek, NSW 2178



## EPA Activities

Elizabeth Drive West, Kemps Creek, NSW 2178

### Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

| Licence No | Organisation         | Name | Address | Suburb | Activity | Loc Conf | Distance | Direction |
|------------|----------------------|------|---------|--------|----------|----------|----------|-----------|
| N/A        | No records in buffer |      |         |        |          |          |          |           |

Delicensed Activities Data Source: Environment Protection Authority  
 © State of New South Wales through the Environment Protection Authority

### Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

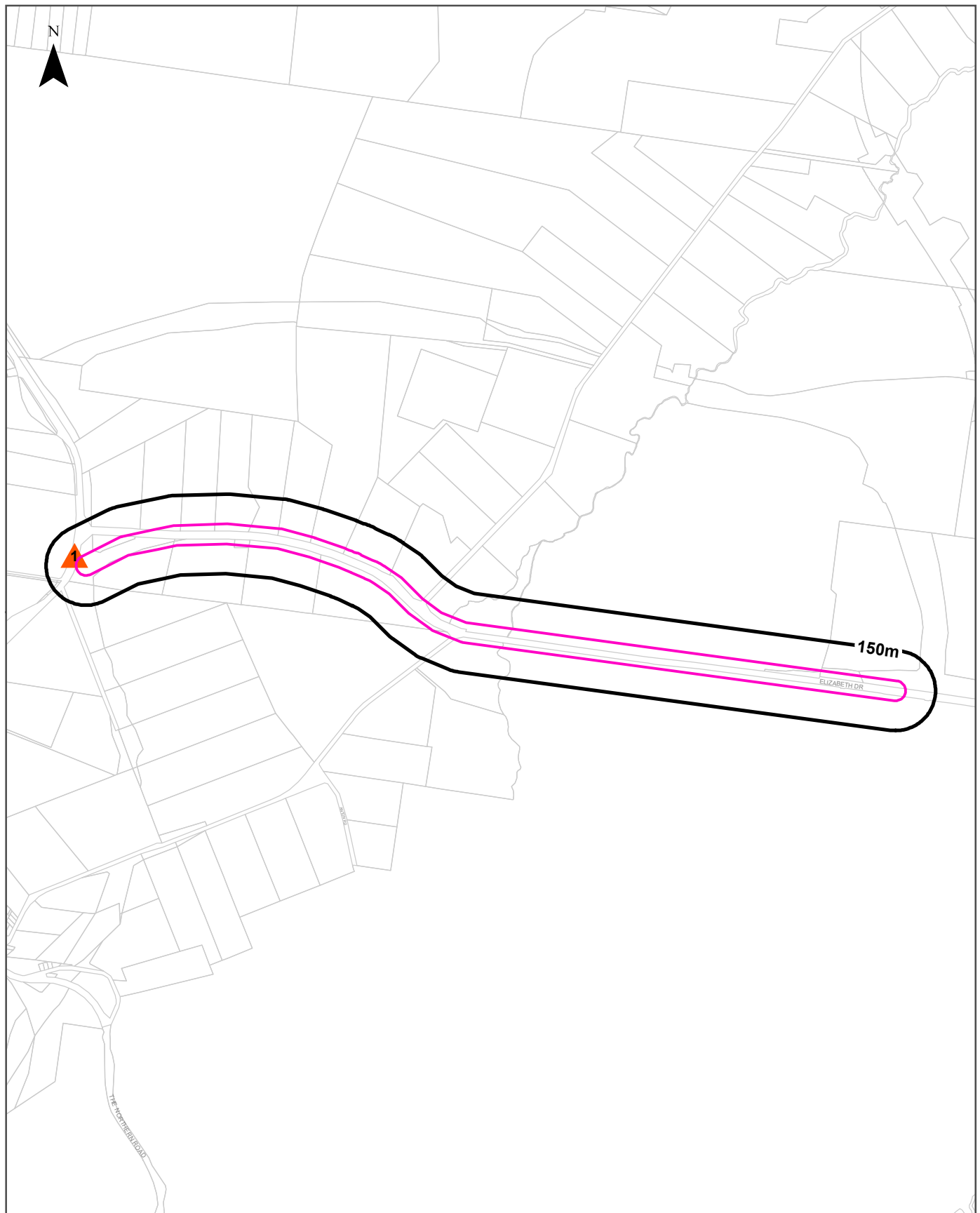
| Licence No | Organisation                            | Location   | Status      | Issued Date | Activity   | Loc Conf            | Distance | Direction |
|------------|---|--|-------------|-------------|--|---------------------|----------|-----------|
| 12863      | EPIC MINING PTY LIMITED                 | Ferndale, 275 Adams Road, LUDDENHAM                              | Revoked     | 05/06/2009  | Other Land-Based Extraction; Waste storage - other types of waste; Waste disposal by application to land | Premise Match       | 0m       | On-site   |
| 21248      | CPB CONTRACTORS PTY LIMITED             | , BETWEEN LITTLEFIELDS ROAD AND EATON ROAD, LUDDENHAM, NSW 2745, | Surrendered | 05/07/2019  | Road construction  | Road Match          | 0m       | On-site   |
| 21248      | CPB CONTRACTORS PTY LIMITED             | , BETWEEN LITTLEFIELDS ROAD AND EATON ROAD, LUDDENHAM, NSW 2745, | Surrendered | 05/07/2019  | Crushing, grinding or separating   | Road Match          | 0m       | On-site   |
| 21248      | CPB CONTRACTORS PTY LIMITED             | , BETWEEN LITTLEFIELDS ROAD AND EATON ROAD, LUDDENHAM, NSW 2745, | Surrendered | 05/07/2019  | Land-based extractive activity   | Road Match          | 0m       | On-site   |
| 4653       | LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD | WATERWAYS THROUGHOUT NSW   | Surrendered | 06/09/2000  | Other Activities / Non Scheduled Activity - Application of Herbicides                                    | Network of Features | 0m       | On-site   |
| 4838       | Robert Orchard                          | Various Waterways throughout New South Wales - SYDNEY NSW 2000   | Surrendered | 07/09/2000  | Other Activities / Non Scheduled Activity - Application of Herbicides                                    | Network of Features | 0m       | On-site   |
| 5176       | LIVERPOOL CITY COUNCIL                  | WATERWAYS OF LIVERPOOL CITY                                      | Surrendered | 17/04/2001  | Other Activities / Non Scheduled Activity - Application of Herbicides                                    | Network of Features | 0m       | On-site   |
| 6630       | SYDNEY WEED & PEST MANAGEMENT PTY LTD   | WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148                   | Surrendered | 09/11/2000  | Other Activities / Non Scheduled Activity - Application of Herbicides                                    | Network of Features | 0m       | On-site   |

Former Licensed Activities Data Source: Environment Protection Authority  
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# Historical Business Directories

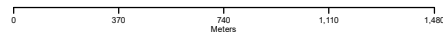
Elizabeth Drive West, Kemps Creek, NSW 2178



## Legend

- Site Boundary
- Buffer 150m
- Property Boundary
- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- Business directory records mapped to a road corridor
- Business directory records mapped to a general area

Scale:



Coordinate System:  
GDA 1994 MGA Zone 56

Date: 31 January 2022

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## Historical Business Directories

Elizabeth Drive West, Kemps Creek, NSW 2178

### Business Directory Records 1950-1991 Premise or Road Intersection Matches

Universal Business Directory records from years 1991, 1986, 1982, 1970, 1961 & 1950, mapped to a premise or road intersection within the dataset buffer:

| Map Id | Business Activity    | Premise | Ref No. | Year | Location Confidence | Distance to Property Boundary or Road Intersection | Direction |
|--------|----------------------|---------|---------|------|---------------------|--|-----------|
| N/A    | No records in buffer |         |         |      |                     |  |           |

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## Business Directory Records 1950-1991 Road or Area Matches

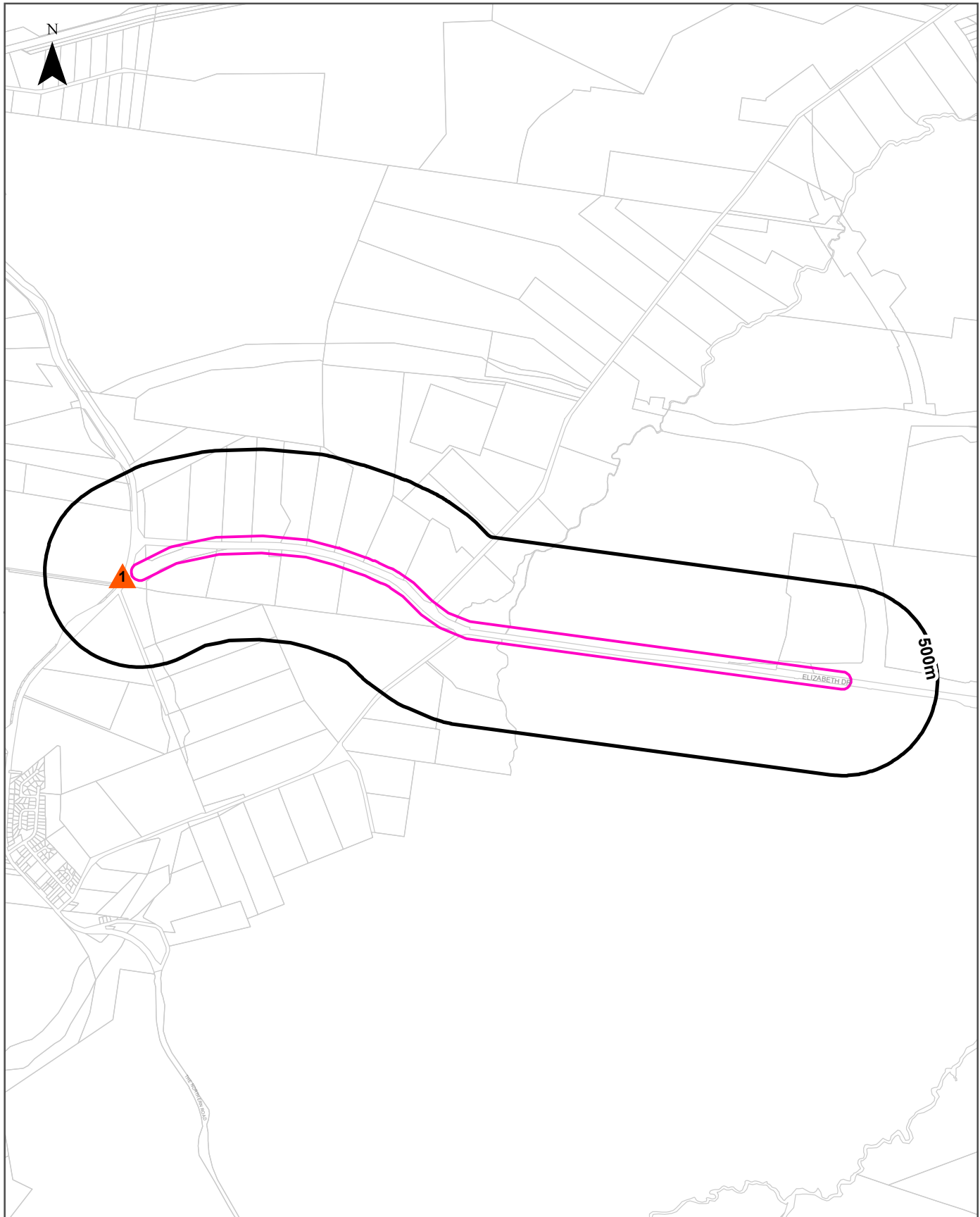
Universal Business Directory records from years 1991, 1986, 1982, 1970, 1961 & 1950, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

| Map Id | Business Activity  | Premise  | Ref No. | Year | Location Confidence | Distance to Road Corridor or Area |
|--------|--|--|---------|------|---------------------|-----------------------------------|
| 1      | Motor Garages & Service Stations                               | Caltex Luddenham Service Station, The Northern Rd., Luddenham 2745 | 97558   | 1991 | Road Match          | 0m                                |
|        | Florists Wholesale   | Sproule H G., The Northern Rd., Luddenham 2745                     | 45949   | 1991 | Road Match          | 0m                                |
|        | Landscapers Supplies   | Sunset Nursery, The Northern Rd., Luddenham, 2745                  | 50606   | 1991 | Road Match          | 0m                                |
|        | Wine &/or Spirit Merchants Wholesale                           | Vicarys Winery, The Northern Rd Luddenham 2745                     | 66369   | 1991 | Road Match          | 0m                                |
|        | MOTOR GARAGES & SERVICE STATIONS.                              | Caltex Service, The Northern Rd., Luddenham. 2750                  | 64391   | 1986 | Road Match          | 0m                                |
|        | VIDEO RECORDER &/OR CASSETTE SALES &/OR HIRE &/OR SERVICE.     | G. & G. Video, The Northern Rd. Luddenham. 2750                    | 97557   | 1986 | Road Match          | 0m                                |
|        | MIXED BUSINESSES.  | Gatteleri, D. & G., The Northern Rd., Luddenham. 2750              | 60025   | 1986 | Road Match          | 0m                                |
|        | MIXED BUSINESSES.  | Luddenham General Store, The Northern Rd., Luddenham. 2750         | 60169   | 1986 | Road Match          | 0m                                |
|        | GROCERS-RETAIL.  | Luddenham Supa Save, The Northern Rd., Luddenham. 2750             | 40967   | 1986 | Road Match          | 0m                                |
|        | FLORISTS-WHOLESALE.  | Sproule H G, The Northern Rd., Luddenham. 2750                     | 33977   | 1986 | Road Match          | 0m                                |
|        | GARDEN EQUIPMENT, TOOLS & SUPPLIES MFRS. &/OR IMPS. &/OR DIST. | Sunset Nursery, The Northern Rd., Luddenham. 2750                  | 38278   | 1986 | Road Match          | 0m                                |
|        | NURSERYMENS SUPPLIES.  | Sunset Nursery, The Northern Rd., Luddenham. 2750                  | 70146   | 1986 | Road Match          | 0m                                |
|        | WINE &/OR SPIRIT MERCHANTS RETAIL.                             | Vicarys Winery, The Northern Rd., Luddenham. 2750                  | 99585   | 1986 | Road Match          | 0m                                |
|        | WINE &/OR SPIRIT MERCHANTS WHOLESALE.                          | Vicarys Winery, The Northern Rd., Luddenham. 2750                  | 99689   | 1986 | Road Match          | 0m                                |
|        | FRUITERERS & GREENGROCERS                                      | Lynel, K. J., Northern Rd. Luddenham 2750                          | 535614  | 1970 | Road Match          | 0m                                |
|        | ANIMAL & BIRD FOOD SUPPLIES &/OR MERCHANTS                     | Pace, M., Northern Rd. Luddenham 2750                              | 535610  | 1970 | Road Match          | 0m                                |
|        | BUILDERS &/OR BUILDING CONTRACTORS                             | Petith, E. M., Northern Rd. Luddenham 2750                         | 535611  | 1970 | Road Match          | 0m                                |
|        | MIXED BUSINESSES   | Rigg, J. S. & H. L., Northern Rd. Luddenham 2750                   | 535618  | 1970 | Road Match          | 0m                                |
|        | MOTOR, OIL & SPIRIT DEPOTS                                     | Rigg, J. S. & H. L., Northern Rd. Luddenham 2750                   | 535620  | 1970 | Road Match          | 0m                                |
|        | PRODUCE MERCHANTS- GRAIN & SEED-RETAIL                         | Rigg, J. S. & H. L., Northern Rd. Luddenham 2750                   | 535623  | 1970 | Road Match          | 0m                                |
|        | CAFES, TEA ROOMS & COFFEE LOUNGES, Etc.                        | Sales, H. L., Northern Rd. Luddenham 2750                          | 535613  | 1970 | Road Match          | 0m                                |
|        | MOTOR, OIL & SPIRIT DEPOTS                                     | Sales, H. L., Northern Rd. Luddenham 2750                          | 535621  | 1970 | Road Match          | 0m                                |
|        | WINE & SPIRIT MERCHANTS- RETAIL                                | Vicary, C., Northern Rd. Luddenham 2750                            | 535626  | 1970 | Road Match          | 0m                                |
|        | NEWSAGENTS-GENERAL   | Willmington, S. A., Northern Rd. Luddenham 2750                    | 535622  | 1970 | Road Match          | 0m                                |

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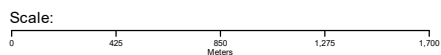
# Dry Cleaners, Motor Garages & Service Stations

Elizabeth Drive West, Kempas Creek, NSW 2178



## Legend

- Site Boundary
- Buffer 500m
- Property Boundary
- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- Business directory records mapped to a road corridor
- Business directory records mapped to a general area



Coordinate System:  
GDA 1994 MGA Zone 56

Date: 31 January 2022

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018

# Historical Business Directories

Elizabeth Drive West, Kemps Creek, NSW 2178

## Dry Cleaners, Motor Garages & Service Stations 1948-1993 Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer.

Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

| Map Id | Business Activity    | Premise | Ref No. | Year | Location Confidence | Distance to Property Boundary or Road Intersection | Direction |
|--------|----------------------|---------|---------|------|---------------------|--|-----------|
| N/A    | No records in buffer |         |         |      |                     |  |           |

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## Dry Cleaners, Motor Garages & Service Stations 1948-1993 Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

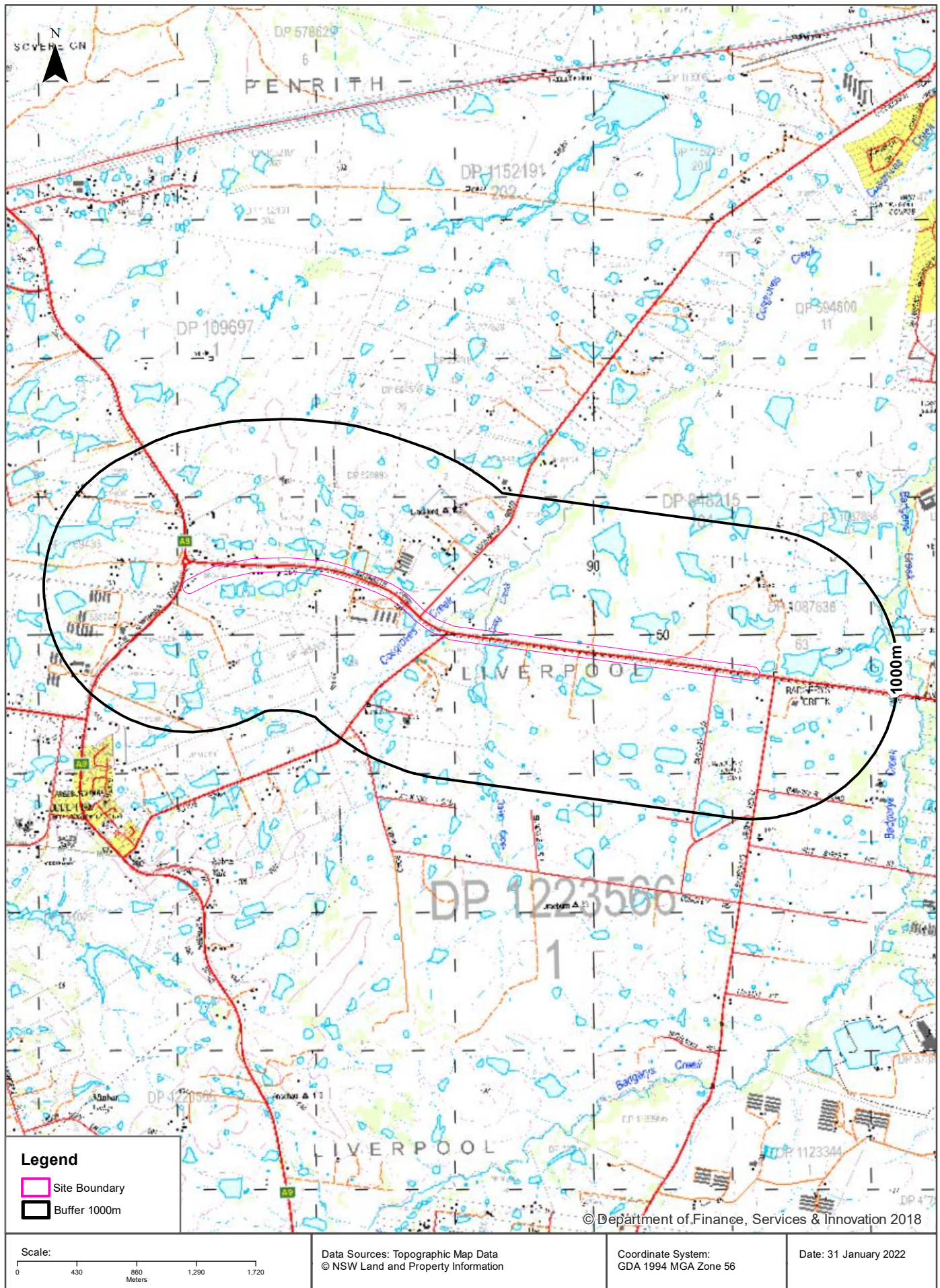
Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

| Map Id | Business Activity                 | Premise   | Ref No. | Year | Location Confidence | Distance to Road Corridor or Area |
|--------|-----------------------------------|---|---------|------|---------------------|-----------------------------------|
| 1      | MOTOR GARAGES & SERVICE STATIONS. | Caltex Luddenham Service Station, The Northern Rd., Luddenham. 2745 | 18790   | 1993 | Road Match          | 0m                                |
|        | Motor Garages & Service Stations  | Caltex Luddenham Service Station, The Northern Rd., Luddenham 2745  | 97558   | 1991 | Road Match          | 0m                                |
|        | MOTOR GARAGES & SERVICE STATIONS. | Caltex Luddenham Service Station, The Northern Rd., Luddenham. 2745 | 11328   | 1990 | Road Match          | 0m                                |
|        | MOTOR GARAGE & SERVICE STATIONS.  | Caltex Luddenham Service, The Northern Rd., Luddenham. 2750         | 64768   | 1989 | Road Match          | 0m                                |
|        | MOTOR GARAGES & SERVICE STATIONS. | Caltex Luddenham Service, The Northern Rd., Luddenham. 2750         | 53888   | 1988 | Road Match          | 0m                                |
|        | MOTOR GARAGES & SERVICE STATIONS. | Caltex Service, The Northern Rd., Luddenham. 2750                   | 64391   | 1986 | Road Match          | 0m                                |
|        | MOTOR GARAGES & SERVICE STATIONS. | Caltex Service, The Northern Rd., Luddenham. 2750                   | 39385   | 1985 | Road Match          | 0m                                |

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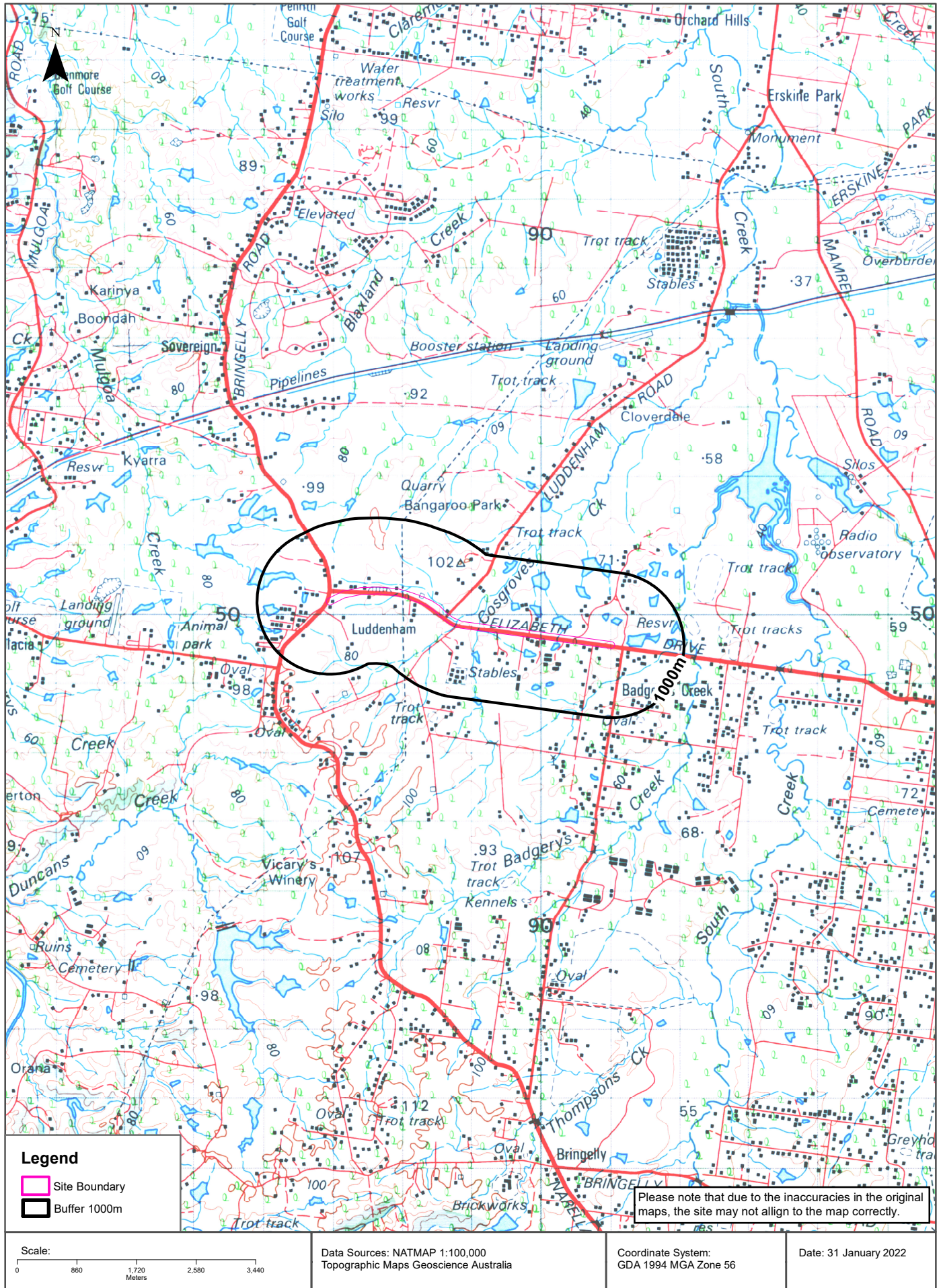
# Topographic Map 2015

Elizabeth Drive West, Kemp's Creek, NSW 2178



# Historical Map 1975

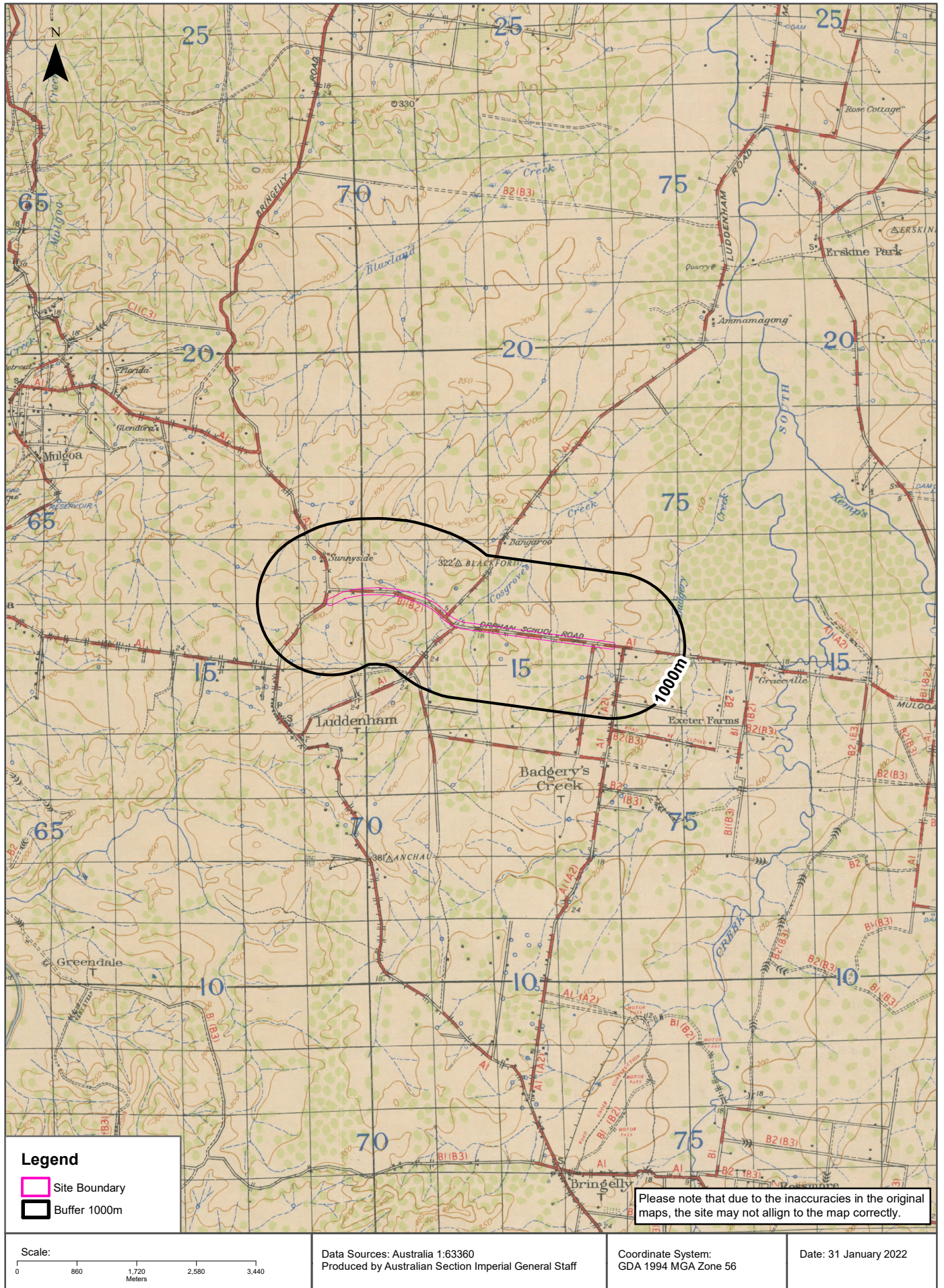
Elizabeth Drive West, Kemp's Creek, NSW 2178





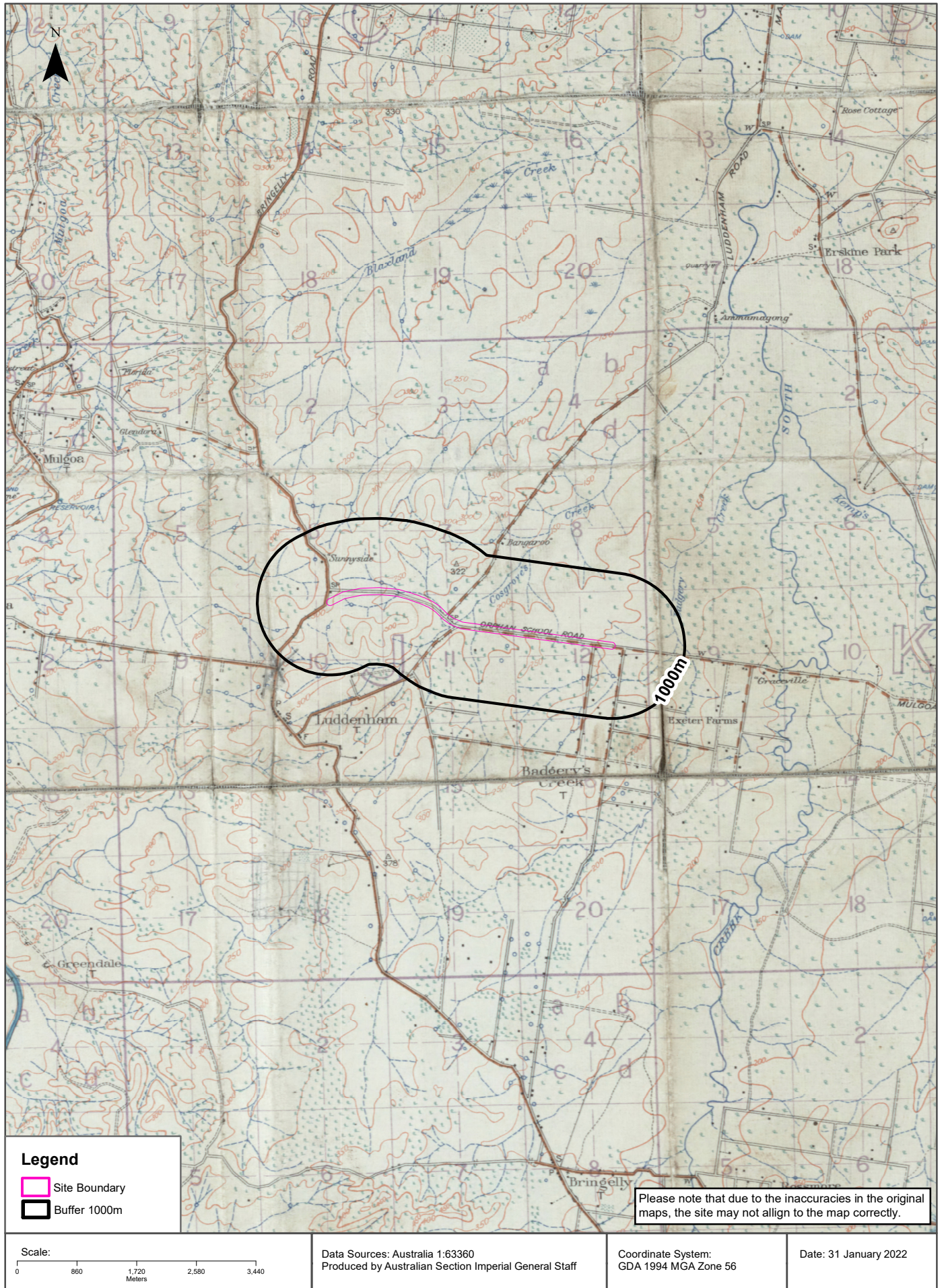
# Historical Map c.1942

Elizabeth Drive West, Kemp's Creek, NSW 2178



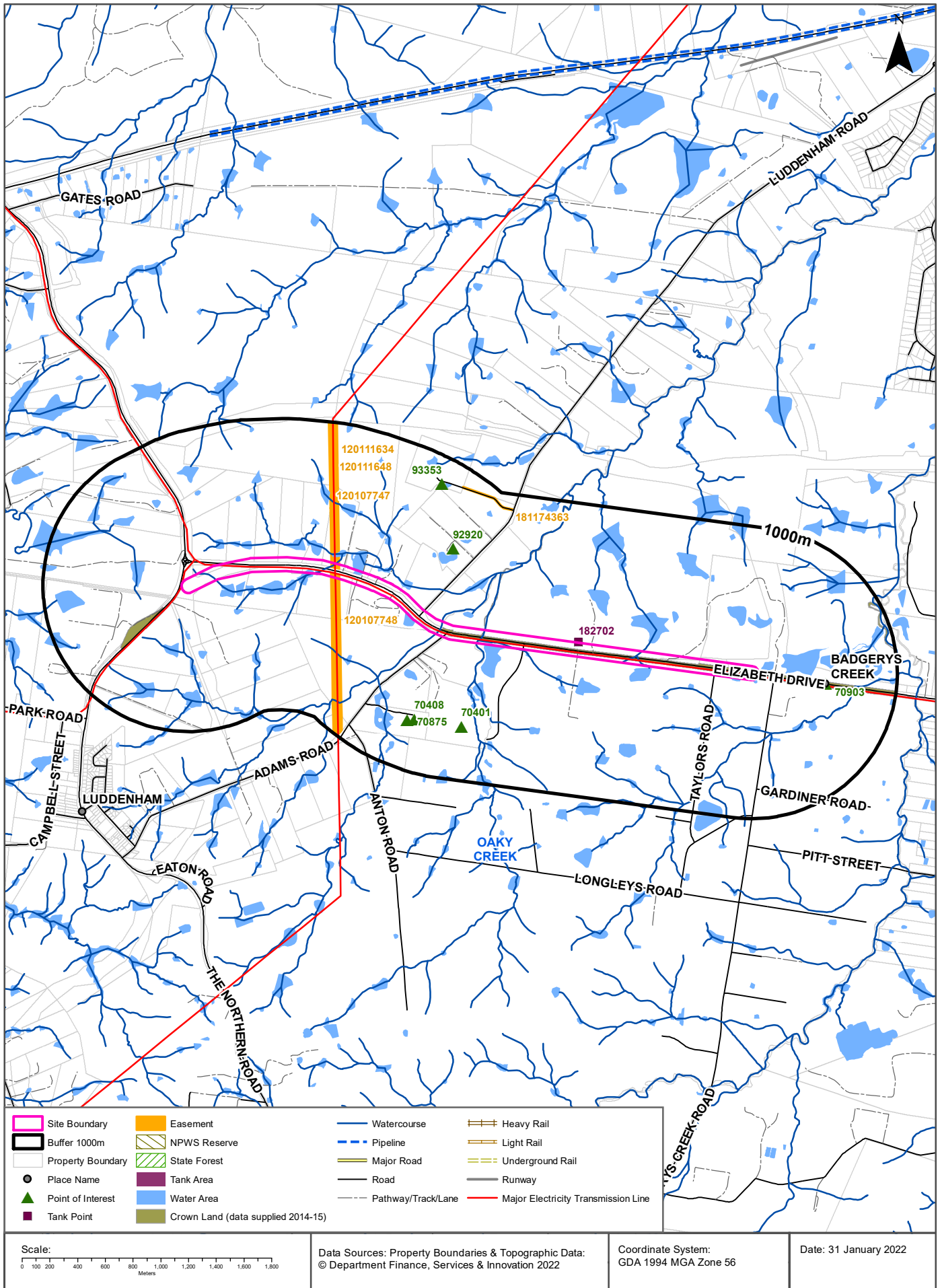
# Historical Map c.1929

Elizabeth Drive West, Kemp's Creek, NSW 2178



# Topographic Features

Elizabeth Drive West, Kemp's Creek, NSW 2178



# Topographic Features

Elizabeth Drive West, Kemps Creek, NSW 2178

## Points of Interest

What Points of Interest exist within the dataset buffer?

| Map Id | Feature Type       | Label                 | Distance | Direction  |
|--------|--------------------|-----------------------|----------|------------|
| 92920  | Tourist Attraction | MODEL PARK            | 467m     | North      |
| 70903  | Suburb             | BADGERYS CREEK        | 487m     | East       |
| 70401  | Quarry - Open Cut  | Quarry - Open Cut     | 611m     | South      |
| 70408  | Parking Area       | Parking Area          | 627m     | South West |
| 70875  | Club               | HUBERTUS COUNTRY CLUB | 655m     | South West |
| 93353  | Parking Area       | Parking Area          | 810m     | North      |

Topographic Data Source: © Land and Property Information (2015)

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# Topographic Features

Elizabeth Drive West, Kemps Creek, NSW 2178

## Tanks (Areas)

What are the Tank Areas located within the dataset buffer?

Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

| Map Id | Tank Type            | Status | Name | Feature Currency | Distance | Direction |
|--------|----------------------|--------|------|------------------|----------|-----------|
| N/A    | No records in buffer |        |      |                  |          |           |

## Tanks (Points)

What are the Tank Points located within the dataset buffer?

Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

| Map Id | Tank Type | Status      | Name | Feature Currency | Distance | Direction |
|--------|-----------|-------------|------|------------------|----------|-----------|
| 182702 | Water     | Operational |      | 22/07/2018       | 4m       | East      |

Tanks Data Source: © Land and Property Information (2015)

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## Major Easements

What Major Easements exist within the dataset buffer?

Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

| Map Id    | Easement Class | Easement Type | Easement Width | Distance | Direction  |
|-----------|----------------|---------------|----------------|----------|------------|
| 120111648 | Primary        | Undefined     |                | 0m       | On-site    |
| 120107748 | Primary        | Undefined     |                | 0m       | On-site    |
| 120107747 | Primary        | Undefined     |                | 377m     | North West |
| 120111634 | Primary        | Undefined     |                | 537m     | North West |
| 181174363 | Primary        | Right of way  | 11m            | 858m     | North      |

Easements Data Source: © Land and Property Information (2015)

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# Topographic Features

Elizabeth Drive West, Kemps Creek, NSW 2178

## State Forest

What State Forest exist within the dataset buffer?

| State Forest Number | State Forest Name    | Distance | Direction |
|---------------------|----------------------|----------|-----------|
| N/A                 | No records in buffer |          |           |

State Forest Data Source: © NSW Department of Finance, Services & Innovation (2018)  
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## National Parks and Wildlife Service Reserves

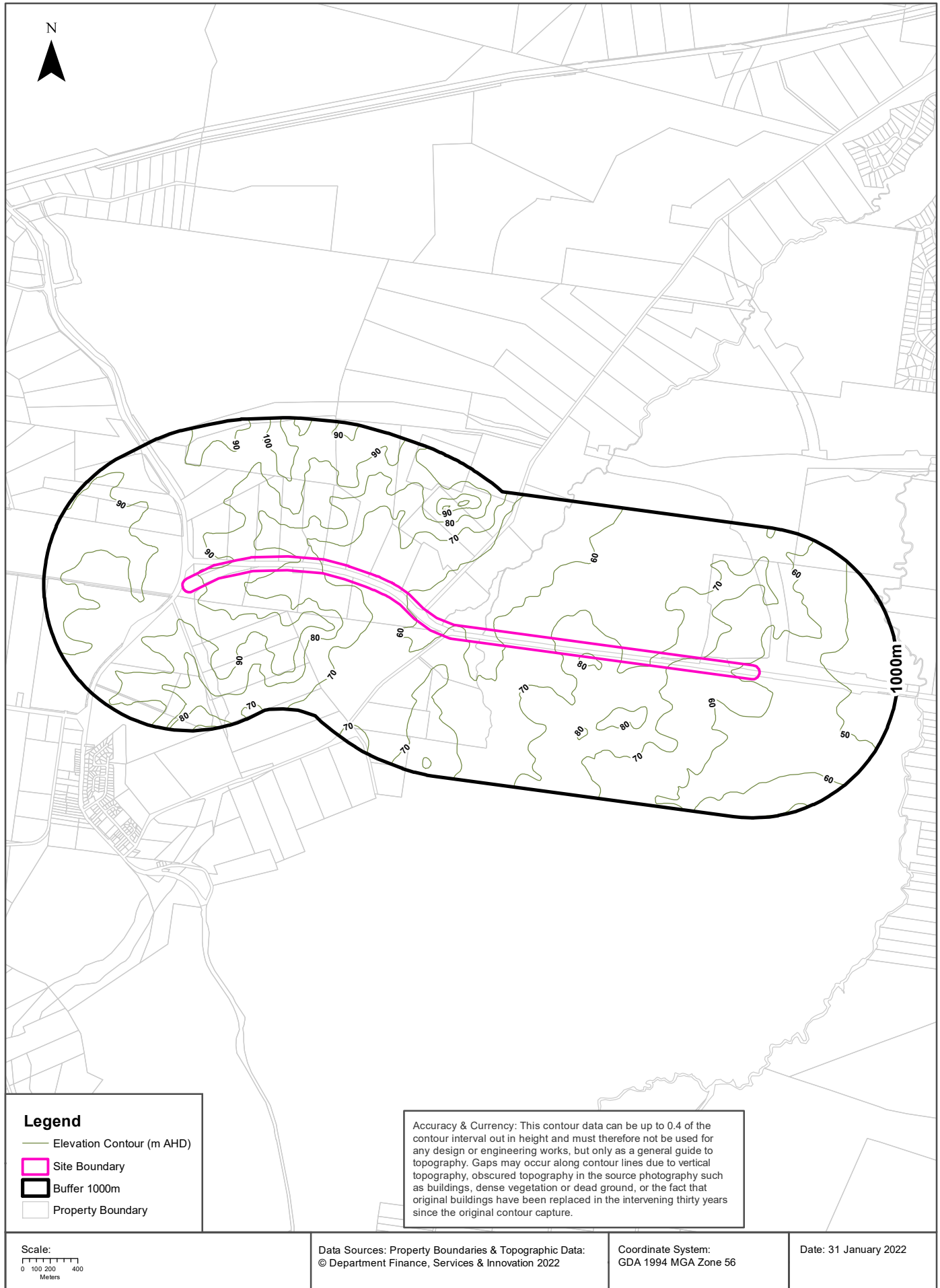
What NPWS Reserves exist within the dataset buffer?

| Reserve Number | Reserve Type         | Reserve Name | Gazetted Date | Distance | Direction |
|----------------|----------------------|--------------|---------------|----------|-----------|
| N/A            | No records in buffer |              |               |          |           |

NPWS Data Source: © NSW Department of Finance, Services & Innovation (2018)  
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# Elevation Contours (m AHD)

Elizabeth Drive West, Kempas Creek, NSW 2178



# Hydrogeology & Groundwater

Elizabeth Drive West, Kemps Creek, NSW 2178

## Hydrogeology

Description of aquifers within the dataset buffer:

| Description  | Distance | Direction |
|--|----------|-----------|
| Porous, extensive aquifers of low to moderate productivity | 0m       | On-site   |

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)

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## Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018

Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

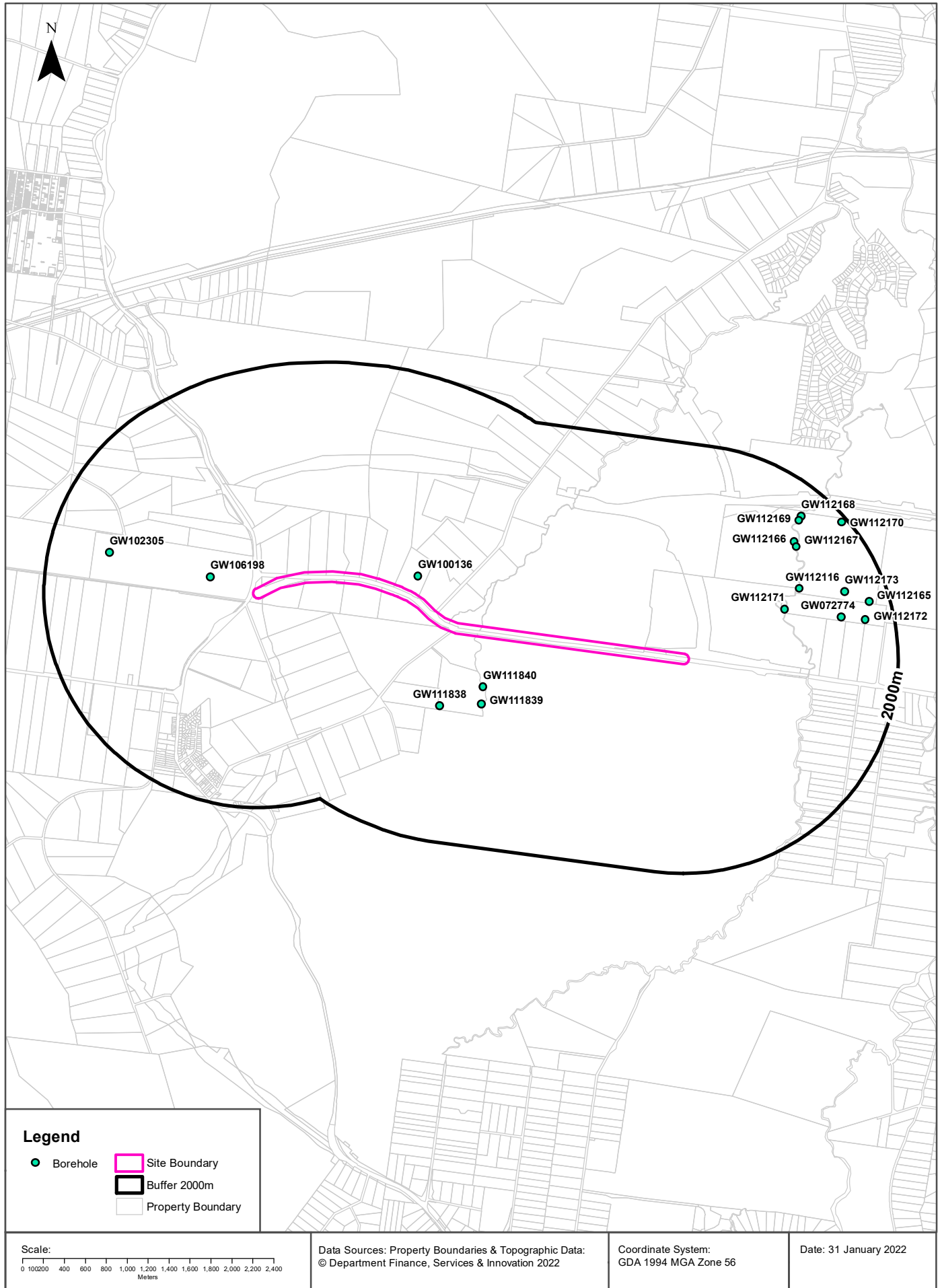
| Prohibition Area No. | Prohibition          | Distance | Direction |
|----------------------|----------------------|----------|-----------|
| N/A                  | No records in buffer |          |           |

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 Data Source : NSW Department of Primary Industries



# Groundwater Boreholes

Elizabeth Drive West, Kempas Creek, NSW 2178



# Hydrogeology & Groundwater

Elizabeth Drive West, Kemps Creek, NSW 2178

## Groundwater Boreholes

Boreholes within the dataset buffer:

| GW No.   | Licence No             | Work Type | Owner Type | Authorised Purpose | Intended Purpose | Name | Complete Date | Final Depth (m) | Drilled Depth (m) | Salinity (mg/L) | SWL (m bgl) | Yield (L/s) | Elev (AHD) | Dist  | Dir        |
|----------|------------------------|-----------|------------|--------------------|------------------|------|---------------|-----------------|-------------------|-----------------|-------------|-------------|------------|-------|------------|
| GW100136 | 10BL144703, 10WA108263 | Bore      | Private    | Stock              | Stock            |      | 27/11/1991    | 110.70          | 110.70            |                 | 23.80       | 0.600       |            | 160m  | North West |
| GW106198 | 10BL162354, 10WA108601 | Bore      | Private    | Domestic, Stock    | Domestic, Stock  |      | 11/07/2005    |                 |                   |                 |             |             |            | 433m  | West       |
| GW111840 | 10BL602996             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 19/01/2009    | 30.70           | 30.70             |                 |             |             |            | 472m  | South      |
| GW111839 | 10BL602996             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 15/01/2009    | 30.40           | 30.40             |                 |             |             |            | 637m  | South      |
| GW111838 | 10BL602996             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 12/01/2009    | 30.00           | 30.00             |                 |             |             |            | 708m  | South      |
| GW112171 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 23/07/1991    | 32.00           | 32.00             |                 |             |             |            | 1027m | East       |
| GW112116 | 10BL157456             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 09/11/1995    | 23.40           | 23.40             |                 |             |             |            | 1245m | East       |
| GW102305 | 10BL158553             | Bore      | Private    | Stock              | Stock            |      | 07/04/1998    | 61.00           | 61.00             | Fair            | 12.00       | 0.400       |            | 1422m | West       |
| GW112167 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 05/03/1993    | 20.60           | 20.60             |                 |             |             |            | 1470m | East       |
| GW112166 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 21/08/1992    | 32.34           | 32.34             |                 |             |             |            | 1492m | East       |
| GW072774 |                        | Bore      | Private    |                    | G/water Xplore   |      | 26/10/1994    | 30.00           | 30.00             |                 |             |             |            | 1511m | East       |
| GW112173 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 10/03/1993    | 24.00           | 24.00             |                 |             |             |            | 1619m | East       |
| GW112169 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 08/03/1993    | 16.55           | 16.55             |                 |             |             |            | 1671m | East       |
| GW112168 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 28/08/1992    | 26.50           | 26.50             |                 |             |             |            | 1719m | East       |
| GW112172 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 17/07/1991    | 36.50           | 36.50             |                 |             |             |            | 1729m | East       |
| GW112165 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 26/08/1992    | 34.95           | 34.95             |                 |             |             |            | 1809m | East       |
| GW112170 | 10BL154345             | Bore      | Private    | Monitoring Bore    | Monitoring Bore  |      | 19/07/1991    | 26.90           | 26.90             |                 |             |             |            | 1948m | East       |

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores © Commonwealth of Australia (Bureau of Meteorology) 2015. Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

# Hydrogeology & Groundwater

Elizabeth Drive West, Kemps Creek, NSW 2178

## Driller's Logs

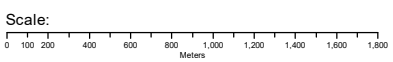
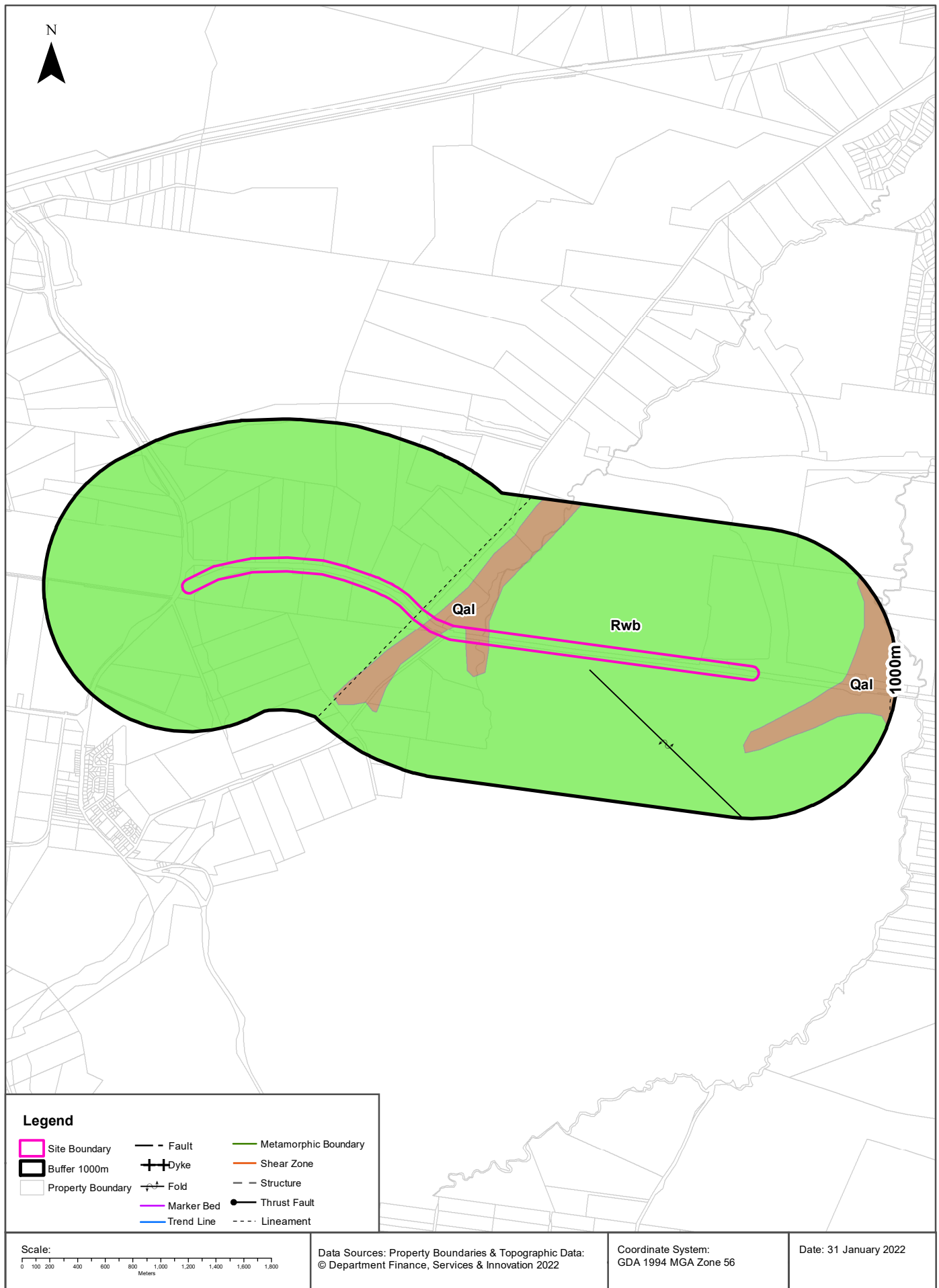
Drill log data relevant to the boreholes within the dataset buffer:

| Groundwater No | Drillers Log  | Distance | Direction  |
|----------------|---|----------|------------|
| GW100136       | 0.00m-0.30m TOPSOIL<br>0.30m-1.50m BROWN CLAY<br>1.50m-11.60m RED CLAY<br>11.60m-39.60m YELLOW SANDSTONE<br>39.60m-80.20m GREY SHALE<br>80.20m-110.70m BLACK SHALE  | 160m     | North West |
| GW111840       | 0.00m-12.50m BROWN TO YELLOW BROWN WEATHERED SHALE/CLAYSTONE<br>12.50m-30.70m BROWN TO GREY SHALE/CLAYSTONE   | 472m     | South      |
| GW111839       | 0.00m-8.00m SHALE/CLAYSTONE BROWN TO YELLOW,WEATHERED<br>8.00m-30.40m SHALE BROWN TO GREY,CLAYSTONE   | 637m     | South      |
| GW111838       | 0.00m-5.50m SHALE/CLAYSTONE BROWN TO YELLOW WEATHERED<br>5.50m-30.00m SHALE/CLAYSTONE BROWN TO GREY   | 708m     | South      |
| GW102305       | 0.00m-6.50m SOIL<br>6.50m-9.50m SHALE BLUE<br>9.50m-11.50m SHALE BROWN SMALL GRAVEL<br>11.50m-61.00m SHALE  | 1422m    | West       |
| GW072774       | 0.00m-0.50m Hard Yellow Brown, Mottled, Dry Clay<br>0.50m-1.40m Stiff, Red-brown, Mottled, Moist, Plastic Clay<br>1.40m-2.00m Stiff, Grey, Moist, Plastic Clay<br>2.00m-3.50m Stiff, Red Brown To Grey, Mottled, Slightly Moist, Moderately Plastic Clay<br>3.50m-4.50m Hard To Stiff, Red-brown, Mottled, Dry Clay<br>4.50m-5.00m Hard To Stiff, Grey To Brown, Mottled Dry Clay<br>5.00m-6.00m Weak, Grey, Fissile, Dry Shale<br>6.00m-8.50m Med Strength, Grey, Fissile, Dry Shale, Minor Carbonaceous Fragments, Minor Yellow Brown Clay At 7.5m<br>8.50m-9.00m Siltstone/sandstone Hard, Grey, Massive, Silt To Very Fine Grained Siltstone/sandstone, Minor Fine Carbonaceous Fragments<br>9.00m-10.50m Carbonaceous Shale Medium Strength, Dark Grey, Fissile, Dry. Carbonaceous Fragments Up To Cm & Plant Fossils On Bedding<br>10.50m-11.00m Weak, Dark Grey To Black, Fissile Dry Carb Shle. Carbonaceous Fragments Up To Cm And Plant Fossile On Bedding Planes<br>11.00m-18.00m Med Strength, Dark Grey, Fissile, Dry Carb Shle. Carb Fragments Up To Few Cm. Evid Of Plant Fossils. Minor Pyrite 1.5-13<br>18.00m-19.00m Hard Grey, Massive Silt To Very Fine Grained Slsn/sdsn. Minor Fine Carbonaceous Fragments<br>19.00m-21.50m Carbonaceous Shle, Med Strength, Dark Grey, Fissile, Dry. Carb Fragments Up To Few Cm. Fossils Plant, Minor Siltstone<br>21.50m-22.50m Slsn And Sdsn, Hard, Grey, Massive, Silt To Very Fine Grained. Minor Fine Carbonaceous Gragments. Minor Carb.shale<br>22.50m-24.00m Carb. Shale, Med Strength, Dark Grey Fissile, Dry. Carb Fragments Up To Few Cm With Plant Fossile. Minor Slsn ->sdsn<br>24.00m-26.00m Slsn/sdsn And Carb. Shale Interbeded<br>26.00m-30.00m Carbonaceous, Med Strength, Dark Grey, Fissile, Dry. Frow Cm Length With Plant Fossils. Minor Slsn To F/g Sdsn | 1511m    | East       |

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp  
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# Geology

Elizabeth Drive West, Kemp's Creek, NSW 2178



Data Sources: Property Boundaries & Topographic Data:  
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Coordinate System:  
GDA 1994 MGA Zone 56

Date: 31 January 2022

# Geology

Elizabeth Drive West, Kemps Creek, NSW 2178

## Geological Units 1:100,000

What are the Geological Units within the dataset buffer?

| Symbol | Description   | Unit Name       | Group                               | Sub Group | Age             | Dom Lith | Map Sheet | Dist | Dir     |
|--------|---|-----------------|-------------------------------------|-----------|-----------------|----------|-----------|------|---------|
| Rwb    | Shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff | Bringelly Shale | Wianamatta Group (undifferentiated) |           | Middle Triassic |          | Penrith   | 0m   | On-site |
| Qal    | Fine-grained sand, silt and clay  |                 |                                     |           | Quaternary      |          | Penrith   | 0m   | On-site |

## Geological Structures 1:100,000

What are the Geological Structures within the dataset buffer?

| Feature   | Name               | Description             | Map Sheet | Distance | Direction |
|-----------|--------------------|-------------------------|-----------|----------|-----------|
| Lineament |                    |                         | Penrith   | 0m       | On-site   |
| Fold      | Rossmore Anticline | Fold, position accurate | Penrith   | 83m      | East      |
| Lineament |                    | Narellan Lineament      | Penrith   | 957m     | East      |

Geological Data Source : NSW Department of Industry, Resources & Energy

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# Naturally Occurring Asbestos Potential

Elizabeth Drive West, Kemps Creek, NSW 2178

## Naturally Occurring Asbestos Potential

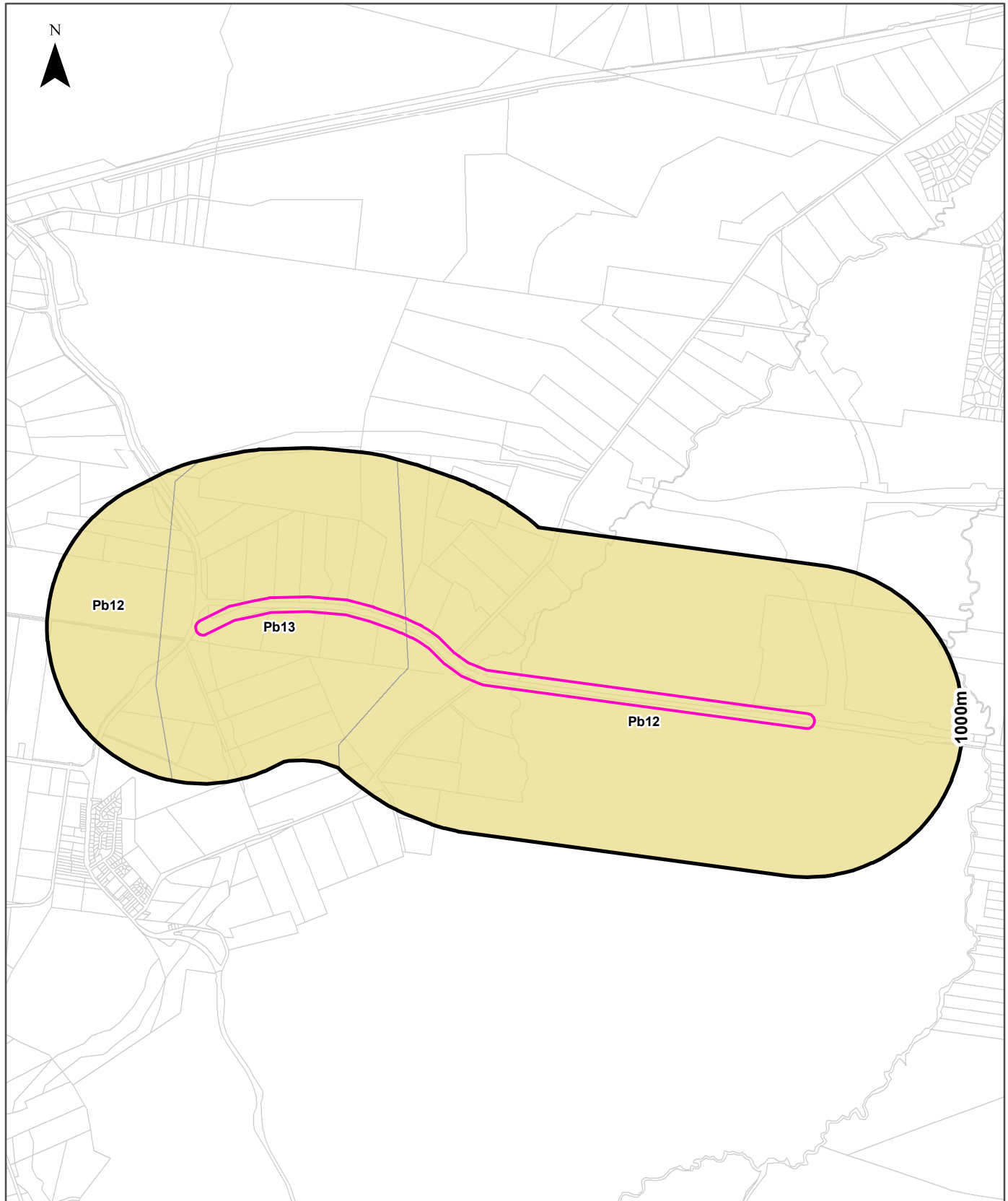
Naturally Occurring Asbestos Potential within the dataset buffer:

| Potential            | Sym | Strat Name | Group | Formation | Scale | Min Age | Max Age | Rock Type | Dom Lith | Description | Dist | Dir |
|----------------------|-----|------------|-------|-----------|-------|---------|---------|-----------|----------|-------------|------|-----|
| No records in buffer |     |            |       |           |       |         |         |           |          |             |      |     |

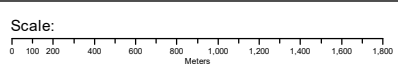
Naturally Occurring Asbestos Potential Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy

# Atlas of Australian Soils

Elizabeth Drive West, Kempas Creek, NSW 2178



|                   |            |  |           |         |          |         |  |
|-------------------|------------|--|-----------|---------|----------|---------|--|
| <b>Legend</b>     |            | <b>Australian Soil Classification Orders</b> |           |         |          |         |  |
| Site Boundary     | Anthrosol  | Dermosol                                     | Kandosol  | Podosol | Tenosol  | No Data |  |
| Buffer 1000m      | Calcarosol | Ferrosol                                     | Kurosol   | Rudosol | Vertosol |         |  |
| Property Boundary | Chromosol  | Hydrosol                                     | Organosol | Sodosol | Lake     |         |  |



Data Sources: Property Boundaries & Topographic Data:  
© Department Finance, Services & Innovation 2022

Coordinate System:  
GDA 1994 MGA Zone 56

Date: 31 January 2022

## Soils

Elizabeth Drive West, Kemp's Creek, NSW 2178

### Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

| Map Unit Code | Soil Order | Map Unit Description   | Distance | Direction |
|---------------|------------|--|----------|-----------|
| Pb12          | Kurosol    | Gently rolling to rounded hilly country with some steep slopes and broad valleys: chief soils are hard acidic red soils (Dr2.21) with hard neutral and acidic yellow mottled soils (Dy3.42 and Dy3.41) on lower slopes and in valleys. Associated are small areas of various soils including (Gn3.54) on some ridges, (Dr3.31) on some slopes; (Dr2.23) in saddles and some mid-slope positions, and some low-lying swampy areas of (Uf6) soils and (Uc1.2) soils with peaty surfaces. Small areas of other soils such as (Db1.2) are likely throughout.   | 0m       | On-site   |
| Pb13          | Kurosol    | Ridge and valley country of gently undulating ridge tops and steep side slopes often with slumping, also rounded hilly to steep hilly areas and relatively narrow valleys: chief soils are hard acidic red soils (Dr2.21) with hard acidic yellow mottled soils (Dy3.41); in places some ironstone gravels occur in both these soils. Associated are hard neutral and alkaline red soils (Dr2.22 and Dr2.23) in saddles and some mid-slope positions; (Dy3.42 and Dy3.43) soils, usually in depressions; and small areas of undescribed soils in wet soaks and valley areas. Small areas of other soils are likely throughout. | 0m       | On-site   |

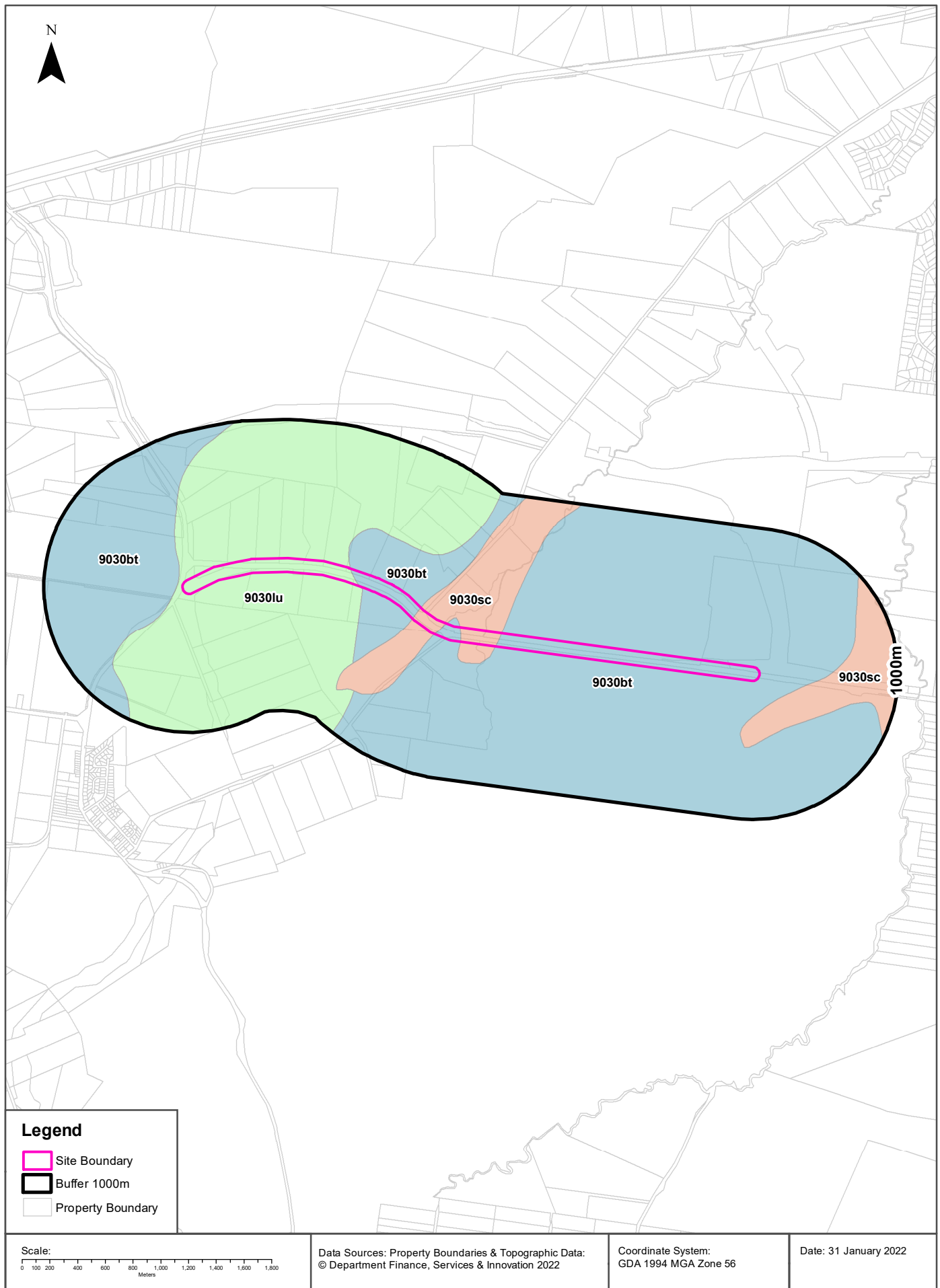
Atlas of Australian Soils Data Source: CSIRO

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# Soil Landscapes of Central and Eastern NSW

Elizabeth Drive West, Kempas Creek, NSW 2178



## Soils

Elizabeth Drive West, Kemps Creek, NSW 2178

### Soil Landscapes of Central and Eastern NSW

Soil Landscapes of Central and Eastern NSW within the dataset buffer:

| Soil Code              | Name        | Distance | Direction |
|------------------------|-------------|----------|-----------|
| <a href="#">9030bt</a> | Blacktown   | 0m       | On-site   |
| <a href="#">9030lu</a> | Luddenham   | 0m       | On-site   |
| <a href="#">9030sc</a> | South Creek | 0m       | On-site   |

Soil Landscapes of Central and Eastern NSW: NSW Department of Planning, Industry and Environment  
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# Acid Sulfate Soils

Elizabeth Drive West, Kemps Creek, NSW 2178

## Environmental Planning Instrument - Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

| Soil Class | Description | EPI Name |
|------------|-------------|----------|
| N/A        |             |          |

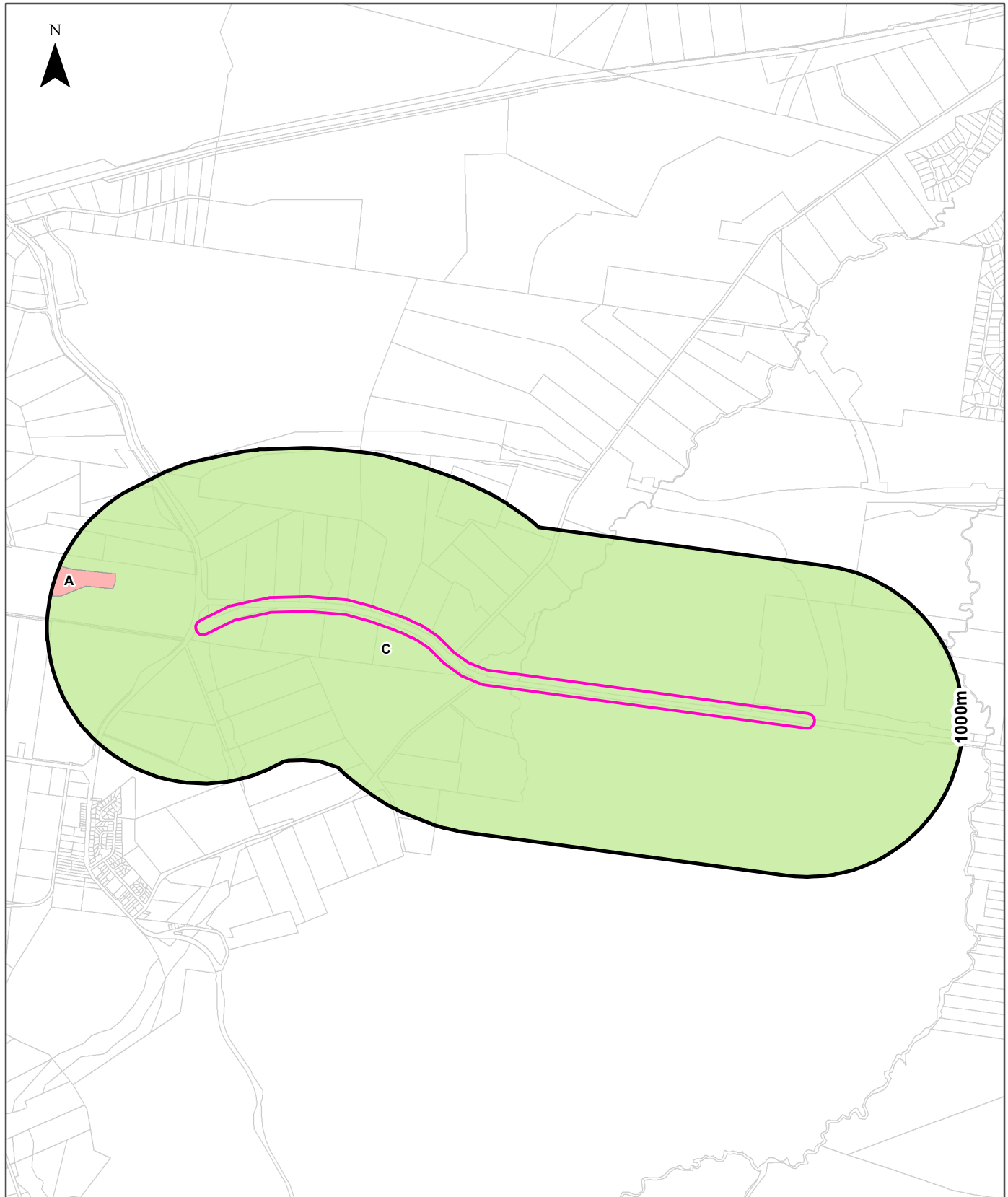
If the on-site Soil Class is 5, what other soil classes exist within 500m?

| Soil Class | Description | EPI Name | Distance | Direction |
|------------|-------------|----------|----------|-----------|
| N/A        |             |          |          |           |

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# Atlas of Australian Acid Sulfate Soils

Elizabeth Drive West, Kempas Creek, NSW 2178



|  |  |
|--|--|
| <b>Legend</b>  |  |
| Site Boundary  | <b>Probability of occurrence of Acid Sulfate Soils</b>   |
| Buffer 1000m   | A. High (>70%)   |
| Property Boundary  | B. Low (6-70%)   |
|  | C. Extremely Low (1-5%)  |
|  | D. No Chance (0%)  |
|  | No Data  |
| <b>Scale:</b><br>0 100 200 400 600 800 1,000 1,200 1,400 1,600 1,800<br>Meters | <b>Data Sources:</b> Property Boundaries & Topographic Data:<br>© Department Finance, Services & Innovation 2022 |
|  | <b>Coordinate System:</b><br>GDA 1994 MGA Zone 56  |
|  | <b>Date:</b> 31 January 2022   |

## Acid Sulfate Soils

Elizabeth Drive West, Kemps Creek, NSW 2178

### Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

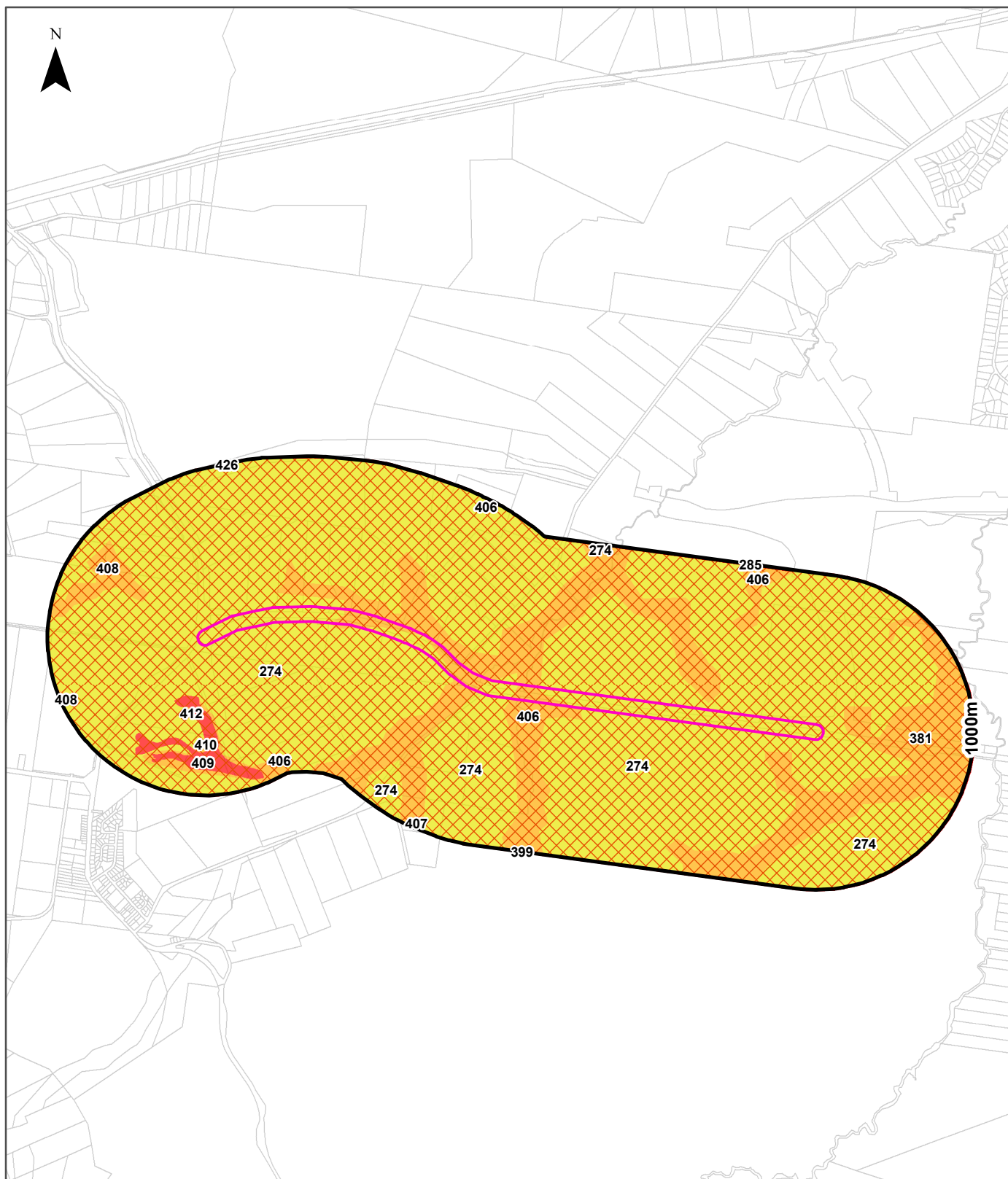
| Class | Description   | Distance | Direction |
|-------|---|----------|-----------|
| C     | Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas. | 0m       | On-site   |
| A     | High Probability of occurrence. >70% chance of occurrence.  | 613m     | West      |

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

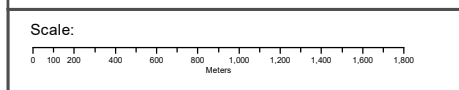
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# Dryland Salinity

Elizabeth Drive West, Kempas Creek, NSW 2178



|  |   |   |
|--|---|---|
| <p> Site Boundary</p> <p> Buffer 1000m</p> <p> Property Boundary</p> | <p><b>Dryland Salinity - National Assessment</b></p> <p> Delineated risk area but no high hazard or risk rating for either 2000, 2020, 2050</p> <p> High hazard or risk in 2050 only</p> <p> High hazard or risk defined for 2050, but no assessment made for 2000 or 2020</p> <p> High hazard or risk in 2020 and 2050</p> <p> High hazard or risk in 2000 and 2050. 2020 not defined as high hazard</p> <p> High hazard or risk defined for all years: 2000, 2020, 2050</p> | <p><b>Salinity Potential of Western Sydney</b></p> <p> Area of Known Salinity</p> <p> Area of High Salinity Potential</p> <p> Area of Moderate Salinity Potential</p> <p> Area of Very Low Salinity Potential</p> <p> Area of Water</p> |
|--|---|---|



Data Sources: Property Boundaries & Topographic Data:  
© Department Finance, Services & Innovation 2022

Coordinate System:  
GDA 1994 MGA Zone 56

Date: 31 January 2022

# Dryland Salinity

Elizabeth Drive West, Kemps Creek, NSW 2178

## Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

Yes

Is there Dryland Salinity - National Assessment data within the dataset buffer?

Yes

What Dryland Salinity assessments are given?

| Assessment 2000     | Assessment 2020     | Assessment 2050     | Distance | Direction |
|---------------------|---------------------|---------------------|----------|-----------|
| High hazard or risk | High hazard or risk | High hazard or risk | 0m       | On-site   |

Dryland Salinity Data Source : National Land and Water Resources Audit

The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.

In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

## Dryland Salinity Potential of Western Sydney

Dryland Salinity Potential of Western Sydney within the dataset buffer?

| Feature Id | Classification | Description                         | Distance | Direction  |
|------------|----------------|-------------------------------------|----------|------------|
| 274        | MODERATE       | Area of Moderate Salinity Potential | 0m       | On-site    |
| 406        | HIGH           | Area of High Salinity Potential     | 0m       | On-site    |
| 381        | HIGH           | Area of High Salinity Potential     | 103m     | East       |
| 409        | SALT           | Area of Known Salinity              | 347m     | West       |
| 412        | HIGH           | Area of High Salinity Potential     | 428m     | West       |
| 408        | HIGH           | Area of High Salinity Potential     | 431m     | West       |
| 410        | HIGH           | Area of High Salinity Potential     | 646m     | West       |
| 407        | SALT           | Area of Known Salinity              | 947m     | South West |
| 399        | SALT           | Area of Known Salinity              | 968m     | South      |
| 426        | HIGH           | Area of High Salinity Potential     | 981m     | North West |
| 285        | MODERATE       | Area of Moderate Salinity Potential | 995m     | North East |

Dryland Salinity Potential of Western Sydney Data Source : NSW Office of Environment and Heritage

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# Mining

Elizabeth Drive West, Kempas Creek, NSW 2178

## Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

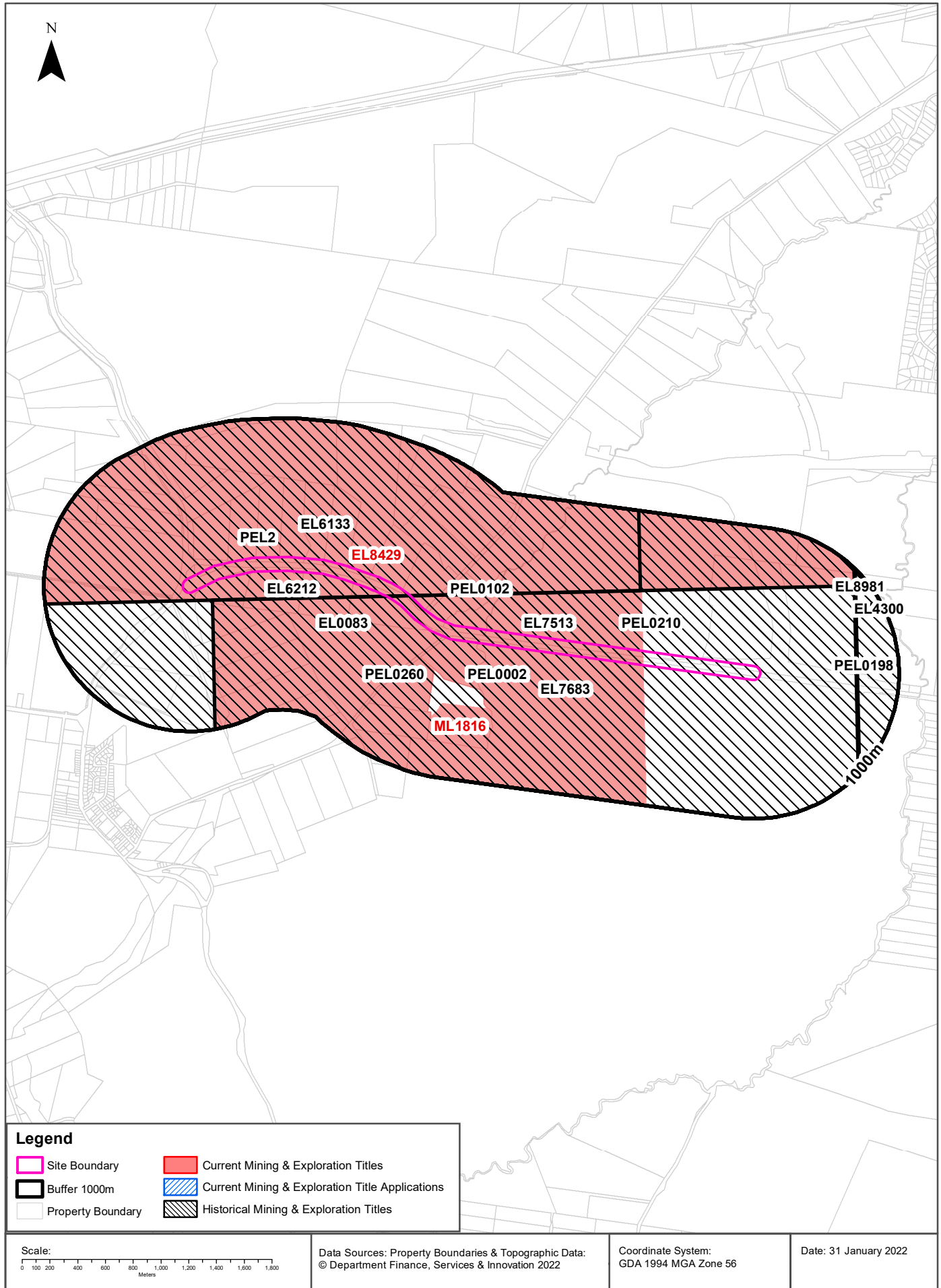
| District  | Distance | Direction |
|---|----------|-----------|
| There are no Mining Subsidence Districts within the report buffer |          |           |

Mining Subsidence District Data Source: © Land and Property Information (2016)  
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# Mining & Exploration Titles

Elizabeth Drive West, Kempas Creek, NSW 2178



# Mining

Elizabeth Drive West, Kempas Creek, NSW 2178

## Current Mining & Exploration Titles

Current Mining & Exploration Titles within the dataset buffer:

| Title Ref | Holder                           | Grant Date | Expiry Date | Last Renewed | Operation | Resource | Minerals                    | Dist | Dir     |
|-----------|----------------------------------|------------|-------------|--------------|-----------|----------|-----------------------------|------|---------|
| EL8429    | THE AUSTRAL BRICK CO PTY LTD     | 20/04/2016 | 20/04/2024  | 09 Jul 2021  | EXPLORING | MINERALS | Group 5                     | 0m   | On-site |
| ML1816    | LUDDENHAM OPERATIONS PTY LIMITED | 14/10/2021 | 14/10/2042  | 14 Oct 2021  | MINING    | MINERALS | Clay/Shale, Structural Clay | 463m | South   |

Current Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

## Current Mining & Exploration Title Applications

Current Mining & Exploration Title Applications within the dataset buffer:

| Application Ref | Applicant            | Application Date | Operation | Resource | Minerals | Dist | Dir |
|-----------------|----------------------|------------------|-----------|----------|----------|------|-----|
| N/A             | No records in buffer |                  |           |          |          |      |     |

Current Mining & Exploration Title Applications Data Source: © State of New South Wales through NSW Department of Industry

# Mining

Elizabeth Drive West, Kemp's Creek, NSW 2178

## Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

| Title Ref | Holder   | Start Date  | End Date    | Resource  | Minerals   | Dist | Dir     |
|-----------|--|-------------|-------------|-----------|------------|------|---------|
| EL0083    | CONTINENTAL OIL CO OF AUSTRALIA LIMITED  | 01 Feb 1967 | 01 Feb 1968 | MINERALS  |            | 0m   | On-site |
| EL7683    | EPIC MINING PTY LTD  | 7 Jan 2011  | 7 Jan 2013  | MINERALS  |            | 0m   | On-site |
| PEL0002   | AGL UPSTREAM INVESTMENTS PTY LIMITED   | 29/03/1993  | 6/07/2015   | PETROLEUM | Petroleum  | 0m   | On-site |
| EL7513    | GRADIENT ENERGY LIMITED  | 7 Apr 2010  | 15 Apr 2011 | MINERALS  | Geothermal | 0m   | On-site |
| PEL0210   | THE AUSTRALIAN GAS LIGHT COMPANY (AGL), NORTH BULLI COLLIERIES PTY LTD                         |             |             | PETROLEUM | Petroleum  | 0m   | On-site |
| PEL2      | AGL UPSTREAM INVESTMENTS PTY LIMITED   |             |             | MINERALS  |            | 0m   | On-site |
| EL6133    | THE AUSTRAL BRICK CO PTY LTD   | 02 Oct 2003 | 01 Oct 2005 | MINERALS  |            | 0m   | On-site |
| EL6212    | HOT ROCK ENERGY PTY LTD, LONGREACH OIL LIMITED   | 4 Mar 2004  | 3 Mar 2013  | MINERALS  | Geothermal | 0m   | On-site |
| PEL0260   | NORTH BULLI COLLIERIES PTY LTD, AGL PETROLEUM OPERATIONS PTY LTD, THE AUSTRALIAN GAS LIGHT CO. | 9/09/1981   | 8/03/1993   | PETROLEUM | Petroleum  | 0m   | On-site |
| PEL0102   | AUSTRALIAN OIL AND GAS CORPORATION LTD   |             |             | PETROLEUM | Petroleum  | 0m   | On-site |
| PEL0198   | JOHN STREVENS (TERRIGAL) NL  |             |             | PETROLEUM | Petroleum  | 699m | East    |
| EL8981    | THE AUSTRAL BRICK CO PTY LTD   |             |             | MINERALS  |            | 911m | East    |
| EL4300    | NOLAN, David Eric  | 25 Mar 1991 | 25 Mar 1995 | MINERALS  | Clay Shale | 928m | East    |

Historical Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

# State Environmental Planning Policy

Elizabeth Drive West, Kemps Creek, NSW 2178

## State Significant Precincts

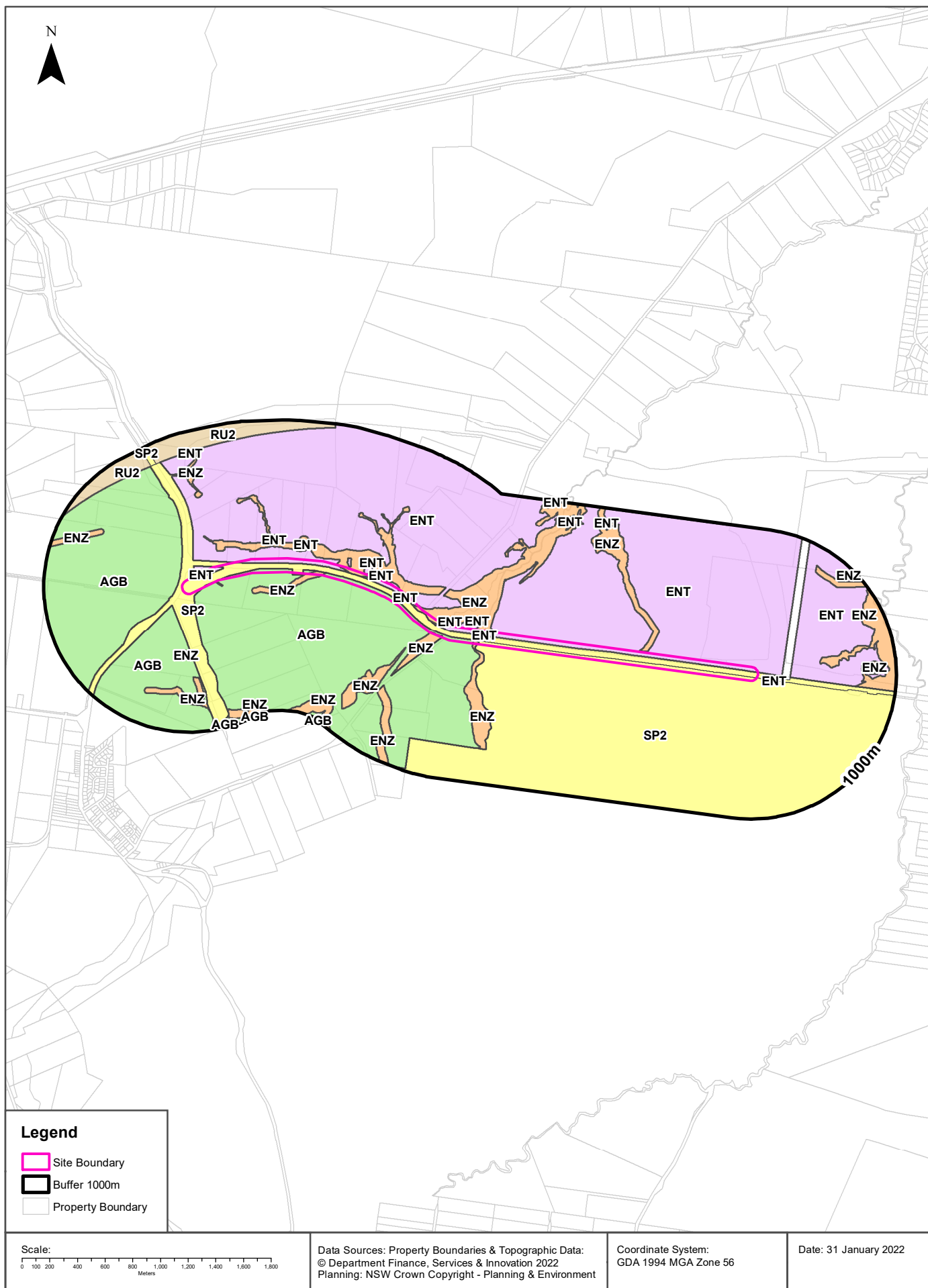
What SEPP State Significant Precincts exist within the dataset buffer?

| Map Id | Precinct             | EPI Name | Published Date | Commenced Date | Currency Date | Amendment | Distance | Direction |
|--------|----------------------|----------|----------------|----------------|---------------|-----------|----------|-----------|
| N/A    | No records in buffer |          |                |                |               |           |          |           |

State Environment Planning Policy Data Source: NSW Crown Copyright - Planning & Environment  
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# EPI Planning Zones

Elizabeth Drive West, Kempas Creek, NSW 2178



# Environmental Planning Instrument

Elizabeth Drive West, Kemps Creek, NSW 2178

## Land Zoning

What EPI Land Zones exist within the dataset buffer?

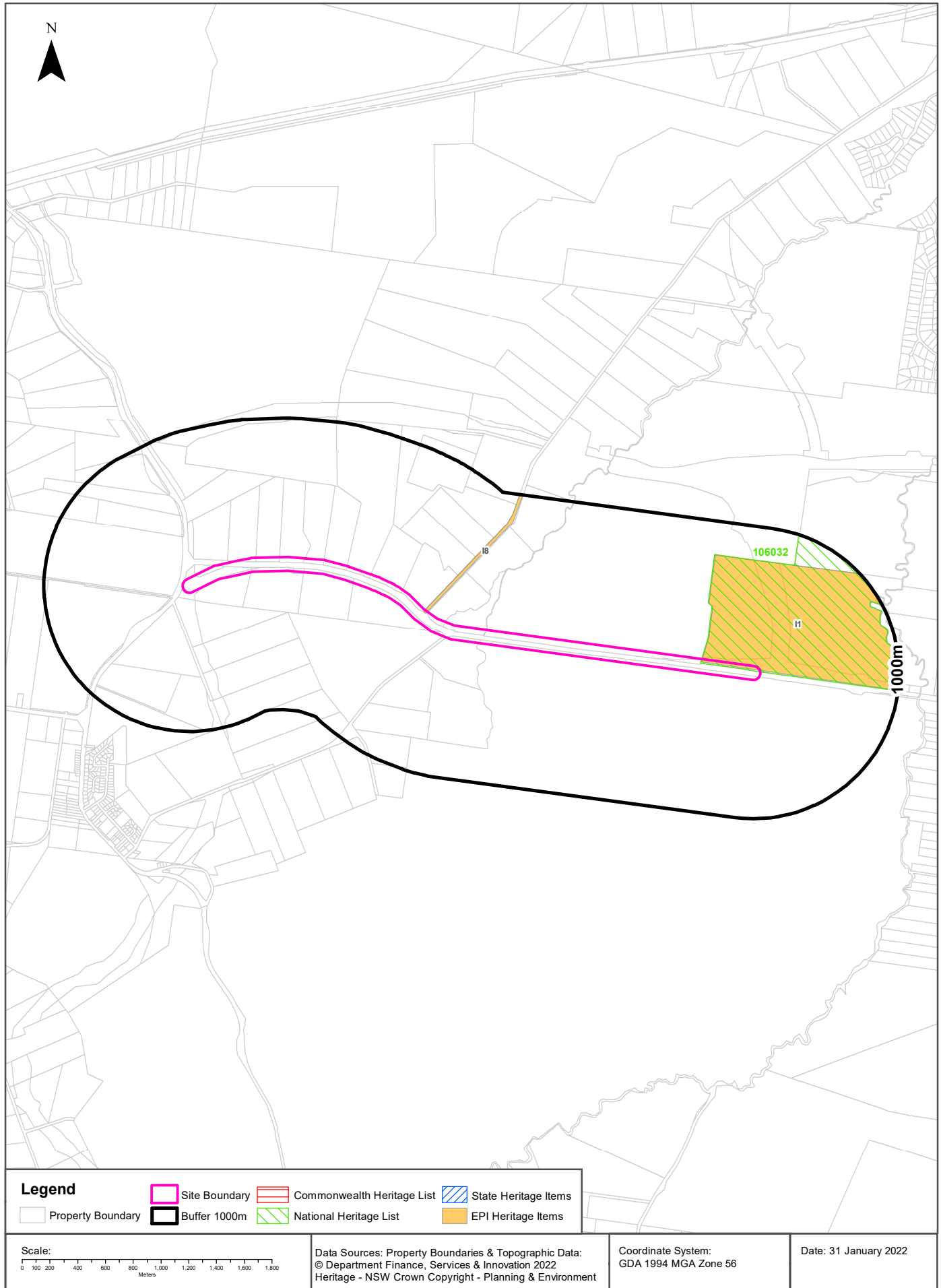
| Zone | Description                | Purpose  | EPI Name   | Published Date | Commenced Date | Currency Date | Amendment | Distance | Direction  |
|------|----------------------------|--|--|----------------|----------------|---------------|-----------|----------|------------|
| SP2  | Infrastructure             | Western Sydney International (Nancy-Bird Walton) * | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 0m       | On-site    |
| ENZ  | Environment and Recreation |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 0m       | On-site    |
| ENT  | Enterprise                 |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 0m       | On-site    |
| AGB  | Agribusiness               |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 0m       | On-site    |
| SP2  | Infrastructure             | Northern Road                                      | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 0m       | On-site    |
| ENT  | Enterprise                 |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 1m       | North West |
| ENT  | Enterprise                 |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 11m      | North West |
| ENT  | Enterprise                 |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 18m      | North West |
| AGB  | Agribusiness               |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 37m      | West       |
| ENT  | Enterprise                 |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 101m     | East       |
| ENT  | Enterprise                 |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 107m     | North West |
| ENT  | Enterprise                 |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 126m     | North West |
| AGB  | Agribusiness               |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 128m     | West       |
| ENZ  | Environment and Recreation |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 193m     | South West |
| ENT  | Enterprise                 |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 229m     | East       |
| ENZ  | Environment and Recreation |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 409m     | West       |
| ENZ  | Environment and Recreation |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 450m     | East       |
| ENZ  | Environment and Recreation |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 504m     | South West |
| ENZ  | Environment and Recreation |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 517m     | North West |
| ENZ  | Environment and Recreation |  | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |           | 601m     | West       |

| Zone | Description                | Purpose         | EPI Name   | Published Date | Commenced Date | Currency Date | Amendment  | Distance | Direction  |
|------|----------------------------|-----------------|--|----------------|----------------|---------------|--|----------|------------|
| ENZ  | Environment and Recreation |                 | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |  | 682m     | West       |
| ENT  | Enterprise                 |                 | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |  | 721m     | North West |
| ENZ  | Environment and Recreation |                 | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |  | 787m     | East       |
| ENZ  | Environment and Recreation |                 | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |  | 793m     | South West |
| ENT  | Enterprise                 |                 | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |  | 798m     | North East |
| ENT  | Enterprise                 |                 | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |  | 840m     | North East |
| RU2  | Rural Landscape            |                 | Penrith Local Environmental Plan 2010                                  | 11/09/2020     | 01/10/2020     | 31/03/2021    | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 847m     | North West |
| SP2  | Infrastructure             | Classified Road | Penrith Local Environmental Plan 2010                                  | 11/09/2020     | 01/10/2020     | 31/03/2021    | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 854m     | North West |
| RU2  | Rural Landscape            |                 | Penrith Local Environmental Plan 2010                                  | 11/09/2020     | 01/10/2020     | 31/03/2021    | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 857m     | North West |
| AGB  | Agribusiness               |                 | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |  | 925m     | West       |
| ENT  | Enterprise                 |                 | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    |  | 980m     | North East |

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# Heritage Items

Elizabeth Drive West, Kemp's Creek, NSW 2178





## Heritage

Elizabeth Drive West, Kemp's Creek, NSW 2178

### Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

| Place Id | Name                 | Address | Place File No | Class | Status | Register Date | Distance | Direction |
|----------|----------------------|---------|---------------|-------|--------|---------------|----------|-----------|
| N/A      | No records in buffer |         |               |       |        |               |          |           |

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch  
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### National Heritage List

What are the National Heritage List Items located within the dataset buffer?

Note. Please click on Place Id to activate a hyperlink to online website.

| Place Id               | Name                           | Address                                  | Place File No | Class    | Status                                   | Register Date | Distance | Direction |
|------------------------|--------------------------------|--|---------------|----------|--|---------------|----------|-----------|
| <a href="#">106032</a> | McGarvie Smith University Farm | 124 Elizabeth Dve,<br>Badgerys Creek NSW | 1/14/029/0038 | Historic | Nomination<br>now ineligible<br>for PPAL |               | 0m       | On-site   |

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch  
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### State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

| Map Id | Name                 | Address | LGA | Listing Date | Listing No | Plan No | Distance | Direction |
|--------|----------------------|---------|-----|--------------|------------|---------|----------|-----------|
| N/A    | No records in buffer |         |     |              |            |         |          |           |

Heritage Data Source: NSW Crown Copyright - Office of Environment & Heritage  
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### Environmental Planning Instrument - Heritage

What are the EPI Heritage Items located within the dataset buffer?

| Map Id | Name                     | Classification | Significance | EPI Name   | Published Date | Commenced Date | Currency Date | Distance | Direction |
|--------|--------------------------|----------------|--------------|--|----------------|----------------|---------------|----------|-----------|
| I1     | McGarvie Smith Farm      | Item - General | Local        | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    | 0m       | On-site   |
| I8     | Luddenham Road alignment | Item - General | Local        | State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 | 11/09/2020     | 01/10/2020     | 11/09/2020    | 0m       | On-site   |

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# Natural Hazards - Bush Fire Prone Land

Elizabeth Drive West, Kempas Creek, NSW 2178



## Natural Hazards

Elizabeth Drive West, Kemps Creek, NSW 2178

### Bush Fire Prone Land

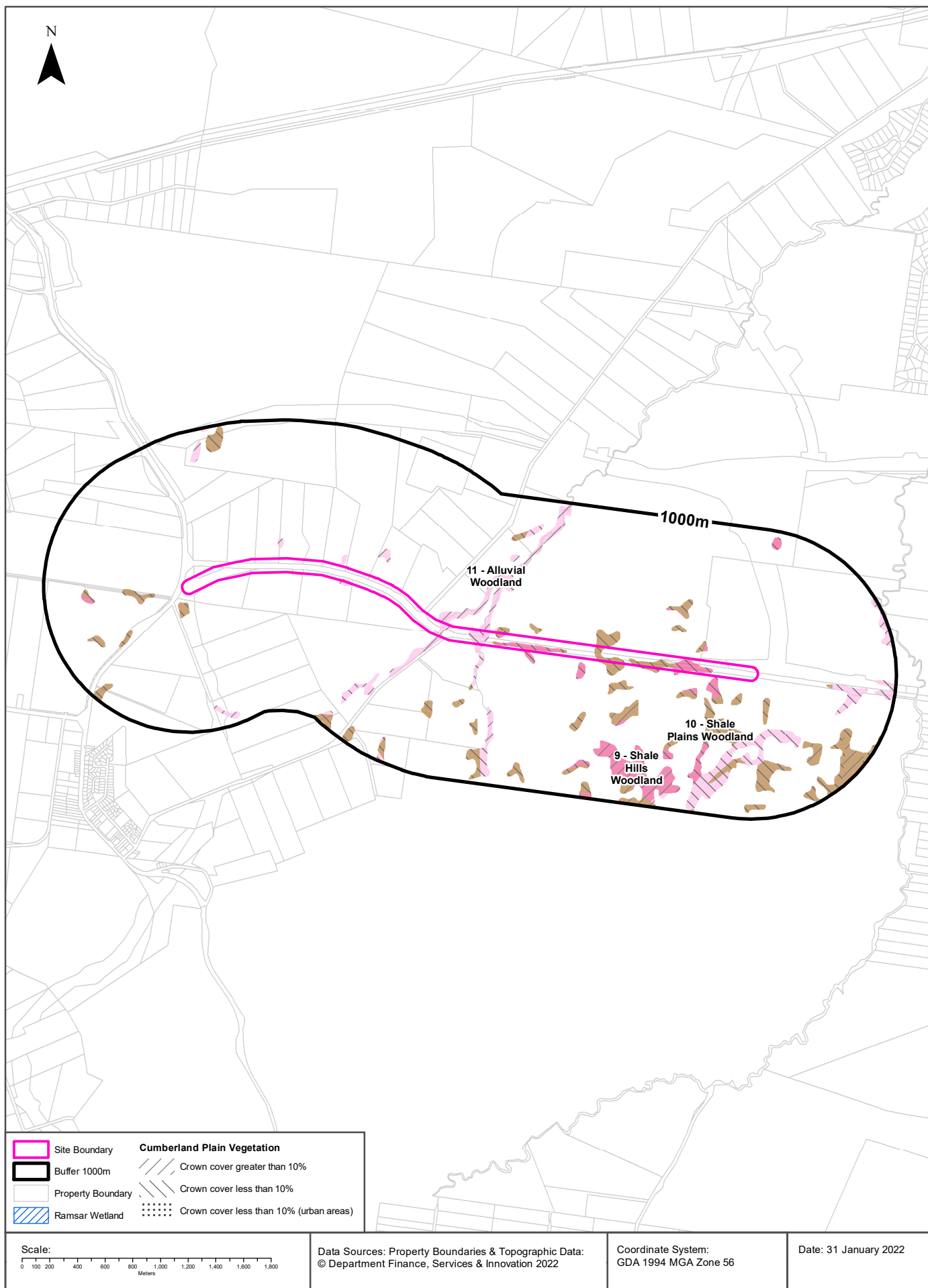
What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

| Bush Fire Prone Land Category | Distance | Direction |
|-------------------------------|----------|-----------|
| Vegetation Category 1         | 0m       | On-site   |
| Vegetation Category 3         | 0m       | On-site   |
| Vegetation Category 2         | 0m       | On-site   |
| Vegetation Buffer             | 0m       | On-site   |

NSW Bush Fire Prone Land - © NSW Rural Fire Service under Creative Commons 4.0 International Licence

# Ecological Constraints - Vegetation & Ramsar Wetlands

Elizabeth Drive West, Kempas Creek, NSW 2178



## Ecological Constraints

Elizabeth Drive West, Kempas Creek, NSW 2178

### Remnant Vegetation of the Cumberland Plain

What remnant vegetation of the Cumberland Plain exists within the dataset buffer?

| Description                | Crown Cover                  | Distance | Direction  |
|----------------------------|------------------------------|----------|------------|
| 11 - Alluvial Woodland     | Crown cover greater than 10% | 0m       | On-site    |
| 9 - Shale Hills Woodland   | Crown cover less than 10%    | 0m       | On-site    |
| 10 - Shale Plains Woodland | Crown cover less than 10%    | 0m       | On-site    |
| 11 - Alluvial Woodland     | Crown cover less than 10%    | 0m       | On-site    |
| 10 - Shale Plains Woodland | Crown cover greater than 10% | 243m     | South East |
| 9 - Shale Hills Woodland   | Crown cover greater than 10% | 401m     | South East |

Remnant Vegetation of the Cumberland Plain : NSW Office of Environment and Heritage  
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### Ramsar Wetlands

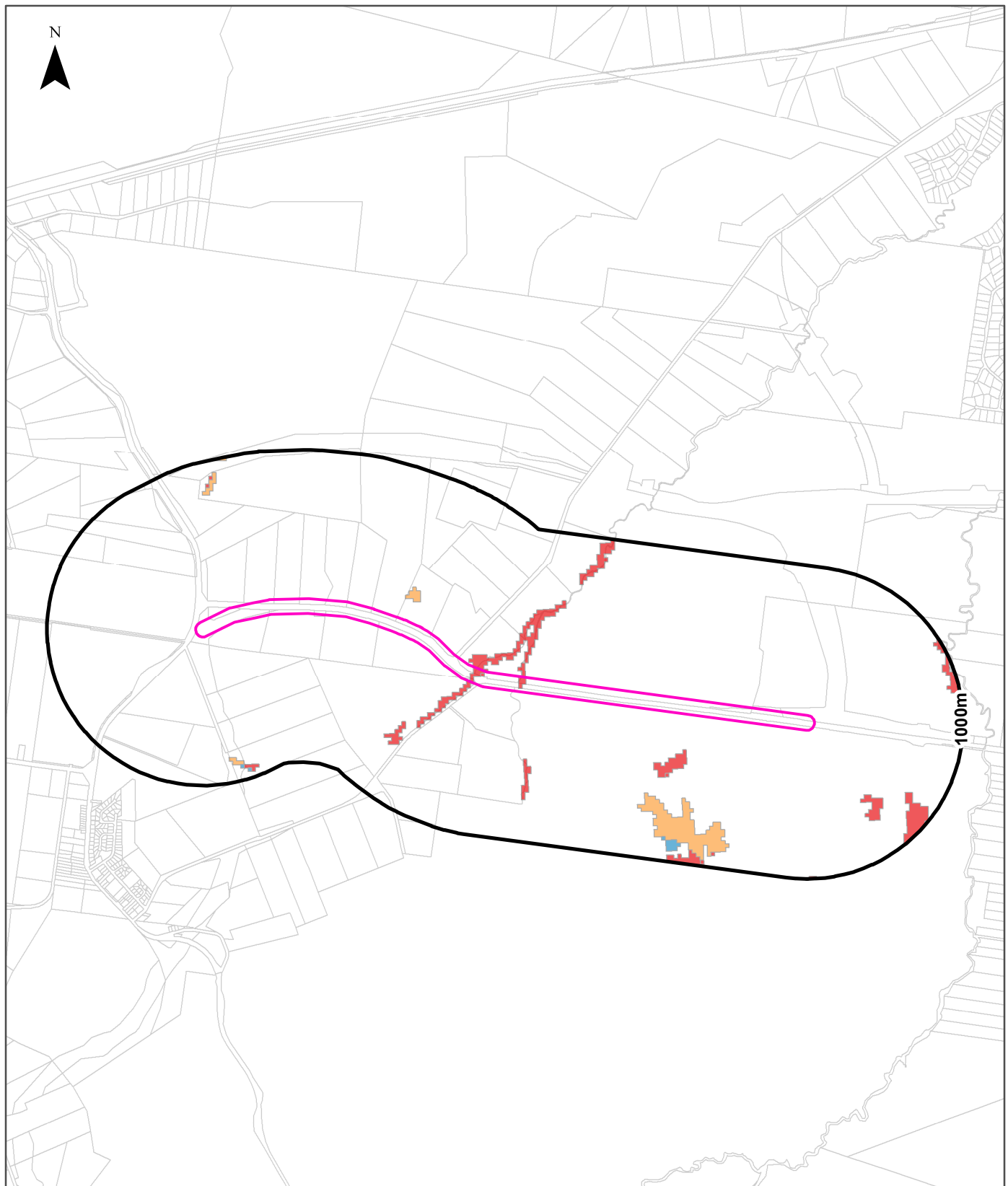
What Ramsar Wetland areas exist within the dataset buffer?

| Map Id | Ramsar Name          | Wetland Name | Designation Date | Source | Distance | Direction |
|--------|----------------------|--------------|------------------|--------|----------|-----------|
| N/A    | No records in buffer |              |                  |        |          |           |

Ramsar Wetlands Data Source: © Commonwealth of Australia - Department of Agriculture, Water and the Environment

# Ecological Constraints - Groundwater Dependent Ecosystems Atlas

Elizabeth Drive West, Kemps Creek, NSW 2178



|   |  |  |   |
|---|--|--|---|
| <b>Legend</b><br>Site Boundary<br>Buffer 1000m<br>Property Boundaries |  | High potential GDE - from national assessment<br>High potential GDE - from regional studies<br>Moderate potential GDE - from national assessment<br>Moderate potential GDE - from regional studies | Low potential GDE - from national assessment<br>Low potential GDE - from regional studies<br>Known GDE - from regional studies<br>Unclassified potential GDE - from national assessment<br>Unclassified potential GDE - from regional studies |
| Scale:<br>0 100 200 400 600 800 1,000<br>Meters                       |  | Data Sources: Property Boundaries & Topographic Data:<br>© Department Finance, Services & Innovation 2022  | Coordinate System:<br>GDA 1994 MGA Zone 56<br>Date: 31 January 2022   |

# Ecological Constraints

Elizabeth Drive West, Kemps Creek, NSW 2178

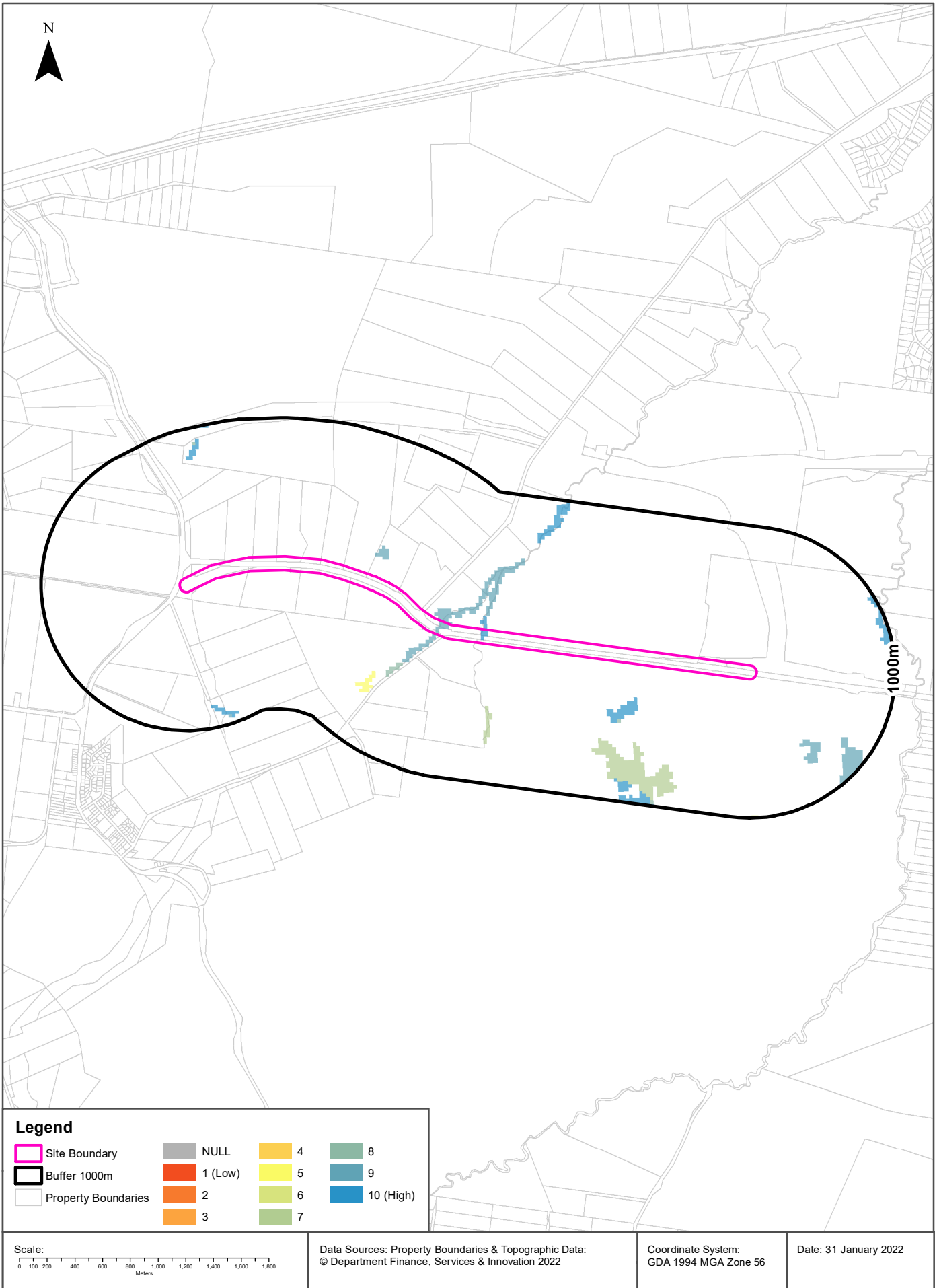
## Groundwater Dependent Ecosystems Atlas

| Type        | GDE Potential                                     | Geomorphology                                     | Ecosystem Type | Aquifer Geology            | Distance | Direction  |
|-------------|---|---|----------------|----------------------------|----------|------------|
| Terrestrial | High potential GDE - from national assessment     | Undulating to low hilly country, mainly on shale. | Vegetation     | Unconsolidated sedimentary | 0m       | On-site    |
| Terrestrial | High potential GDE - from national assessment     | Undulating to low hilly country, mainly on shale. | Vegetation     | Consolidated sedimentary   | 0m       | On-site    |
| Terrestrial | Moderate potential GDE - from national assessment | Undulating to low hilly country, mainly on shale. | Vegetation     | Consolidated sedimentary   | 132m     | North West |
| Terrestrial | Low potential GDE - from national assessment      | Undulating to low hilly country, mainly on shale. | Vegetation     | Consolidated sedimentary   | 834m     | South East |

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology  
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# Ecological Constraints - Inflow Dependent Ecosystems Likelihood

Elizabeth Drive West, Kempas Creek, NSW 2178





# Ecological Constraints

Elizabeth Drive West, Kemps Creek, NSW 2178

## Inflow Dependent Ecosystems Likelihood

| Type        | IDE Likelihood | Geomorphology                                     | Ecosystem Type | Aquifer Geology            | Distance | Direction  |
|-------------|----------------|---|----------------|----------------------------|----------|------------|
| Terrestrial | 9              | Undulating to low hilly country, mainly on shale. | Vegetation     | Unconsolidated sedimentary | 0m       | On-site    |
| Terrestrial | 10             | Undulating to low hilly country, mainly on shale. | Vegetation     | Unconsolidated sedimentary | 0m       | On-site    |
| Terrestrial | 9              | Undulating to low hilly country, mainly on shale. | Vegetation     | Consolidated sedimentary   | 0m       | On-site    |
| Terrestrial | 10             | Undulating to low hilly country, mainly on shale. | Vegetation     | Consolidated sedimentary   | 237m     | South East |
| Terrestrial | 8              | Undulating to low hilly country, mainly on shale. | Vegetation     | Unconsolidated sedimentary | 294m     | South West |
| Terrestrial | 8              | Undulating to low hilly country, mainly on shale. | Vegetation     | Consolidated sedimentary   | 408m     | South East |
| Terrestrial | 7              | Undulating to low hilly country, mainly on shale. | Vegetation     | Consolidated sedimentary   | 442m     | South      |
| Terrestrial | 5              | Undulating to low hilly country, mainly on shale. | Vegetation     | Unconsolidated sedimentary | 458m     | South West |
| Terrestrial | 6              | Undulating to low hilly country, mainly on shale. | Vegetation     | Consolidated sedimentary   | 980m     | South East |

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology  
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# Ecological Constraints

Elizabeth Drive West, Kemps Creek, NSW 2178

## NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

| Kingdom  | Class    | Scientific                      | Common  | NSW Conservation Status | NSW Sensitivity Class | Federal Conservation Status | Migratory Species Agreements |
|----------|----------|---------------------------------|---|-------------------------|-----------------------|-----------------------------|------------------------------|
| Animalia | Amphibia | Litoria aurea                   | Green and Golden Bell Frog                    | Endangered              | Not Sensitive         | Vulnerable                  |                              |
| Animalia | Amphibia | Pseudophryne australis          | Red-crowned Toadlet                           | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Anseranas semipalmata           | Magpie Goose                                  | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Anthochaera phrygia             | Regent Honeyeater                             | Critically Endangered   | Not Sensitive         | Critically Endangered       |                              |
| Animalia | Aves     | Apus pacificus                  | Fork-tailed Swift                             | Not Listed              | Not Sensitive         | Not Listed                  | ROKAMBA;CAMBA; JAMBA         |
| Animalia | Aves     | Artamus cyanopterus cyanopterus | Dusky Woodswallow                             | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Botaurus poiciloptilus          | Australasian Bittern                          | Endangered              | Not Sensitive         | Endangered                  |                              |
| Animalia | Aves     | Burhinus grallarius             | Bush Stone-curlew                             | Endangered              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Calidris acuminata              | Sharp-tailed Sandpiper                        | Not Listed              | Not Sensitive         | Not Listed                  | ROKAMBA;CAMBA; JAMBA         |
| Animalia | Aves     | Callocephalon fimbriatum        | Gang-gang Cockatoo                            | Vulnerable              | Category 3            | Not Listed                  |                              |
| Animalia | Aves     | Calyptorhynchus banksii samueli | Red-tailed Black-Cockatoo (inland subspecies) | Vulnerable              | Category 2            | Not Listed                  |                              |
| Animalia | Aves     | Calyptorhynchus lathami         | Glossy Black-Cockatoo                         | Vulnerable              | Category 2            | Not Listed                  |                              |
| Animalia | Aves     | Certhionyx variegatus           | Pied Honeyeater                               | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Chthonicola sagittata           | Speckled Warbler                              | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Circus assimilis                | Spotted Harrier                               | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Climacteris picumnus victoriae  | Brown Treecreeper (eastern subspecies)        | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Daphoenositta chrysoptera       | Varied Sittella                               | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Ephippiorhynchus asiaticus      | Black-necked Stork                            | Endangered              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Gallinago hardwickii            | Latham's Snipe                                | Not Listed              | Not Sensitive         | Not Listed                  | ROKAMBA;JAMBA                |
| Animalia | Aves     | Glossopsitta pusilla            | Little Lorikeet                               | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Haliaeetus leucogaster          | White-bellied Sea-Eagle                       | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Hieraaetus morphnoides          | Little Eagle                                  | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Hirundapus caudacutus           | White-throated Needletail                     | Not Listed              | Not Sensitive         | Vulnerable                  | ROKAMBA;CAMBA; JAMBA         |
| Animalia | Aves     | Hirundo rustica                 | Barn Swallow                                  | Not Listed              | Not Sensitive         | Not Listed                  | ROKAMBA;CAMBA; JAMBA         |
| Animalia | Aves     | Ixobrychus flavicollis          | Black Bittern                                 | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves     | Lathamus discolor               | Swift Parrot                                  | Endangered              | Category 3            | Critically Endangered       |                              |

| Kingdom  | Class      | Scientific                             | Common  | NSW Conservation Status | NSW Sensitivity Class | Federal Conservation Status | Migratory Species Agreements |
|----------|------------|--|---|-------------------------|-----------------------|-----------------------------|------------------------------|
| Animalia | Aves       | <i>Limosa limosa</i>                   | Black-tailed Godwit                           | Vulnerable              | Not Sensitive         | Not Listed                  | ROKAMBA;CAMBA; JAMBA         |
| Animalia | Aves       | <i>Lophochroa leadbeateri</i>          | Major Mitchell's Cockatoo                     | Vulnerable              | Category 2            | Not Listed                  |                              |
| Animalia | Aves       | <i>Lophoictinia isura</i>              | Square-tailed Kite                            | Vulnerable              | Category 3            | Not Listed                  |                              |
| Animalia | Aves       | <i>Melanodryas cucullata cucullata</i> | Hooded Robin (south-eastern form)             | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves       | <i>Melithreptus gularis gularis</i>    | Black-chinned Honeyeater (eastern subspecies) | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves       | <i>Neophema pulchella</i>              | Turquoise Parrot                              | Vulnerable              | Category 3            | Not Listed                  |                              |
| Animalia | Aves       | <i>Ninox connivens</i>                 | Barking Owl                                   | Vulnerable              | Category 3            | Not Listed                  |                              |
| Animalia | Aves       | <i>Ninox strenua</i>                   | Powerful Owl                                  | Vulnerable              | Category 3            | Not Listed                  |                              |
| Animalia | Aves       | <i>Oxyura australis</i>                | Blue-billed Duck                              | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves       | <i>Petroica boodang</i>                | Scarlet Robin                                 | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves       | <i>Petroica phoenicea</i>              | Flame Robin                                   | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves       | <i>Pezoporus wallicus wallicus</i>     | Eastern Ground Parrot                         | Vulnerable              | Category 3            | Not Listed                  |                              |
| Animalia | Aves       | <i>Pluvialis squatarola</i>            | Grey Plover                                   | Not Listed              | Not Sensitive         | Not Listed                  | ROKAMBA;CAMBA; JAMBA         |
| Animalia | Aves       | <i>Rostratula australis</i>            | Australian Painted Snipe                      | Endangered              | Not Sensitive         | Endangered                  |                              |
| Animalia | Aves       | <i>Stagonopleura guttata</i>           | Diamond Firetail                              | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves       | <i>Stictonetta naevosa</i>             | Freckled Duck                                 | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Aves       | <i>Thinornis cucullatus cucullatus</i> | Eastern Hooded Dotterel                       | Critically Endangered   | Not Sensitive         | Vulnerable                  |                              |
| Animalia | Aves       | <i>Tringa nebularia</i>                | Common Greenshank                             | Not Listed              | Not Sensitive         | Not Listed                  | ROKAMBA;CAMBA; JAMBA         |
| Animalia | Aves       | <i>Tyto novaehollandiae</i>            | Masked Owl                                    | Vulnerable              | Category 3            | Not Listed                  |                              |
| Animalia | Aves       | <i>Tyto tenebricosa</i>                | Sooty Owl                                     | Vulnerable              | Category 3            | Not Listed                  |                              |
| Animalia | Gastropoda | <i>Meridolum corneovirens</i>          | Cumberland Plain Land Snail                   | Endangered              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Gastropoda | <i>Pommerhelix duralensis</i>          | Dural Land Snail                              | Endangered              | Not Sensitive         | Endangered                  |                              |
| Animalia | Mammalia   | <i>Chalinolobus dwyeri</i>             | Large-eared Pied Bat                          | Vulnerable              | Not Sensitive         | Vulnerable                  |                              |
| Animalia | Mammalia   | <i>Falsistrellus tasmaniensis</i>      | Eastern False Pipistrelle                     | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Mammalia   | <i>Micronomus norfolkensis</i>         | Eastern Coastal Free-tailed Bat               | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Mammalia   | <i>Miniopterus australis</i>           | Little Bent-winged Bat                        | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Mammalia   | <i>Miniopterus orianae oceanensis</i>  | Large Bent-winged Bat                         | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Mammalia   | <i>Myotis macropus</i>                 | Southern Myotis                               | Vulnerable              | Not Sensitive         | Not Listed                  |                              |
| Animalia | Mammalia   | <i>Petauroides volans</i>              | Greater Glider                                | Not Listed              | Not Sensitive         | Vulnerable                  |                              |
| Animalia | Mammalia   | <i>Petrogale penicillata</i>           | Brush-tailed Rock-wallaby                     | Endangered              | Not Sensitive         | Vulnerable                  |                              |
| Animalia | Mammalia   | <i>Phascolarctos cinereus</i>          | Koala   | Vulnerable              | Not Sensitive         | Vulnerable                  |                              |
| Animalia | Mammalia   | <i>Potorous tridactylus</i>            | Long-nosed Potoroo                            | Vulnerable              | Not Sensitive         | Vulnerable                  |                              |
| Animalia | Mammalia   | <i>Pteropus poliocephalus</i>          | Grey-headed Flying-fox                        | Vulnerable              | Not Sensitive         | Vulnerable                  |                              |

| Kingdom  | Class    | Scientific                                      | Common                         | NSW Conservation Status           | NSW Sensitivity Class | Federal Conservation Status | Migratory Species Agreements |
|----------|----------|---|--------------------------------|-----------------------------------|-----------------------|-----------------------------|------------------------------|
| Animalia | Mammalia | <i>Saccolaimus flaviventris</i>                 | Yellow-bellied Sheathtail-bat  | Vulnerable                        | Not Sensitive         | Not Listed                  |                              |
| Animalia | Mammalia | <i>Scoteanax rueppellii</i>                     | Greater Broad-nosed Bat        | Vulnerable                        | Not Sensitive         | Not Listed                  |                              |
| Animalia | Mammalia | <i>Vespadelus troughtoni</i>                    | Eastern Cave Bat               | Vulnerable                        | Not Sensitive         | Not Listed                  |                              |
| Animalia | Reptilia | <i>Chelonia mydas</i>                           | Green Turtle                   | Vulnerable                        | Not Sensitive         | Vulnerable                  |                              |
| Animalia | Reptilia | <i>Suta flagellum</i>                           | Little Whip Snake              | Vulnerable                        | Not Sensitive         | Not Listed                  |                              |
| Plantae  | Flora    | <i>Acacia pubescens</i>                         | Downy Wattle                   | Vulnerable                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Acacia terminalis</i> subsp. Eastern Sydney  | Sunshine wattle                | Endangered                        | Not Sensitive         | Endangered                  |                              |
| Plantae  | Flora    | <i>Dillwynia tenuifolia</i>                     |                                | Vulnerable                        | Not Sensitive         | Not Listed                  |                              |
| Plantae  | Flora    | <i>Dillwynia tenuifolia</i>                     |                                | Endangered Population, Vulnerable | Not Sensitive         | Not Listed                  |                              |
| Plantae  | Flora    | <i>Eucalyptus benthamii</i>                     | Camden White Gum               | Vulnerable                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Eucalyptus leucoxyloides</i> subsp. pruinosa | Yellow Gum                     | Vulnerable                        | Not Sensitive         | Not Listed                  |                              |
| Plantae  | Flora    | <i>Eucalyptus nicholii</i>                      | Narrow-leaved Black Peppermint | Vulnerable                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Eucalyptus scoparia</i>                      | Wallangarra White Gum          | Endangered                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Grevillea juniperina</i> subsp. juniperina   | Juniper-leaved Grevillea       | Vulnerable                        | Not Sensitive         | Not Listed                  |                              |
| Plantae  | Flora    | <i>Grevillea parviflora</i> subsp. parviflora   | Small-flower Grevillea         | Vulnerable                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Isotoma fluviatilis</i> subsp. fluviatilis   |                                | Not Listed                        | Not Sensitive         | Extinct                     |                              |
| Plantae  | Flora    | <i>Macadamia integrifolia</i>                   | Macadamia Nut                  | Not Listed                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Macadamia tetraphylla</i>                    | Rough-shelled Bush Nut         | Vulnerable                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Marsdenia viridiflora</i> subsp. viridiflora | Native Pear                    | Endangered Population             | Not Sensitive         | Not Listed                  |                              |
| Plantae  | Flora    | <i>Micromyrtus minutiflora</i>                  |                                | Endangered                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Persoonia mollis</i> subsp. revoluta         |                                | Vulnerable                        | Not Sensitive         | Not Listed                  |                              |
| Plantae  | Flora    | <i>Persoonia nutans</i>                         | Nodding Geebung                | Endangered                        | Not Sensitive         | Endangered                  |                              |
| Plantae  | Flora    | <i>Pimelea spicata</i>                          | Spiked Rice-flower             | Endangered                        | Not Sensitive         | Endangered                  |                              |
| Plantae  | Flora    | <i>Pultenaea parviflora</i>                     |                                | Endangered                        | Not Sensitive         | Vulnerable                  |                              |
| Plantae  | Flora    | <i>Rhodamnia rubescens</i>                      | Scrub Turpentine               | Critically Endangered             | Not Sensitive         | Critically Endangered       |                              |

Data does not include NSW category 1 sensitive species.

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Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

| LC Code             | Location Confidence  |
|---------------------|--|
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| Area Match          | Georeferenced to an approximate or general area              |
| Road Match          | Georeferenced to a road or rail corridor                     |
| Road Intersection   | Georeferenced to a road intersection                         |
| Buffered Point      | A point feature buffered to x metres                         |
| Adjacent Match      | Land adjacent to a georeferenced feature                     |
| Network of Features | Georeferenced to a network of features                       |
| Suburb Match        | Georeferenced to a suburb boundary                           |
| As Supplied         | Spatial data supplied by provider                            |

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