



Desktop Land Capability Assessment

Parwan Employment Precinct

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Abbreviations and Acronyms

Abbreviation/ Acronym	Description
ACM	Asbestos Containing Material
ASS	Acid Sulfate Soils
DEECA	Department of Energy, Environment and Climate Action
DELWP	Department of Environment, Land, Water, and Planning
EPA	Environment Protection Authority (Victoria)
ERS	Environmental Reference Standard
GQRUZ	Groundwater Quality Restricted Use Zones
GWW	Greater Western Water
HEMP	Health and Environment Management Plan
LGA	Local Government Area
MBC	Maddingley Brown Coal
NEPM	National Environment Protection Measure
PAN	Pollution Abatement Notice
PEP	Parwan Employment Precinct
PBID	Parwan Balliang Irrigation District
PRSA	Preliminary Risk Screening Advice
PSR	Priority Sites Register
PSP	Precinct Structure Plan
VPA	Victorian Planning Authority
WIN	Western Irrigation Network
WWTP	Wastewater Treatment Plant

1 Introduction

The Victorian Planning Authority (VPA) engaged SMEC Australia Pty Ltd (SMEC) to conduct a Desktop Land Capability Assessment (LCA) for the Parwan Employment Precinct (PEP).

Note that the information in this updated report (3rd revision) largely reflects the status of conditions for the precinct at the time the first edition of this report was originally issued in October 2020 to VPA, with key updates summarised below.

The key changes made in each revision of this report are summarised as follows:

- Revision 0 – Draft report provided to VPA
- Revision 1 – Minor amendments to draft report
- Revision 2 – Expanded discussion regarding potential impact of sodic soils and lava caves on PEP and facilities requiring a buffer to manage odour risks
- Revision 3 – This report has been updated to provide further information regarding management of sodic soils, discuss the potential impacts of the draft EPA Publications 1949 and 1950 (*Landfill Buffer Guideline* and *Separation Distance Guideline*) and the proposed Western Irrigation Network to the south of the PEP.

1.1 Background

SMEC understand the PEP is an area of approximately 2,552 hectares of land. A plan of the PEP is presented in Figure 1-1.



Figure 1-1 Parwan Employment Precinct (PEP) Site Investigation Area

1.2 Objectives

The objectives of the desktop LCA presented within this report were to:

- Assess the existing planning setting, land uses and environmental conditions within the study area;
- Within the PEP and surrounding buffer zones, identify:

- Areas of potential soil and/or groundwater contamination;
- Geotechnical and hydrological variables;
- Existing adverse amenity land use;
- Buffers that may affect the viability of developing land; and
- Provide recommendations on the existence and management of sodic soils.

1.3 Scope of Works

1.3.1 Environmental and Contaminated Land Assessment

A desktop review was undertaken, applying the principles of Schedule B2 of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (amended 2013). The purpose of the desktop assessment was to identify potential contamination source areas, potential affected media and potential receptors of contamination. As part of the desktop review, SMEC undertook the following:

- A project kickoff meeting between SMEC, VPA and Moorabool Shire Council to discuss known existing and historic land uses and planning permits in the study area as well as surrounding properties, where relevant that may result in soil and groundwater contamination and adverse amenity land uses.
- A review of available geotechnical, hydrological and environmental information (i.e. geological maps, historical aerial photography, planning overlays, etc.).
- Review of relevant regulatory and planning guidelines and applicable Australian Standards.
- Identification and review of the significance of the Lava caves within the PEP.
- Review of relevant regulatory information, including:
 - EPA records including the 'Priority Sites Registry', the list of issued 'Certificates and Statements of Environmental Audit' and to determine any identify any known Existing land uses or developments that may result in significant impacts on the environment, amenity and human health due to pollution and waste.
 - Department of Environment, Land, Water, and Planning (DELWP) records. Note DELWP is now called Department of Energy, Environment and Climate Action (DEECA).
 - Melbourne Water and Greater Western Water (GWW, previously called Western Water).
 - Department of Jobs, Precincts and Regions (DJPR) regarding the location of existing and past quarries or earth resources. Note DJPR is now called Department of Jobs, Skills, Industry and Regions.
- Review of any previous or current reports commissioned by Council, the VPA and Melbourne Water regarding contamination, adverse amenity uses, and geological and hydrological conditions, in or within the vicinity of the study area.
- Review and validation of any previous or current publicly available reports regarding contamination, adverse amenity land uses and buffers established in the Bacchus Marsh Urban Growth Framework and Maddingley Planning Study.
- Review of Australian Heritage Databases specifically for historic uses related to the potential for contamination.
- Identification of the presence and severity of sodic soils within the precinct based on available mapping.
- The identification of natural waterway and wetland features (and any other surface water features).

1.3.2 Geotechnical Assessment

To determine the potential for geotechnical constraints, SMEC undertook a desktop study of the study area. No invasive geotechnical investigations were conducted.

The desktop study included a review of published information relating to the site including published geological and soil zoning maps, lithological and groundwater data available in the Victorian Groundwater database and our experience in the area. Aerial imagery and contour mapping was reviewed to assess any potential topographic or geomorphological features which may be a constraint to development. The results of the assessment are presented in Section 5.

2 General Precinct Information

The general precinct information is summarised below.

Table 2-1: Parwan Employment Precinct (PEP) General Information

Precinct name:	Parwan Employment Precinct (PEP)
Precinct location:	The area bound by Parwan Creek to the west, Parwan Precinct Structure Plan (PSP) area to the north, Nortons Road and GWW's Parwan recycled water plant (WWTP) to the east and Nerowie Road to the south. The precinct boundary is provided in Appendix A, Figure 1.
Total precinct area:	2,552 hectares (approximately)
Local government area:	Moorabool Shire Council
Current zonings:	<ul style="list-style-type: none"> • Farming Zone (FZ) • Road Zone – Category 2 (RDZ2) • Special Use Zone – Schedule 1 (SUZ1) • Industrial 1 Zone (IN1Z); • Comprehensive Development Zone – Schedule 1 (CDZ1)
Current overlays	<ul style="list-style-type: none"> • Design and Development Overlay – Schedule 2 • Environmental Significance Overlay – Schedule 2 • Environmental Significance Overlay – Schedule 4 • Development Plan Overlay – Schedule 1 • Airport Environs Overlay
Current precinct uses:	<ul style="list-style-type: none"> • Agriculture and associated incidental Land Uses: <ul style="list-style-type: none"> ○ Gravel Roads ○ Storage ○ Machinery Maintenance ○ Residential housing • Class C Recycled water supply and irrigation customer use (eg. pivot irrigation immediately south of GWW's Parwan Wastewater Treatment Plant (WWTP)). • Roads and Road Reserves • Intensive agriculture (poultry and mushroom production) • Motocross facilities/ raceway • Horse training • Airport and associated facilities • Industries including fertiliser suppliers • Quarrying

	<ul style="list-style-type: none"> Animal rendering (EPA approved Development Licence no. DL000223070, under construction) and future abattoir site (no Development Licence Application has been made yet to EPA)
Proposed precinct use:	<ul style="list-style-type: none"> Commercial Agricultural Industrial
Previous known environmental Audits:	No Record Available at the Time of Reporting

2.1 Precinct Description

The precinct boundary is shown in Appendix A, Figure 1.

The surrounding land uses include:

- North – Agricultural (mostly dryland), solid inert landfill, composting facility, coal mine, motocross club;
- East – agricultural (mostly dryland), GWW's Parwan WWTP;
- South – agricultural including the proposed Class C recycled water scheme supply area known as the Western Irrigation Network (WIN) currently being established by GWW immediately south of the PEP; and
- West – agricultural (mostly dryland).

2.2 Inspection of Precinct Lands

An drive-over inspection was undertaken on 3 September 2020 of readily viewable properties across the PEP from fencelines using publicly accessible roadways and viewpoints. Private properties were not accessed as part of the precinct inspection. The precinct inspection focussed on specific properties where the desktop assessment identified potential contamination. Records and photographs from the inspection are presented in Appendix B.

The outcomes of the precinct inspection are summarised in Table 2-2 and full inspection records and photographs are provided in Appendix B, the location of the following sites is shown on Figure 2 of Appendix A.

Table 2-2 Outcomes of PEP Inspections

Site ID and Land Use	Property Address	Identified Land Use and Potential Sources of Contamination
1. Broiler Farm	4050 Geelong-Bacchus Marsh Rd	Broadacre cropping and sheds containing poultry and other agricultural work, onsite wastewater treatment and disposal to land
2. Mushroom Farm (Parwan Valley Mushrooms)	12 Aerodrome Rd, Parwan	Industrial buildings, yards, sheds, shipping containers, pallets, gravel stockpile, dam, above ground fuel storage
3. Storage/dumping of vehicles/machinery	229 Smiths Rd Parwan	A large number of vehicles and machinery observed to be disposed and stored at this site
4. Storage/dumping of vehicles/machinery and spoil	4265 Geelong-Bacchus Marsh Rd	Viewed from moving car. Appears to be residential property with horses

Site ID and Land Use	Property Address	Identified Land Use and Potential Sources of Contamination
5. Storage of spoil	135 Smiths Road, Parwan	Residential property with significant amount of uncontrolled waste, IBCs, dam and generally in poor condition
6. Future Animal rendering plant and abattoir (L&G Meats)	3922 Geelong Bacchus Marsh Road	Future rendering plant (EPA approved Development Licence DL000223070 , under construction) and abattoir (proposed) at this site. Further public information on this project is available on Engage Victoria website: https://engage.vic.gov.au/project/epa-development-licences/page/l-g-meats
7. Raceway and quarrying activity	429 Parwan South Road	
8. Airport	Bacchus Marsh Airport (including associated land parcels)	Runway and airport buildings Chemical and fuel storage Possible fire retardant use and/or storage
9. Lava Caves	65 Parwan South Rd, Parwan	Lava caves on private land. Only able to view from road. Unable to assess the extent and condition of the lava caves.
10. Recycled water pivot irrigation site	Lot 1 on plan of Subdivision 328177, Parwan South Rd, Parwan	GWW Class C recycled water customer immediately south of GWW's Parwan WWTP. Total 25 ha under irrigation - two centre pivot irrigation points, 12.5 ha each. This recycled Water use scheme is subject to Recycled Water Agreement with GWW and EPA exemption/A14 Permit.

2.3 Acid Sulphate Soils

A search of the Commonwealth Scientific and Industrial Research Organisation (CSIRO) 'Atlas of Acid Sulfate Soils' was conducted to assess the presence of acid sulphate soils within the Precincts or 1 km investigation buffers around each Precinct Part.

There is an extremely low (1-5%) probability of occurrence of acid sulphate soils within the majority of the precinct area. Areas with a low (6-70%) probability of occurrence of ASS at the north of the precinct at 55 Cummins Road, where the Bacchus Marsh motocross club is located. There is an isolated area with a high (>70%) probability of occurrence of ASS at 3922 Bacchus Marsh Road.

2.4 Hydrogeology

2.4.1 Groundwater Depth

Groundwater depth varies from less than 5m to 50m. Shallow groundwater (less than 5m below ground level) occurs across the majority of the Precinct, as presented in Table 2-3. Information regarding the depth to groundwater is presented in Appendix C.

Table 2-3 Distribution of groundwater depth across the precinct

Depth Range (mbgl)	% of Total Area
<5	>64%
10 to 20	11%
5 to 10	8%
20 to 50	12%

2.4.2 Groundwater Salinity

In accordance with the Environmental Reference Standard (ERS) 2021 gazetted (no. S245, May 2021) under the new Environment Protection Act 2017, salinity is used to determine potential beneficial uses of groundwater. Groundwater salinity at the precinct ranges from 7,000 to 13,000mg/L of Total Dissolved Solids (TDS) based on modelling provided by Visualising Victoria's Groundwater.

Based on the review of publicly available data for TDS, the groundwater segment is likely to be Segment E. The potential environmental values of groundwater required to be protected for future potential use are summarised in Table 2-4.

Table 2-4 Groundwater Environmental Values that apply to the groundwater segments (Table 5.3 of ERS 2021)

Environmental Values	Segments (mg/L TDS)						
	A1	A2	B	C	D	E	F
	(0 – 600)	(601 – 1,200)	(1,201 – 3,100)	(3,101 – 5,400)	(5,401 – 7,100)	(7,101 – 10,000)	>10,001
Water dependent ecosystems and species	✓	✓	✓	✓	✓	✓	✓
Potable water supply - desirable	✓						
Potable water supply – acceptable		✓					
Potable mineral water supply	✓	✓	✓	✓			
Agriculture and irrigation (irrigation)	✓	✓	✓				
Agriculture and irrigation (stock watering)	✓	✓	✓	✓	✓	✓	
Industrial and commercial	✓	✓	✓	✓	✓		
Water-based recreation (primary contact recreation)	✓	✓	✓	✓	✓	✓	✓
Traditional Owner cultural values	✓	✓	✓	✓	✓	✓	✓
Buildings and structures	✓	✓	✓	✓	✓		
Geothermal properties	✓	✓	✓	✓	✓	✓	✓

2.4.3 Groundwater Extraction

A review of licensed groundwater bores within the precinct and the surrounding precinct area was conducted and is presented in Appendix C. There are four licenced groundwater bores located within the PEP which are summarised in Table 2-5.

Table 2-5 Summary of groundwater extraction within PEP

Bore ID	Registered Use
136243	Stock
87796	Not known
WRK067666	Observation
942649	Exploration

Groundwater bores within 2km of the precinct were investigated to understand the degree of regional groundwater utilisation. There are multiple bores within 2km of the precinct, predominately located to the north indicating regional groundwater utilisation for irrigation, investigation, dewatering, industrial, commercial, stock and domestic. Groundwater bores are presented in Appendix C.

2.5 Surface Water

A small area of the precinct is located within the 1 in 100-year flood extent, in the vicinity of Parwan Creek at the north and north-western extent of the precinct. The flood extents are presented in Appendix D.

The majority of the precinct is generally flat, with the western part of the precinct sloping gently towards the north/north-west, and the central part of the precinct gently sloping to the east. The precinct slopes steeply towards the Parwan Creek at the north/north-western precinct extents.

There are no permanent natural waterways within the precinct, although some farm dams and local natural landlocked depressions may receive surface water flows from localised catchments. There are several small wetlands (some of these also landlocked) throughout the precinct which are presented in Table 2-6. Note that biodiversity assessment mapping including several other wetland areas was identified in the report: "Biodiversity Assessment: Parwan Employment and Parwan Precinct Structure Plan" (July 2020), Ecology & Heritage Partners .

Table 2-6 Wetlands within PEP

Affected Parcel(s)	Location	Approximate Area
Lot 2 PS520698	South-western part of PEP	5.4 hectares
Lot 1 TP88461 Lot 2 TP188461 PC362391	South-central to PEP	25.5 hectares

Mapping showing the site topography is presented in Figure 3 of Appendix A.

At the time of writing this report the Moorabool Shire Council was undertaking a Planning Scheme Amendment (Amendment C91). Amendment C91 of the Moorabool Shire Scheme was gazetted on 18th March 2022. Amendment C91 applies the Land Subject to Inundation Overlay (LSIO) and the Special Building Overlay (SBO) to land affected by a 1% AEP flood event, in the eastern portion of Moorabool Shire which includes areas in and around PEP.

2.6 Ecological Constraints

2.6.1 Native Vegetation

A search of the DELWP (2015) National Vegetation Database was conducted, which identified the presence of the endangered Ecological Vegetation Communities (EVCs) within the PEP, as summarised in Table 2-7. The presence of

these EVCs may act as a constraint on development, triggering requirement for planning permits. Native vegetation mapping is presented in Appendix F.

Table 2-7 Summary of modelled native vegetation within PEP

EVC Name	EVC Code	Conservation Status	Geographic Occurrence
Plains Grassy Woodland	55	Endangered	Common
Creekline Grassy Woodland	68	Endangered	Common
Plains Grassy Wetland	125	Endangered	Common
Plains Grassland	132	Endangered	Common
Lignum Swamp	104	Endangered	Rare
Plains Grassy Woodland/ Plains Grassland Mosaic	693	Endangered	NA

Modelled native vegetation is spread throughout the precinct, with the greatest occurrence in the vicinity of the Parwan Creek.

2.6.2 Groundwater and Inflow Dependent Ecosystems

Searches of the Bureau of Meteorology (BoM; 2017) Groundwater Dependent Ecosystems (GDE) Atlas and Inflow Dependent Ecosystems (IDE) Likelihood Database were conducted to assess for the potential presence of ecosystems within the Parwan PEP dependent on groundwater (which may be extracted or impacted as a result of proposed redevelopment) or inflow (which may be amended by drainage modifications due to development). A summary of the findings is presented in Table 2-8 and Table 2-9.

Please note: the GDE and IDE are related to the presence of rivers, wetlands and EVCs as identified in other sections of this report. As wetlands are potentially sensitive environmental receptors, these are listed if within 350 m of the precinct.

Table 2-8 Groundwater Dependent Ecosystems within PEP

Groundwater Dependent Ecosystems (GDE) Potential	GDE Type	Ecosystem Type	Aquifer Geology	Distance to site
High	Aquatic	Aquatic (Dog Trap Gully)	Fractured rock	Onsite
High	Aquatic	Aquatic (Parwan Creek)	Unconsolidated sedimentary	Onsite
Low to High	Terrestrial	Vegetation	Fractured rock / unconsolidated sedimentary	Onsite
Moderate to High	Aquatic	Wetland	-	Onsite
High	Aquatic	Wetland	-	173m

Table 2-9 Inflow Dependent Ecosystems within PEP

Inflow Dependent Ecosystems (IDE) Potential (out of 10)	IDE Type	Ecosystem Type	Aquifer Geology	Distance to site
1 to 7	Aquatic	Wetland		Onsite

1	Aquatic	River (Dog Trap Gully)	Fractured rock	Onsite
1 to 6	Aquatic	River (Parwan Creek)	Unconsolidated sedimentary	Onsite
2 to 9	Terrestrial	Vegetation	Fractured rock / Unconsolidated sedimentary	Onsite
6	Aquatic	Wetland		173m
3	Aquatic	Wetland		285m

The full database search results are presented in Appendix F.

A review of Ramsar-listed wetlands was conducted and is presented in Appendix F. There are no Ramsar-listed wetlands within the precinct investigation area.

3 Precinct Current and Historical Land Use Context

3.1 Historical Aerial Photographs and Maps

A review of historical aerial imagery and maps of the precinct dated between 1951 and 2019 was undertaken to identify former land use which may present a potential contaminated land risk, summarised as follows:

- 1951 – the precinct is undeveloped except for several residential/agricultural buildings and the aerodrome, located in the central-eastern part of the precinct. Several small buildings associated with the aerodrome are visible at the eastern end of the runway. A wetland is evident at 3922 Geelong-Bacchus Marsh Road. The Maddingley open cut coal mine is evident to the north-west of the precinct from aerial photographs.
- 1985 – between 1951 and 1985, the motocross track located to the north-west of the precinct was constructed, as well as additional residential/agricultural properties and buildings;
- 2006 – GWW's Parwan wastewater treatment plant (WWTP) (established in 1994) now evident offsite to the east, consisting of seven large lagoons and irrigation areas; Parwan Motocross track is visible at 395 Parwan South Rd;
- 2009 – Bacchus Marsh School of Aviation (Pilot Training) and Gliding Clubs identified on 2009 Melways map;
- 2019 – eight long sheds and wastewater lagoons (likely poultry) constructed at 4050 Geelong-Bacchus Marsh Road between 2014 and 2019.

Refer to Appendix G for historical aerial images.

3.2 Historical Business Directories

The Universal Business Directory and Sands and McDougall Directory records were searched to identify businesses located within the precinct area and 1km investigation buffer between 1905 and 1991. The following businesses are located within PEP:

- Bacchus Marsh School of Aviation (also listed under the following names: Beaufort Gliding Club, Victorian Motorless Flight Group) located at Aerodrome Road, Bacchus Marsh, was listed in 1991 as a flying school/club and/or sporting body.

3.3 EPA Records

A review of Environment Protection Authority Victoria (EPA) records was conducted on 13 August 2020 and is presented in Appendix H.

The Priority Sites Register (PSR) records locations where the EPA has issued a Clean-Up Notice or Pollution Abatement Notice (PAN) under the old Environment Protection Act 1970 (now revoked) for a site typically known to contain polluted soil and/or groundwater that may pose a risk to human health or to the environment.

The PSR does not list all sites known to be contaminated in Victoria and as such a site should not be presumed to be free of contamination if it does not appear on the PSR. Note that under the new Environment Protection Act 2017, the equivalent notices are now called: Environment Action Notices, Site Management Orders, Improvement Notices and Prohibition Notices. Note this updated report has not updated the PRS search which was conducted in August 2020 and reported in SMEC's original PEP report. As of 13 August 2020, no sites listed on the current or former EPA Victoria PSR were identified within the precinct investigation area. No other current PANs or other Notices were identified within the precinct area.

No Groundwater Quality Restricted Use Zones (GQRUZ) were identified within the precinct area or within 1km of the precinct area.

No currently EPA licensed activities were identified within the precinct area. Offsite licenced activities within the 1km investigation buffer are summarised below:

- GWW's Parwan WWTP operates under EPA operating licence [OL000070755](#) and is located directly adjacent to the precinct to the east. The WWTP treats sewage and abattoir wastewater to a Class C standard prior to discharge to land onsite as well as to offsite customers (currently immediately south of the WWTP). GWW has been issued with pollution abatement notices for pond seepage and groundwater protection.
- The Maddingley Brown Coal Landfill is currently subject to an EPA licence which enables the precinct to deposit to land solid inert waste, tyres shredded into pieces, paper pulp, waste acid sulphate soils, metal recycling

residue, prescribed industrial waste and solid wastes. The licence also enables composting onsite. The landfill site has former and current pollution abatement notices.

No environmental Audit overlays or Environmental Audits were identified to exist or have been conducted within the precinct investigation area. Offsite Environmental Audits within the 1km investigation buffer are summarised below:

- Maddingley Brown Coal Landfill directly to the west of the precinct is subject to audit recommendations under Section 53V of the Environment Protection Act 1970.

As of 13 August 2020, areas within the PEP that are subject to EPA works approval are summarised in Table 3-1.

Table 3-1 Development Licences / Works Approvals within PEP

Address	Organisation	Development Licence or Works Approval Status	Scheduled Categories
3922 Geelong-Bacchus Marsh Road	L&G Meats	Approved/ Issued	D02 Rendering* *Works for the manufacture or extraction of animal substances not for human consumption, with a throughput of more than 200 tonnes per year
4050 Geelong Bacchus Marsh Road	Geofry Farm	Approved/ Issued	Works Approval Exemption
Aerodrome Road	Dandy Aircraft Pty Ltd	Approved/ Issued	Exempt under 19A(4): installation of a wastewater treatment plant

A Development Licence (previously called works approval under the now revoked Environment Protection Act 1970) is required where a proposed development is deemed by the EPA to potentially result in a risk of environmental harm and are most commonly required for scheduled premises. The Development Licence application (DLA) is reviewed by the EPA and where approved an operating licence will be issued by the EPA which contains specific conditions in relation to managing specific risks to the environment.

Note that since the original PEP report, EPA has developed a [Public Register of Permissions](#). This updated report does not provide details of all sites that have permissions under the new EP Act 2017. The EPA permission register can be easily searched using “Parwan”. To illustrate, a quick search (on 24 March 2023) of this register using “Parwan” permissions identifies the following list of permit holders (expired and active):

- L&G Meats (Development Licence for Rendering - expired)
- Dandy Aircraft Pty Ltd (Sewage Treatment, and A14 wastewater supply/use) (current)
- Stankovic Land Trust (unknown activity, current)
- City West Water Corporation and Greater Western Water (sewage treatment) (current)
- Shinboner Nominees (A14 permit discharge to aquifer) (current).

Further searches of this register can be easily made using neighbouring suburbs (Maddingley, Bacchus Marsh, Eynsebury, Balliang, etc) or postcodes to identify further EPA sites with statutory permissions. Note that these additional searches were not undertaken for this updated report.

3.4 Review of Previous Reports

The following background reports were made available by VPA for review:

- Centrum Town Planning, Maddingley Planning Study Background Report, March 2019 (Centrum, March 2019)
- Pacific Environment, *Draft Bacchus Marsh Urban Growth Framework Parwan Buffer Assessment* (AQU-VC-005-21862), 26 June 2017 (Pacific Environment, June 2017)
- Reeds Consulting, *High Level Servicing and Infrastructure Assessment Report of Parwan Station PSP and Parwan Employment Precinct*, April 2020 (Reeds Consulting, April 2020).

Summaries of the Centrum and Pacific reports are provided below.

3.4.1 Centrum, March 2019

The purpose of the Maddingley Planning Study was to provide the strategic foundation for potential changes to the Moorabool Planning Scheme that will guide future land use and development within amenity buffers of the Maddingley WRR Hub and other industrial uses.

The report concluded the key challenges for the Maddingley Planning Study are considered to be:

- how to protect and plan for a waste hub of state significance at the local level;
- how to formally recognise existing buffers in the Planning Scheme, particularly the amalgamated MBC coal and composting buffer, including consideration of the Best Practice Environmental Management (BPEM) (EPA Publication 788.3 *Siting, design, operation and rehabilitation of landfills*) to reduce buffer requirements;
- how to develop policies and provisions for the operation of buffers both within and outside the Planning Scheme;
- how to appropriately apply zones in conjunction with any other buffer tools;
- determining whether it may be possible to use the industrial zones more extensively;
- reviewing the provisions of the Special Use Zone (SUZ1);
- determining the type and level of infrastructure that might be required to attract industry and development activity;
- identifying a suitable framework for identifying and levying infrastructure costs that should be shared;
- gaining community and stakeholder support for the Maddingley Planning Study; and
- how to balance competing objectives in the absence of a full evidence base to measure different social, economic and environmental outcomes.

3.4.2 Pacific Environment, August 2017

The report provided a buffer assessment of a number of sites within and surrounding the PEP and Parwan PSP area.

The study area included within the Pacific Environment August 2017 report is shown in Figure 3-1.



Figure 3-1: Study Area (Pacific Environment, August 2017)

The assessment focused on the following sites:

- GWW's Bacchus Marsh wastewater treatment plant (WWTP) also known as the Parwan Recycled Water Plant
- Maddingley landfilling and composting operations
- the mushroom farm on Geelong Bacchus Marsh Road
- the broiler farm on Browns Lane
- the broiler farm on Geelong Bacchus Marsh Road.

The assessment also included a review of the buffer distance which should apply to the sand quarries north of Bacchus Marsh.

Separate conclusions were made for each of the sites.

3.4.2.1 GWW's Bacchus Marsh WWTP at Parwan

The guideline separation distance of 1,400 m for the current plant capacity of 20,000 Equivalent Population was found to be an appropriate separation distance that accommodates increased treatment loads of the current plant design in combination with additional odour controls for the inlet works and also future mechanical treatment plant upgrades (including odour control). It was noted that the treatment plant is located to the south, and in the summer time prevailing wind direction is towards the north. The report concluded the separation distance is considered sufficient for normal operations. Suitable planning controls were recommended to ensure the cumulative odour impacts to the proposed residential area to the north are taken into consideration in the future development.

3.4.2.2 Maddingley landfilling and composting operations

The guideline separation distance for the solid inert waste landfill operation is 200 m. This separation distance was found appropriate for the solid inert waste landfilling operations. However, it is noted that the landfilling odour impacts sit well within the odour footprint from the composting operations. The dispersion modelling of the composting operations showed odour impacts at greater distance to the east of the site compared to the west of the

site. The guideline separation distance for the composting operations is specified as 2,000 m or greater. In the discussion of the preliminary results from the dispersion modelling the EPA expressed a strong preference for a minimum separation distance of 2,000 m based on uncertainty regarding the composting operations and the lack of licence limits on production. The western boundary of Parwan PSP area was drawn based on the 2 km separation distance from the composting activities. The dispersion modelling confirmed this as a recommended separation distance to the east of the facility and also showed that a separation distance reduced to 1,500 m to the west of the facility can be recommended. Improved composting practices would result in improved odour performance.

No reduction in the required buffer distance has been agreed to by EPA Victoria.

3.4.2.3 Mushroom farm on Geelong Bacchus Marsh Road

There is no guideline separation distance specified for mushroom and substrate production, it is to be determined on a case by case specific basis. The dispersion modelling showed small odour footprints for existing operations and the potential future onsite production of substrate as for an enclosed facility. The largest distances in the odour footprints, from the site boundaries, for the two scenarios were 200 m and 400 m. It was concluded odour from the mushroom farm, which is located within the PEP, does not have the potential to impact on the Parwan PSP area.

3.4.2.4 Broiler farms on Browns Lane and Geelong Bacchus Marsh Road

The calculated guideline separation distances for the 51 Browns Lane and 4050 Geelong-Bacchus Marsh Road broiler farms are 425 m and 686 m respectively. Browns Lane broiler farm is located within Parwan PSP area, approximately 230 m to the north of the PEP. The Geelong Bacchus Marsh Road broiler farm is located within the PEP. The dispersion modelling, assessing these two sites cumulatively, show odour impacts at higher levels than any other of the sites included in the assessment. As assessed against the Victorian Odour Environmental Risk Assessment (OERA) guideline a medium level of risk is predicted across the Parwan PSP area. However, this level of risk is based on the risk rating relating to the frequency of lower odour concentrations. Modelling showed that lower levels/concentrations of odour are predicted to occur on occasion across the proposed residential area of the Parwan PSP area, which is situated to the north of the PEP.

3.4.3 Reeds Consulting, April 2020

The report was a high level servicing report to provide an infrastructure assessment for the PEP and Parwan PSP area. The report concluded Parwan is currently serviced by scattered infrastructure that is generally already at capacity and significant extensions will be required to service the future development of the precincts.

The report was of little relevance to the objectives of this investigation.

3.5 Western Irrigation Network

Greater Western Water's The Western Irrigation Network (WIN) is a major new recycled water irrigation scheme in the Parwan-Balliang agricultural district ~7 km south of Bacchus Marsh, providing Class C recycled water suitable for irrigation farming. The Class C quality recycled water is to be sourced from both Parwan WWTP (located directly adjacent to the PEP) and Melton WWTP.

Stage 1 of the project involves new infrastructure to connect the Melton and Parwan WWTPs to distribute recycled water to several foundation irrigation customers in the Parwan-Balliang area. Sunbury WWTP may be connected to the WIN in the future subject to irrigation demand and business case assessment.

Upon completion of the WIN establishment, 2.4 billion litres of recycled water per year could be supplied to up to 1,500 hectares of irrigation land across multiple properties in the (to be proclaimed) Parwan – Balliang Irrigation District (PBID). The recycled water scheme could expand to up to 18 billion litres by 2050 with the interconnection of recycled water from Sunbury WWTP (Greater Western Water, 2023).

The PEP is within the WIN project area, as shown in Figure 3-2. Stage 1 of the WIN project will be to the PBID in Parwan South and Balliang area indicatively as shown in Figure 3-2. The PBID includes the PEP area. Supply to the PBID is expected to commence in summer 2023-24.

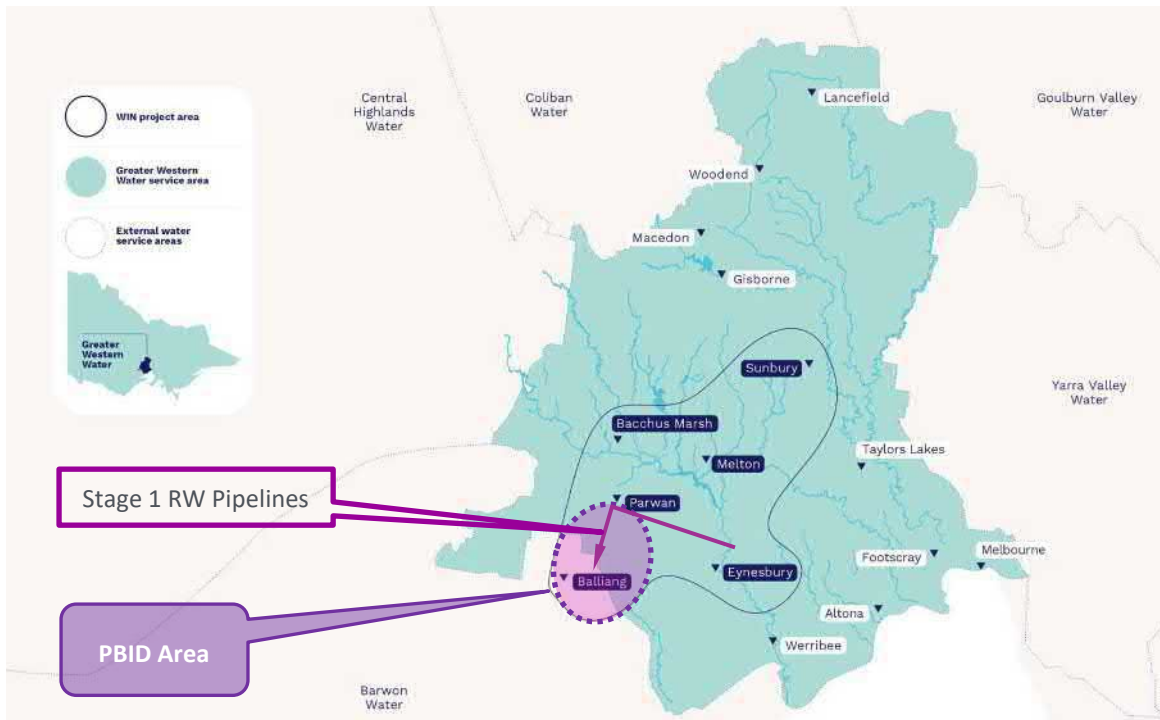


Figure 3-2 Western Irrigation Network Project map (Greater Western Water, 2023)

GWW lodged an EES referral for the WIN project to the Planning Minister for decision on the need for assessment under the Environmental Effects Act 1978. In August 2021 the Minister confirmed that the WIN project did not require an EES, subject to conditions and recognising that potential effects could be addressed through the requirements of the Environment Protection Act 2017 including EPA Permissions for the recycled water scheme.

Guidance for the supply and use of recycled water in Victoria is provided in EPA Publication 1910.2 – *Victorian guideline for water recycling* (EPA, 2021), EPA Publication 1911.2 – *Technical information for the Victorian guideline for water recycling* (EPA, 2021) and EPA Publication 168.3 – *Victorian guideline for irrigation with recycled water* (EPA, 2022).

EPA’s “Victorian guideline for water recycling” (Publication 1910, 2021) and associated EPA permissions requires the supply and use of recycled water to be managed and monitored in accordance with a documented “Health and Environmental Management Plan” (HEMP).

The WIN requires a Health and Environment Management Plan (HEMP) to be prepared and approved by the EPA which assesses and manages risks to human health and the environment, details performance objectives of the network and provide a framework for assessing the sustainability of the network. Irrigation would typically be supported by a site-specific assessment of land capability for irrigation with recycled water, which considers proximity to sensitive uses. Indicative buffer distances to sensitive receptors are provided, which varies according to water quality and irrigation method.

GWW is currently preparing the WIN HEMP for submission to EPA Victoria. The WIN HEMP details how GWW will safely and sustainably manage recycled water supply and use in the PBID in accordance with EPA guidelines and the conditions of the EPA Permission for the WIN.

Indicative buffer distances for Class C irrigation are:

- Non-spray methods (ie. flood): 0 metres
- Pivot spray irrigation (relevant to the WID) and other sprinkler methods: >100 metres

Buffer distances provided are indicative and risk assessment is recommended to be undertaken by irrigators, assessing irrigation method and site-specific controls. Buffer distances may also apply to surface waters. The WIN is likely to result in an increase in use of Class C recycled water for irrigation with each irrigation site requiring buffer distances between sensitive uses to be adhered to.

3.6 Council Records

The Moorabool Shire Council provided a record of sites where environmental complaints or enforceable actions have occurred. These sites are listed in Table 3-2

Table 3-2 : Council Records of Environmental Complaints or Enforceable Complaints

Site	Address	Complaints	Location
Maddingley Bown Coal	11 Tilley's Road Maddingley	Dust, loose rubbish, odour and other EPA issues	<u>Outside of PEP and Parwan PSP area</u>
Parwan Mushroom Farm	12 Aerodrome road Parwan	Odour	<u>Within PEP</u>
Broiler Farm	51 Browns Lane Parwan	Odour and noise	<u>Within Parwan PSP area (north of Parwan PEP)</u>
Bacchus Marsh Aerodrome	145 Aerodrome Road Parwan	Odour, noise (had an ongoing septic issue that has now been resolved)	<u>Within PEP</u>

Council records have been used to support the identification of sites with potential contamination and/or amenity impacts.

3.7 Sodic and Dispersive Soils

3.7.1 Assessing the presence of sodic and dispersive soils

As requested by VPA, SMEC conducted a high-level review of the sodic and dispersive soils within the study area to determine the extent of these site features and the potential constraints to the future development of the precinct.

Soil sodicity is reported as Exchangeable Sodium Percentage (ESP) and is a measure of the exchangeable sodium in relation to other exchangeable cations in soil. A soil with an ESP greater than 6 % is generally considered sodic.

To assess the soil sodicity within the study area a review of soil mapping from Victorian Resources online (VRO) was conducted. The extent of sodic soils and lava caves within the PEP is shown in Figure 3, Appendix A.

Surface soils in the western portion of the PEP are generally classified as Sodic with an ESP of 6-15%.

Surface soils in the eastern portion of the PEP are generally classified as Strongly Sodic with an ESP of 15-25%.

In addition to the ESP reported for the different areas of the precinct the slope is a critical factor when assessing the impact of sodic soils on a land development site. Areas of steep sloping sodic soils represent a greater risk of erosion. Figure 3 of Appendix A shows the topography of the precinct area. Steeper areas will require greater care when exposing soils to manage risk of erosion.

Figure 3-3, Figure 4-2 and Figure 4-3, whilst not available at a high resolution, are also presented to demonstrate that sodic and dispersive soil profiles are widely distributed all across Victoria and the greater Melbourne urban growth area, but are more prevalent in the northern and western suburbs, in the vicinity of the PEP.

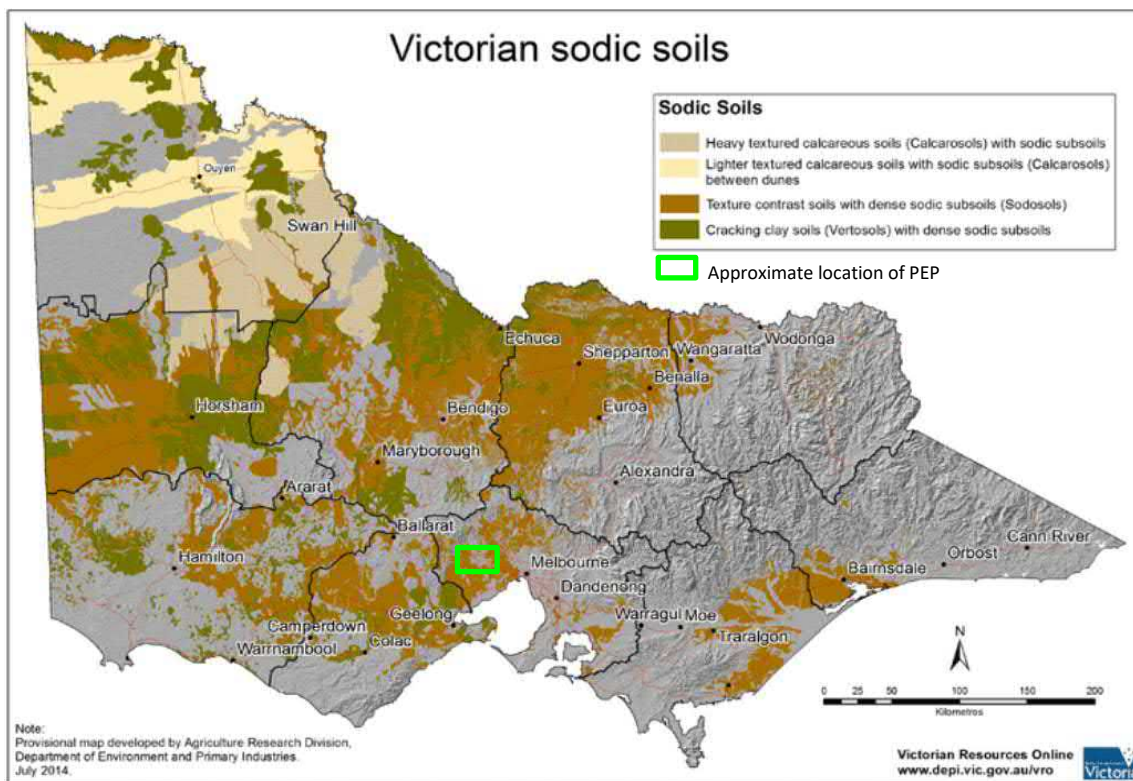


Figure 3-3 Victorian sodic soils (VRO, 2014)

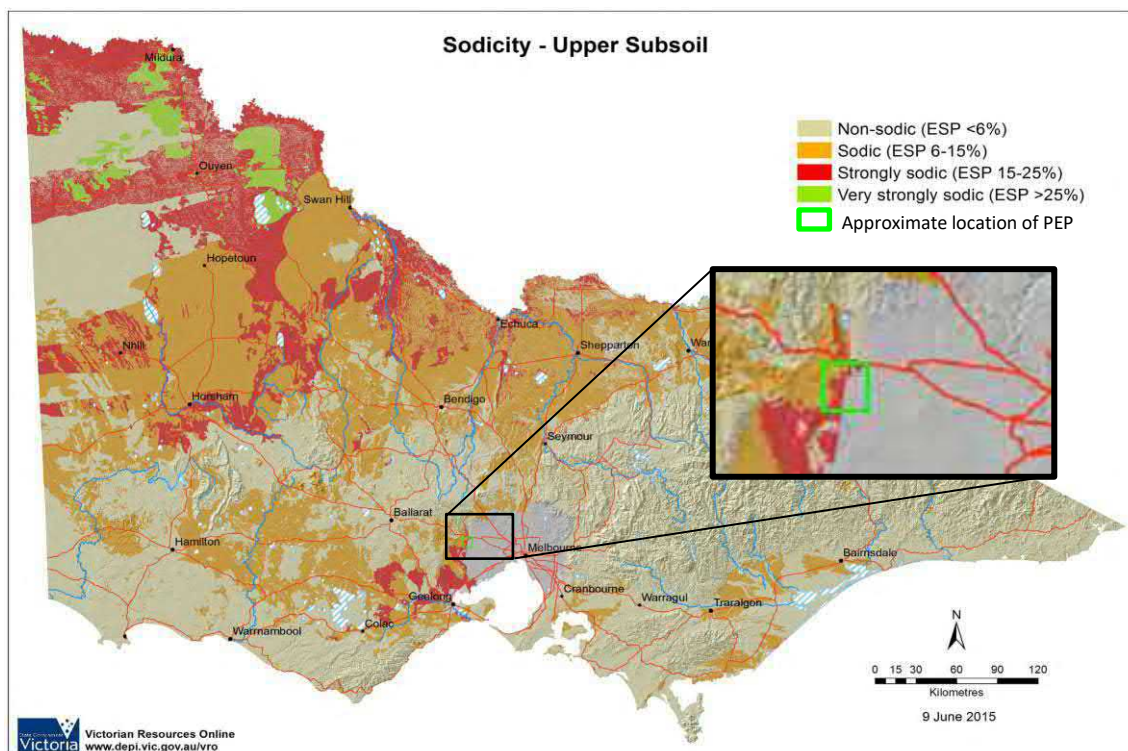


Figure 3-4 Victorian sodic soils – upper subsoil (VRO, 2015)

Note: mapping excludes Melbourne metropolitan areas, as indicated by grey shading

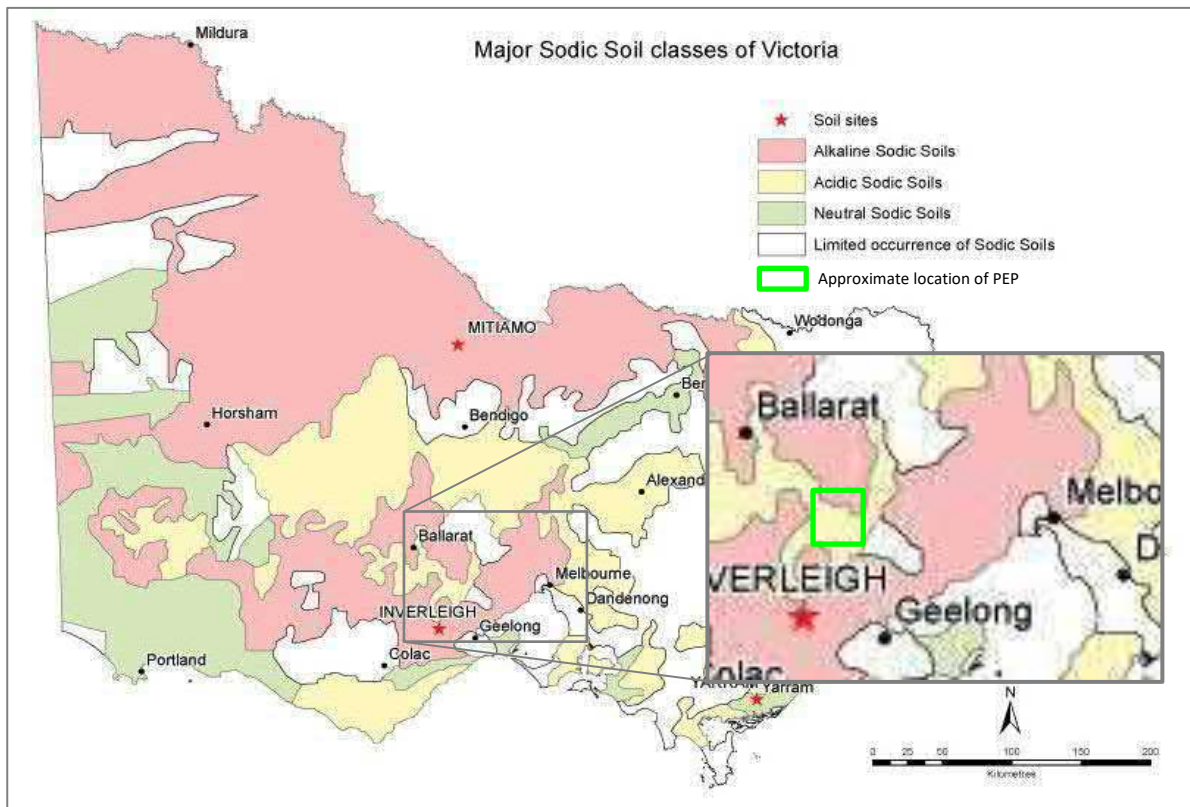


Figure 3-5 Major Sodic Soil classes of Victoria (VRO)

3.7.2 Potential impact of sodic soils

The presence of sodic soils at or near the surface may pose the following potential risks to the current and future land use:

- Once being exposed to water, sodic soils are easily eroded and transported downstream and are very difficult to contain;
- Excessive erosion presents issues relating to safety, loss of amenity, rectification of infrastructure and natural environments, and preventing movement of erosion across property boundaries;
- Sediment (turbidity) is likely to have significant adverse effects on downstream waterway environments, potentially resulting in loss of flora and fauna;
- Sedimentation and erosion caused by sodic soils exceeds the usual capacity of stormwater drainage systems and urban waterways provided in greenfield developments;
- Turbidity caused by sodic soils is very difficult to clear up and is beyond the capacity of the usual stormwater drainage quality infrastructure provided in greenfield developments (i.e. wetlands and sedimentation beds);
- Highly turbid runoff from active development flows into creeks and water courses;
- Construction activities in dispersive soils causes significant water turbidity;
- Can cause unstoppable tunnel and gully erosion;
- Where subsoil is saline, grass growth is inhibited particularly on lower slope towards drains;
- Turbid water in water features/retarding basins will lead to further increases in salinity;
- Hard surfaces and high impervious surface area in new developments leads to decreased runoff and drainage, stopping the sodic soil issue from being resolved naturally;
- Poor infiltration and increased volumes of stormwater runoff;
- Increased tunnel, sheet, rill and gully erosion;
- Increased turbidity and erosion in waterways in response to increased runoff from development areas leading to a deterioration in water quality and degradation of aquatic flora and fauna habitat;
- Failure of/or reducing functioning of interim and ultimate water sensitive urban design asset;

- Soil movement leading to failure of newly constructed and established civil and private assets;
- Poor ability to establish vegetative growth due to adverse soil chemical conditions leading to a failure to thrive for open spaces, gardens and street trees; and
- Dispersion of topsoil and subsoil.

Urban development and site construction cause significant ground disturbance, removal of vegetative ground cover and expose sodic and dispersive soils to erosion. Erosion risks are directly influenced by sodic and dispersive soil exposure and changes in landscape hydrology. Changes to hydrology, including the concentration of flow in culverts, runoff from impervious areas and ponding of rainfall contribute to increased erosion risk.

In addition to the ESP reported for the different areas of the precinct, slope is a critical factor when assessing the impact of sodic soils on a land development site. Areas of steep sloping sodic soils represent a greater risk of erosion. Figure 3 of Appendix A shows the topography of the precinct area. Steeper areas will require greater care when managing the risk of erosion.

Implications of the presence of sodic soils across the PEP are as follows:

- There is potential risk of soil erosion and sediment pollution if sodic soils (where present) are exposed, stockpiled and where water from sodic soil runoff, excavations or ponding on surface is allowed to drain offsite in an uncontrolled manner.
- Urban development and construction involving ground disturbance, and vegetation removal, can expose sodic/dispersive soils to water and wind erosion.
- If underlying clays are exposed during works, these soils will require careful management to prevent sediment pollution loads in runoff and drainage to local drainage lines.
- Erosion and sediment pollution risks are able to be routinely managed by the construction industry, and the best practice measures are well documented in industry and EPA guidance.
- Any soil profiles identified in the study area having clay in topsoil or subsoil should be assumed as having some sodic / dispersion risk that should be appropriately managed by the developer at time of making planning and development applications to Council.
- The developer should demonstrate management of construction sites in accordance with Industry Sediment and Pollution control codes (eg. IECA Best Practice Erosion and Sediment Control Guidance, and VPA's Engineering Design and Construction Manual for subdivision in Growth Areas - Addendum 19-01 Sodic and Dispersive Soils (currently in Draft)), and EPA Victoria Guidance including EPA Publication 275 *Construction techniques for sediment pollution control* including development of Erosion and Sediment Control (ESC) Plans as part of Construction Environmental Management Plan (CEMPs).

Our review indicates that sodic soils are present in surface soils across the PEP. Erosion risks associated with sodic and dispersive soils can be managed by appropriate planning and standard construction erosion control techniques however it is recommended soil disturbance be avoided in steeper areas (greater than 5% slope). Further investigation of sodic soils is recommended.

3.7.3 Management of sodic soils

The following management steps are recommended to minimise soil erosion associated with dispersive sodic soils during the land development:

- During construction works the dispersive sodic soil risk should be documented within a CEMP which lists the required controls to manage sodic soils;
- Avoiding and preventing the use of natural creeks and waterway as urban flow conveyance structures, particularly when these waterways support rare and threatened species and ecological communities;
- Alternative designs to capture, treat and reuse stormwater;
- Lining and armouring conveyance structures;
- Mechanisms to slow surface water flows, and reduce dispersive forces;
- Mechanisms to flocculate sediment from the system;
- Avoiding disturbance in the catchment to the greatest extent possible, particularly in winter and during times of summer storms;
- Early installation of ultimate permanent drainage system; and
- Provision of grassed/mulched contour banks, grassed buffer filter strips to filter potential high sediments in runoff;

- Temporary drainage control systems, including mechanically and/or chemically treated sediment ponds; and
- Diversion of 'clean' upstream water around the development site;
- Diversion of 'clean' upstream water around the development site.

In areas where soil disturbance can't be avoided during the construction phase, erosion protection measures may be required to reduce the risk of erosion of sodic soils across the PEP. Controls to be considered are listed in Table 3-3.

Table 3-3: Sodic and Dispersive Soil Controls¹

Sodic and Dispersive Soil Controls	
Preservation and treatment of topsoil	<ul style="list-style-type: none"> ▪ Preservation of A-horizon topsoil should be used to shroud sodic and dispersive subsoil in all areas across the precinct. ▪ Topsoils with clay-loam textures have a greater resilience to erosion by comparison with finer textured clay-dominant subsoils. Topsoils are also easier to stabilise from dispersion and erosion. ▪ Gypsum treatment of all topsoils to minimise dispersion of any clay within topsoil or subsoil. Gypsum treatment of topsoil is a simple, fast and cost-effective solution that can be applied without use of specialised equipment.
Undisturbed sites	<ul style="list-style-type: none"> ▪ Maintenance of topsoil across undisturbed land, preferably with grasses to provide surface soil stability and root anchorage. ▪ Maintenance of tree cover where trees exist. ▪ Groundcover including a mix of perennial grasses and larger shrubs and overstory vegetation is critical for slowing down overland flow and providing root anchorage of soil.
Disturbed sites – large scale surface disturbance	<ul style="list-style-type: none"> ▪ Minimise the amount of time land is exposed (e.g. by staging development). ▪ Apply gypsum to all topsoils for improved stability. ▪ Avoiding removal or disturbance to topsoil or vegetation until absolutely necessary. ▪ Covering dispersive subsoils with a shroud of stabilised topsoil (100-150mm) or organic matter/mulch, should works cease for any period of time or if prolonged rainfall is forecast. ▪ Consider using appropriately specified geotextile barriers and other engineering measures to protect disturbed areas particularly where there is minimal topsoil, or where steep slopes occur. ▪ Provide grassed/mulched contour banks, grassed buffer filter strips to filter potential high sediments in runoff; ▪ Re-vegetate exposed areas immediately after completion of earthworks, with specific emphasis on steep slopes. ▪ Avoid construction techniques that result in exposure of dispersive subsoils. ▪ Use alternatives to 'cut and fill' construction such as pier and pile foundations. ▪ Use of interception trenches stabilised with topsoil to catch runoff in a controlled fashion and divert flow to sedimentation ponds to capture sediments. ▪ Use of organic materials on finished surfaces to soften the impact of rainfall, filter runoff and aid the generation of seed or turf. ▪ May need to treat hard pan areas (caused by compaction by earthworks equipment) with gypsum, lime, dolomite and/or organic matter, and possibly in conjunction with deep ripping. ▪ Use of agricultural fertilisers at sound agronomic rates to expedite the process of vegetation establishment.
Disturbed sites – Trenching, culverts and drains	<ul style="list-style-type: none"> ▪ Where possible avoid the use of trenches for the construction of services i.e. water & power. ▪ If trenches must be used, ensure that repacked spoil is properly compacted. Treat with hydrated lime (subsurface treatment) and gypsum (topsoils) to limit dispersion and erosion. ▪ Consider alternative trenching techniques that do not expose dispersive subsoils. i.e. use of trenchless technology installations of utilities/services such as horizontal directional drilling ▪ Ensure runoff from hardstand areas is not discharged into areas with dispersive soils. ▪ If necessary create safe areas for discharge of runoff. ▪ Provide grassed/mulched contour banks, grassed buffer filter strips to filter potential high sediments in runoff; ▪ If possible do not excavate culverts and drains in dispersive soils.

- Following engineered design, consider placement of non-sodic soil to create appropriate road surfaces and drains without the need for excavation.
- Ensure that culverts and drains excavated into dispersive subsoils are capped with non-dispersive topsoil, gypsum stabilised (if required) and vegetated.

¹Source - *Jacobs, Sodic Soils Assessment, Beveridge North Precinct Area, 2020*

All land developers should be required to further investigate and identify potential existence of sodic and dispersive soils to assess vulnerability for erosion if exposed or disturbed.

Any soil profiles with clay in topsoil or subsoil identified in the study area should be assumed as having some sodic / dispersion risk that should be managed by the developer at time of making development applications to council.

The developer should demonstrate appropriate management of construction sites in accord with Industry Sediment and Pollution control codes (eg. IECA Best Practice Erosion and Sediment Control Guidance, and VPA's Engineering Design and Construction Manual for subdivision in Growth Areas - Addendum 19-01 Sodic and Dispersive Soils (currently in Draft)), and EPA Victoria Guidance including EPA *Construction techniques for sediment pollution control* (Publication 275) including development of ESC Plans as part of CEMPs.

ESC plans should identify effective procedures to stabilise the soils, including options such as chemical treatment of soils, careful staging of works to minimise sodic soil exposure to rainfall and overland flows, and installation of sediment collection works (silt fences, mulch berms, sediment ponds, filter dams, grass filter strips etc) as recommended in industry and EPA guidance.

3.8 Lava Caves

As requested by VPA, SMEC also conducted a high-level review of presence of lava caves within the study area to determine the extent of these site features and the potential constraints to the future development of the precinct.

Based on the review of historical geological mapping the lava caves were mapped to be present at the rear of private lands at 65 Parwan South Road, Parwan and are shown on Figure 3, Appendix A. The land on which the known lava caves exist are privately owned and not publicly accessible. Therefore, no site visit was undertaken to these caves.

Limited information was available regarding the extent and condition of the lava caves and any other potential cave locations in the precinct. A review of available information regarding the lava caves was conducted and is summarised as follows.

3.8.1 Description

Lava tubes form when the outer surface of a lava flow cools and solidifies to a hard crust surrounding a still liquid interior. This interior may drain through a breach in the solid crust, leaving an elongated hollow interior or lava tunnel.

The Parwan caves are understood to be located 8 to 10 m below the level of the land surface. There is a single entrance 1.5 m wide that descends 3 m to the floor of the cave. The roof of the main passages averages 2 m high and allows easy movement through the cave for a distance of approximately 70 metres.

This information is based on an investigation of the known lava caves in 1986 by Neville Rosengren.

3.8.2 Significance

There are few lava caves in Victoria and the Parwan cave is the only one known on the Werribee Plains. It is the closest known cave to the Melbourne metropolitan area, is a relatively large cave and is important for the occurrence of the newly described mineral. The presence of the phosphates indicates the cave was recently used by bats but it has been abandoned for the last 100 years.

The lava caves are considered of geological heritage significance by the Geological Society of Australia.

3.8.3 Management

As the lava caves are currently located on private land there is no known record of active management or preservation of the caves.

The lava caves are sometimes accessed illegally, and there are reports of visible graffiti and litter dumping within the caves. It is understood that the private landowner allows interested parties to visit the caves from time to time, but this is an informal, non-regulated activity.

A suitable separation distance could be readily applied to the known location of the lava caves at 65 Parwan South Road for any future development through various planning instruments and land agreements. The extent of the required separation distance is beyond the scope of this LCA and should be the subject of specialist geotechnical studies associated with development plans and planning applications.

4 EPA Separation Distance Guidelines

4.1 EPA Separation Distance Guidelines

Current EPA Publication 1518 *Recommended separation distances for industrial residual air emissions* (EPA, 2013) provides advice on recommended separation distances between industrial land uses that emit odour or dust, and sensitive land uses. Separation distances are also specified in a suite of other publications, with the key guidance relevant to the PEP including:

- Siting, design, operation and rehabilitation of landfills (Pub. 788.3, Aug 2015)
- [Designing, constructing and operating composting facilities \(Pub. 1588.1, June 2017\)](#)
- [Victorian Guidelines for Water Recycling \(Pub. 1910 and 1911, March 2021\)](#)
- [Victorian guideline for irrigation with recycled water \(Publication 168.3, Oct 2022\)](#).

4.2 Victorian Planning Provisions – Clause 53.10 Threshold Distances

Victoria's Planning Schemes also contain Clause 53.10 (Uses and activities with potential adverse impacts), which sets out distances that apply to land uses with potential off-site impacts. These distances are based on the potential adverse impacts of each land use or activity. They represent a threshold distance within which further detailed assessment is needed. This is to determine whether the proposed use or activity is appropriate [Source: Planning Victoria website link: Buffers and land use compatibility].

[Clause 53.10](#) Threshold distances are mostly the same or largely consistent with EPA separation distance guidelines.

4.3 EPA's new Draft Separation Distance and Landfill Buffer Guidelines

In December 2022, The Victorian Environmental Protection Authority (EPA) released two new draft Guidelines for industry consultation:

- Draft Publication 1950 - Landfill Buffer Guideline; and
- Draft Publication 1949 - Separation Distance Guideline.

A summary of aspects of the draft guidelines is provided below.

Key aspects of both the draft Landfill Buffer Guideline and draft Separation Distance Guideline are:

- The guideline objectives are twofold:
 - protect human health and amenity from the effects of pollution and waste associated with industry and landfills; and
 - protect industry and landfills from inappropriate land use and development nearby that may constrain operations.
- Separation distances are applied to reduce the occurrence of incompatible land uses which are likely to cause adverse human health or amenity impacts;
- Distance calculation method varies between rural and urban settings;
- The guidelines will adopt the agent of change principle, meaning that the onus is on the person or entity proposing a new, expanded or modified land use that may lead to land use conflict, meaning that the draft guidelines do not apply retrospectively for existing land uses.

4.3.1 Key changes proposed by EPA in the 2022 draft Separation Distance Guidelines

A summary of key changes is provided below:

- This guideline will be organised into two environmental categories – odour and dust;
- Separation distance applies between industrial and sensitive land uses;
- Recommended separation distances are designed to account for potential unintended offsite emissions expected as part of day-to-day operation of industrial land use (ie. including minor accidents, minor failures and slight changes in weather conditions), but major incidents could still result in offsite impacts;
- Additional information about human health and amenity risks is provided, as well as methods and guidance for assessment of separation distance suitability;

- Variations to recommended separation distances may be permissible based on dust and/or odour risk assessment in accordance with existing EPA Publications 1883 and 1943;
- Some examples of changes to the draft recommended separation distances compared with the current EPA Publication 1518 – *Recommended Separation Distances for Industrial Residual Air Emissions – Guideline* are:
 - Where a specified distance is provided in the current guidelines, the draft guidelines require a ‘case by case’ determination of separation distance;
 - Separation distances provided for industries previously not specified in Publication 1518;
 - Increase in separation distances for some industries (ie. up to a 400% increase on existing distances in some cases); and
 - Reduction in separation distances for some industries (typically based on industry-wide improvement in processes).

4.3.2 Key changes to Landfill Buffer Distance Guidelines

A summary of key changes is provided as follows:

- The draft guideline will replace the existing EPA Publication 1642 - *Assessing planning proposals within the buffer of a landfill* and relevant sections of EPA Publication 788.3 - *Siting, design, operation and rehabilitation of landfills*;
- Human health and amenity risks addressed are landfill gas, odour, noise, litter and dust;
- The definition of sensitive land use varies for each human health and amenity risk ie. any building or structure is considered sensitive land use in the context of landfill gas due to the explosion risk;
- Examples of sensitive use zones which correspond to the VPP are:
 - Activity Centre Zone
 - Capital City Zone
 - Commercial 1 Zone
 - Docklands Zone
 - residential zones
 - Rural Living Zone.
- Increase health and amenity buffer, including those for a landfill accepting municipal (putrescible) waste (Type 2) with a tip face greater than 500m² increases from 500m to 1,500m under the draft guideline;
- The buffer distance for a landfill accepting solid inert waste (Type 3) increases from 200m to 500m (for odour) under the draft guideline – relevant to MBC operations;
- The guideline provides planning advice and details on environmental risks associated with landfill buffers;
- Buffer distances provided in the draft guideline will apply to new or expanded landfills;
- The draft guideline discusses appropriate land uses within buffer zones; and
- Provides guidance for planning authorities assessing planning permit applications and planning scheme amendments that would allow use or development within a landfill buffer.

4.4 Implications of new EPA Separation Distance Guidelines for the PEP

New EPA Publications 1949 (Dec 2022) and 1950 (Dec 2022) are proposing new separation distances that are typically 2-3 times larger than that recommended in EPA publications 1518 and 788.3 for most industrial odour/dust source activities including coal mines and landfills.

The PEP may be considered an industrial agent of change in accord with the draft Separation Distance Guideline, which provides examples of industrial agent of change, including:

- “Strategic planning matters involving an existing or proposed employment or industrial precinct/use
- Development of a local land use policy/strategy relating to industry” (EPA, 2023)

The guideline puts the onus on the agent of change to identify and assess cumulative impacts.

If the draft Landfill Buffer Guideline and draft Separation Distance Guideline are issued unchanged, then the implications for key land uses (and therefore development constraints) in the PEP could include:

- 51 Browns Lane Broiler Farm
 - No recommended separation distance to sensitive uses provided in draft Separation Distance Guideline. Reference is made to the existing *Planning and environment guideline for establishing meat chicken farms (Guide 1 – Assessment guide)* (2021).
- Maddingley Brown Coal (MBC) open cut coal mine (11 Tilley's Road)
 - Open cut coal mining currently occurs at MBC, with coal mined at the site being used as a soil conditioner, and some soil based products mixed and sold from the site (MBC, 2023).
 - MBC is located within 1km of the PEP and a buffer distance of 1km is currently recommended by EPA Publication 1518 from sensitive land uses. The proposed 2km buffer for open cut coal mining in EPA publication 1949 is consistent with the 2km buffer identified for the Maddingley landfilling and composting operations (Pacific Environment, 2017).
 - Under the draft Separation Distance Guideline, a separation distance of 500m to sensitive uses is recommended for 'Soil blending, conditioning and mixing' however this typically applies to farms and market gardens.
 - The recommended separation distance as per the draft Separation Distance Guideline to sensitive uses is **2,000 metres, as a minimum**. Reference is made to EPA Publication 1961 *Guideline for Assessing and Minimising Air Pollution in Victoria*.
- MBC landfill and composting operations (11 Tilley's Rd)
 - MBC landfill accepts the following wastes: paper pulp, solid inert waste, tyres shredded into pieces <250mm, metal recycling shredder residue (floc), waste acid sulphate soils, contaminated soil (Category C), solid wastes contaminated with Prescribed Industrial Waste (PIW), NOS. The licence allows one tipping face (ie. Cell 6), although the audit identified a second tipping face (Nolan Consulting, 2021).
 - The MBC landfill is likely to be classified as Type 1 or Type 2 landfill under the draft Landfill Buffer Guidelines.
 - The draft Landfill Buffer Guidelines provide default buffer distances for Type 2 landfills based on the tip face area. The MBC landfill tip face area is unknown. Default buffers are not provided for Type 1 landfills, consequently EPA is to be contacted for guidance.
 - Type 2 landfills with a tip face of less than 500m² require the following default buffer distances:
 - **500 metres from sensitive land uses** to protect human health and amenity impacts. There is no provision to reduce this default buffer.
 - **500 metres from buildings or structures** (including buildings or structures not used for sensitive uses) for landfill gas impacts
 - Type 2 landfills with a tip face of greater than 500m² require the following default buffer distances:
 - **1,500 metres from sensitive land uses** to protect human health and amenity impacts. There is no provision to reduce this default buffer. An odour risk assessment demonstrating an alternative buffer may be used to reduce the buffer to a minimum of 1,000 meters.
 - **500 metres from buildings or structures** (including buildings or structures not used for sensitive uses) for landfill gas impacts
 - Buffer distances for composting operations are provided in the draft Separation Distance Guideline (Appendix C). The distances vary according to the feedstock type, technology used and throughput of the composting plant. The MBC landfill licence allows for composting in Area B (Nolan Consulting, 2021) however the throughput and technology could not be determined from publicly available records. The recommended separation distances provided in the draft Separation Distance Guideline vary from **400 metres to 2,200 metres** and plants with a throughput of >50,000 tonnes/year are assessed on a case by case basis. Reference is made to EPA Publication 1588.1 *Designing, construction and operating composting facilities* (EPA, 2017) which also provides guidance for determining appropriate separation distances.
- Other existing operations requiring a separation distance which have not been identified in this report may be present.

Based on current land use patterns, separation distances should be calculated using the rural method. However, the urban method should be used where the nearest sensitive land use includes residential zones allowing subdivision to less than 4,000m².

5 Geotechnical Desktop Assessment

5.1 Documents, Drawings, Standards and Guidelines

The following documents are referred to within the geotechnical desktop study.

Table 5-1 Sources of Information

Information Type	Description	Reference	Prepared by	Date
Geological Memoir	Geological Survey of Victoria Report 76. Department of Minerals and Energy, Victoria	Explanatory notes on Bacchus Marsh and Ballan 1:50 000 geological maps.	Roberts, P.S	1984
Geological Map	Geological Survey of Victoria,	Bacchus Marsh. 1:50 000 geological map.	Roberts, P.S	1985
Online historical satellite photography resource	Historical and current satellite photography	Google Earth	-	Accessed on 22/9/2020
Online mapping resource	GeoVic	https://earthresources.vic.gov.au/geology-exploration/maps-reports-data/geovic	DJPR 2020	Accessed on 22/9/2020
Online mapping resource	Australian Soil Resource Information System (ASRIS)	http://www.asris.csiro.au	CSRIO	Accessed on 22/9/2020
Online mapping resource	Visualising Victoria's Groundwater	https://www.vvg.org.au/	Federation University et al.	Accessed on 22/9/2020
Online mapping resource	Soil Health Knowledge Base	https://www.ccmaknowledgebase.vic.gov.au/soilhealth/	CCMA	Accessed on 22/9/2020
Online Mapping Resource	Geoscience Australia's Online earthquake Resource	Geoscience Australia (http://www.ga.gov.au/earthquakes)	Geoscience Australia	Accessed on 22/9/2020
Paper	Coal Mining Heritage Study – Mine Sites Identification	https://www.heritage.vic.gov.au/__data/assets/pdf_file/0019/61462/COAL_pp_158_207.pdf	Heritage Victoria	Accessed on 22/9/2020
Australian Standard	Earthquake Actions in Australia	AS1170.4-2007	Standards Australia	2007
Australian Standard	Residential Slabs and Footings	AS 2870 – 2011	Standards Australia	2011

5.2 General context

5.2.1 Topography and land use

The topography of the precinct is illustrated in Figure 5-1. The approximate extents of the PEP and the Parwan PSP area are shown as red lines.

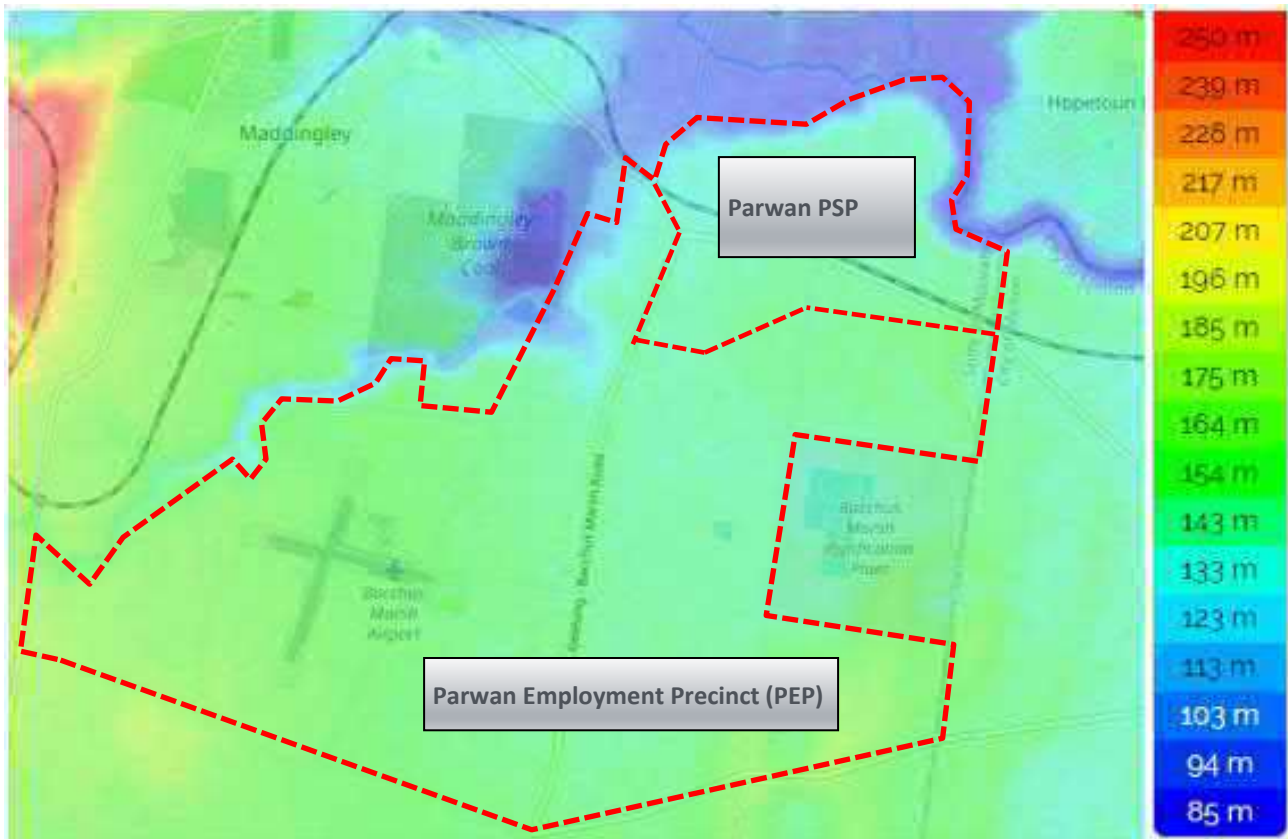


Figure 5-1: Topographic Map within the site area (indicated by red dashes line)

Figure 5-2 shows Maddingley Brown Coal open cut mine is located to the north west of the precinct. Records indicate that private mine known as Parwan Colliery, was operational between 1929 and 1931, and as Bacchus Marsh Coal Mine, between 1941 and 1944.

A map of shaft locations is provided in Figure 5-2 (Heritage Victoria 2020). A diagram indicating direction of drifts from a shaft sunk as part of mining operations is provided in Figure 5-3 (Heritage Victoria 2020). Figure 5-2 indicates that shafts sunk as part of mining operations for the Parwan Colliery and Bacchus Marsh Coal Mine, are located within, or very close to, the precinct. Figure 5-3 indicates that some drifts were excavated from shafts as part of the mining operation. The direction of the drifts in the figure suggests excavation works may have extended into the precinct however have not been confirmed. Further investigation regarding the potential for mining activity having occurred within the precinct extents is required to confirm the extent of mine shafts within the precinct.

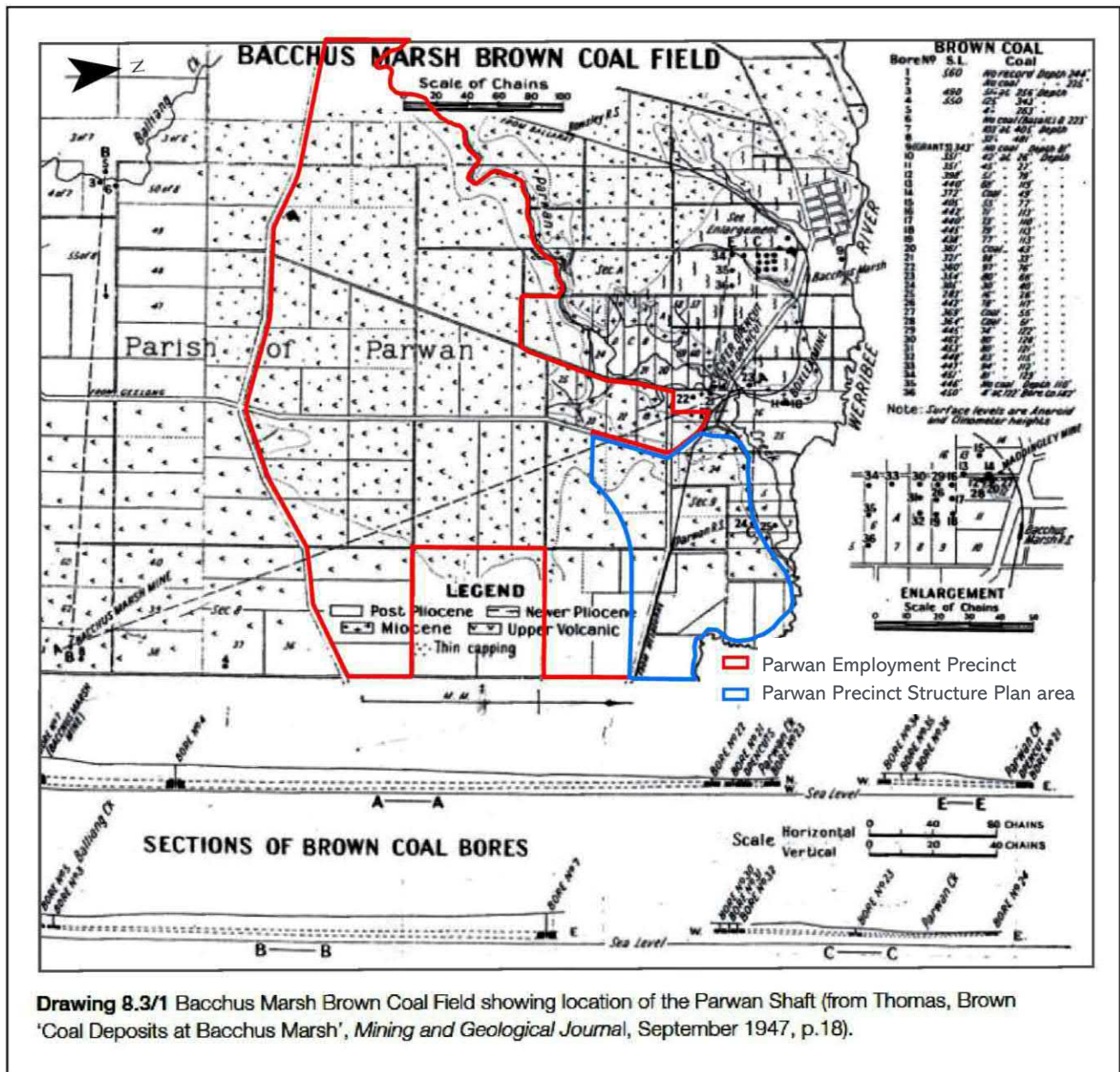


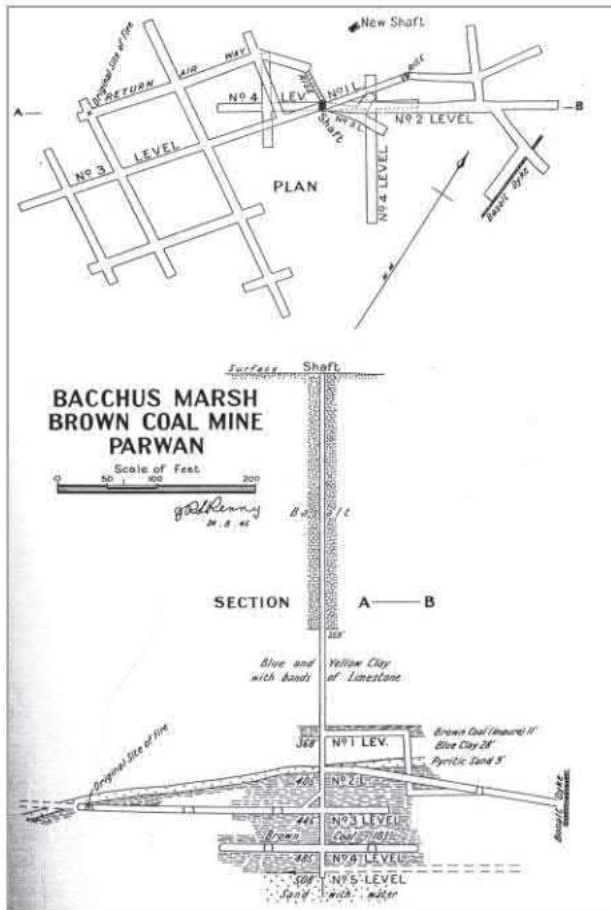
Figure 5-2 Excerpt from Coal Mining Heritage Study – Mine Sites Identification (Heritage Victoria 2020) illustrating the extents of the Bacchus March Brown Coal Field, and Parwan Shaft.

* Note:

North is towards the right of the figure

The site extents are between the Parwan Creek and the Legend of the figure.

shafts 21, 22 and 24 are located within the proximity of the site extents.



Drawing 8.3/2 Bacchus Marsh Coal Mine, Parwan: Plan and Sections of underground workings at August 1945 (from Kenny, *Mining and Geological Journal*, Vol. 3 No.1, March 1947, p.15).

Figure 5-3 Excerpt from Coal Mining Heritage Study – Mine Sites Identification (Heritage Victoria 2020) illustrating the drifts excavated away from a shaft as part of the Bacchus March Brown Coal Mine.

5.2.2 Geology

The geology of the precinct is illustrated in Figure 5-4 which was sourced from a printed extract of the online Geological Resource, GeoVic. The precinct extent of both Parwan PSP area and the PEP are illustrated in the figure.

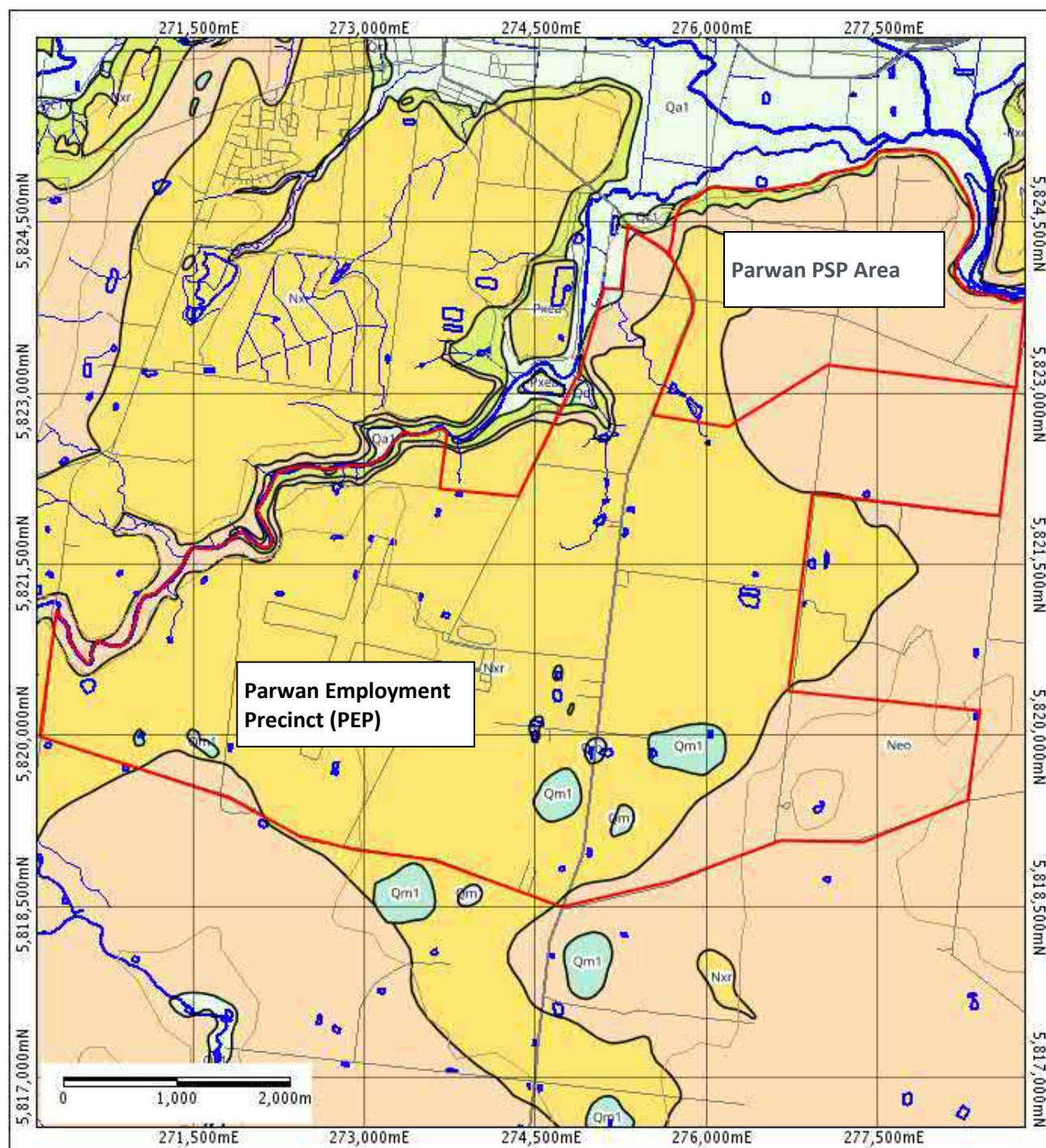


Figure 5-4: Local Surface Geology (GeoVic 2020)

Legend

Swamp and lake deposits (Qm1):
rare dolomite

Alluvium (Qa1):

Colluvium (Qc1):

Darley Gravel (Nxr):

Grey to black carbonaceous mud, silt, clay, minor peat: generally unconsolidated;

Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits

Diamictite, gravel, sand, silt, clay, rubble: sorting variable, usually poor; generally poorly rounded; clasts locally sourced; includes channel deposits with better rounding and sorting

Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source

Newer Volcanic Group - basalt flows (Neo):

Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay

Werribee Formation (-Pxe):

Sand, silt, clay, gravel in variable proportions: generally white to pale grey; in part carbonaceous, pyritic; ferruginous bands common; contains Cinnamomum flora

It is likely that the Darley Gravels are a superficial, narrow layer of granular material overlying the Newer Volcanics. The Newer Volcanic basaltic rock may be overlain by residual highly plastic clay of varying thickness, which may include basalt boulders, suspended within the clay. The Werribee Formation sediments comprise clays, sands, brown coal and gravel. Within or close to the precinct, the Werribee Formation comprises the Yaloak Formation: which is Clay, Gravel and a thin brown coal seam, outcropping in the Upper Parwan Valley (Roberts P.S. 1984).

The memoir of the area indicates a thick brown coal seam, as seen in the Parwan Mine, within the Yaloak Formation (of the Werribee Formations) which comprises Clay, gravel and thin brown coal outcropping in the Upper Parwan Valley (Roberts P.S. 1984).

Historical borehole records are available on publicly available online data bases. Table 5-2 provides a summary of those bores where summaries of strata encountered is readily accessible.

Table 5-2 Summary of records of boreholes with summaries of strata encountered readily accessible, within the study area (GeoVic 2020)

BH ID	Drill date	Drilling method	The location of the borehole	MGA94 Zone 55 Grid Reference (m)	
				Eastings	Northings
326082	12/3/1984	Rotary (diamond/drag bit)	PEP	273842	5821103
942649	29/10/1981	Rotary (diamond/drag bit) and Mud Drilling	PEP	275981	5820926
326003	31/12/1944	-	Parwan PSP area	276830	5824592
326001	31/12/1943	-	Parwan PSP area	275108	5823998
326000	31/12/1943	-	Parwan PSP area	275077	5824244
326004	31/12/1944	-	Parwan PSP area	276876	5824850

The available summaries of the strata encountered, is presented in Appendix I.

5.2.3 The presence of moisture reactive soils within the study area

Australian Standard AS 2870 – 2011 (Residential Slabs and Footings) provides guidance on soil classification. The precinct is located within Climactic Zone 3. Site investigations, leading to soil characterisation over the precinct, is recommended to enable a site-specific soil classification. It is possible that the classification of soils derived from Newer Volcanic Basalt, could be between moderately to highly reactive clay, and may experience seasonal ground movement from moisture variation of between 20 to 60 mm, over a surface material thickness of up to 2.3 m.

5.2.4 Geomorphology

5.2.4.1 Seismicity

Geoscience Australia (<http://www.ga.gov.au/earthquakes>) lists earthquakes that have occurred within Victoria. It shows no earthquakes with a magnitude greater than 6 have occurred since European settlement in Victoria.

Table 5-3 shows list of earthquakes that are greater than 4 and have occurred in the last 20 years in Victoria. It is noted that the maximum earthquake happened in 2021 with a magnitude of 5.9 at a depth of 10km.

Table 5-3: List of earthquakes with a magnitude greater than 4, since 2000 in Victoria (Geoscience Australia 2020)

SN.	Magnitude	Year	Depth (km)	Location
1	5.9	2021	10	Rawson, VIC.
2	4.8	2015	10	W of King Island, Tasmania.

SN.	Magnitude	Year	Depth (km)	Location
3	4.3	2012	0	Near Moe, VIC.
4	5.4	2012	10	SW of Moe, VIC.
5	4.4	2011	2	Korumburra, VIC.
6	4.6	2009	15	Korumburra, VIC.
7	4.6	2009	15	N of Korumburra, VIC.
8	4.0	2002	3	Fish Creek, VIC.
9	5.0	2000	18	Boolarra South, VIC.

Australian Standard AS1170.4-2007 “Earthquake Actions in Australia” indicates a Hazard Factor (Z) of no greater than 0.09 (10% probability of exceedance in 50 years) for the region surrounding the precinct.

5.2.4.2 Erosion and landslides

The precinct is located within the Port Phillip and Westernport Catchment Management Authority. However, the database maintained by the adjacent Corangamite Catchment Management Authority, includes Erosion and Landslide. The database returns are illustrated in Figure 5-5.

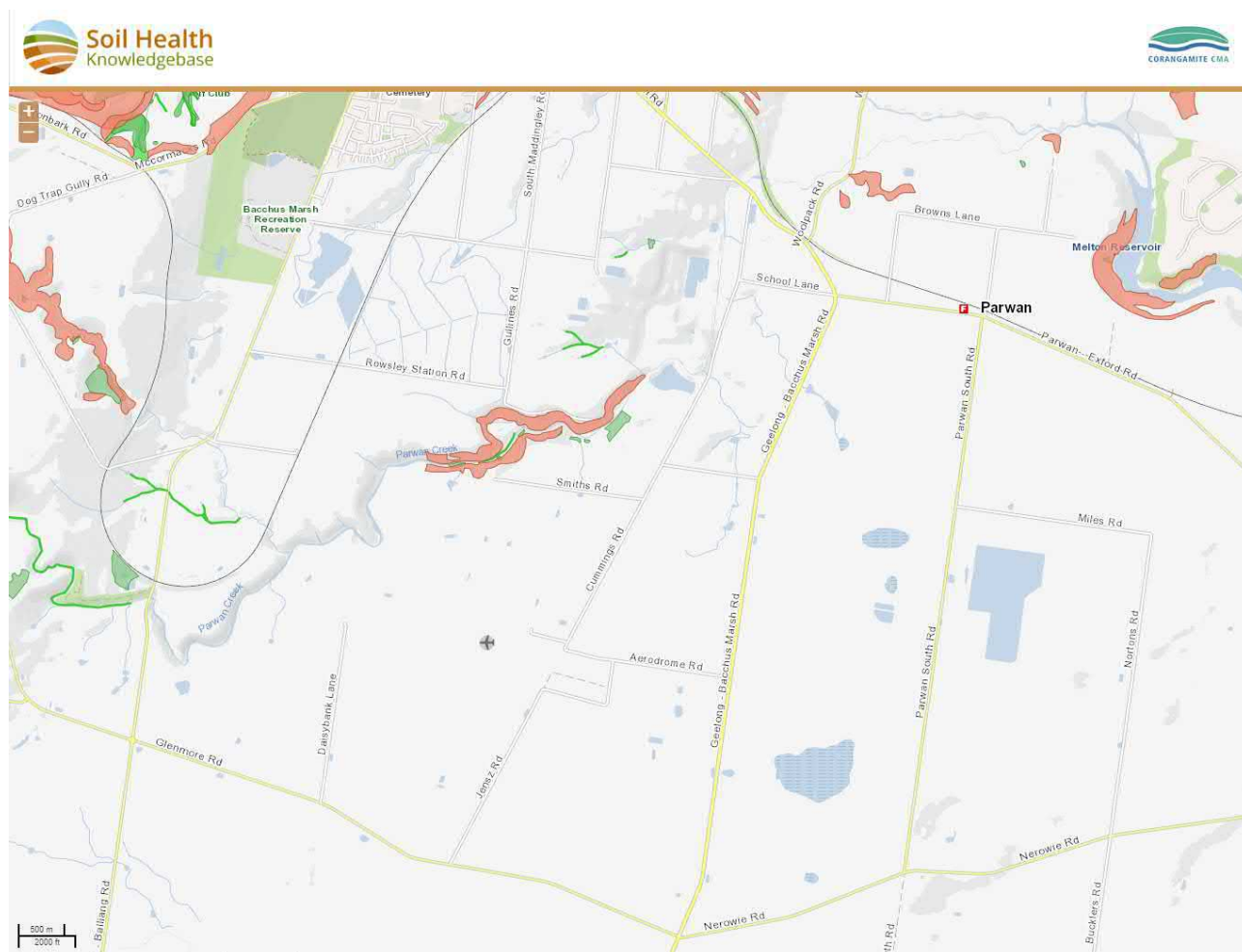


Figure 5-5: Location of areas of erosion susceptibility and known landslides (CCMA 2020)

Legend:

Red coloured areas are areas of known landslides.

Green coloured areas are areas of erosion susceptibility.

Most of the precinct has a low risk of landslide given the mostly flat to gently undulating topography. The map indicates only isolated areas of landslides are located within the bounds of both the PEP and Parwan PSP area, proximate to the escarpments of Parwan Ck and Werribee River.

5.3 Topography and Geology - southern and central parts of the study area

5.3.1 Topography

As illustrated in Figure 5-1 and Figure 5-4, the precinct is generally flat, rising towards the south west corner. The maximum elevation is above 170 mAHD. The lowest elevation is 110 m AHD, located towards the northern corner, close to Parwan Creek. Ponds associated with hollows filled with swamp deposits are located east of the Aerodrome. To the south east corner, where the land rises to 160 mAHD, is a crater irregularly shaped, approximate maximum dimension is 650 m.

Along the eastern boundary the precinct is characterised by a valley slope, associated with Parwan Creek, which has a gradient of approximately 1v:3h.

5.3.2 Geology

Figure 5-4 indicates that the surface geology of the PEP typically comprises Darley Gravels. Swamp deposits, expected to overlay the Darley Gravels, form the surface geology of isolated occasional pocket within the southern half of the PEP. The Newer Volcanics form the surface geology of eastern and northern parts of the south, and daylights close to the western extents as the ground level drops towards the Parwan Creek. At lower elevations close to Parwan Creek the geology changes to the Werribee Formation, with alluvial material occasionally present.

It is likely that the Darley Gravels are a superficial, narrow layer of granular material overlying the Newer Volcanics. The Newer Volcanic basaltic rock may be overlain by residual highly plastic clay of varying thickness, which may include basalt boulders, suspended within the clay.

The logs of historical boreholes located within the PEP are presented in Appendix I.

6 Contaminated Land

At the time of writing Revision 1 of this report, the preliminary investigation of contaminated land applied the principles of the now superseded *Potentially Contaminated Land General Practice Note* (Department of Sustainability and Environment (DSE), June 2005) to assess the potential for contamination as either *High*, *Medium* or *Low*. The conclusions were based on the findings of the desktop review and restricted site inspection (conducted September 2020).

SMEC note that the outcomes and recommendations of the contaminated land assessment may now be outdated due to the updated *Potentially Contaminated Land Planning Practice Note* (DSE, 2021).

Where a sensitive land use is proposed, the required action to occur under the Planning Practice Note (DSE, 2005), prior to the change in land use for each of the risk categories are:

- **High Risk (A)** – Require an environmental audit as required by Ministerial Direction No. 1 or the Environmental Audit Overlay. Where a planning scheme amendment is proposed to allow a more sensitive land use;
- **Medium (B)** – Requires a site assessment from a suitably qualified environmental professional; or
- **Low (C)** – General duty under Section 12(2)(b) and Section 60(1)(a)(iii) of the Planning and Environment Act (1987) (the P&E Act).

Source – DSE June 2005, Table 2 Assessment Matrix

The risk rating of each land parcel according to the practice note (DSE, 2005) within the PEP is presented in Figure 2 of Appendix A. For those sites identified to have a *high* or *medium* risk of potential contamination the site address and a description of the contamination risk is documented within Table 6-1. All remaining sites within the PEP were considered to have risk rating of *Low*.

It was observed that many sites were in relatively poor condition with uncontrolled waste disposal occurring. Uncontrolled waste disposal increases the likelihood of unexpected finds and associated contamination risk which would only be identified during earth works or an intrusive investigation.

Table 6-1 Identification of Properties with Potential for Contamination within PEP

Site ID and Land Use	Address	Description	Potential for Contamination	Risk Rating (Table 2, Potentially Contaminated Land Practice Note (DSE, 2005))
1. Broiler Farm	4050 Geelong Bacchus Marsh Road	Broiler farm	Medium	B
2. Mushroom Farm (Parwan Valley Mushrooms)	12 Aerodrome Road, Parwan	Parwan Valley Mushrooms, industrial activity, liquid waste disposal	Medium	B
3. Storage/dumping of vehicles/machinery	229 Smiths Road Parwan (partial)	A large number of vehicles and machinery observed to be disposed and stored at this site	Medium	B
4. Storage/dumping of vehicles/machinery and spoil	4050 Geelong Bacchus Marsh Road	Uncontrolled waste disposal	Medium	B
5. Storage of Spoil	135 Smiths Road Parwan	Waste disposal	Medium	B

Site ID and Land Use	Address	Description	Potential for Contamination	Risk Rating (Table 2, Potentially Contaminated Land Practice Note (DSE, 2005))
6. Animal rendering (proposed use)	3922 Geelong Bacchus Marsh Road	Current dryland agricultural uses. Future animal rendering and abattoir (works approval issued)	N/A (site activity yet to be realised) (has been shown green to reflect that the site activity is yet to be realised)	C current agricultural use A if operating as rendering plant or abattoir
7. Raceway and quarrying activity	429 Parwan South Road	Raceway and quarry	Medium	B
8. Airport	Bacchus Marsh Airport (including associated land parcels)	Runway and airport buildings Chemical and fuel storage Possible fire retardant use and/or storage	High	A
9. Lava Caves	65 Parwan South Rd, Parwan	Lava caves on private land. Only able to view from road. Unable to assess the extent and condition of the lava caves.	N/A	N/A
10. Recycled water pivot irrigation site	Lot 1 PS836526, Parwan South Rd, Parwan	GWW Class C recycled water customer immediately south of GWW's Parwan wastewater treatment plant (WWTP). Total 25 ha under irrigation - two centre pivot irrigation points, 12.5 ha each	Medium	C

[Refer to Appendix A Figure 2 for a map of the outlined sites.](#)

Where a planning scheme amendment is proposed to a more sensitive land use an environmental audit will be required for those sites with High Risk (A) rating and a site assessment will be required for sites with a Medium Risk (B) rating.

It should be noted the site inspection of the precinct was restricted due to limited site access (e.g private lands) and unexpected finds are likely to be encountered during the development of the precinct. An unexpected finds protocol should be developed to ensure potential contamination identified is correctly investigated and managed in accordance with the requirements of the DSE, *Potentially Contaminated Land General Practice Note*, June 2005.

7 Conclusions

7.1 Contaminated Land

Desktop assessment and fenceline site inspection was conducted in September 2020 to identify sites with current or historical activities with the potential to have caused land contamination. Applying the principles of the now outdated *Potentially Contaminated Land General Practice Note* (DSE, 2005), eight (8) sites with a medium potential for contamination were identified. The 'B' risk rating was applied to these properties which required a site assessment by a suitably qualified professional to assess land suitability for sensitive land uses.

There are now additional land uses classified as having a 'high' potential for contamination in the updated *Potentially Contaminated Land Planning Practice Note* (DSE, 2021), such as firefighting or training (use of foams) and mass animal burial on agricultural sites. The recommended actions for each risk category (ie. A, B or C from Table 3 [DSE, 2021]), have also changed; for example risk category A and B now include Preliminary Risk Screening Assessments (PRSA) to support planning scheme amendments and planning permit applications.

7.2 Odour/Dust Risks and Separation Distances

Odour risks and appropriate buffer distances were previously reported by Pacific Environment, August 2017 within the Bacchus Marsh Urban Growth Framework Bacchus Marsh Buffer Assessment.

The assessment identified odour risks associated with GWW's Parwan WWTP, the Maddingley landfilling and composting operations and the broiler farm on Geelong Bacchus Marsh Road to impact on the precinct.

Pacific Environment concluded odour risks can be mitigated through appropriate buffer distances. The current buffer distances recommended for each of these existing land uses were:

- Maddingley landfill and composting operations (11 Tilley's Rd) 2,000 metres.
- GWW's Parwan WWTP (Parwan South Road) 1,400 metres.
- Broiler farm (Geelong Bacchus Marsh Road) 425 metres.

The current buffer distance which applies to the Parwan WWTP is for the current population the plant services. The development of the Precinct and surrounding area will result in an increased load on the plant and a required increased buffer distance. As part of the Phase 2 studies for Parwan PSP and PEP, the VPA will commission a separate buffers assessment to further investigate the recommended buffer distances.

7.3 Current EPA Separation Distance Guidelines (2013)

SMEC reviewed the current EPA separation distances recommended for industrial residual air emissions to sensitive land uses which are:

- Maddingley Brown Coal open cut coal mine: 1 km (EPA Pub 1518, 2013)
- MBC composting operations: 2km (EPA Pub 1588.1)
- MBC landfill operations (Type 3 inert waste landfill): 200m (EPA Pub 788.3)
- Broiler farms at 51 Browns Lane and 4050 Geelong-Bacchus Marsh Road: minimum 250m (actual separation distance must be calculated based on the farm capacity) (Victorian Code for Broiler Farms, 2018 and EPA Pub 1518)
- Western Irrigation Network: 0 to 100 metres for each irrigation site (EPA Pub 1910).
- Recycled water pivot irrigation site (Lot 1 PS836526): 100m (EPA Pub 1910).
- Under construction animal rendering plant at 3922 Geelong Bacchus Marsh Road: 1km

7.4 Draft EPA Separation Distances and Landfill Buffer Guidelines (2022)

As discussed in Section 4.3 the draft Landfill Buffer and Separation Distances guidelines should be considered as part of the Phase 2 studies for the Parwan PEP.

The potential changes in buffer distances as a result of the draft guidelines are:

- Maddingley Brown Coal (MBC) open cut coal mine: 2km.
- MBC Composting operations: up to 2,200 metres depending on composting methods and throughput
- MBC Type 3 inert waste landfill: 500m

- GWW's Bacchus Marsh WWTP (Parwan South Road): no change
- Recycled water pivot irrigation site (Lot 1 PS836526): 100m (EPA Pub 1910).
- Broiler farms (51 Browns Lane and 4050 Geelong-Bacchus Marsh Road): no change
- Western Irrigation Network: no change.

7.5 Use of Recycled Water – WIN Recycled Water Scheme

The current boundary of the proposed WIN is directly to the south of the PEP. There is potential for Class C recycled water to be available for beneficial use within the PEP if the WIN area is expanded – supplied from the WIN recycled water scheme (Bacchus Marsh and Melton WWTP combined flows). Class C recycled water use is subject to EPA Permits and human health and environmental site restrictions that are described in EPA approved Health and Environmental Management Plans (HEMP) and User Site Management Plans (USMPs).

Potential irrigation of Class C recycled water within the Parwan PEP has the potential to impact on land uses and development in the precinct due to the need to maintain buffer distances between irrigation areas and sensitive land uses for many common high throw pivot and travelling spray irrigation methods. Proponents of irrigation of recycled water (supplied by GWW as part of the WIN Recycled Water scheme) would need to ensure adequate irrigation system siting and design, spray drift control and provision of separation distances (typically 10m for spray) to manage potential human health impacts at existing or future nearby sensitive land uses.

7.6 Hydrogeology

The desktop review indicated groundwater depth varied significantly from less than 5m to 50m. Shallow groundwater (less than 5m below ground level) occurs across the majority of the Precinct.

Groundwater salinity ranges from 7,000 to 13,000mg/L of TDS limiting potential beneficial uses of groundwater.

A review of licensed groundwater bores within the precinct reported four licenced groundwater bores located within the PEP.

Groundwater bores within 2km of the precinct include dewatering bores which are likely to be associated with Maddingley landfilling operations. Dewatering of the former coal mine site is likely to have altered groundwater conditions including depth and groundwater flow direction.

7.7 Sodic and Dispersive Soils

Sodic soils (sodosols and vertisols) are present in surface and subsoils across the Parwan PEP. Surface soils in the western portion of the Parwan PEP were classified as Sodic with an ESP of 6-15%. The eastern portion of the Parwan PEP was classified as Strongly Sodic with an ESP of 15-25%.

7.7.1 Sodic and Dispersive Soil Risks

Erosion risks associated with sodic and dispersive soils can be managed by appropriate planning and standard construction erosion control techniques. Identifying where dispersive sodic soils are located in the landscape and, where possible, avoiding or minimising disturbance to these areas is recommended. If exposure of the higher risk soils cannot be avoided there are potentially a range of conventional engineering controls that can be developed to manage sodic and dispersive soil related risks. Management controls for construction are presented in Section 3.7.3.

Steep slopes (greater than 5% slope) were also identified as potentially increasing the risk of erosion of dispersive sodic soils which are present across the precinct.

7.8 Geotechnical

Figure 5-4 indicates that the surface geology of the PEP typically comprises Darley Gravels. Swamp deposits, expected to overlie the Darley Gravels, form the surface geology of isolated occasional pocket within the southern half of the PEP. The Newer Volcanics form the surface geology of eastern and northern parts of the south, and daylight close to the western extents as the ground level drops towards the Parwan Creek. At lower elevations close to the Parwan Creek the geology changes to the Werribee Formation, with alluvial material occasionally present.

It is likely that the Darley Gravels are a superficial, narrow layer of granular material overlying the Newer Volcanics. The Newer Volcanic basaltic rock may be overlain by residual highly plastic clay of varying thickness, which may include basalt boulders, suspended within the clay.

A desktop review indicated historical mine shaft excavations may extend into the precinct.

7.9 Lava Caves

Based on the review of historical geological mapping the lava caves were mapped to be present at the rear of 65 Parwan South Road, Parwan.

The lava caves are considered of geological heritage significance by the Geological Society of Australia.

8 Recommendations and Development Implications

8.1 Contaminated Land

SMEC recommends that the desktop contaminated land assessment be updated to incorporate any land use changes and changes to the updated *Potentially Contaminated Land Planning Practice Note* (DSE, 2021).

8.2 Amenity (Odour and Dust) Risks and Separation Distances

VPA should consider the potential impact of the recently published EPA draft Separation Distance Guideline (Pub. 1949, Dec 2022) and draft Landfill Buffer Guideline (Pub. 1950, Dec 2022) on the existing and potential future land use developments across the Parwan PSP area. As the agent of change in land use within the PEP, VPA should identify and assess cumulative impacts.

It is recommended an increased buffer be allowed for the WWTP to accommodate the future increase in population growth and pollutant load on the plant.

8.3 Sodic and Dispersive Soils

8.3.1 Potential Further Investigations

Due to the presence of potentially dispersive sodic and strongly sodic soils within the PEP, further investigation of sodic soils is recommended which may include:

- Soil investigation of surface and subsoil conditions including laboratory testing of select parameter focusing on steeper areas where the erosion risk is greatest; and
- Validation of desktop mapping of topography to confirm high risk areas prone to erosion (drainage lines, localised steep sloping areas etc).

This information should be used to update mapping to identify areas where soil disturbance should be avoided or at least minimised as far as reasonably practicable. As part of the Phase 2 studies for Parwan PSP and PEP, the VPA will commission a separate sodic soils assessment to assess the presence and extent of the soils and potential implications for development within the precinct.

Subject to further assessment, it is recommended soil disturbance be avoided in steeper areas (> 5% slope).

Further suggested management controls for construction are presented in Section 3.7.3.

8.3.2 Potential Development Implications

The presence of sodic and/or dispersive soils, may result in significant changes to the design of the precinct (including greater emphasis on prevention and source control) and the required drainage assets. This may lead to an increase in the land set aside for the delivery of stormwater treatment assets to ensure that they meet Best Practice Environmental Management Guidelines (BPEM) and the management of the dispersive sodic soils through the delivery of development in the catchment.

Future land use change areas, such as expanded growth boundaries, future Precinct Structure Plans and planning scheme amendments, should seek to understand the capability of the soils in the landscape early in the process of preparing for land use change. This will ensure the required land take for drainage assets is understood and planning and design interventions are incorporated earlier, so that the development meets BPEM Guidelines and the Healthy Waterways Strategy Targets.

During the review of all precinct plans, a review of the soils and functionality of the drainage strategy should be undertaken. Any amendments required to address identified issues caused by problematic soils should be made.

8.4 Geotechnical

Prior to subdivision, geotechnical site investigations will be required to determine the sub-surface profile and geotechnical properties of the on-site soils with respect to the proposed development. The investigation would be used to determine the soil suitability for any geotechnical works required on the precinct and to provide geotechnical parameters for design. It is recommended that the geotechnical investigations include in-situ testing such as Standard Penetration Testing (SPT) and/or Dynamic Cone Penetration (DCP) testing to assess the soil strength and that soil sampling and laboratory testing is undertaken to assess the relevant engineering properties such as plasticity, shrink-swell potential and CBR strength.

A desktop review indicated historical mine shaft excavations may extend into the precinct. Further investigation is required to confirm the extent of mine shafts within the precinct.

8.5 Lava Caves

Given the ad-hoc nature of access (illegal and permitted) via private land to the lava Caves, an appropriate public access and geological and cultural heritage preservation management plan may be warranted to control such access to preserve this important geological feature for future generations. The lava caves should be avoided for urban development and a suitable buffer distance for development should be determined by the responsible authority (not in scope of this LCA).

A suitable separation distance could be readily applied to the known location of the lava caves at 65 Parwan South Road for any future development through various planning instruments and land agreements. The extent of the required separation distance is beyond the scope of this LCA and should be the subject of specialist geotechnical studies associated with development plans and planning applications.

A more recent geological survey of the lava caves would provide valuable information to determine the condition and cultural value of the lava caves in their current state and requirements for future management.

9 Limitations and Assumptions

Site conditions can vary from those encountered and reported herein. The information and findings in this report are based on the site observations and other data obtained by SMEC.

This report has been prepared to general industry standards and tailored to meet the client's needs at the time of writing. For the sections of this report which were based on historic reports prepared by others, SMEC take no responsibility for the accuracy of information within third party reports.

This report was prepared to meet the objectives presented in Section 1.2.

10 References

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Appendix A Precinct Plans

Figure 1 – Parwan Employment Precinct Title Boundaries

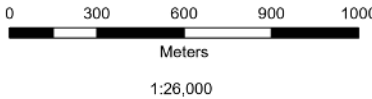
Figure 2 – Parwan Employment Precinct Potential Contaminated Land Risk and Buffer Areas

Figure 3 – Parwan Employment Precinct Sodic Soils, Lava Caves and Topography





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ABN 47 065 475 149



Legend

-  Parwan Employment Precinct
-  Title Boundary

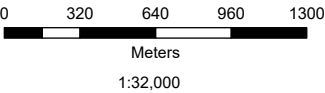
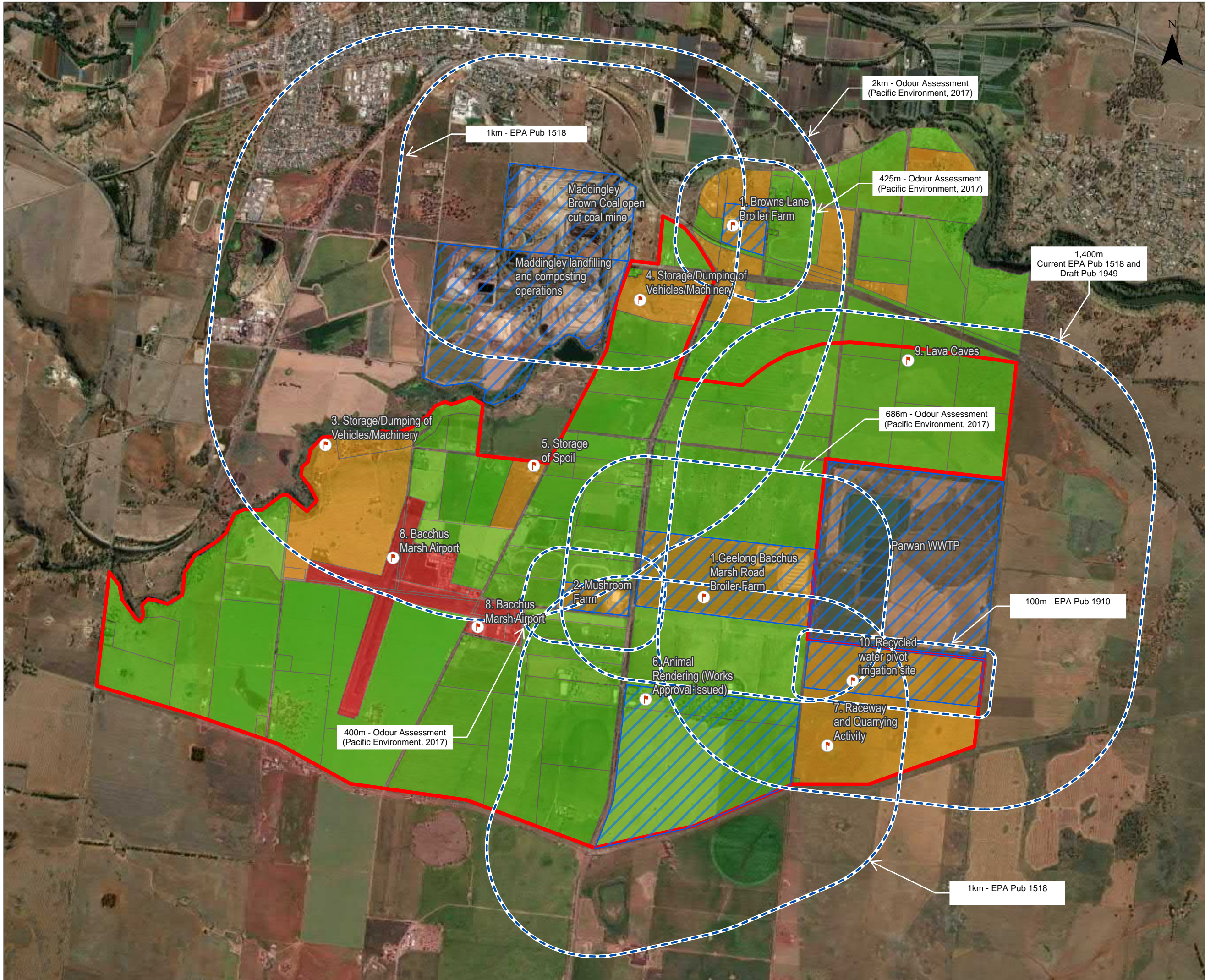
Key Map










SOURCES:
1. Property Boundaries © DELWP 2021
2. Sodic Soils © Agriculture Victoria 2021
3. Basemap © World Imagery: Earthstar Geographics
World Topographic Map: Esri, HERE, Garmin, FAO, USGS, NGA

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PROJECT: VPA Parwan LCA
PROJECT NO: 30042260
FIGURE NAME: Parwan Employment Precinct Investigation Area
CREATED BY: EY15682
DATE: 22/03/2023
VERSION:
PAGE SIZE: A3



Legend

-  Site ID and Land Use
-  Parwan Employment Precinct
-  Buffer Distance Recommended
-  Sites of Potential Odour Risk /Dusk Risk
- Contamination Potential**
 -  Low
 -  Medium
 -  High

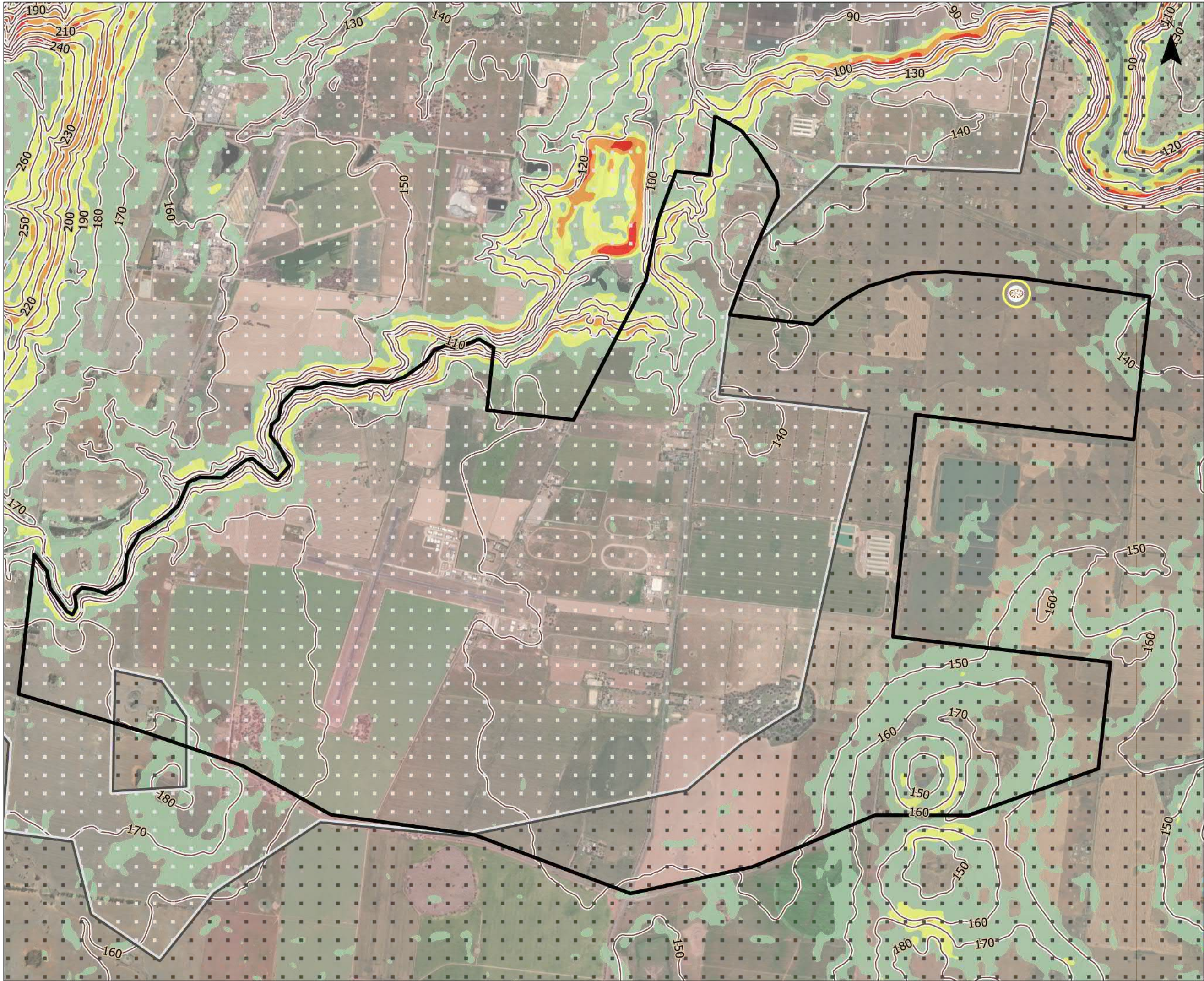
Key Map



SOURCES:
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2. Sodic Soils © Agriculture Victoria 2021
3. Basemap © World Imagery: Maxar
World Topographic Map: Esri, HERE, Garmin, FAO, USGS, NGA

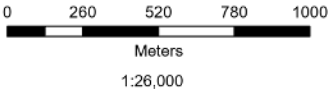
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PROJECT: VPA Parwan LCA
PROJECT NO: 30042260
FIGURE NAME: Parwan Employment Precinct Odour, Dust and Contamination Risk
CREATED BY: JZ15939
DATE: 22/03/2023
VERSION:
PAGE SIZE: A3



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Legend

- Lava Cave Location
- Topographic Contours
- Parwan Employment Precinct
- Approximate Lava Cave Extent

Approximate Sodic Soil Type Boundary

- Sodic (ESP 6-15%)
- Strongly sodic (ESP 15-25%)

Relative Slope

Low

Medium

High

Key Map



- SOURCES:**
1. Property Boundaries © DELWP 2021
 2. Sodic Soils © Agriculture Victoria 2021
 3. Basemap © World Imagery: Earthstar Geographics
 - World Topographic Map: Esri, HERE, Garmin, FAO, USGS, NGA

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PROJECT: VPA Parwan LCA
PROJECT NO: 30042260
FIGURE NAME: Parwan Employment Precinct Investigation Area
CREATED BY: EY15682
DATE: 22/03/2023
VERSION:
PAGE SIZE: A3

Appendix B Precinct Photographs and Inspection Records

Appendix B – Site Inspection Notes 3rd September 2020 - Parwan Employment Precinct

Land Use	Address	Location (onsite/ offsite)	Comments from site inspection on 3 Sept 2020 (Nicole Krasic)	Photo order	Site Inspection conducted (Y/N)
Parwan Employment Precinct (PEP)					
Rallydrive Australia (motocross tracks)	429 Parwan South Road 2\PS328177	Onsite			
Quarry	395 Parwan South Road	Onsite			
Broiler Farm	4050 Geelong-Bacchus Marsh Road 1\LP148386	Onsite	Unable to enter property. Sheds in distance, likely to be used to house poultry	5 -7	Y
Mushroom Farm (Parwan Valley Mushrooms)	535 Aerodrome Rd, Parwan	Onsite	Buildings, yard, sheds, shipping containers, pallets, gravel stockpile, dam	15-17, 23, 24	Y
Bacchus Marsh Airport (Aerodrome)	Cummings Rd	Onsite			
Edenhills Pet Cremation	42 School Lane, Maddingley	Onsite			
Nutratherm (Fertiliser Supplier)	4099 Geelong-Bacchus Marsh Rd	Onsite	Residential property with buildings/sheds/structures. Large soil pile behind resident which maybe associated with the excavation of a dam	26, 25	Y

Appendix B – Site Inspection Notes 3rd September 2020 - Parwan Employment Precinct

Land Use	Address	Location (onsite/offsite)	Comments from site inspection on 3 Sept 2020 (Nicole Krasic)	Photo order	Site Inspection conducted (Y/N)
Storage/dumping of vehicles/machinery	229 Smiths Road Parwan 2\LP214227	Onsite	Unable to locate. Drove to end of Smiths Road which believe was address, however locked gate		Y
Storage/dumping of vehicles/machinery and spoil	4265 Geelong-Bacchus Marsh Road 2\PS419531	Onsite	Unable to stop & view due to location and no safe spot to stop nearby (traffic and barriers). Appears to be residential property with horses		Y
Storage of spoil	135 Smiths Road 4\LP124567	Onsite	Crn of Cummings & Smiths Rd. Residential property with lots of rubbish, scraps, IBCs, dam & generally rundown property	18-22	Y
Unknown sheds/industrial (possibly agistment?)	4104 Geelong-Bacchus Marsh Road 2\PS434105	Onsite	GENETICS AUSTRALIS Sheds and buildings with empty dam	1-4	Y
L&G Meats	3922 Geelong-Bacchus Marsh Road (rendering activities)	Onsite			
Residential (Added those on day of inspection)	4011 Geelong-Bacchus Marsh Road		House, horses (stables)	14	
Residential (Added those on day of inspection)	3921, 3919 Geelong-Bacchus Marsh Road		Houses, dams, sheds	8-11	
Residential (Added those on day of inspection)	3922 Geelong-Bacchus Marsh Road		House, shed, dam	12, 13	

Site Investigation Photographs

Photograph Log of Site Inspection Completed on 3rd September 2020

Parwan Precinct Structure Plan





Photograph 1
107 Parwan-Exford Road
Parwan CFA



Photograph 2
107 Parwan-Exford Road
Parwan CFA

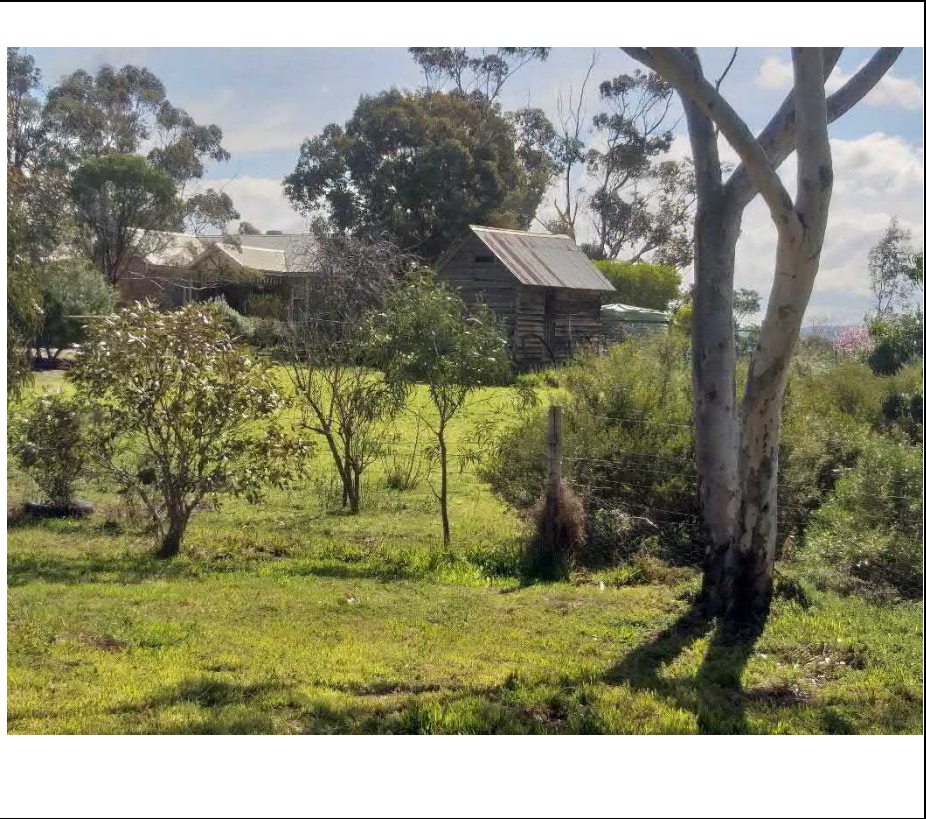
	
<p>Photograph 3 35 Whelans Road</p>	<p>Photograph 4 35 Whelans Road</p>

	
Photograph 5 10 Whelans Road	Photograph 6 10 Whelans Road

	
<p>Photograph 7 170 Whelans Road</p>	<p>Photograph 8 170 Whelans Road</p>

Appendix B – Site Inspection Photographs - Parwan Precinct Structure Plan

	
<p>Photograph 9 71 Whelans Road</p>	<p>Photograph 10 26 Whelans Lane</p>

	
<p>Photograph 11 51 Browns Lane</p>	<p>Photograph 12 81 Browns Lane</p>

	
<p>Photograph 13 81 Browns Lane</p>	<p>Photograph 14 9 Parwan-Exford Road</p>



Photograph 16
9 Parwan-Exford Road

Parwan Employment Precinct

	
<p>Photograph 17 4050 Geelong-Bacchus Marsh Road</p>	<p>Photograph 18 4050 Geelong-Bacchus Marsh Road</p>

	
<p>Photograph 17 4099 Geelong-Bacchus Marsh Road</p>	<p>Photograph 18 135 Smiths Road</p>

	
<p>Photograph 17 4099 Geelong-Bacchus Marsh Road</p>	<p>Photograph 18 135 Smiths Road</p>

	
<p>Photograph 17 4099 Geelong-Bacchus Marsh Road</p>	<p>Photograph 18 4104 Geelong-Bacchus Marsh Road</p>

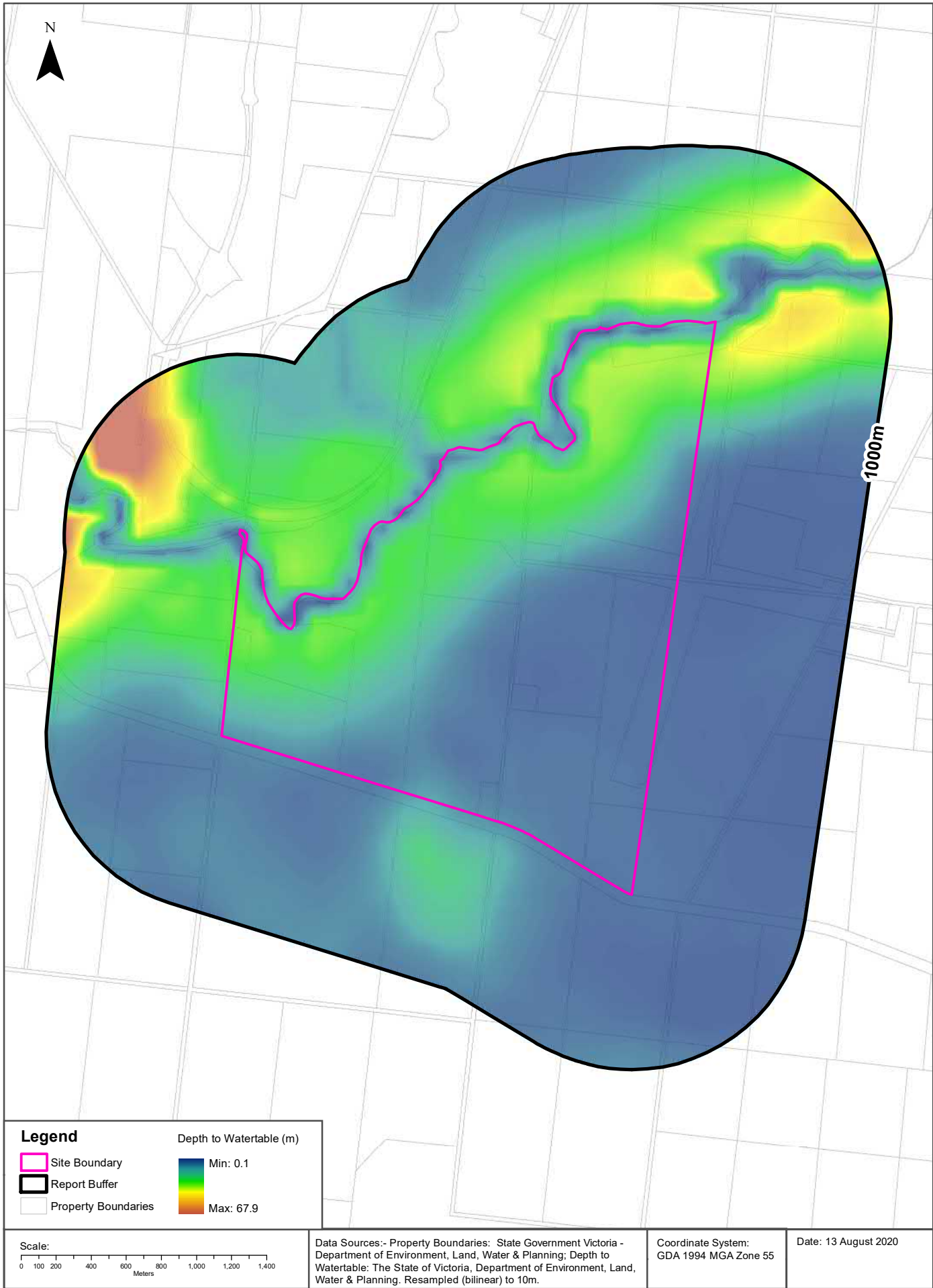
	
<p>Photograph 17 4104 Geelong-Bacchus Marsh Road</p>	<p>Photograph 18 4104 Geelong-Bacchus Marsh Road</p>

	
<p>Photograph 17 4104 Geelong-Bacchus Marsh Road</p>	<p>Photograph 18 4256 Geelong-Bacchus Marsh Road</p>



Photograph 17
4256 Geelong-Bacchus Marsh Road

Appendix C Geology and Hydrogeology Plans



Hydrogeology & Groundwater

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Fractured or fissured, extensive aquifers of low to moderate productivity	0m	Onsite

Hydrogeology Map of Australia: Commonwealth of Australia (Geoscience Australia)
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Groundwater Salinity

On-site Groundwater Salinity:

Groundwater Salinity	Percent Of Site Area
7,000 - 13,000 mg/l	100

Depth to Watertable

On-site Depth to Watertable:

Depth to Watertable	Percent Of Site Area
Less than 5 metres	39
20 to 50 metres	25
10 to 20 metres	16
5 to 10 metres	12

Surface Elevation

Approximate on-site Surface Elevation:

Surface Elevation
114 AHDm to 173 AHDm

Basement Elevation

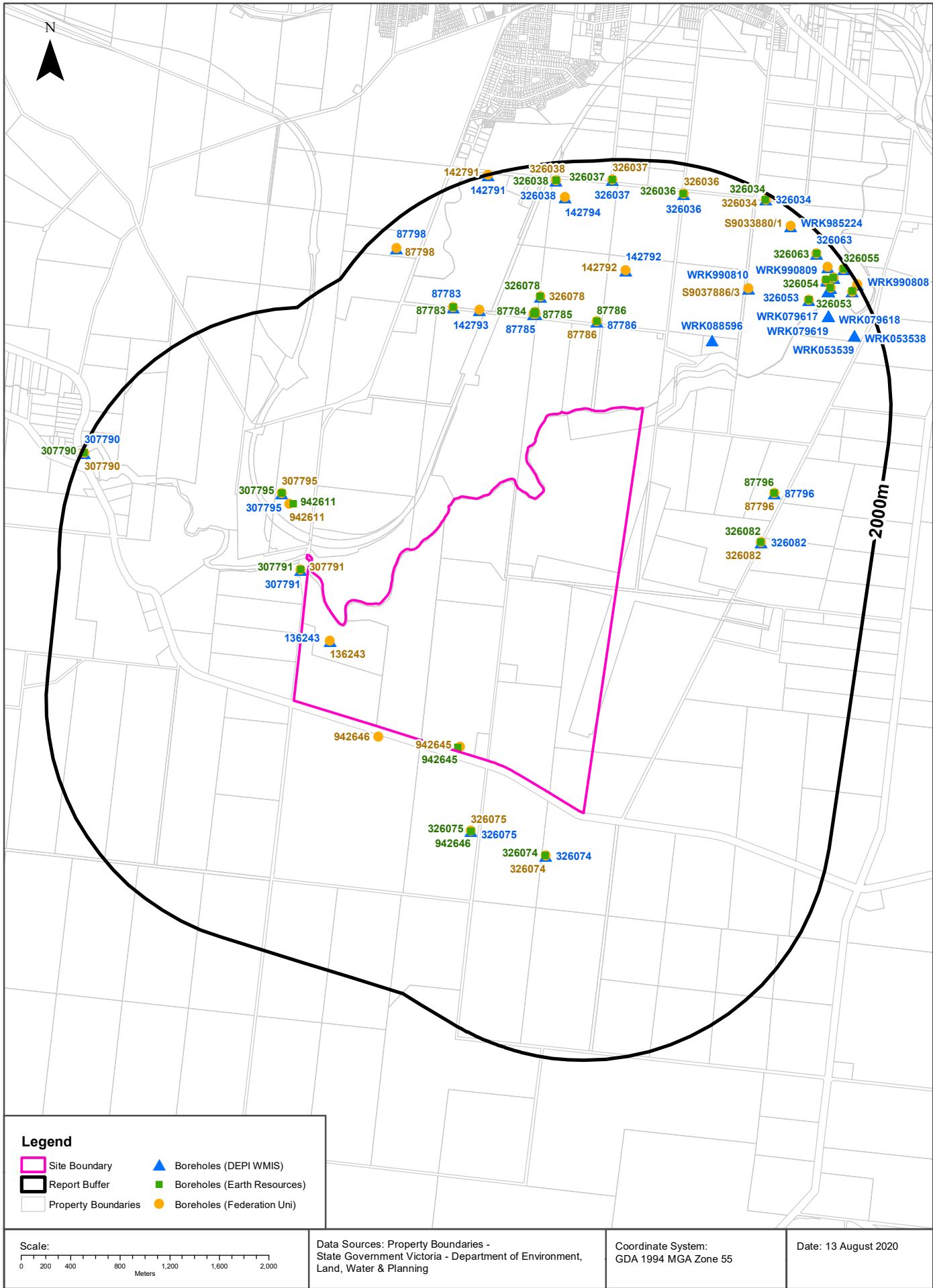
Approximate on-site Basement Elevation:

Basement Elevation - Basement Rocks comprise Lower Palaeozoic basement rocks that form the highlands and the crystalline basement; and Mesozoic rocks of the Otway and Gippsland basins both outcropping and subsurface
-30 AHDm to 10 AHDm

Groundwater Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Boreholes (DELWP WMIS)

Boreholes from the Department of Environment, Land, Water & Planning's Water Measurement Information System, within the dataset buffer:

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
136243	Stock	0.00m-1.50m GREY CLAY 1.50m-9.00m HARD BASALT 9.00m-12.00m STIFF ORANGE CLAY 12.00m-28.00m MEDIUM BASALT 28.00m-31.00m CLAYEY BASALT 31.00m-85.00m MEDIUM HARD BASALT 85.00m-91.00m COARSE SAND	-0.30m-1.50m INNER LINING - CASING = Pvc 1.50m-91.00m INNER LINING - SCREEN = Pvc 0.00m-0.50m OUTER LINING - GRAVEL = Cement			1998-03-25	0	Onsite
307791	Non Groundwater					1919-12-31	59	West
326074	Non Groundwater					1981-09-29	447	South
307795	Non Groundwater					1984-02-14	539	North West
326075	Non Groundwater					1981-09-30	582	South
87786	Not Known					1959-12-11	710	North
WRK088596	Investigation		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2016-05-11	782	North East
87785	Not Known					1959-10-21	815	North
87784	Not Known					1959-09-07	821	North
326078	Non Groundwater					1983-11-16	948	North
142793	Groundwater Investigation	0.00m-0.50m SOIL & CLAY 0.50m-30.00m BASALTIC CLAY 30.00m-45.00m WEATHERED BASALT 45.00m-58.00m BASALT 58.00m-63.00m WEATHERED BASALT	0.00m-63.00m INNER LINING - CASING = Pvc 57.00m-63.00m INNER LINING - SCREEN = Pvc 0.00m-1.00m OUTER LINING - GRAVEL = Cement 58.70m-59.70m OUTER LINING - GRAVEL = Bentonite 59.70m-63.00m OUTER LINING - GRAVEL = Gravel		57.00m-63.00m Basalt	1999-02-01	1013	North
326082	Non Groundwater					1984-03-12	1098	East
142792	Groundwater Investigation	0.00m-22.00m MOTTLED SANDY CLAY 22.00m-51.60m BASALT	0.00m-51.60m INNER LINING - CASING = Not Known 45.60m-51.60m INNER LINING - SCREEN = Not Known 0.00m-1.00m OUTER LINING - GRAVEL = Cement 43.00m-44.00m OUTER LINING - GRAVEL = Bentonite 44.00m-51.60m OUTER LINING - GRAVEL = Gravel		45.60m-51.60m Basalt	1999-01-29	1105	North
87796	Not Known					1987-06-01	1147	North East
87783	Not Known					1959-08-19	1155	North
WRK990810							1286	North East
326053	Non Groundwater					1960-07-22	1597	North East

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
WRK079619	Observation	0.00m-10.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-10.00m OUTER LINING - GRAVEL = Gravel		7.00m-10.00m Clay	2014-05-13	1670	North East
WRK079618	Observation	0.00m-11.00m CLAY	0.00m-8.00m INNER LINING - CASING = Pvc 8.00m-11.00m INNER LINING - SCREEN = Pvc 0.00m-6.00m OUTER LINING - GRAVEL = Cement 6.00m-7.00m OUTER LINING - GRAVEL = Bentonite 7.00m-11.00m OUTER LINING - GRAVEL = Gravel		8.00m-11.00m Clay	2014-05-13	1670	North East
WRK079617	Observation	0.00m-9.50m CLAY	0.00m-6.50m INNER LINING - CASING = Pvc 6.50m-9.50m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-9.50m OUTER LINING - GRAVEL = Gravel		6.50m-9.50m Clay	2014-05-13	1670	North East
WRK079620	Observation	0.00m-10.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-10.00m OUTER LINING - GRAVEL = Gravel		7.00m-10.00m Clay	2014-05-13	1670	North East
142794	Groundwater Investigation	0.00m-0.30m SOIL 0.30m-10.00m BROWN/GREY CLAY 10.00m-18.00m BASALT 18.00m-35.00m GRANITIC SANDY CLAYS 35.00m-42.50m BASALT 42.50m-45.00m FINE SAND SILT	0.00m-42.50m INNER LINING - CASING = Pvc 36.50m-42.50m INNER LINING - SCREEN = Pvc 0.00m-1.00m OUTER LINING - GRAVEL = Cement 3.40m-35.00m OUTER LINING - GRAVEL = Bentonite 35.00m-42.50m OUTER LINING - GRAVEL = Gravel		36.50m-42.50m Basalt	1999-02-02	1713	North
326036	Non Groundwater					1953-12-31	1760	North East
WRK069601	Observation	0.00m-40.50m FILL	0.00m-34.00m INNER LINING - CASING = Steel 34.00m-40.50m INNER LINING - SCREEN = Stainless Steel 0.00m-31.50m OUTER LINING - GRAVEL = Bentonite 31.50m-40.50m OUTER LINING - GRAVEL = Gravel		34.00m-40.50m Fill	2012-07-02	1767	North East
WRK069600	Observation	0.00m-60.80m FILL	0.00m-52.70m INNER LINING - CASING = Steel 52.70m-60.70m INNER LINING - SCREEN = Stainless Steel 0.00m-48.20m OUTER LINING - GRAVEL = Bentonite 48.20m-50.70m OUTER LINING - GRAVEL = Bentonite 50.70m-60.70m OUTER LINING - GRAVEL = Gravel		52.70m-60.70m Fill	2012-07-19	1767	North East
WRK069603	Observation	0.00m-9.50m CLAY 9.50m-22.50m SILT 22.50m-29.50m SAND 29.50m-35.00m CLAY 35.00m-36.00m SAND 36.00m-47.00m GRAVEL 47.00m-49.50m COAL	0.00m-38.00m INNER LINING - CASING = Pvc 38.00m-47.00m INNER LINING - SLOT = Pvc 0.00m-34.00m OUTER LINING - GRAVEL = Cement 34.00m-37.00m OUTER LINING - GRAVEL = Bentonite 37.00m-47.00m OUTER LINING - GRAVEL = Bentonite 47.00m-49.50m OUTER LINING - GRAVEL = Bentonite		38.00m-47.00m Gravel	2012-10-12	1767	North East
WRK069602	Observation					2012-08-03	1770	North East
326058	Non Groundwater					1960-07-22	1799	North East
326054	Non Groundwater					1960-06-29	1803	North East

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
WRK053538	Observation	0.00m-1.00m fill 1.00m-16.00m yellow clay 16.00m-67.00m coal 67.00m-74.00m sand	0.50m-19.00m INNER LINING - CASING = Steel 19.00m-71.00m INNER LINING - CASING = Pvc 71.00m-74.00m INNER LINING - SLOT = Pvc 0.00m-69.50m OUTER LINING - GRAVEL = Cement 69.50m-71.50m OUTER LINING - GRAVEL = Bentonite 71.50m-74.00m OUTER LINING - GRAVEL = Gravel		0.50m-19.00m Clay 19.00m-71.00m Coal 71.00m-74.00m Sand	2010-05-28	1804	North East
WRK053539	Observation	0.00m-4.00m fill 4.00m-28.00m clay 28.00m-62.00m coal 62.00m-69.00m sand	0.50m-30.00m INNER LINING - CASING = Steel 30.00m-66.00m INNER LINING - CASING = Pvc 66.00m-69.00m INNER LINING - SCREEN = Pvc 0.00m-62.00m OUTER LINING - GRAVEL = Cement 62.00m-65.50m OUTER LINING - GRAVEL = Bentonite 65.50m-69.00m OUTER LINING - GRAVEL = Gravel		0.50m-30.00m Clay 30.00m-66.00m Coal 66.00m-69.00m Sand	2010-06-03	1804	North East
87798	Domestic, Stock	0.00m-0.50m BROWN VOLCANIC EARTH 0.50m-17.00m STIFF CREAM CLAY 17.00m-43.00m MEDIUM HARD WEATHERED BASALT 43.00m-51.00m SOFT BROWN CLAY 51.00m-75.00m SOFT DRY RED SAND (TRACES OF COAL)				1988-10-08	1820	North
326037	Non Groundwater					1953-12-31	1838	North
326038	Non Groundwater					1953-12-31	1854	North
326072	Non Groundwater					1949-07-15	1863	North East
326063	Non Groundwater					1947-08-14	1874	North East
WRK990809							1875	North East
WRK985224							1892	North East
326057	Non Groundwater					1960-07-15	1933	North East
326034	Non Groundwater					1953-12-31	1952	North East
326055	Non Groundwater					1960-07-05	1969	North East
307790	Non Groundwater					1919-12-31	1976	West
WRK990808							1996	North East
142791	Groundwater Investigation	0.00m-1.00m SOIL & CLAY 1.00m-4.50m CLAYEY BASALT 4.50m-17.00m BASALT 17.00m-20.00m RED BASALTIC CLAY 20.00m-45.00m WEATHERED BASALT 45.00m-48.00m CLAYEY BASALT 48.00m-50.00m BROWN CLAY 50.00m-51.00m FINE SAND/SOME QUARTZ	0.00m-49.60m INNER LINING - CASING = Not Known 43.60m-49.60m INNER LINING - SCREEN = Not Known 0.00m-1.00m OUTER LINING - GRAVEL = Cement 41.50m-42.00m OUTER LINING - GRAVEL = Bentonite 42.00m-49.60m OUTER LINING - GRAVEL = Gravel		43.60m-49.60m Basalt	1999-01-28	1996	North

Boreholes WMIS Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Boreholes (Earth Resources Database)

Boreholes from the Earth Resources dataset, within the dataset buffer:

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
942645		Private Individual/Corporation		Percussion	Abandoned	01/10/1981	13.00		100	0	Onsite
307791		Department of Manufacturing & Industry Development				31/12/1919	121.01	160.00	100	61	West
942611		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	14/02/1984	138.99		110	422	North West
326074		Private Individual/Corporation		Reverse Circulation		29/09/1981	13.00	162.00	300	447	South
307795		Private Individual/Corporation		Rotary (diamond/drag bit)		14/02/1984	138.99	180.00	300	540	North West
326075		Private Individual/Corporation		Rotary (diamond/drag bit)		30/09/1981	238.00	170.00	300	582	South
942646		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	30/09/1981	238.00	166.11	25	582	South
87786		Department of Manufacturing & Industry Development		Percussion (cable)		11/12/1959	117.65	152.40	10	711	North
87785		Department of Manufacturing & Industry Development		Percussion (cable)		21/10/1959	42.98	155.80	10	815	North
87784		Department of Manufacturing & Industry Development		Percussion (cable)		07/09/1959	36.27	155.80	10	822	North
942609		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	16/11/1983	103.87	151.37	110	835	North
326078		Private Individual/Corporation		Rotary (diamond/drag bit)		16/11/1983	103.87	155.00	300	949	North
326082		Private Individual/Corporation		Rotary (diamond/drag bit)		12/03/1984	129.70	150.00	300	1096	East
87796		Private Individual/Corporation		Air Percussion/Air Rotary	Abandoned	01/06/1987	42.00		100	1145	North East
87783		Department of Manufacturing & Industry Development		Percussion (cable)		19/08/1959	232.26	161.50	10	1157	North
326053		Private Individual/Corporation				22/07/1960	55.80	103.00	10	1596	North East
326036		Department of Manufacturing & Industry Development				31/12/1953	84.73	144.20	10	1760	North East
326058		Private Individual/Corporation				22/07/1960	56.10	102.50	10	1798	North East

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
326054		Private Individual/Corporation				29/06/1960	53.90	100.90	10	1802	North East
326037		Department of Manufacturing & Industry Development				31/12/1953	30.18	147.80	10	1839	North
326038		Department of Manufacturing & Industry Development				31/12/1953	24.99	149.40	10	1855	North
326072		Private Individual/Corporation				15/07/1949	64.60	105.00	10	1862	North East
326063		Private Individual/Corporation				14/08/1947	12.20	100.00	10	1874	North East
326057		Private Individual/Corporation				15/07/1960	54.90	100.70	10	1932	North East
326034		Department of Manufacturing & Industry Development				31/12/1953	90.83	136.20	10	1952	North East
326055		Private Individual/Corporation				05/07/1960	51.80	100.20	10	1968	North East
307790		Department of Manufacturing & Industry Development				31/12/1919	102.41	155.00	100	1977	West

Boreholes Earth Resources Data Source: © The State of Victoria, Department of Economic Development, Jobs, Transport and Resources 2015. Creative Commons Attribution 3.0 Australia

Boreholes (Federation University)

Boreholes from the Federation University Australia dataset, within the dataset buffer:

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
136243		Groundwater	Stock		D: 0.000m-1.500m Grey Clay D: 1.500m-9.000m Hard Basalt D: 9.000m-12.000m Stiff Orange Clay D: 12.000m-28.000m Medium Basalt D: 28.000m-31.000m Clayey Basalt D: 31.000m-85.000m Medium Hard Basalt D: 85.000m-91.000m Coarse Sand	0	Onsite
942645	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			0	Onsite
307791	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Soil D: 0.300m-4.600m Gravel And Clay D: 4.600m-18.600m Basalt D: 18.600m-33.200m Clay, Grey, Sandy D: 33.200m-79.600m Basalt D: 79.600m-83.800m Clay, Grey D: 83.800m-89.600m Sand And Fine Gravel D: 89.600m-100.000m Brown Coal, Inferior, Or Ligneous Clay D: 100.000m-101.200m Sand D: 101.200m-121.000m Clay, Grey, Sandy[End Of Hole :- Depth Bored Brackish Water Struck At 65 And 160 Feet, Standing At 134Feet.]	59	West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
942646	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater		g: 0.000m-6.000m Clay g: 6.000m-42.000m Basalt g: 42.000m-54.000m Silty Clay, Clay g: 54.000m-65.000m Basalt g: 65.000m-70.000m Silty Clay, Clay g: 70.000m-78.000m Basalt g: 78.000m-82.500m Silty Clay, Clay g: 82.500m-89.000m Sand g: 89.000m-98.500m Silty Clay, Sand g: 98.500m-126.000m Coal g: 126.000m-140.500m Sand, Minor Clay Interbeds g: 140.500m-238.000m Silty Clay, Clay, Minor Sand Beds	75	South West
942611	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			431	North West
326074	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			447	South
307795	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			539	North West
326075	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			582	South
87786	Victorian Mines Department (1909 - 1977)				D: 0.000m-0.600m Red Soil G: 0.000m-0.600m Red Soil D: 0.600m-4.600m Yellow Mottled Clay G: 0.600m-4.600m Yellow Mottled Clay D: 4.600m-6.400m Grey Mottled Clay G: 4.600m-6.400m Grey Mottled Clay D: 6.400m-7.600m Red Mottled Clay G: 6.400m-7.600m Red Mottled Clay G: 7.600m-9.400m Yellow Mottled Clay D: 7.600m-9.400m Yellow Mottled Clay D: 9.400m-10.100m Yellow Clay And Basalt G: 9.400m-10.100m Yellow Clay And Basalt G: 10.100m-16.200m Basalt D: 10.100m-16.200m Basalt D: 16.200m-19.200m Yellow Clay G: 16.200m-19.200m Yellow Clay D: 19.200m-21.000m Yellow Mottled Clay G: 19.200m-21.000m Yellow Mottled Clay D: 21.000m-22.900m Grey Mottled Clay G: 21.000m-22.900m Grey Mottled Clay G: 22.900m-26.500m Yellow Mottled Clay D: 22.900m-26.500m Yellow Mottled Clay G: 26.500m-27.100m Grey Mottled Clay D: 26.500m-27.100m Grey Mottled Clay G: 27.100m-29.000m Brown Clay D: 27.100m-29.000m Brown Clay D: 29.000m-30.500m Yellow Mottled Clay G: 29.000m-30.500m Yellow Mottled Clay G: 30.500m-32.300m Yellow Mottled Sandy Clay D: 30.500m-32.300m Yellow Mottled Sandy Clay G: 32.300m-34.100m Yellow Clayey Sand D: 32.300m-34.100m Yellow Clayey Sand G: 34.100m-35.100m Coarse Sand And Gravel D: 34.100m-35.100m Coarse Sand And Gravel D: 35.100m-36.600m Yellow Clay And Basalt G: 35.100m-36.600m Yellow Clay And Basalt G: 36.600m-60.700m Basalt D: 36.600m-60.700m Basalt G: 60.700m-64.000m Blue Mottled Mudstone D: 60.700m-64.000m Blue Mottled Mudstone D: 64.000m-65.500m Blue Sandy Clay G: 64.000m-65.500m Blue Sandy Clay D: 65.500m-70.400m Fine Sand G: 65.500m-70.400m Fine Sand D: 70.400m-94.200m Brown Coal G: 70.400m-94.200m Brown Coal D: 94.200m-100.600m Brown Coal And Sand G: 94.200m-100.600m Brown Coal And Sand D: 100.600m-103.600m Coarse Sand G: 100.600m-103.600m Coarse Sand D: 103.600m-107.000m Fine Sand G: 103.600m-107.000m Fine Sand D: 107.000m-117.700m Grey Clay G: 107.000m-117.700m Grey Clay	710	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
87785	Victorian Mines Department (1909 - 1977)				G: 0.000m-0.600m Red Soil G: 0.600m-4.600m Yellow Mottled Clay G: 4.600m-6.100m Grey Mottled Clay G: 6.100m-7.300m Red Mottled Clay G: 7.300m-8.200m Yellow Mottled Clay G: 8.200m-9.100m Yellow Mottled Clay And Stones G: 9.100m-9.800m Yellow Clay And Basalt G: 9.800m-15.900m Basalt G: 15.900m-21.300m Yellow Mottled Clay G: 21.300m-22.600m Grey Mottled Clay G: 22.600m-26.200m Yellow Mottled Clay G: 26.200m-26.800m Grey Mottled Clay G: 26.800m-29.600m Brown Clay G: 29.600m-30.500m Yellow Mottled Clay G: 30.500m-32.300m Yellow Clayey Sand G: 32.300m-34.100m Yellow Mottled Sandy Clay G: 34.100m-35.100m Coarse Dry Sand And Gravel G: 35.100m-35.700m Clay And Basalt G: 35.700m-36.600m Decomposed Basalt G: 36.600m-40.500m Basalt G: 40.500m-43.000m Basalt And Coarse Gravel	815	North
87784	Victorian Mines Department (1909 - 1977)				G: 0.000m-0.600m Red Soil G: 0.600m-4.600m Yellow Mottled Clay G: 4.600m-6.100m Grey Mottled Clay G: 6.100m-7.300m Red Mottled Clay G: 7.300m-8.200m Yellow Mottled Clay G: 8.200m-9.100m Yellow Mottled Clay And Stones G: 9.100m-9.800m Yellow Clay And Basalt G: 9.800m-15.900m Soft Basalt G: 15.900m-21.300m Yellow Mottled Clay G: 21.300m-22.600m Grey Mottled Clay G: 22.600m-26.200m Yellow Mottled Clay G: 26.200m-26.800m Grey Mottled Clay G: 26.800m-29.600m Brown Clay G: 29.600m-30.500m Yellow Mottled Clay G: 30.500m-32.300m Yellow Clayey Sand G: 32.300m-34.100m Yellow Mottled Sandy Clay G: 34.100m-35.100m Coarse Sand And Gravel G: 35.100m-36.000m Clay And Basalt G: 36.000m-36.300m Basalt	821	North
942609	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			833	North
326078	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			948	North
142793		Groundwater	Groundwater Investigation		D: 0.000m-0.500m Soil & Clay D: 0.500m-30.000m Basaltic Clay D: 30.000m-45.000m Weathered Basalt D: 45.000m-58.000m Basalt D: 58.000m-63.000m Weathered Basalt	1013	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326082	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		D: 0.000m-3.000m Clay - Red Brown Clay. Little Moisture, Fair Consistency D: 3.000m-6.000m Soil - Red Brown Earth D: 6.000m-29.000m Basalt - The Basalt Is Scoria, Weathered, With Large Vesicles Throughout Becomes More Massive Until 26M Where A Fine Red Brown Clay Layer Is Present. At 27M Basalt Is Vesicular, Partly Weathered Grey Colour D: 29.000m-43.000m Clay - Ochre Coloured Then A Lighter Orange At 33M, Little Moisture, Slightly Silty. At 34.5M Clay Turns A Reddy Colour. At 35M Clay Becomes Whiter And More Silty. 37.5M Clay Is Very Silty And A Distinctly Ochre Colour. At 39M Clay Is Very Silty And Orang D: 43.000m-57.000m Silt/Sand - Silt As Described Above With Sand ~ 1Mm Average Angular To Sub-Angular Well Sorted D: 57.000m-62.500m Clay - Good Consistency, Ochre To Orange Colour - White And Fawn D: 62.500m-63.000m Carbonaceous Clay - Dark Black To Brown - Good Consistency, High Moisture Content D: 63.000m-67.200m Brown Coal - Start Coring - 63.5M 63.5 - 64.9 No Recovery 64.9 - 66.4 2.1M Recovery 66.4 - 69.4 3.09M Recovery D: 67.200m-73.100m Clay - Grey Clay, Good Consistency, Good Moisture - Contains Bands Of Pyrite 69.4 - 72.4 2.04M Recovery Clay Also Contains Fine Shell Material 72.4 - 75.4 3.1M Recovery Last 0.6M Of Clay Has Abundant Pyrite And Some Rounded Quartz Grains ~ 3Mm To <1Mm D: 73.100m-121.100m Brown Coal - Black To Dark Brown Slightly Clayey For 73.06 - 73.56M Abundant Lignite Material 75.4 - 78.4 3.0M Recovery 78.4 - 81.4 3.0M Recovery 81.4 - 84.4 3.0M Recovery 84.4 - 87.4 3.0M Recovery Coal Is Much Drier And Less Clayier 87.4 - 90.4 3.0M Reco D: 121.100m-129.700m Silty Clay - Fawn Coloured Clay With Silty Particles Within - Good Consistency Silt Becomes More Abundant At 120.2M. Some Parts Of The Bed Are Clayier And Others Siltier 117.7 - 120.7 2.7M Recovery 0.8M Coal 1.8M Non Coal 120.7 - 123.7 1.7M Recovery 123.7	1098	East
142792		Groundwater	Groundwater Investigation		D: 0.000m-22.000m Mottled Sandy Clay D: 22.000m-51.600m Basalt	1105	North
87796					D: 0.000m-0.300m Black Topsoil D: 0.300m-3.000m Basalt Floaters D: 3.000m-6.000m Honeycomb Basalt D: 6.000m-31.000m Basalt D: 31.000m-36.000m Fine Sands To 1Inch River Grave Ls No Water-Abandoned	1147	North East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
87783	Victorian Mines Department (1909 - 1977)				G: 0.000m-0.900m Red Soil G: 0.900m-2.100m Grey Mottled Clay G: 2.100m-3.400m Yellow Mottled Clay G: 3.400m-5.500m Grey Mottled Clay G: 5.500m-6.700m Red Mottled Clay G: 6.700m-15.500m Grey Mottled Clay G: 15.500m-18.000m Grey Mottled Sandy Clay G: 18.000m-22.300m Grey Mottled Clay G: 22.300m-25.000m Yellow Mottled Clay G: 25.000m-25.600m Red Mottled Clay G: 25.600m-28.700m Grey Sandy Clay G: 28.700m-31.700m Grey Clay With Pebbles G: 31.700m-54.000m Basalt And Thin Bands Of Clay G: 54.000m-55.800m Basalt G: 55.800m-56.400m Yellow Clay And Gravel G: 56.400m-57.000m Grey Mottled Clay G: 57.000m-71.000m Grey Clay G: 71.000m-87.800m Brown Coal G: 87.800m-94.200m Grey Sand G: 94.200m-113.700m Grey Sandy Clay G: 113.700m-117.000m Coarse Clayey Sand G: 117.000m-125.600m Grey Sandy Clay G: 125.600m-126.200m Brown Sandy Clay G: 126.200m-130.800m Grey Sandy Clay G: 130.800m-131.400m Brown Sandy Clay G: 131.400m-135.900m Grey Sandy Clay G: 135.900m-136.200m Sandstone G: 136.200m-145.400m Grey Sandy Clay G: 145.400m-147.500m Brown Sandy Clay G: 147.500m-147.800m Grey Sandy Clay G: 147.800m-154.800m Grey Clay G: 154.800m-155.100m Thin Band Of Stone G: 155.100m-159.100m Grey Clay G: 159.100m-159.400m Thin Band Of Stone G: 159.400m-172.200m Grey Clay G: 172.200m-172.800m Hard Band Of Stone G: 172.800m-183.500m Grey Clay G: 183.500m-183.800m Stone G: 183.800m-185.300m Grey Clay G: 185.300m-190.800m Dark Grey Clay G: 190.800m-191.100m Band Of Stone G: 191.100m-200.900m Grey Clay G: 200.900m-203.000m Dark Grey Clay G: 203.000m-203.600m Band Of Stone G: 203.600m-206.400m Grey Clay G: 206.400m-207.000m Stone G: 207.000m-210.000m Grey Clay G: 210.000m-210.300m Stone G: 210.300m-211.800m Grey Clay G: 211.800m-214.000m Stone G: 214.000m-217.600m Grey Clay G: 217.600m-218.800m Stone G: 218.800m-222.200m Grey Clay G: 222.200m-223.100m Stone G: 223.100m-226.200m Grey Clay G: 226.200m-232.300m Blue Clay Water Struck At 150 And 303 Feet,Standi At 45 Feet	1155	North
S9037886/3		Groundwater				1286	North East
326053	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Silty Soil G: 0.600m-3.700m Brown Silty Clay G: 3.700m-5.800m Mottled Silty Clay G: 5.800m-6.400m Yellow Sandy Clay G: 6.400m-7.300m Gravel Wet G: 7.300m-8.700m Clayey Gravel Wet G: 8.700m-9.700m Ligneous Clay G: 9.700m-12.800m Inferior Coal G: 12.800m-14.300m Coal Brown G: 14.300m-15.800m Inferior Coal G: 15.800m-17.400m Coal Brown G: 17.400m-25.000m Inferior Coal G: 25.000m-26.500m Coal Brown G: 26.500m-28.000m Inferior Coal G: 28.000m-31.100m Coal Brown G: 31.100m-32.600m Inferior Coal G: 32.600m-52.400m Coal Brown G: 52.400m-53.900m Inferior Coal G: 53.900m-55.800m Ligneous Sandy Clay G: 55.800m-55.800m Sand	1597	North East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
142794		Groundwater	Groundwater Investigation		D: 0.000m-0.300m Soil D: 0.300m-10.000m Brown/Grey Clay D: 10.000m-18.000m Basalt D: 18.000m-35.000m Granitic Sandy Clays D: 35.000m-42.500m Basalt D: 42.500m-45.000m Fine Sand Silt	1713	North
326036	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-4.300m Brown Clay And Bands Of Cement Sandston G: 4.300m-13.700m Yellow And White Mottled Sandy Clay G: 13.700m-17.400m Gravel And Quartz G: 17.400m-21.900m Yellow And White Mottled Sandy Clay-Ban Of Sand G: 21.900m-34.400m Yellow And White Mottled Clayey Sand G: 34.400m-36.300m Sand And Gravel G: 36.300m-39.600m Brown Sandy Clay G: 39.600m-47.900m Ligneous Clay G: 47.900m-81.400m Brown Coal G: 81.400m-84.100m Brown Clay G: 84.100m-84.700m Brown Sand	1760	North East
326058	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Soil G: 0.300m-3.400m Silt G: 3.400m-6.400m Brown Silty Clay G: 6.400m-9.900m Gravel Wet G: 9.900m-26.500m Inferior Coal G: 26.500m-29.600m Coal Brown G: 29.600m-32.600m Inferior Coal G: 32.600m-46.300m Coal Brown G: 46.300m-47.900m Inferior Coal G: 47.900m-52.400m Coal Brown G: 52.400m-53.900m Inferior Coal G: 53.900m-55.500m Ligneous Silty Clay G: 55.500m-56.100m Inferior Coal Silty	1799	North East
326054	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-1.200m Silty Soil G: 1.200m-3.400m Silt G: 3.400m-4.900m Mottled Clay G: 4.900m-5.800m Mottled Silty Clay G: 5.800m-6.400m Clay & Large Stones G: 6.400m-7.000m Gravel Wet G: 7.000m-7.900m Clayey Silt G: 7.900m-9.400m Inferior Coal G: 9.400m-11.000m Coal Brown G: 11.000m-12.500m Inferior Coal G: 12.500m-14.000m Coal Brown G: 14.000m-17.000m Inferior Coal G: 17.000m-23.200m Coal Brown G: 23.200m-24.700m Inferior Coal G: 24.700m-26.200m Coal Brown G: 26.200m-35.400m Inferior Coal G: 35.400m-38.400m Coal Brown G: 38.400m-39.900m Inferior Coal G: 39.900m-41.500m Coal Brown G: 41.500m-44.500m Inferior Coal G: 44.500m-50.600m Coal Brown G: 50.600m-52.100m Inferior Coal Silty G: 52.100m-53.900m Ligneous Silty Clay G: 53.900m-53.900m Sand	1803	North East
87798	Rural Water Commission / Corporation (1984 - 1995)	Groundwater	Domestic Stock		D: 0.000m-0.500m Brown Volcanic Earth D: 0.500m-17.000m Stiff Cream Clay D: 17.000m-43.000m Medium Hard Weathered Basalt D: 43.000m-51.000m Soft Brown Clay D: 51.000m-75.000m Soft Dry Red Sand(Traces Of Coal)	1820	North
326037	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-2.100m Brown Clay G: 2.100m-3.700m Yellow Sandy Clay G: 3.700m-6.700m Yellow Clayey Sand G: 6.700m-7.900m Grey Sand G: 7.900m-12.800m Grey Clay G: 12.800m-20.100m Yellow And White Mottled Sandy Clay G: 20.100m-22.900m Gravel And Quartz G: 22.900m-25.000m Yellow Clay G: 25.000m-29.300m Grey Basalt G: 29.300m-30.200m Hard Grey Basalt	1838	North
326038	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-3.000m Brown Clay G: 3.000m-4.300m Yellow Sandy Clay, Lots Of Quartz G: 4.300m-11.300m Yellow And White Mottled Clay G: 11.300m-13.100m Gravel And Quartz G: 13.100m-19.500m Sand And Gravel G: 19.500m-24.400m Grey Sandy Clay G: 24.400m-25.000m Hard Basalt	1854	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326072	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-9.100m Clay & Gravel G: 9.100m-9.800m Ligneous Sand G: 9.800m-57.900m Coal Brown G: 57.900m-58.500m Fine Sand G: 58.500m-64.600m Clay	1863	North East
326063	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-1.200m Soil G: 1.200m-6.100m Clay G: 6.100m-6.700m Sand G: 6.700m-8.800m Gravel Wet G: 8.800m-12.200m Coal Brown	1874	North East
S9037886/2		Groundwater				1875	North East
S9033880/1		Groundwater				1892	North East
326057	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-5.800m Silt G: 5.800m-7.900m Gravel G: 7.900m-9.400m Clayey Silt G: 9.400m-26.200m Inferior Coal G: 26.200m-29.300m Coal Brown G: 29.300m-30.800m Inferior Coal G: 30.800m-35.400m Coal Brown G: 35.400m-36.900m Inferior Coal G: 36.900m-49.000m Coal Brown G: 49.000m-50.600m Inferior Coal G: 50.600m-52.100m Coal Brown G: 52.100m-53.600m Inferior Coal G: 53.600m-54.900m Ligneous Silty Clay	1933	North East
326034	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-2.100m Brown Clay G: 2.100m-3.000m Yellow Sandy Clay G: 3.000m-3.700m Coarse Sand G: 3.700m-10.400m Yellow Clay G: 10.400m-15.500m Coarse Gravel And Quartz G: 15.500m-25.600m Grey Clay G: 25.600m-29.300m Brown Sandy Clay G: 29.300m-31.700m Hard Quartz G: 31.700m-37.800m Yellow And White Sandy Clay G: 37.800m-43.300m Ligneous Clay G: 43.300m-86.600m Brown Coal G: 43.300m-61.600m C = 59, Gdse = 22.96, H = 4.3, N = 0.5, Volatiles = 46.1 G: 61.600m-76.800m C = 66, Gdse = 26.18, H = 5, N = 0.7, Volatiles = 51.3 G: 86.600m-89.000m Ligneous Clay G: 89.000m-90.800m Grey Sandy Clay	1952	North East
326055	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-0.900m Silty Soil G: 0.900m-2.100m Silt G: 2.100m-2.700m Silty Clay G: 2.700m-5.200m Mottled Clay G: 5.200m-7.000m Gravel G: 7.000m-8.500m Clayey Silt G: 8.500m-9.400m Gravel Wet G: 9.400m-15.500m Inferior Coal G: 15.500m-17.000m Coal Brown G: 17.000m-20.100m Inferior Coal G: 20.100m-24.700m Coal Brown G: 24.700m-27.700m Inferior Coal G: 27.700m-29.300m Coal Brown G: 29.300m-32.300m Inferior Coal G: 32.300m-33.800m Coal Brown G: 33.800m-35.400m Inferior Coal G: 35.400m-38.400m Coal Brown G: 38.400m-41.500m Inferior Coal G: 41.500m-43.000m Coal Brown G: 43.000m-50.600m Inferior Coal G: 50.600m-51.800m Ligneous Silty Clay	1969	North East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
307790	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-2.700m Sand And Clay D: 2.700m-3.400m Cement, Ferruginous D: 3.400m-4.000m Clay, Sandy D: 4.000m-4.900m Cement, Ferruginous D: 4.900m-6.700m Clay, White And Yellow D: 6.700m-11.300m Clay And Sand, Portions Ligneous D: 11.300m-11.900m Brown Coal, Inferior D: 11.900m-40.200m Clay, Sandy In Places With Occasional Ironstone And Ligneous Clay Bands D: 40.200m-40.500m Ironstone D: 40.500m-45.400m Clay, Grey With Ligneous Bands D: 45.400m-84.400m Clay, Grey, Sandy, With Occasional Thin Bands Of Brown Coal D: 84.400m-84.700m Brown Coal, Inferior D: 84.700m-102.400m Clay, Ligneous, With Bands Of Ironstone And Ligneous Clay[End Of Hole :-Depth Bored Brackish Water Struck At 16 Feet, Standing At 12 Feet.]	1976	West
142791		Groundwater	Groundwater Investigation		D: 0.000m-1.000m Soil & Clay D: 1.000m-4.500m Clayey Basalt D: 4.500m-17.000m Basalt D: 17.000m-20.000m Red Basaltic Clay D: 20.000m-45.000m Weathered Basalt D: 45.000m-48.000m Clayey Basalt D: 48.000m-50.000m Brown Clay D: 50.000m-51.000m Fine Sand/Some Quartz	1996	North
S9037886/1		Groundwater				1996	North East

Boreholes FedUni Data Source: © Federation University Australia

Historical Mining Activity - Shafts

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Historical Mining Activity - Shafts

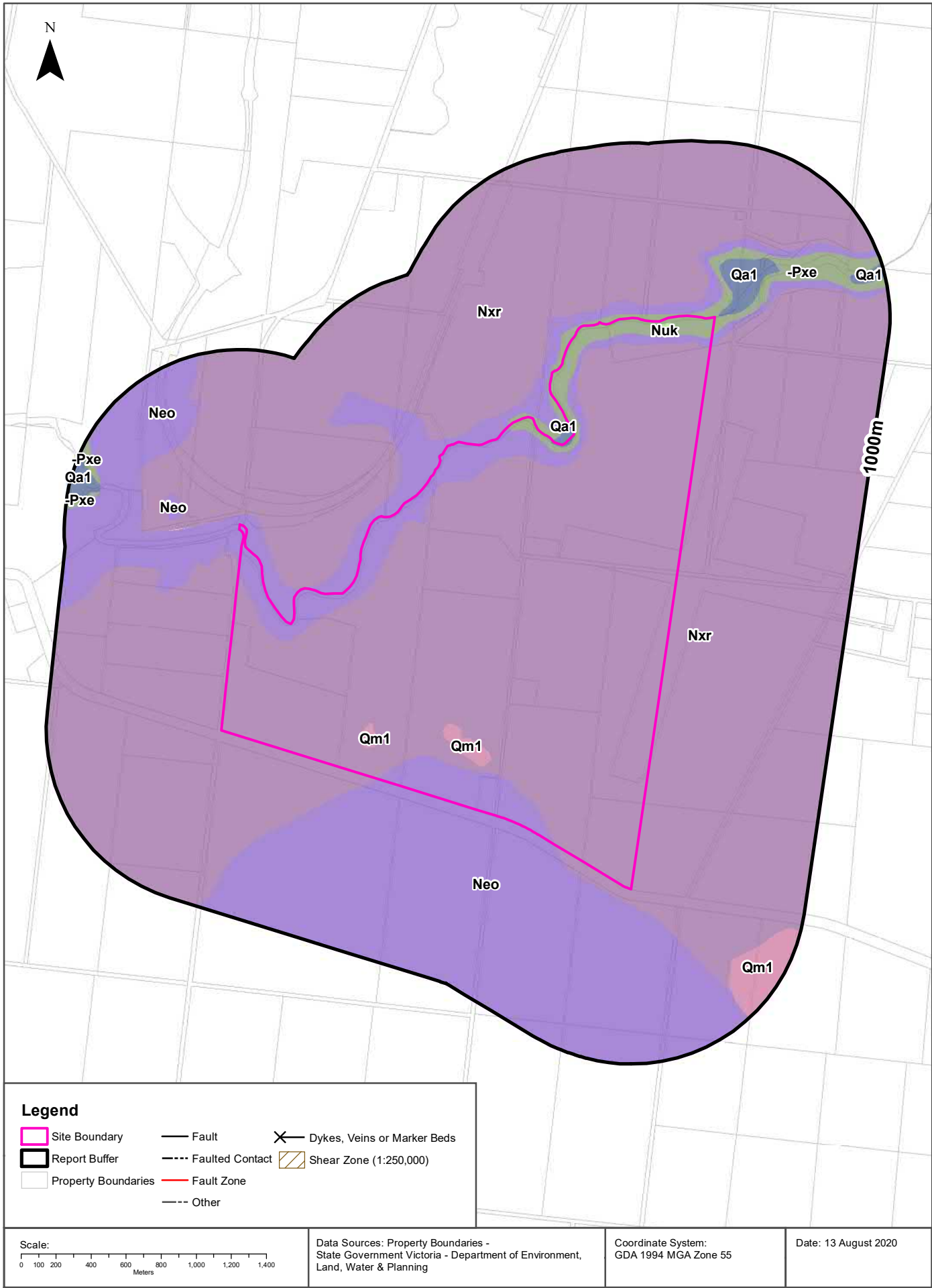
Mine Shaft Locations were collected by a variety of methods from 1869 in some areas of the state, mainly concentrating in Ballarat and Bendigo. In places a shaft may be recorded multiple times with a different source. In cases where several shaft locations are shown close together (generally with separations less than stated position errors) and they have different sources, it is possible that one shaft has been mapped several times. In cases where several shaft locations are shown close together but they have the same information source, it is possible that each shaft location represents a different shaft on the ground.

Historical Mine Shafts within the dataset buffer:

Map Id	Name	Source	Depth (m)	Collar (ft)	Fill/Cap Method	Location Desc	Location Accuracy	Distance	Direction
N/A	No records in buffer								

Historical Mining Activity Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources

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Geology

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Geological Units

What are the Geological Units onsite?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	1:50,000
Nuk	Kerrs Road Basalt (Nuk): generic	Olivine basalt: grey; fine to medium-grained; vesicular	Miocene to Miocene	basalt (all)	1:50,000
Nxr	Darley Gravel (Nxr): generic	Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source	Neogene to Pleistocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
-Pxe	Werribee Formation (-Pxe): generic	Sand, silt, clay, gravel in variable proportions: generally white to pale grey; in part carbonaceous, pyritic; ferruginous bands common; contains Cinnamomum flora	Eocene to Miocene	sand (significant); silt material (significant); clay lithology (significant); gravel material (significant)	1:50,000
Qa1	alluvium(Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
Qm1	swamp and lake deposits (Qm1): generic	Grey to black carbonaceous mud, silt, clay, minor peat: generally unconsolidated; rare dolomite	Pleistocene to Holocene	mud (major proportion); silt material (significant); clay lithology (significant); peat (minor proportion)	1:50,000

What are the Geological Units within the dataset buffer?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	1:50,000
Nuk	Kerrs Road Basalt (Nuk): generic	Olivine basalt: grey; fine to medium-grained; vesicular	Miocene to Miocene	basalt (all)	1:50,000

Symbol	Name	Description	Geological Age	Lithology	Dataset
Nxr	Darley Gravel (Nxr): generic	Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source	Neogene to Pleistocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
-Pxe	Werribee Formation (-Pxe): generic	Sand, silt, clay, gravel in variable proportions: generally white to pale grey; in part carbonaceous, pyritic; ferruginous bands common; contains Cinnamomum flora	Eocene to Miocene	sand (significant); silt material (significant); clay lithology (significant); gravel material (significant)	1:50,000
Qa1	alluvium(Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
Qm1	swamp and lake deposits (Qm1): generic	Grey to black carbonaceous mud, silt, clay, minor peat: generally unconsolidated; rare dolomite	Pleistocene to Holocene	mud (major proportion); silt material (significant); clay lithology (significant); peat (minor proportion)	1:50,000

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Geology

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Geological Structures

What are the Geological Faults or Faulted Contacts onsite?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:50,000

What are the Dykes, Marker Beds and Veins onsite?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:50,000

What are the Shear Zones onsite (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

What are the Geological Faults or Faulted Contacts within the dataset buffer?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:50,000

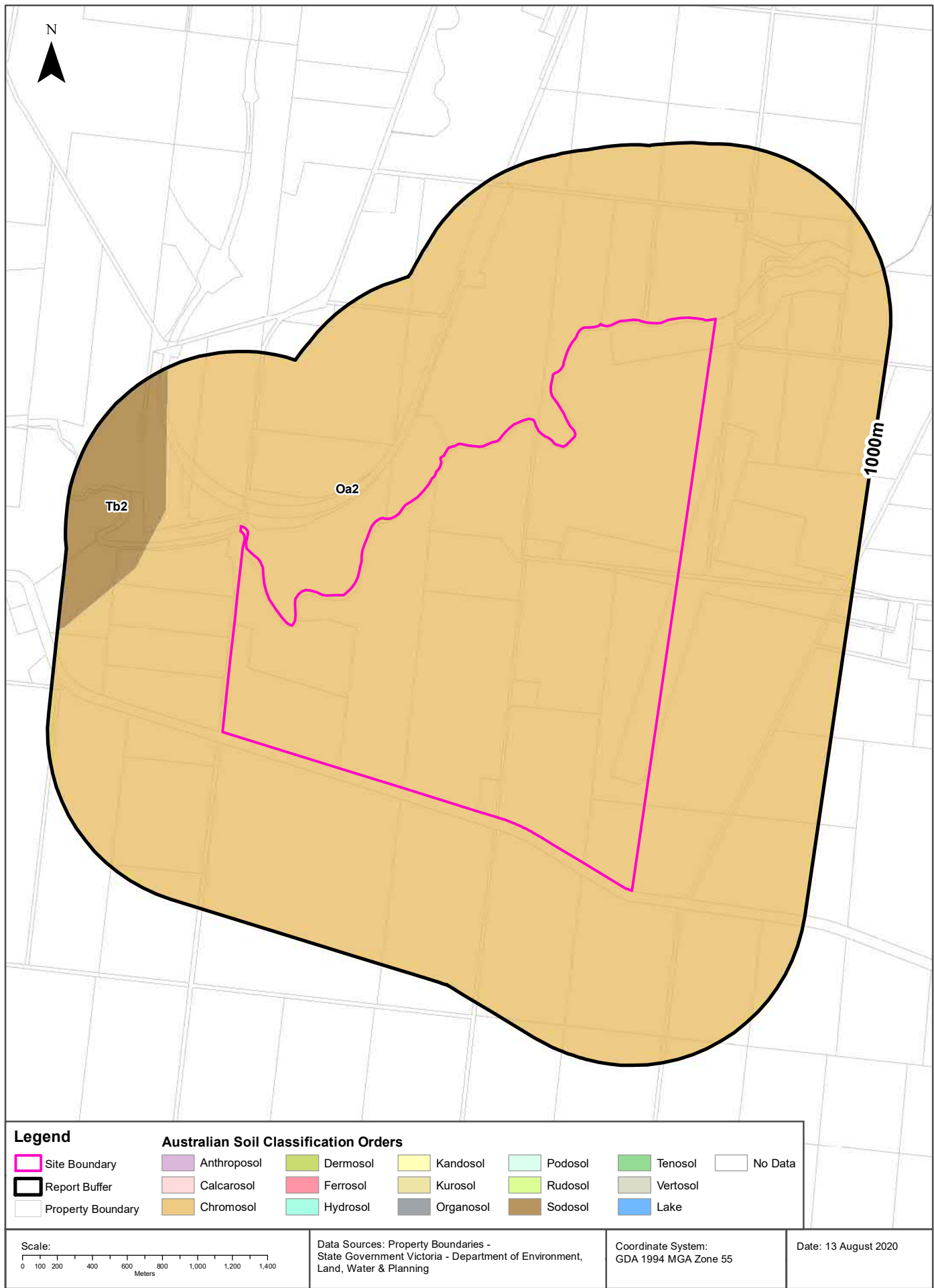
What are the Dykes, Marker Beds and Veins within the dataset buffer?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:50,000

What are the Shear Zones within the dataset buffer (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Soil Landscapes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

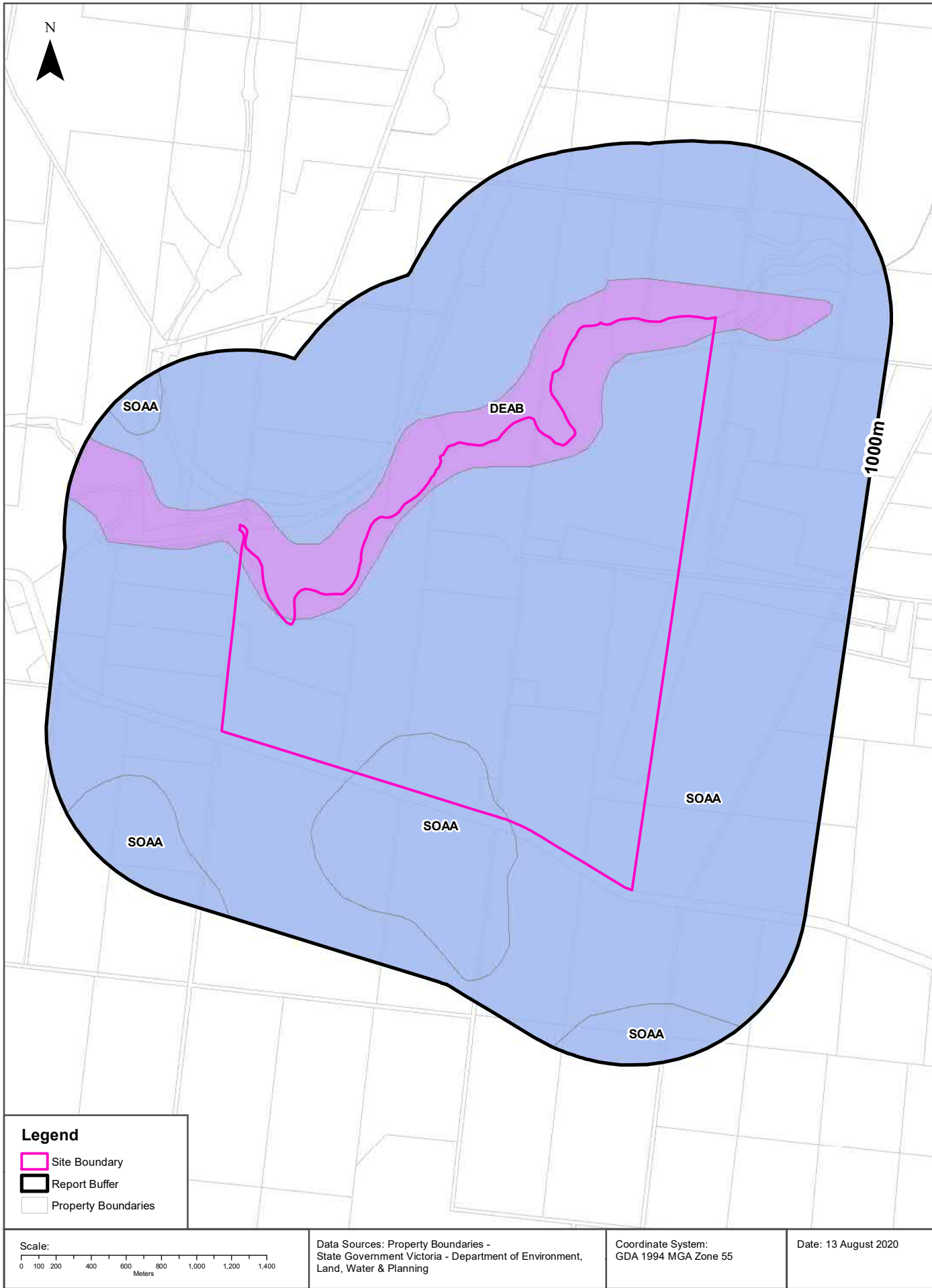
Atlas of Australian Soils

Australian soil types within the dataset buffer:

Symbol	Soil Order	Map Unit Description	Distance
Oa2	Chromosol	Dissected plateaux at low elevation: plains of hard alkaline red soils (Dr2.13) often in gilgai micro- association with dark cracking clays (Ug5.1), and grey and brown cracking clays (Ug5.2 and Ug5.3), small areas of other soils such as (Dr2.33), (Dy3.43), and (Dd1.1); also with (1) low, broad, sprawling stony rises of (Dr2.13), (2) low rounded hills of various (D) soils such as (Db1.23) with boulder strewn slopes, and (3) incised, often gorge-like, stream valleys of undescribed soils.	0m
Tb2	Sodosol	Hilly with some flat-topped knolls and ridges, gorges, some river flats: moderate to steep hill slopes of hard acidic yellow mottled soils (Dy3.41), some containing ironstone grav, with rock out- crops and various (Uc) and (Um) soils; flat-topped ridges and knolls of hard alkaline red soils (Dr2.13); some rocky gorges; lower hill slopes of various (D) soils including (Db2.22); and river flats of undescribed soils.	446m

Atlas of Australian Soils: CSIRO

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Soils Landscapes

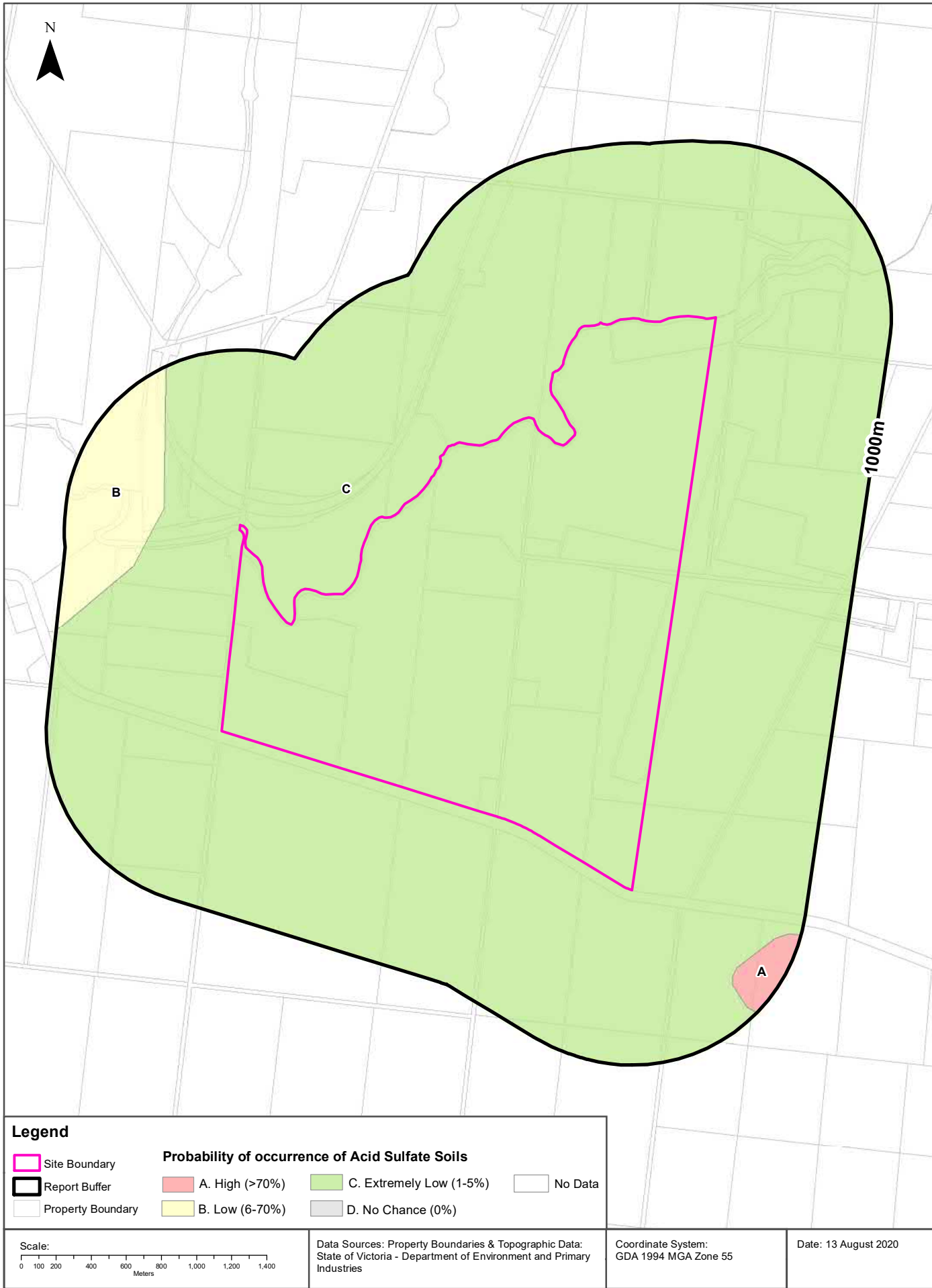
Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Victorian Soil Type Mapping

Victorian Soil Types within the dataset buffer:

Symbol	Description	Distance
DEAB	Brown Dermosols	0m
SOAA	Red Sodosols	0m

Victorian Soil Type Mapping Data Source: Department of Economic Development, Jobs, Transport and Resources
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Acid Sulfate Soils

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Atlas of Australian Acid Sulfate Soils

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

PROBCLASS	Description	Distance
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m
B	Low Probability of occurrence. 6-70% chance of occurrence.	447m
A	High Probability of occurrence. >70% chance of occurrence.	740m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Acid Sulfate Soils

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Coastal Acid Sulfate Soils

What are the on-site Coastal Acid Sulfate Soil types?

Coastal Acid Sulfate Soil Types
There are no Acid Sulfate areas onsite

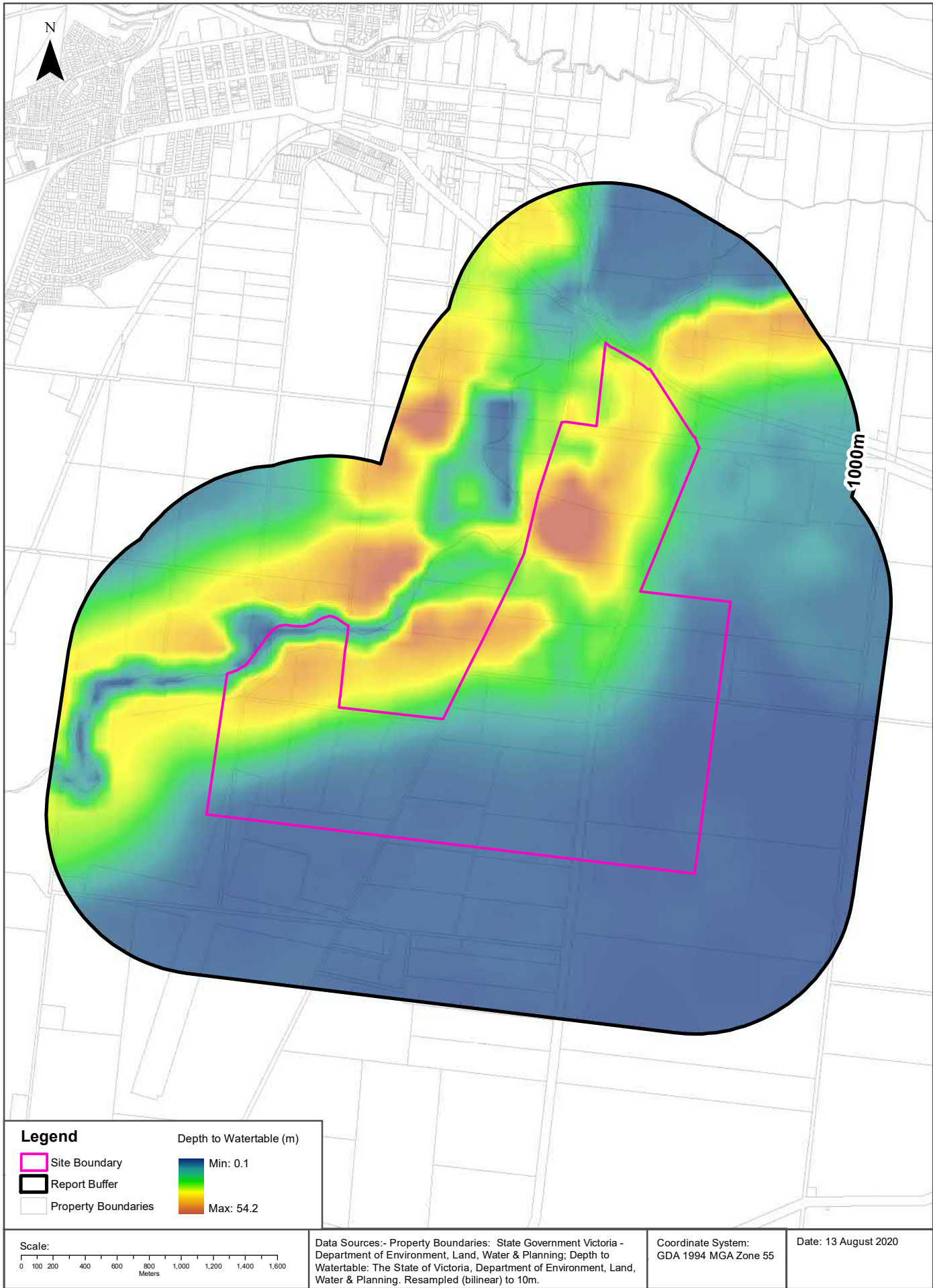
What are the Coastal Acid Sulfate Soil types within the dataset buffer?

Coastal Acid Sulfate Soil Types	Distance	Direction
There are no Acid Sulfate areas within the report buffer		

Coastal Acid Sulfate Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Depth to Watertable

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Hydrogeology & Groundwater

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Fractured or fissured, extensive aquifers of low to moderate productivity	0m	Onsite

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

On-site Groundwater Salinity:

Groundwater Salinity	Percent Of Site Area
7,000 - 13,000 mg/l	100

Depth to Watertable

On-site Depth to Watertable:

Depth to Watertable	Percent Of Site Area
Less than 5 metres	40
20 to 50 metres	33
10 to 20 metres	14
5 to 10 metres	8

Surface Elevation

Approximate on-site Surface Elevation:

Surface Elevation
96 AHDm to 153 AHDm

Basement Elevation

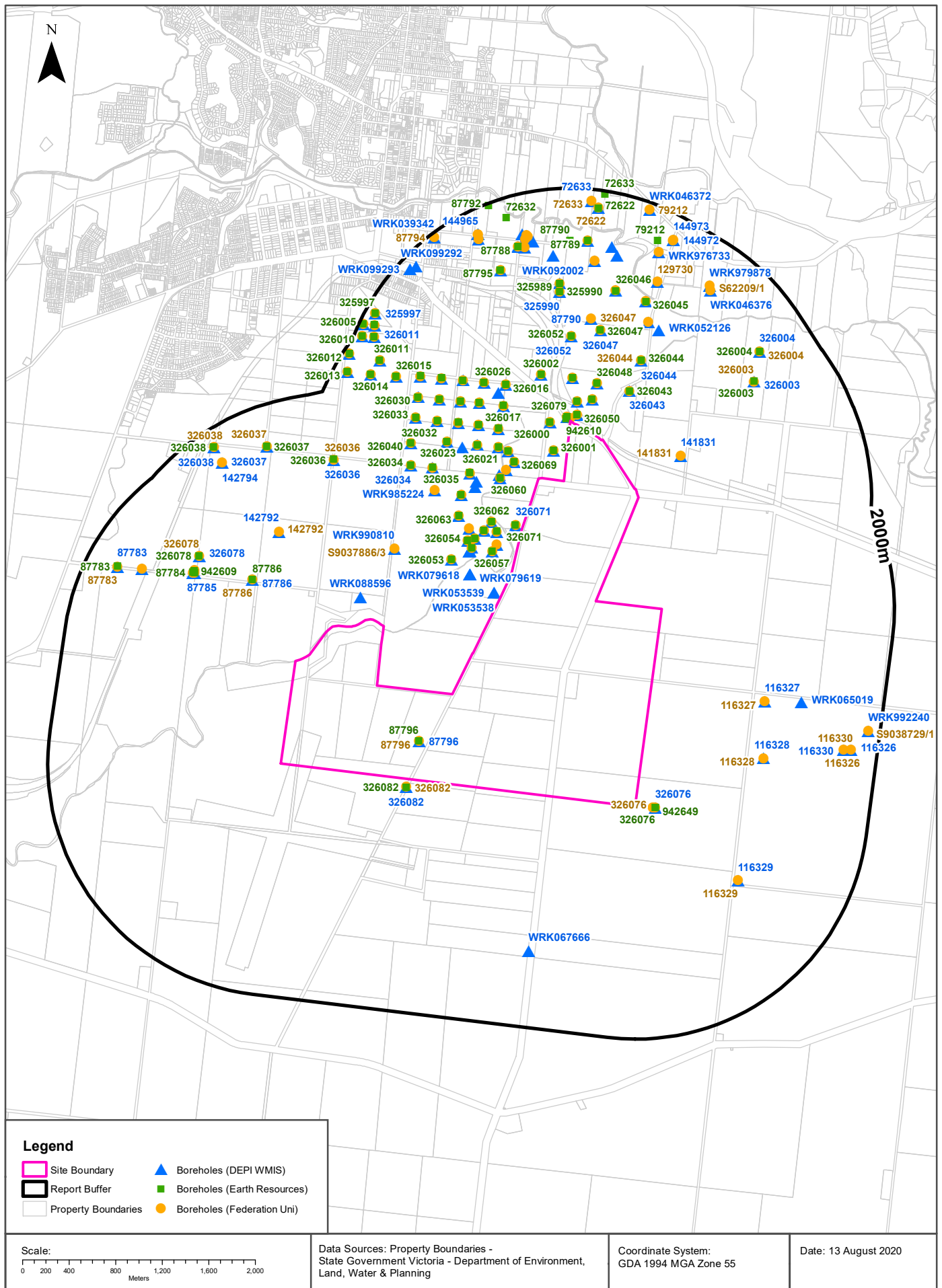
Approximate on-site Basement Elevation:

Basement Elevation - Basement Rocks comprise Lower Palaeozoic basement rocks that form the highlands and the crystalline basement; and Mesozoic rocks of the Otway and Gippsland basins both outcropping and subsurface
-14 AHDm to 29 AHDm

Groundwater Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Boreholes (DELWP WMIS)

Boreholes from the Department of Environment, Land, Water & Planning's Water Measurement Information System, within the dataset buffer:

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
87796	Not Known					1987-06-01	0	Onsite
326079	Non Groundwater					1984-02-11	43	North
326071	Non Groundwater					1949-07-19	63	North
WRK053539	Observation	0.00m-4.00m fill 4.00m-28.00m clay 28.00m-62.00m coal 62.00m-69.00m sand	0.50m-30.00m INNER LINING - CASING = Steel 30.00m-66.00m INNER LINING - CASING = Pvc 66.00m-69.00m INNER LINING - SCREEN = Pvc 0.00m-62.00m OUTER LINING - GRAVEL = Cement 62.00m-65.50m OUTER LINING - GRAVEL = Bentonite 65.50m-69.00m OUTER LINING - GRAVEL = Gravel		0.50m-30.00m Clay 30.00m-66.00m Coal 66.00m-69.00m Sand	2010-06-03	66	North
WRK053538	Observation	0.00m-1.00m fill 1.00m-16.00m yellow clay 16.00m-67.00m coal 67.00m-74.00m sand	0.50m-19.00m INNER LINING - CASING = Steel 19.00m-71.00m INNER LINING - CASING = Pvc 71.00m-74.00m INNER LINING - SLOT = Pvc 0.00m-69.50m OUTER LINING - GRAVEL = Cement 69.50m-71.50m OUTER LINING - GRAVEL = Bentonite 71.50m-74.00m OUTER LINING - GRAVEL = Gravel		0.50m-19.00m Clay 19.00m-71.00m Coal 71.00m-74.00m Sand	2010-05-28	66	North
326050	Non Groundwater					1947-05-31	71	North
326082	Non Groundwater					1984-03-12	72	South West
326001	Non Groundwater					1943-12-31	116	North
326000	Non Groundwater					1943-12-31	172	North
326076	Non Groundwater					1981-10-29	172	South East
326051	Non Groundwater					1947-05-31	175	North
WRK990808							178	North
WRK088596	Investigation		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2016-05-11	203	North West
326057	Non Groundwater					1960-07-15	203	North
326056	Non Groundwater					1960-07-12	204	North
326069	Non Groundwater					1948-07-31	251	North
326049	Non Groundwater					1947-05-31	256	North
326062	Non Groundwater					1947-08-12	267	North
WRK043014	Dewatering, Industrial, Irrigation, Stock					1800-01-01	286	North

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
326055	Non Groundwater					1960-07-05	313	North
326060	Non Groundwater					1947-08-07	314	North
WRK079618	Observation	0.00m-11.00m CLAY	0.00m-8.00m INNER LINING - CASING = Pvc 8.00m-11.00m INNER LINING - SCREEN = Pvc 0.00m-6.00m OUTER LINING - GRAVEL = Cement 6.00m-7.00m OUTER LINING - GRAVEL = Bentonite 7.00m-11.00m OUTER LINING - GRAVEL = Gravel		8.00m-11.00m Clay	2014-05-13	320	North
WRK079619	Observation	0.00m-10.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-10.00m OUTER LINING - GRAVEL = Gravel		7.00m-10.00m Clay	2014-05-13	320	North
WRK079617	Observation	0.00m-9.50m CLAY	0.00m-6.50m INNER LINING - CASING = Pvc 6.50m-9.50m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-9.50m OUTER LINING - GRAVEL = Gravel		6.50m-9.50m Clay	2014-05-13	320	North
WRK079620	Observation	0.00m-10.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-10.00m OUTER LINING - GRAVEL = Gravel		7.00m-10.00m Clay	2014-05-13	320	North
WRK110063	Industrial or Commercial		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2018-11-01	331	North
326041	Sec Bores (Use Unidentified)					1979-09-20	348	North
326042	Non Groundwater					1947-05-31	366	North
326072	Non Groundwater					1949-07-15	376	North
326058	Non Groundwater					1960-07-22	381	North
WRK069602	Observation					2012-08-03	393	North
326048	Non Groundwater					1947-05-31	393	North
WRK069601	Observation	0.00m-40.50m FILL	0.00m-34.00m INNER LINING - CASING = Steel 34.00m-40.50m INNER LINING - SCREEN = Stainless Steel 0.00m-31.50m OUTER LINING - GRAVEL = Bentonite 31.50m-40.50m OUTER LINING - GRAVEL = Gravel		34.00m-40.50m Fill	2012-07-02	394	North
WRK069600	Observation	0.00m-60.80m FILL	0.00m-52.70m INNER LINING - CASING = Steel 52.70m-60.70m INNER LINING - SCREEN = Stainless Steel 0.00m-48.20m OUTER LINING - GRAVEL = Bentonite 48.20m-50.70m OUTER LINING - GRAVEL = Bentonite 50.70m-60.70m OUTER LINING - GRAVEL = Gravel		52.70m-60.70m Fill	2012-07-19	394	North

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
WRK069603	Observation	0.00m-9.50m CLAY 9.50m-22.50m SILT 22.50m-29.50m SAND 29.50m-35.00m CLAY 35.00m-36.00m SAND 36.00m-47.00m GRAVEL 47.00m-49.50m COAL	0.00m-38.00m INNER LINING - CASING = Pvc 38.00m-47.00m INNER LINING - SLOT = Pvc 0.00m-34.00m OUTER LINING - GRAVEL = Cement 34.00m-37.00m OUTER LINING - GRAVEL = Bentonite 37.00m-47.00m OUTER LINING - GRAVEL = Bentonite 47.00m-49.50m OUTER LINING - GRAVEL = Bentonite		38.00m-47.00m Gravel	2012-10-12	394	North
326054	Non Groundwater					1960-06-29	429	North
326021	Non Groundwater					1953-12-31	435	North
WRK990809							444	North
326002	Non Groundwater					1944-12-31	470	North
326043	Non Groundwater					1947-05-31	478	North East
141831	Domestic, Stock	0.00m-36.00m HARD FRACTURED BASALT 36.00m-62.00m HARD PRACTURED BASALT 62.00m-99.00m ORANGE/BROWN CLAY 99.00m-144.00m BROWN LIGNEOUS CLAY/SAND, SALTY FINE SAND 144.00m-167.00m HARD BLUE SANDSTONE	0.00m-36.00m INNER LINING - CASING = Steel 40.00m-144.00m INNER LINING - CASING = Steel 142.00m-144.00m INNER LINING - SCREEN = Steel 130.00m-144.00m OUTER LINING - GRAVEL = Gravel			1999-12-05	481	North East
WRK057606	Observation		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2012-01-01	495	North
WRK057605	Observation		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2012-01-01	501	North
326053	Non Groundwater					1960-07-22	518	North West
326018	Non Groundwater					1953-12-31	548	North
326063	Non Groundwater					1947-08-14	554	North
326061	Non Groundwater					1947-08-11	575	North
326059	Non Groundwater					1947-07-31	588	North
326017	Non Groundwater					1952-12-31	589	North
326022	Non Groundwater					1953-12-31	599	North
326016	Non Groundwater					1952-12-31	635	North
WRK990810							637	North West
WRK053537	Observation	0.00m-1.00m sandy top soil 1.00m-39.00m clay 39.00m-42.00m hard band quartz 42.00m-50.00m yellow clay 50.00m-100.00m coal 100.00m-108.00m sand	0.50m-50.50m INNER LINING - CASING = Steel 50.50m-105.50m INNER LINING - CASING = Pvc 105.50m-108.20m INNER LINING - SLOT = Pvc 0.00m-94.20m OUTER LINING - GRAVEL = Cement 94.20m-104.60m OUTER LINING - GRAVEL = Bentonite 105.20m-108.20m OUTER LINING - GRAVEL = Gravel		0.50m-50.50m Clay 50.50m-105.50m Coal 105.50m-108.20m Sand	2010-05-24	663	North
326019	Non Groundwater					1953-12-31	690	North
WRK084902	Dewatering	0.00m-15.00m GRAVELLY SAND 15.00m-23.00m SILTY CLAY 23.00m-61.00m COALBROWN 61.00m-62.50m CLAYLIGHT GREY 62.50m-67.00m COALBROWN 67.00m-71.50m SANDMED-COARSE 71.50m-77.50m BROWN COAL 77.50m-91.00m CLAYLIGHT GREY 91.00m-100.50m SANDY CLAY 100.50m-101.00m ROCK REFUSAL (SICURIAN BEDROCK)	0.00m-18.00m INNER LINING - CASING = Steel 18.00m-66.50m INNER LINING - CASING = Pvc 66.50m-72.50m INNER LINING - SCREEN = Stainless Steel 0.00m-52.00m OUTER LINING - GRAVEL = Cement 52.00m-56.00m OUTER LINING - GRAVEL = Bentonite 56.00m-73.00m OUTER LINING - GRAVEL = Gravel			2015-06-23	707	North

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
326052	Non Groundwater					1947-05-31	725	North
326044	Non Groundwater					1947-05-31	754	North East
87786	Not Known					1959-12-11	777	West
326020	Non Groundwater					1953-12-31	798	North
326026	Non Groundwater					1953-12-31	811	North
326047	Non Groundwater					1947-05-31	817	North
WRK985224							819	North
326024	Non Groundwater					1953-12-31	838	North
326023	Non Groundwater					1953-12-31	847	North
87790	Irrigation	0.00m-2.00m BROWN SEDS AND CLAYS 2.00m-6.00m WATER BEARING BROWN SEDS AND CLAYS, CLAYS CONT. DECREASING 6.00m-8.00m BROWN CLAYS, LOW SPH. SUB ROUNDED QUARTER INCH PEBBLES 8.00m-10.00m QUARTZ SANDS 1 INCH VERY ANGULAR ROCKS 10.00m-16.00m GRAVELS AND SANDS DECREASING IN GRAVEL 16.00m-20.00m COAL AND SEDIMENTS 20.00m-26.00m COAL AND SEDIMENTS 26.00m-28.00m COAL 28.00m-34.00m COAL AND SEDIMENTS 34.00m-40.00m COAL AND SEDIMENTS 40.00m-46.00m CARBONATIOUS MED GRAIN SEDS	0.00m-3.00m INNER LINING - CASING = Pvc 3.00m-6.00m INNER LINING - SCREEN = Pvc 6.00m-13.00m INNER LINING - CASING = Pvc 13.00m-16.00m INNER LINING - SCREEN = Pvc 16.00m-20.00m INNER LINING - CASING = Pvc 20.00m-23.00m INNER LINING - SCREEN = Pvc 23.00m-37.00m INNER LINING - CASING = Pvc 37.00m-45.00m INNER LINING - SCREEN = Pvc 45.00m-46.00m INNER LINING - CASING = Pvc		3.00m-6.00m Sedimentary 13.00m-16.00m Sand 20.00m-23.00m Coal 37.00m-45.00m Sedimentary	1982-11-09	894	North
326035	Non Groundwater					1953-12-31	895	North
142792	Groundwater Investigation	0.00m-22.00m MOTTLED SANDY CLAY 22.00m-51.60m BASALT	0.00m-51.60m INNER LINING - CASING = Not Known 45.60m-51.60m INNER LINING - SCREEN = Not Known 0.00m-1.00m OUTER LINING - GRAVEL = Cement 43.00m-44.00m OUTER LINING - GRAVEL = Bentonite 44.00m-51.60m OUTER LINING - GRAVEL = Gravel		45.60m-51.60m Basalt	1999-01-29	936	North West
326025	Non Groundwater					1953-12-31	941	North
116327	Groundwater Investigation	0.00m-1.00m SILTY CLAY RED 1.00m-3.00m SILTY CLAY BROWN/GREY 3.00m-3.80m SANDY CLAY BROWN 3.80m-6.00m BASALT GREY	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 2.00m-3.00m OUTER LINING - GRAVEL = Bentonite 3.00m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-06	982	East
326027	Non Groundwater					1953-12-31	986	North
326032	Non Groundwater					1953-12-31	1002	North
116328	Groundwater Investigation	0.00m-0.80m SILTY CLAY YELLOW/BROWN 0.80m-1.40m CLAY GREY/BROWN 1.40m-6.00m BASALT BROWN/GREY	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 1.50m-2.50m OUTER LINING - GRAVEL = Bentonite 2.50m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-06	1037	East
WRK052126	Irrigation	0.00m-4.00m TOP SOIL 4.00m-10.00m GRAVEL COBBLES 10.00m-19.00m COAL 19.00m-20.00m CLAY 20.00m-29.00m GRAVEL 29.00m-30.00m COAL	0.00m-20.00m INNER LINING - CASING = Pvc 20.00m-29.00m INNER LINING - SCREEN = Stainless Steel 29.00m-30.00m INNER LINING - CASING = Pvc 0.00m-16.00m OUTER LINING - GRAVEL = Bentonite		20.00m-29.00m Gravel 29.00m-30.00m Coal	2009-10-01	1055	North East

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
129731	Groundwater Investigation	0.00m-0.50m TOP SOIL 0.50m-4.30m STIFF GREY BROWN SILTY CLAY 4.30m-8.50m FIRM BROWN CLAY SILTY WITH SAND & GRAVEL	0.00m-6.50m INNER LINING - CASING = Pvc 6.50m-7.50m INNER LINING - SCREEN = Pvc 7.50m-8.50m INNER LINING - CASING = Pvc 0.00m-5.50m OUTER LINING - GRAVEL = Cement 5.50m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-8.50m OUTER LINING - GRAVEL = Gravel		0.00m-3.80m Clay 3.80m-6.20m Clay 6.20m-7.40m Clay	1996-11-21	1068	North
326034	Non Groundwater					1953-12-31	1079	North West
116329	Groundwater Investigation	0.00m-1.40m SILTY CLAY BROWN 1.40m-6.00m WEATHERED BASALT BROWN	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 2.50m-3.50m OUTER LINING - GRAVEL = Bentonite 3.50m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-07	1087	South East
326031	Non Groundwater					1953-12-31	1089	North
325990	Non Groundwater					1942-12-31	1114	North
326040	Non Groundwater					1953-12-31	1137	North West
87785	Not Known					1959-10-21	1151	West
87784	Not Known					1959-09-07	1164	West
326028	Non Groundwater					1953-12-31	1164	North
326033	Non Groundwater					1953-12-31	1175	North
326046	Non Groundwater					1947-05-31	1180	North
325989	Non Groundwater					1942-12-31	1184	North
326045	Non Groundwater					1947-05-31	1212	North
326078	Non Groundwater					1983-11-16	1224	West
326030	Non Groundwater					1953-12-31	1248	North
WRK065019	Observation	0.00m-1.80m SOIL 1.80m-22.00m SCORIA 22.00m-34.00m BASALT	0.00m-29.00m INNER LINING - CASING = Pvc 29.00m-32.00m INNER LINING - SCREEN = Pvc 0.00m-26.50m OUTER LINING - GRAVEL = Cement 26.50m-28.50m OUTER LINING - GRAVEL = Bentonite 28.50m-32.00m OUTER LINING - GRAVEL = Gravel		0.00m-29.00m Basalt 29.00m-32.00m Basalt	2011-07-20	1298	East
326029	Non Groundwater					1953-12-31	1340	North
WRK067666	Observation	0.00m-8.60m CLAY 8.60m-40.60m BASALT 40.60m-50.20m CLAY 50.20m-59.30m BASALT 59.30m-80.60m CLAY 80.60m-83.60m COAL 83.60m-88.10m CLAY 88.10m-136.10m COAL 136.10m-143.00m SAND	0.00m-104.00m INNER LINING - CASING = Pvc 104.00m-128.00m INNER LINING - SCREEN = Pvc Class 18 128.00m-134.00m INNER LINING - CASING = Pvc 0.00m-88.00m OUTER LINING - GRAVEL = Cement 88.00m-90.00m OUTER LINING - GRAVEL = Bentonite 90.00m-134.00m OUTER LINING - GRAVEL = Gravel 134.00m-143.00m OUTER LINING - GRAVEL = Bentonite		128.00m-134.00m Coal	2012-07-15	1342	South
326003	Non Groundwater					1944-12-31	1362	North East
WRK042478	Irrigation	0.00m-0.40m RICH BLACK EARTH 0.40m-1.80m BLACK CLAY 1.80m-4.70m SILTY YELLOW CLAY 4.70m-8.60m LARGE CEMENTED GRAVELS 8.60m-21.00m BROWN COAL 21.00m-28.60m SILTY BROWN CLAY	0.00m-2.00m INNER LINING - CASING = Pvc 2.00m-5.00m INNER LINING - SCREEN = Pvc 5.00m-12.00m INNER LINING - CASING = Pvc		2.00m-5.00m Clay	1982-10-22	1388	North

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
326036	Non Groundwater					1953-12-31	1404	North West
129730	Groundwater Investigation	0.00m-0.50m TOP SOIL 0.50m-3.50m STIFF GREY BROWN SILT CLAY 3.50m-8.00m FIRM BROWN CLAYEY SILT WITH SANDY GRAVEL 8.00m-8.50m BROWN COAL	0.00m-6.50m INNER LINING - CASING = Pvc 6.50m-7.50m INNER LINING - SCREEN = Pvc 7.50m-8.50m INNER LINING - CASING = Pvc 0.00m-5.50m OUTER LINING - GRAVEL = Cement 5.50m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-8.50m OUTER LINING - GRAVEL = Gravel		0.00m-2.50m Clay 2.50m-3.30m Clay 3.30m-5.20m Gravel 5.20m-6.80m Gravel	1996-11-22	1410	North
WRK092002	Domestic & Stock	0.00m-1.80m BLACK 1.80m-2.20m TAN SANDY CLAY 2.20m-5.50m BROWN CLAY 5.50m-8.00m DIRTY SILTY RIVER GRAVEL 8.00m-9.00m BLACK CLAY WITH GRAVEL 9.00m-15.00m COAL 15.00m-18.00m WHITE BROWN CLAY 18.00m-25.00m BROWN CLAYS 25.00m-27.00m FINE SAND 27.00m-31.00m FINE GRAVEL & SANDS 31.00m-37.50m BROWN CLAY & WOOD FIBRES 37.50m-38.50m WHITE GRAVELLY CLAY	0.00m-28.00m INNER LINING - CASING = Pvc Class 12 28.00m-32.00m INNER LINING - SCREEN = Stainless Steel 32.00m-35.80m INNER LINING - CASING = Pvc Class 12 0.00m-15.60m OUTER LINING - GRAVEL = Cement 15.60m-17.00m OUTER LINING - GRAVEL = Bentonite 17.00m-37.50m OUTER LINING - GRAVEL = Gravel			2016-12-07	1424	North
87795	Domestic, Miscellaneous		0.00m-2.00m INNER LINING - CASING = Not Known 2.00m-4.22m INNER LINING - SCREEN = Not Known			1986-07-31	1428	North
WRK094131	Irrigation	0.00m-1.00m Top Soil 1.00m-5.00m CLAY 5.00m-7.00m CLAYey Gravel 7.00m-8.00m GRAVEL 8.00m-10.00m CLAY 10.00m-17.50m COAL 17.50m-19.00m MEd Sand 19.00m-25.00m LIGNITEClas & coal 25.00m-36.00m MEd Sands 36.00m-38.00m Fine sands 38.00m-41.00m MEd Sands 41.00m-46.00m CLAYey Sands 46.00m-50.00m CLAY	0.00m-9.00m INNER LINING - CASING = Steel 9.00m-26.00m INNER LINING - CASING = UPVC class 12 26.00m-36.00m INNER LINING - SCREEN = Wire W S/Steel 0.00m-15.00m OUTER LINING - GRAVEL = Cement 15.00m-43.00m OUTER LINING - GRAVEL = Gravel		26.00m-36.00m Sand	2017-08-30	1471	North
326015	Non Groundwater					1944-12-31	1505	North
WRK058469	Irrigation	0.00m-3.00m top soil 3.00m-8.00m clay 8.00m-10.00m gravel 10.00m-20.00m coal 20.00m-34.00m clay 34.00m-44.00m sand 44.00m-45.00m clay	0.00m-35.00m INNER LINING - CASING = Pvc 35.00m-44.00m INNER LINING - SCREEN = Stainless Steel 44.00m-45.00m INNER LINING - CASING = Pvc 8.00m-29.00m OUTER LINING - GRAVEL = Cement		0.00m-35.00m Gravel	2010-10-23	1535	North
87803	Domestic, Stock	0.00m-1.50m BLACK TOP SOIL 1.50m-4.00m GREY CLAY 4.00m-8.00m BROWN COAL 8.00m-12.00m RIVER GRAVELS TO 50MM 12.00m-21.50m GREY CLAY 21.50m-26.00m RIVER GRAVELS TO 100MM	0.00m-23.00m INNER LINING - CASING = Mild Steel 23.00m-26.00m INNER LINING - SCREEN = Mild Steel		23.00m-26.00m Gravel	1990-08-24	1536	North
142793	Groundwater Investigation	0.00m-0.50m SOIL & CLAY 0.50m-30.00m BASALTIC CLAY 30.00m-45.00m WEATHERED BASALT 45.00m-58.00m BASALT 58.00m-63.00m WEATHERED BASALT	0.00m-63.00m INNER LINING - CASING = Pvc 57.00m-63.00m INNER LINING - SCREEN = Pvc 0.00m-1.00m OUTER LINING - GRAVEL = Cement 58.70m-59.70m OUTER LINING - GRAVEL = Bentonite 59.70m-63.00m OUTER LINING - GRAVEL = Gravel		57.00m-63.00m Basalt	1999-02-01	1539	West
326004	Non Groundwater					1944-12-31	1541	North East
87789	Not Known	0.00m-2.00m KHAKI SEDS 2.00m-6.00m KHAKI SEDS AND GREY CLAYS 6.00m-8.00m WATER BEARING KHAKI SEDS AND CLAYS (GREY) 8.00m-10.00m COAL SEAM 10.00m-16.00m CARB. SEDS AND CLAYS 16.00m-24.00m GREY SANDS DECREASING IN CLAY CONTENT 24.00m-39.00m GREY CLAYS AND SEDIMENTS AND CARBONATIOUS MATERIAL	0.00m-10.00m INNER LINING - CASING = Pvc 10.00m-14.25m INNER LINING - SCREEN = Pvc 24.56m-30.81m INNER LINING - SCREEN = Bronze Mesh 32.81m-39.00m INNER LINING - SCREEN = Bronze Mesh 0.00m-10.00m OUTER LINING - GRAVEL = Cement		10.00m-14.25m Sedimentary 24.56m-30.81m Sand 32.81m-39.00m Clay	1982-10-30	1552	North

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87788	Not Known	0.00m-0.50m RICH BLACK EARTH 0.50m-1.50m BLACK CLAY 1.50m-7.20m SANDY YELLOW CLAY 7.20m-9.00m LAYER CEMENTED GRAVEL 9.00m-22.00m BROWN COAL 22.00m-24.30m FINE GRAVEL AQUIFER	0.00m-22.50m INNER LINING - CASING = Galvanised Iron 22.50m-24.30m INNER LINING - SCREEN = Galvanised Iron		22.50m-24.30m Gravel	1982-10-20	1562	North
WRK089104	Domestic & Stock	0.00m-9.00m CLAY/BROWN/SANDY 9.00m-14.00m LIGNITE/CLAY/BROWN-BLACK 14.00m-19.00m SAND/FIND 19.00m-22.00m LIGNITE 22.00m-29.00m SAND/COARSE 29.00m-33.00m LIGNES/SAND 33.00m-39.00m LIGNITES/SAND 39.00m-40.40m CLAY/WEATHERED	0.00m-23.70m INNER LINING - CASING = Pvc 23.70m-29.70m INNER LINING - SLOT = Pvc 0.00m-3.00m OUTER LINING - GRAVEL = Cement 3.00m-40.40m OUTER LINING - GRAVEL = Gravel			2016-06-20	1575	North
WRK046376	Irrigation					2006-10-31	1581	North East
87793	Irrigation	0.00m-2.00m DARK BROWN CLAY 2.00m-7.00m LIGHT BROWN CLAY 7.00m-9.10m GRAVELS 9.10m-21.50m COAL 21.50m-23.90m SAND 23.90m-27.50m COAL-SMALL BANDS SAND 27.50m-28.10m SAND 28.10m-33.50m COAL 33.50m-36.50m FINE SAND 36.50m-42.50m BLUE CLAYS 42.50m-44.90m COARSE SANDS 44.90m-52.50m BROWN CLAY 52.50m-53.00m SAND 53.00m-53.50m WHITE CLAY 53.50m-55.90m FINE SAND 55.90m-59.50m CLAY	0.00m-43.00m INNER LINING - CASING = Steel 43.00m-45.00m INNER LINING - SCREEN = Steel 45.00m-53.00m INNER LINING - CASING = Steel 53.00m-55.50m INNER LINING - SCREEN = Steel		43.00m-45.00m Sand 53.00m-55.50m Sand	1982-12-24	1604	North
WRK979878							1607	North East
WRK978683							1621	North
87791	Not Known	0.00m-0.60m BLACK EARTH 0.60m-1.80m BLACK CLAY 1.80m-6.90m SANDY BROWN CLAY 6.90m-9.00m CEMENTED GRAVELS 9.00m-22.20m BROWN COAL 22.20m-24.30m FINE GRAVEL AQUIFER	0.00m-22.50m INNER LINING - CASING = Galvanised Iron 22.50m-24.30m INNER LINING - SCREEN = Galvanised Iron		22.50m-24.30m Gravel	1982-10-18	1634	North
WRK976733	Domestic & Stock		0.30m-6.00m INNER LINING - CASING = Steel 6.00m-9.00m INNER LINING - SLOT = Steel 0.00m-0.50m OUTER LINING - GRAVEL = Cement			2006-12-18	1637	North
326037	Non Groundwater					1953-12-31	1647	North West
WRK052558	Irrigation	0.00m-7.00m CLAY / TOP SOIL 7.00m-9.00m SAND 9.00m-19.00m COAL 19.00m-21.00m GRAVEL 21.00m-22.50m COAL 22.50m-25.50m CLAY 25.50m-27.50m GRAVEL 27.50m-30.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-9.00m INNER LINING - SCREEN = Stainless Steel 9.00m-19.00m INNER LINING - CASING = Pvc 19.00m-23.00m INNER LINING - SCREEN = Stainless Steel 23.00m-24.50m INNER LINING - CASING = Pvc 24.50m-27.00m INNER LINING - SCREEN = Stainless Steel 27.00m-30.00m INNER LINING - CASING = Pvc 0.00m-30.00m OUTER LINING - GRAVEL = Gravel		7.00m-9.00m Sand 24.50m-27.00m Gravel	2009-12-23	1659	North
142794	Groundwater Investigation	0.00m-0.30m SOIL 0.30m-10.00m BROWN/GREY CLAY 10.00m-18.00m BASALT 18.00m-35.00m GRANITIC SANDY CLAYS 35.00m-42.50m BASALT 42.50m-45.00m FINE SAND SILT	0.00m-42.50m INNER LINING - CASING = Pvc 36.50m-42.50m INNER LINING - SCREEN = Pvc 0.00m-1.00m OUTER LINING - GRAVEL = Cement 3.40m-35.00m OUTER LINING - GRAVEL = Bentonite 35.00m-42.50m OUTER LINING - GRAVEL = Gravel		36.50m-42.50m Basalt	1999-02-02	1695	North West
87787	Stock	0.00m-0.60m TOP SOIL 0.60m-1.30m RED CLAY 1.30m-12.10m BASALT BOULDERS 12.10m-18.20m CLAY 18.20m-20.15m SAND CLAY 20.15m-22.17m CLAYEY SAND AND GRAVEL 22.17m-22.23m COARSE SAND 22.23m-22.50m HONEYCOMB BASALT 22.50m-28.90m BASALT 28.90m-33.22m SILURIAN SAND				1976-12-10	1697	North West

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
326014	Non Groundwater					1944-12-31	1697	North West
116330	Groundwater Investigation	0.00m-2.90m SILTY CLAY BROWN 2.90m-9.00m BASALT 9.00m-13.00m FINE SAND SOME GRAVEL 13.00m-15.00m SILTY CLAY 15.00m-17.50m SILTY SAND 17.50m-19.00m SILTY CLAY 19.00m-27.00m BASALT 27.00m-30.00m SILTY CLAY 30.00m-42.50m BASALT 42.50m-56.00m SAND SOME CLAYEY 56.00m-63.00m SAND CLAY/CLAYEY SAND 63.00m-68.00m CLAY SILTY/DARK GREY 68.00m-77.50m COAL CLAYEY	-0.50m-55.00m INNER LINING - CASING = Pvc 55.00m-58.00m INNER LINING - SCREEN = Pvc 58.00m-73.00m INNER LINING - CASING = Pvc 73.00m-76.00m INNER LINING - SCREEN = Pvc 0.00m-36.00m OUTER LINING - GRAVEL = Cement 36.00m-39.00m OUTER LINING - GRAVEL = Bentonite 39.00m-76.00m OUTER LINING - GRAVEL = Gravel			1993-07-12	1712	East
87783	Not Known					1959-08-19	1732	West
WRK043786	Domestic & Stock, Irrigation	0.00m-1.20m TOP SOIL 1.20m-4.00m STIFF BROWN CLAY 4.00m-7.00m SANDY CLAY 7.00m-34.00m BROWN COAL 34.00m-67.00m GREY SILTY CLAYEY SANDS	0.00m-22.00m INNER LINING - CASING = Pvc 22.00m-66.00m INNER LINING - SLOT = Pvc Class 12		22.00m-66.00m Sand	2003-07-17	1749	North
116326	Groundwater Investigation	0.00m-0.15m TOP SOIL 0.15m-1.50m SILTY CLAY RED/BROWN 1.50m-2.00m SANDY CLAY YELLOW 2.00m-3.00m SILTY CLAY BROWN/GREY 3.00m-6.00m BASALT BROWN/GREY CLAY SEAMS	-0.50m-4.90m INNER LINING - CASING = Pvc 4.90m-6.00m INNER LINING - SCREEN = Pvc 1.90m-2.90m OUTER LINING - GRAVEL = Bentonite 2.90m-5.90m OUTER LINING - GRAVEL = Gravel			1993-07-06	1771	East
144973	Observation, State Observation Network		0.00m-21.00m INNER LINING - CASING = Pvc Class 12 21.00m-24.00m INNER LINING - SCREEN = Pvc Class 12 24.00m-25.00m INNER LINING - CASING = Pvc Class 12 19.00m-19.70m OUTER LINING - GRAVEL = Bentonite 19.70m-25.00m OUTER LINING - GRAVEL = Gravel	Date/time: 2020-05-29 1024 Quality: 43 WLMP: 10.66m DBNS: RWL:		2001-05-22	1785	North
144972	Observation, State Observation Network	0.00m-2.80m TOP SOIL & CLAY 2.80m-12.50m SILTY SAND & GRAVEL	0.00m-8.50m INNER LINING - CASING = Pvc Class 12 8.50m-11.50m INNER LINING - SCREEN = Pvc Class 12 11.50m-12.50m INNER LINING - CASING = Pvc Class 12 7.50m-8.00m OUTER LINING - GRAVEL = Bentonite 8.00m-12.50m OUTER LINING - GRAVEL = Gravel	Date/time: 2020-05-29 1017 Quality: 43 WLMP: 5.98m DBNS: RWL:		2001-05-21	1786	North
144963	Observation, State Observation Network	0.00m-3.00m TOP SOIL & CLAY 3.00m-26.32m SILTY SANDS & GRAVEL	0.00m-20.00m INNER LINING - CASING = Pvc Class 12 20.00m-23.00m INNER LINING - SCREEN = Pvc Class 12 23.00m-24.00m INNER LINING - CASING = Pvc Class 12 18.50m-19.60m OUTER LINING - GRAVEL = Bentonite 19.60m-26.32m OUTER LINING - GRAVEL = Gravel	Date/time: 2020-05-29 0926 Quality: 43 WLMP: 9.64m DBNS: RWL:		2001-05-20	1787	North
144965	Observation, State Observation Network	0.00m-3.80m TOP SOIL & CLAYS 3.80m-12.00m SILTY SANDS & GRAVEL	0.00m-5.00m INNER LINING - CASING = Pvc Class 12 5.00m-8.00m INNER LINING - SCREEN = Pvc Class 12 8.00m-9.00m INNER LINING - CASING = Pvc Class 12 3.00m-4.10m OUTER LINING - GRAVEL = Bentonite 4.10m-12.00m OUTER LINING - GRAVEL = Gravel	Date/time: 2020-05-29 0934 Quality: 43 WLMP: 3.52m DBNS: RWL:		2001-05-18	1787	North
326011	Non Groundwater					1944-12-31	1834	North
72622	Not Known					1967-10-14	1844	North
326038	Non Groundwater					1953-12-31	1846	North West
WRK099292	Observation	0.00m-1.80m CLAY 1.80m-15.00m Weathered basalt	0.00m-12.00m INNER LINING - CASING = Pvc 12.00m-15.00m INNER LINING - SCREEN = Pvc 0.20m-10.00m OUTER LINING - GRAVEL = Cement 10.00m-11.50m OUTER LINING - GRAVEL = Bentonite 11.50m-15.00m OUTER LINING - GRAVEL = Gravel			2017-03-21	1871	North

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
325998	Non Groundwater					1943-12-31	1873	North
326013	Non Groundwater					1944-12-31	1879	North West
WRK992240							1896	East
72633	Irrigation		0.00m-4.00m INNER LINING - CASESCRN = Asbestos Cement 3.05m-5.49m INNER LINING - SCREEN = Not Known			1982-12-02	1899	North
WRK099293	Observation	0.00m-12.00m SILTY SANDS 12.00m-15.00m BROWN COAL	0.00m-12.00m INNER LINING - CASING = Pvc 12.00m-15.00m INNER LINING - SCREEN = Pvc 0.00m-8.50m OUTER LINING - GRAVEL = Cement 8.50m-11.00m OUTER LINING - GRAVEL = Bentonite 11.00m-15.00m OUTER LINING - GRAVEL = Gravel			2017-03-09	1899	North
325997	Non Groundwater					1943-12-31	1913	North
326010	Non Groundwater					1944-12-31	1930	North West
WRK046372	Irrigation	0.00m-7.60m CLAYS 7.60m-11.50m RIVER GRAVELLS 11.50m-16.50m COAL 16.50m-37.50m COARSE SAND 37.50m-58.40m WHITE CLAYS 58.40m-0.00m SHALE	0.00m-21.00m INNER LINING - CASING = Not Known 21.00m-23.00m INNER LINING - SCREEN = Not Known 23.00m-39.00m INNER LINING - CASING = Pvc Class 12 25.00m-32.00m INNER LINING - SCREEN = Pvc Class 12 34.50m-36.00m INNER LINING - SCREEN = Wire W S/Steel		21.00m-23.00m Sand 25.00m-32.00m Sand 34.50m-36.00m Sand	1983-01-13	1937	North
326012	Non Groundwater					1944-12-31	1947	North West
326005	Non Groundwater					1944-12-31	1962	North West
WRK039342	Domestic, Irrigation, Stock	0.00m-0.10m TOP SOIL 0.10m-10.60m CLAY 10.60m-13.00m RIVER GRAVEL 13.00m-19.00m COAL 19.00m-48.60m CLAY AND FINE SAND	0.00m-36.58m INNER LINING - CASING = Mild Steel 36.58m-42.60m INNER LINING - SCREEN = Mild Steel		36.58m-42.60m Clay	1986-03-31	1963	North

Boreholes WMIS Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Boreholes (Earth Resources Database)

Boreholes from the Earth Resources dataset, within the dataset buffer:

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
87796		Private Individual/Corporation		Air Percussion/Air Rotary	Abandoned	01/06/1987	42.00		100	0	Onsite
942610		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	11/02/1984	74.70	120.08	110	39	North
326079		Private Individual/Corporation		Rotary (diamond/drag bit)		11/02/1984	74.70	100.00	300	45	North
326071		Private Individual/Corporation				19/07/1949	57.90	100.00	10	64	North
326050		Private Individual/Corporation				31/05/1947	24.70	98.50	10	70	North
326082		Private Individual/Corporation		Rotary (diamond/drag bit)		12/03/1984	129.70	150.00	300	71	South West
326001		Department of Manufacturing & Industry Development				31/12/1943	53.95	109.73	10	117	North
326076		Private Individual/Corporation		Rotary (diamond/drag bit)		29/10/1981	134.00	140.00	300	170	South East
942649		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	29/10/1981	134.00	141.14	25	171	South East
326051		Private Individual/Corporation				31/05/1947	35.98	95.40	10	174	North
326000		Department of Manufacturing & Industry Development				31/12/1943	40.54	97.84	10	174	North
326056		Private Individual/Corporation				12/07/1960	51.80	99.40	10	206	North
326057		Private Individual/Corporation				15/07/1960	54.90	100.70	10	206	North
326069		Private Individual/Corporation				31/07/1948	123.70	100.00	10	253	North
326049		Private Individual/Corporation				31/05/1947	13.11	96.60	10	255	North
326062		Private Individual/Corporation				12/08/1947	12.20	100.00	10	269	North
326055		Private Individual/Corporation				05/07/1960	51.80	100.20	10	315	North
326060		Private Individual/Corporation				07/08/1947	47.50	110.00	10	315	North
326041		State Electricity Commission of Victoria				20/09/1979	45.50	96.40	10	349	North

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
326042		Private Individual/Corporation				31/05/1947	35.37	94.50	10	366	North
326072		Private Individual/Corporation				15/07/1949	64.60	105.00	10	377	North
326058		Private Individual/Corporation				22/07/1960	56.10	102.50	10	382	North
326048		Private Individual/Corporation				31/05/1947	31.10	94.20	10	392	North
326054		Private Individual/Corporation				29/06/1960	53.90	100.90	10	431	North
326021		Department of Manufacturing & Industry Development				31/12/1953	59.44	107.60	10	437	North
326002		Department of Manufacturing & Industry Development				31/12/1944	45.41	107.90	10	471	North
326043		Private Individual/Corporation				31/05/1947	28.05	101.90	10	477	North East
326053		Private Individual/Corporation				22/07/1960	55.80	103.00	10	520	North West
326018		Department of Manufacturing & Industry Development				31/12/1953	61.88	107.60	10	549	North
326063		Private Individual/Corporation				14/08/1947	12.20	100.00	10	555	North
326061		Private Individual/Corporation				11/08/1947	9.80	120.00	10	578	North
326059		Private Individual/Corporation				31/07/1947	50.00	110.00	10	589	North
326017		Department of Manufacturing & Industry Development				31/12/1952	61.88	110.60	10	591	North
326022		Department of Manufacturing & Industry Development				31/12/1953	63.70	113.40	10	601	North
326016		Department of Manufacturing & Industry Development				31/12/1952	61.88	114.30	10	636	North
326019		Department of Manufacturing & Industry Development				31/12/1953	66.14	116.40	10	690	North
326052		Private Individual/Corporation				31/05/1947	72.20	92.70	10	726	North
326044		Private Individual/Corporation				31/05/1947	20.77	91.10	10	753	North East
87786		Department of Manufacturing & Industry Development		Percussion (cable)		11/12/1959	117.65	152.40	10	779	West
326020		Department of Manufacturing & Industry Development				31/12/1953	68.58	121.30	10	800	North

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
326026		Department of Manufacturing & Industry Development				31/12/1953	74.37	134.40	10	813	North
326047		Private Individual/Corporation				31/05/1947	19.82	91.40	10	817	North
326024		Department of Manufacturing & Industry Development				31/12/1953	75.59	128.90	10	839	North
326023		Department of Manufacturing & Industry Development				31/12/1953	72.24	125.00	10	849	North
326035		Department of Manufacturing & Industry Development				31/12/1953	85.34	132.90	10	897	North
326025		Department of Manufacturing & Industry Development				31/12/1953	75.59	129.50	10	942	North
326027		Department of Manufacturing & Industry Development				31/12/1953	74.68	132.60	10	988	North
326032		Department of Manufacturing & Industry Development				31/12/1953	82.30	137.70	10	1003	North
326034		Department of Manufacturing & Industry Development				31/12/1953	90.83	136.20	10	1081	North West
326031		Department of Manufacturing & Industry Development				31/12/1953	82.60	137.70	10	1090	North
325990		Department of Manufacturing & Industry Development				31/12/1942	21.95	121.92	10	1115	North
326040		Department of Manufacturing & Industry Development				31/12/1953	77.72	132.90	10	1139	North West
87785		Department of Manufacturing & Industry Development		Percussion (cable)		21/10/1959	42.98	155.80	10	1152	West
326028		Department of Manufacturing & Industry Development				31/12/1953	75.59	134.40	10	1165	North
87784		Department of Manufacturing & Industry Development		Percussion (cable)		07/09/1959	36.27	155.80	10	1166	West
942609		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	16/11/1983	103.87	151.37	110	1168	West
326033		Department of Manufacturing & Industry Development				31/12/1953	82.30	137.70	10	1177	North
326046		Private Individual/Corporation				31/05/1947	19.82	91.70	10	1181	North
325989		Department of Manufacturing & Industry Development				31/12/1942	22.86	121.92	10	1184	North
326045		Private Individual/Corporation				31/05/1947	20.73	89.90	10	1211	North

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
326078		Private Individual/Corporation		Rotary (diamond/drag bit)		16/11/1983	103.87	155.00	300	1226	West
326030		Department of Manufacturing & Industry Development				31/12/1953	78.64	137.70	10	1249	North
326029		Department of Manufacturing & Industry Development				31/12/1953	21.95	135.60	10	1342	North
326003		Department of Manufacturing & Industry Development				31/12/1944	22.86	120.00	10	1361	North East
326036		Department of Manufacturing & Industry Development				31/12/1953	84.73	144.20	10	1406	North West
87795		Private Individual/Corporation	Domestic water supply	Dragline/back hoe/Caldwell bkt		31/07/1986	4.22		100	1430	North
87795		Private Individual/Corporation	Fire fighting/Sports/general	Dragline/back hoe/Caldwell bkt		31/07/1986	4.22		100	1430	North
326015		Department of Manufacturing & Industry Development				31/12/1944	43.28	137.16	10	1507	North
326004		Department of Manufacturing & Industry Development				31/12/1944	14.33	86.26	10	1540	North East
87790		Private Individual/Corporation	Irrigation	Rotary (diamond/drag bit)		09/11/1982	46.00		100	1545	North
87789		Private Individual/Corporation	Irrigation	Rotary (diamond/drag bit)		30/10/1982	39.00		100	1553	North
87788		Private Individual/Corporation	Irrigation	Percussion (cable)		20/10/1982	24.30		100	1562	North
326037		Department of Manufacturing & Industry Development				31/12/1953	30.18	147.80	10	1648	North West
326014		Department of Manufacturing & Industry Development				31/12/1944	33.53	135.94	10	1699	North West
87787		Private Individual/Corporation	Stock/Poultry water supply		Abandoned	25/12/1976	33.40		300	1699	North West
79212		Private Individual/Corporation	Irrigation	Rotary (diamond/drag bit)		13/01/1983	58.40		100	1716	North
87783		Department of Manufacturing & Industry Development		Percussion (cable)		19/08/1959	232.26	161.50	10	1734	West
72632		Private Individual/Corporation	Domestic water supply	Rotary (diamond/drag bit)		27/10/1982	7.93		100	1831	North
326011		Department of Manufacturing & Industry Development				31/12/1944	60.96	136.55	10	1835	North
72622		Private Individual/Corporation				14/10/1967	45.11	95.00	300	1844	North
326038		Department of Manufacturing & Industry Development				31/12/1953	24.99	149.40	10	1848	North West

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
325998		Department of Manufacturing & Industry Development				31/12/1943	58.83	133.50	10	1875	North
326013		Department of Manufacturing & Industry Development				31/12/1944	65.23	137.46	10	1880	North West
325997		Department of Manufacturing & Industry Development				31/12/1943	59.13	135.64	10	1915	North
326010		Department of Manufacturing & Industry Development				31/12/1944	62.48	138.07	10	1931	North West
326012		Department of Manufacturing & Industry Development				31/12/1944	63.40	136.25	10	1948	North West
326005		Department of Manufacturing & Industry Development				31/12/1944	60.96	134.72	10	1964	North West
72633		Private Individual/Corporation	Irrigation	Shaft/Well		02/12/1982	5.49		100	1968	North
87792		Private Individual/Corporation	Irrigation	Percussion (cable)		22/10/1982	28.60		100	1976	North

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Boreholes (Federation University)

Boreholes from the Federation University Australia dataset, within the dataset buffer:

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
87796					D: 0.000m-0.300m Black Topsoil D: 0.300m-3.000m Basalt Floaters D: 3.000m-6.000m Honeycomb Basalt D: 6.000m-31.000m Basalt D: 31.000m-36.000m Fine Sands To 1Inch River Grave Ls No Water-Abandoned	0	Onsite
942610	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			19	North
326079	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			43	North
326071	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-11.000m Sand & Clay G: 11.000m-53.300m Coal Brown G: 53.300m-56.100m Clay G: 56.100m-57.900m Sand	63	North
326050	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-11.800m No Details Available D: 11.800m-22.400m Brown Coal D: 22.400m-24.700m No Details Available	71	North

326082	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		D: 0.000m-3.000m Clay - Red Brown Clay. Little Moisture, Fair Consistency D: 3.000m-6.000m Soil - Red Brown Earth D: 6.000m-29.000m Basalt - The Basalt Is Scoria, Weathered, With Large Vesicles Throughout Becomes More Massive Until 26M Where A Fine Red Brown Clay Layer Is Present. At 27M Basalt Is Vesicular, Partly Weathered Grey Colour D: 29.000m-43.000m Clay - Ochre Coloured Then A Lighter Orange At 33M, Little Moisture, Slightly Silty. At 34.5M Clay Turns A Reddy Colour. At 35M Clay Becomes Whiter And More Silty. 37.5M Clay Is Very Silty And A Distinctly Ochre Colour. At 39M Clay Is Very Silty And Orang D: 43.000m-57.000m Silt/Sand - Silt As Described Above With Sand ~ 1Mm Average Angular To Sub-Angular Well Sorted D: 57.000m-62.500m Clay - Good Consistency, Ochre To Orange Colour - White And Fawn D: 62.500m-63.000m Carbonaceous Clay - Dark Black To Brown - Good Consistency, High Moisture Content D: 63.000m-67.200m Brown Coal - Start Coring - 63.5M 63.5 - 64.9 No Recovery 64.9 - 66.4 2.1M Recovery 66.4 - 69.4 3.09M Recovery D: 67.200m-73.100m Clay - Grey Clay, Good Consistency, Good Moisture - Contains Bands Of Pyrite 69.4 - 72.4 2.04M Recovery Clay Also Contains Fine Shell Material 72.4 - 75.4 3.1M Recovery Last 0.6M Of Clay Has Abundant Pyrite And Some Rounded Quartz Grains ~ 3Mm To <1Mm D: 73.100m-121.100m Brown Coal - Black To Dark Brown Slightly Clayey For 73.06 - 73.56M Abundant Lignite Material 75.4 - 78.4 3.0M Recovery 78.4 - 81.4 3.0M Recovery 81.4 - 84.4 3.0M Recovery 84.4 - 87.4 3.0M Recovery Coal Is Much Drier And Less Clayier 87.4 - 90.4 3.0M Reco D: 121.100m-129.700m Silty Clay - Fawn Coloured Clay With Silty Particles Within - Good Consistency Silt Becomes More Abundant At 120.2M. Some Parts Of The Bed Are Clayier And Others Siltier 117.7 - 120.7 2.7M Recovery 0.8M Coal 1.8M Non Coal 120.7 - 123.7 1.7M Recovery 123.7	72	South West
326001	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.600m Red Sandy Loam D: 0.600m-1.200m Red Sand D: 1.200m-1.800m Red Sandy Clay D: 1.800m-8.500m Red Clay D: 8.500m-9.800m Clay And Gravel D: 9.800m-13.100m Grey And Yellow Clay D: 13.100m-14.000m Yellow Sand D: 14.000m-17.100m Grey Clay D: 17.100m-20.100m Dark Green Pug D: 20.100m-23.200m Yellow Sand D: 23.200m-52.700m Brown Coal D: 52.700m-53.000m Ligneous Clay D: 53.000m-54.000m Yellow Clay Water Struck At 20.12 Metres	116	North
942649	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			151	South East
326076	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		D: 0.000m-2.000m Clay - Light Red/Brown To Orange/Brown Stiff, Silty Clay With Occasional Ochre/Brown, Very Weathered Rounded Basalt Fragments D: 2.000m-4.000m Clay - Light Grey To Buff Slightly Silty Stiff Clay D: 4.000m-6.000m Clay - Light Grey To Buff, Slightly Silty Stiff Clay With Some Dark Grey/Brown To Dark Brown Well Weathered Basalt Fragments D: 6.000m-14.000m Basalt - Brown/Grey Weathered Basalt With Occasional Off White Crystalline Small Grains (Chalcedone?) D: 14.000m-22.000m Basalt - Dark Brown To Dark Red/Brown Well Weathered Basalt, With Some Red/Brown To Red Claystone Rock Fragments. Occasional Stiff Light Brown Clay. Some Brown Silty Friable Clay Below 20 Metres D: 22.000m-24.000m Clay - Light Brown, Moderately Soft, Smooth To Silty, With Occasional Rare Weathered Basalt (?) Rock Fragments, Some Approaching Friable. Possibly Paleosal. D: 24.000m-28.000m Clay - All As Above, With Some Brown And Grey Friable, Very Silty Clay D: 28.000m-30.000m Silt - Extremely Fine, Orange/Brown With Some Light Grey To Light Brown Moderately Soft Silty Clay D: 30.000m-32.000m Sand - Very Fine, Ochre Stained Quartz Sand With Some Fine To Coarse Sub-Rounded To Rounded Ochre Stained Quartz Grains. Occasional Light Brown Silty Clay D: 32.000m-34.000m Basalt - Dark Brown To Dark Grey Brown, Very Weathered Basalt Fragments With Some Fine To Pebble Sized, Ochre Stained, Sub-Rounded Quartz Grains. Occasional Dark Brown Sandy Friable To Firm Clay D: 34.000m-36.000m Gravel - Coarse, Orange/Brown To Ochre Stained, Sub-Angular To Rounded Quartz Pebbles,	172	South East

				<p>Mainly 2X2X1 Cm Size, With Some Dark Brown Weathered Basalt Rock Fragments. Some Light Grey Firm, Slightly Silty Clay. Occasional Fine To Coarse Ochre Stained Sand</p> <p>D: 36.000m-46.000m Basalt - Dark Grey/Brown, Becoming Dark Grey With Depth, Well Weathered Basalt, With Some Ochre Fragile Slightly Silty Rounded Rock Fragments. Occasional Light Brown And Ochre Soft Clay. Occasional White To Ochre Stained Quartz Grains (Vein Quartz?) - Rou</p> <p>D: 46.000m-48.000m Clay - Very Soft, Silty, Red Clay. Some Dark Brown Grey To Dark Red/Brown Weathered Basalt Rock Fragments. Occasional Ochre Fine Grey Slightly Silty Rock Fragments. Occasional Medium Grained Quartz Sand - Sub-Angular To Sub-Rounded Ochre Stained</p> <p>D: 48.000m-52.000m Clay - Ochre And Red Silty Soft Clay With Some Ochre, Moderately Soft, Sandy Clay, And Some Dark Grey To Dark Brown Weathered Basalt Fragments. Rare, Sub-Rounded, Medium Grained, Ochre Stained Quartz Sand</p> <p>D: 52.000m-54.000m Clay - Ochre, Moderately Soft, Sandy Clay. Abundant Dark Brown Soft Carbonaceous Clay (Some Possibly Ligneous), And Some Dark Grey To Dark Brown Weathered Basalt Fragments. Occasional Ochre Stained, Angular Clean Quartz Grains</p> <p>D: 54.000m-56.000m Carbonaceous Clay - Dark Brown, Moderately Soft, With Some Ochre Sandy Clay. Some Dark Grey Brown Weathered Basalt Fragments. Occasional Medium Grained, Sub-Rounded, Ochre Stained Quartz Grains</p> <p>D: 56.000m-58.000m Brown Coal - Slightly Ligneous With Some Dark Brown Carbonaceous Clay - Soft. Some Ochre Stained Sandy Clay. Occasional Medium Grained Ochre Stained Quartz Sand</p> <p>D: 58.000m-60.000m Carbonaceous Clay - Dark Brown, Moderately Soft With Some Ochre Sandy Clay. Some Dark Grey Brown Weathered Basalt Fragments. Occasional Medium Grained, Sub-Rounded, Ochre Stained Quartz Grains</p> <p>D: 60.000m-68.000m Clay - Medium Grained Soft, Smooth Clay, With Some Medium Grained, Sub-Rounded, Ochre Stained Quartz Sand. Occasional Dark Grey Basalt Fragments And Occasional Dark Brown Carbonaceous Clay Increasing Down</p> <p>D: 68.000m-76.000m Brown Coal (?) - Very Soft, With Some Dark Brown Soft Carbonaceous Clay And Occasional Fine To Medium Grained, Sub-Rounded Quartz Sand. Occasional Medium Grey, Moderately Soft, Smooth Clay And Occasional Ligneous Fragments</p> <p>D: 76.000m-84.000m Brown Coal (?) - Some Ligneous Fragments And Some Dark Brown, Soft Carbonaceous Clay. Rare Fine To Medium Quartz Sand</p> <p>D: 84.000m-90.000m Clay - Dark Brown Carbonaceous Clay, Very Soft, With Some Soft Smooth Brown-Grey Clay And Rare Ochre And Red Friable Clay. Occasional Ligneous Fragments</p> <p>D: 90.000m-102.000m Brown Coal - Some Ligneous Dark Brown Fragments Increasing Downwards. Some Dark Brown Soft Carbonaceous Clay</p> <p>D: 102.000m-108.000m Brown Coal (?) - Some Ligneous Fragments And Occasional Light Grey Soft, Smooth Clay</p> <p>D: 108.000m-114.000m Carbonaceous Clay - Soft, Dark Brown Carbonaceous Clay With Some Moderately Firm Brown Coal And Some Ligneous Fragments. From 112M Downwards Some Fine To Medium Clean Quartz Sand, Moderately Sorted And Sub-Angular To Sub-Rounded</p> <p>D: 114.000m-120.000m Carbonaceous Clay - Dark Brown, Very Soft Carbonaceous Clay. Occasional Beige Soft Smooth. Occasional Fine To Medium Clean Quartz Sand. Occasional Ligneous Fragments</p> <p>D: 120.000m-124.000m Sand - Very Fine To Medium Grained Poorly Sorted Clean Quartz Sand - Sub-Angular To Sub-Rounded. Some Very Soft Carbonaceous Clay And Some Very Soft Light Grey And Beige Smooth Clay. Occasional Ligneous Fragments</p> <p>D: 124.000m-128.000m Sand - Fine To Med But Becoming Coarser Downwards. Sub-Angular To Sub-Rounded Moderately Sorted Quartz Sand With Some Grey/Brown And Light Grey Very Soft Smooth Clay. Occasional Brown Coal And Ligneous Fragments</p> <p>D: 128.000m-134.000m Sand - Fine To Medium Grained, Becoming Coarser Downwards, Sub-Angular To Sub-Rounded Sand. Some Light Grey, Very Stiff Clay</p>		
326000	Victorian Mines Department (1909 - 1977)		Non Groundwater	<p>D: 0.000m-0.300m Red Loam</p> <p>D: 0.300m-1.800m Red Sand</p> <p>D: 1.800m-4.300m Clay, Sand, And Gravel</p> <p>D: 4.300m-4.900m Sand</p> <p>D: 4.900m-8.200m Grey And Yellow Clay</p> <p>D: 8.200m-9.800m Sand And Gravel</p> <p>D: 9.800m-10.100m Yellow Clay</p> <p>D: 10.100m-39.900m Brown Coal</p> <p>D: 39.900m-40.200m Ligneous Clay</p> <p>D: 40.200m-40.500m Brown Clay Water Struck At 4.57 Metres Standing At 4.57 Metres</p>	172	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326051	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-9.400m No Details Available D: 9.400m-17.400m Brown Coal D: 17.400m-36.000m No Details Available	175	North
S9037886/1		Groundwater				178	North
326057	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-5.800m Silt G: 5.800m-7.900m Gravel G: 7.900m-9.400m Clayey Silt G: 9.400m-26.200m Inferior Coal G: 26.200m-29.300m Coal Brown G: 29.300m-30.800m Inferior Coal G: 30.800m-35.400m Coal Brown G: 35.400m-36.900m Inferior Coal G: 36.900m-49.000m Coal Brown G: 49.000m-50.600m Inferior Coal G: 50.600m-52.100m Coal Brown G: 52.100m-53.600m Inferior Coal G: 53.600m-54.900m Ligneous Silty Clay	203	North
326056	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-2.700m Silty Soil G: 2.700m-3.700m Yellow Silty Clay G: 3.700m-4.300m Yellow Clayey Sand G: 4.300m-4.900m Sandy Clay G: 4.900m-8.800m Gravel Wet G: 8.800m-9.400m Mottled Clay & Gravel G: 9.400m-17.000m Inferior Coal G: 17.000m-49.000m Coal Brown G: 49.000m-50.600m Inferior Coal G: 50.600m-51.800m Ligneous Silty Clay	204	North
326069	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.900m Soil G: 0.900m-3.400m Black Sandy Clay G: 3.400m-4.900m Clay & Gravel G: 4.900m-6.100m Black Sandy Clay G: 6.100m-7.900m Grey Sandy Clay G: 7.900m-11.600m Gravel Wet G: 11.600m-12.200m Fine Sand Wet G: 12.200m-13.700m Ligneous Silt G: 13.700m-42.700m Coal Brown G: 15.200m-30.500m C = 60.8, Gdse = 25.77, H = 4.3, N = 0.61, Volatiles = 50.5 G: 30.500m-42.700m C = 62, Gdse = 26.47, H = 4.4, N = 0.58, Volatiles = 52.6 G: 42.700m-45.700m Ligneous Silt G: 45.700m-50.300m Coarse Sand Wet G: 50.300m-51.800m Ligneous Silt G: 51.800m-52.700m Coal Brown G: 52.700m-56.700m Ligneous Silt G: 56.700m-58.200m Fine Sand Wet G: 58.200m-59.700m Ligneous Silt Cont Quartz G: 59.700m-60.000m Fine Sand & Quartz G: 60.000m-61.300m Fine Sand Wet G: 61.300m-101.500m Grey Clay G: 101.500m-101.800m Sandstone G: 101.800m-114.300m Grey Clay G: 114.300m-117.300m Ligneous Clay G: 117.300m-123.400m Grey Clay G: 123.400m-123.700m Sandstone [End Of Hole :- Unconsolidated : Coarse Sand Wet]	251	North
326049	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-13.100m No Details Available - No Coal Found	256	North
326062	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-1.200m Soil G: 1.200m-4.600m Clay G: 4.600m-8.800m Gravel Wet G: 8.800m-12.200m Coal Brown	267	North
140688		Groundwater	Stock Irrigation Dewatering			286	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326055	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-0.900m Silty Soil G: 0.900m-2.100m Silt G: 2.100m-2.700m Silty Clay G: 2.700m-5.200m Mottled Clay G: 5.200m-7.000m Gravel G: 7.000m-8.500m Clayey Silt G: 8.500m-9.400m Gravel Wet G: 9.400m-15.500m Inferior Coal G: 15.500m-17.000m Coal Brown G: 17.000m-20.100m Inferior Coal G: 20.100m-24.700m Coal Brown G: 24.700m-27.700m Inferior Coal G: 27.700m-29.300m Coal Brown G: 29.300m-32.300m Inferior Coal G: 32.300m-33.800m Coal Brown G: 33.800m-35.400m Inferior Coal G: 35.400m-38.400m Coal Brown G: 38.400m-41.500m Inferior Coal G: 41.500m-43.000m Coal Brown G: 43.000m-50.600m Inferior Coal G: 50.600m-51.800m Ligneous Silty Clay	313	North
326060	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Soil G: 0.300m-5.500m Clay G: 5.500m-6.100m Sand G: 6.100m-7.000m Sand & Gravel G: 7.000m-7.600m Clay & Gravel G: 7.600m-9.800m Gravel Wet G: 9.800m-44.800m Coal Brown G: 12.200m-17.700m C = , Gdse = 25.24, H = , N = , Volatiles = 30.5 G: 17.700m-24.300m C = , Gdse = 25.35, H = , N = , Volatiles = 28.9 G: 24.300m-31.100m C = , Gdse = 25.4, H = , N = , Volatiles = 30.4 G: 31.100m-37.700m C = , Gdse = 25.28, H = , N = , Volatiles = 31.5 G: 44.800m-45.700m Coal & Sand G: 45.700m-47.500m Clay G: 47.500m-47.500m Sand Wet	314	North
326041	State Electricity Commission (1919 - 1993)		SEC Bores (Use unidentified)		G: 0.000m-0.500m Mottled Clay G: 0.500m-9.200m Sand & Gravel G: 9.200m-9.400m Inferior Coal G: 9.400m-10.800m Sand & Gravel G: 10.800m-42.000m Coal Brown G: 14.000m-14.600m C = 62.2, Gdse = 24.17, H = 4.4, N = 0.56, Volatiles = 47.4 G: 18.000m-18.600m C = 63.5, Gdse = 24.74, H = 4.6, N = 0.58, Volatiles = 48.8 G: 21.000m-21.700m C = 65.3, Gdse = 25.06, H = 4.6, N = 0.59, Volatiles = 49 G: 26.400m-26.800m C = 65.6, Gdse = 26.01, H = 4.9, N = 0.59, Volatiles = 50.5 G: 27.000m-27.300m C = 65.3, Gdse = 25.95, H = 4.9, N = 0.57, Volatiles = 51.2 G: 29.500m-30.000m C = 66.2, Gdse = 26.38, H = 5, N = 0.43, Volatiles = 50 G: 31.400m-31.700m C = 66.1, Gdse = 25.72, H = 4.6, N = 0.62, Volatiles = 48.5 G: 33.000m-33.300m C = 66.9, Gdse = 26.7, H = 5.2, N = 0.57, Volatiles = 53.4 G: 37.000m-37.600m C = 66.5, Gdse = 26.63, H = 5.2, N = 0.56, Volatiles = 53.1 G: 40.000m-40.600m C = 66.4, Gdse = 26.3, H = 4.9, N = 0.57, Volatiles = 50.5 G: 42.000m-43.800m Inferior Coal G: 43.800m-44.600m Brown Sandy Clay G: 44.600m-45.500m Sand & Pyrites	348	North
326042	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-9.100m No Details Available D: 9.100m-33.200m Brown Coal D: 33.200m-35.400m No Details Available	365	North
326072	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-9.100m Clay & Gravel G: 9.100m-9.800m Ligneous Sand G: 9.800m-57.900m Coal Brown G: 57.900m-58.500m Fine Sand G: 58.500m-64.600m Clay	376	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326058	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Soil G: 0.300m-3.400m Silt G: 3.400m-6.400m Brown Silty Clay G: 6.400m-9.900m Gravel Wet G: 9.900m-26.500m Inferior Coal G: 26.500m-29.600m Coal Brown G: 29.600m-32.600m Inferior Coal G: 32.600m-46.300m Coal Brown G: 46.300m-47.900m Inferior Coal G: 47.900m-52.400m Coal Brown G: 52.400m-53.900m Inferior Coal G: 53.900m-55.500m Ligneous Silty Clay G: 55.500m-56.100m Inferior Coal Silty	381	North
326048	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-9.400m No Details Available D: 9.400m-11.500m Brown Coal D: 11.500m-31.100m No Details Available	393	North
326054	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-1.200m Silty Soil G: 1.200m-3.400m Silt G: 3.400m-4.900m Mottled Clay G: 4.900m-5.800m Mottled Silty Clay G: 5.800m-6.400m Clay & Large Stones G: 6.400m-7.000m Gravel Wet G: 7.000m-7.900m Clayey Silt G: 7.900m-9.400m Inferior Coal G: 9.400m-11.000m Coal Brown G: 11.000m-12.500m Inferior Coal G: 12.500m-14.000m Coal Brown G: 14.000m-17.000m Inferior Coal G: 17.000m-23.200m Coal Brown G: 23.200m-24.700m Inferior Coal G: 24.700m-26.200m Coal Brown G: 26.200m-35.400m Inferior Coal G: 35.400m-38.400m Coal Brown G: 38.400m-39.900m Inferior Coal G: 39.900m-41.500m Coal Brown G: 41.500m-44.500m Inferior Coal G: 44.500m-50.600m Coal Brown G: 50.600m-52.100m Inferior Coal Silty G: 52.100m-53.900m Ligneous Silty Clay G: 53.900m-53.900m Sand	429	North
326021	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-2.700m Brown Sandy Clay G: 2.700m-6.400m Grey Sandy Clay G: 6.400m-11.000m Hard Quartz G: 11.000m-12.800m Yellow Sand G: 12.800m-14.000m White Sandy Clay G: 14.000m-15.200m Grey Sandy Clay G: 15.200m-15.900m Ligneous Clay G: 15.900m-56.100m Brown Coal G: 21.900m-37.200m C = 64.3, Gdse = 24.75, H = 4.6, N = 0.6, Volatiles = 48.5 G: 37.200m-49.400m C = 64.8, Gdse = 25.62, H = 4.9, N = 0.6, Volatiles = 49.6 G: 56.100m-57.900m Ligneous Clay G: 57.900m-59.400m Grey Sand	435	North
S9037886/2		Groundwater				444	North
326002	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.600m Sand And Gravel D: 0.600m-0.900m Clay And Gravel D: 0.900m-1.200m Basalt D: 1.200m-1.800m Clay And Gravel D: 1.800m-2.700m Basalt D: 2.700m-3.700m Gravel D: 3.700m-4.900m Yellow Sand D: 4.900m-7.300m Grey Clay D: 7.300m-8.500m Yellow Clay D: 8.500m-10.400m Grey Sandy Clay D: 10.400m-12.200m Grey Clay D: 12.200m-16.800m Grey Sandy Clay D: 16.800m-18.300m Grey Yellow Sandy Clay D: 18.300m-19.500m Yellow Sand D: 19.500m-20.100m Ligneous Clay D: 20.100m-44.500m Brown Coal D: 44.500m-45.400m Ligneous Clay	470	North
326043	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-21.600m No Details Available D: 21.600m-21.600m Brown Coal D: 21.600m-28.100m No Details Available	478	North East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
141831		Groundwater	Domestic Stock		D: 0.000m-36.000m Hard Fractured Basalt D: 36.000m-62.000m Hard Fractured Basalt D: 62.000m-99.000m Orange/Brown Clay D: 99.000m-144.000m Brown Ligneous Clay/Sand D: 144.000m-167.000m Hard Blue Sandstone	481	North East
326053	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Silty Soil G: 0.600m-3.700m Brown Silty Clay G: 3.700m-5.800m Mottled Silty Clay G: 5.800m-6.400m Yellow Sandy Clay G: 6.400m-7.300m Gravel Wet G: 7.300m-8.700m Clayey Gravel Wet G: 8.700m-9.700m Ligneous Clay G: 9.700m-12.800m Inferior Coal G: 12.800m-14.300m Coal Brown G: 14.300m-15.800m Inferior Coal G: 15.800m-17.400m Coal Brown G: 17.400m-25.000m Inferior Coal G: 25.000m-26.500m Coal Brown G: 26.500m-28.000m Inferior Coal G: 28.000m-31.100m Coal Brown G: 31.100m-32.600m Inferior Coal G: 32.600m-52.400m Coal Brown G: 52.400m-53.900m Inferior Coal G: 53.900m-55.800m Ligneous Sandy Clay G: 55.800m-55.800m Sand	518	North West
326018	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-8.800m Brown Sandy Clay G: 8.800m-14.000m Hard Sandstone With Quartz Boulders G: 14.000m-21.000m Ligneous Clay G: 21.000m-36.300m C = 61.9, Gdse = 24.45, H = 4.4, N = 0.58, Volatiles = 48.7 G: 21.000m-52.400m Brown Coal G: 36.300m-48.500m C = 64.3, Gdse = 25.63, H = 4.8, N = 0.58, Volatiles = 50 G: 52.400m-61.900m Brown Sand	548	North
326063	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-1.200m Soil G: 1.200m-6.100m Clay G: 6.100m-6.700m Sand G: 6.700m-8.800m Gravel Wet G: 8.800m-12.200m Coal Brown	554	North
326061	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-2.100m Soil G: 2.100m-3.000m Sandy Clay G: 3.000m-6.100m Clay & Gravel G: 6.100m-8.200m Clay G: 8.200m-9.100m Clay & Gravel G: 9.100m-9.800m Clay & Sand G: 9.800m-9.800m Coal Brown	575	North
326059	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Soil G: 0.300m-6.400m Clay G: 6.400m-7.600m Gravel G: 7.600m-9.800m Coal Brown G: 9.800m-10.400m Clay G: 10.400m-47.200m Coal Brown G: 12.800m-18.900m C = , Gdse = 25.19, H = , N = , Volatiles = 30.7 G: 18.900m-25.000m C = , Gdse = 25.4, H = , N = , Volatiles = 30.2 G: 25.000m-31.100m C = , Gdse = 25.33, H = , N = , Volatiles = 30.9 G: 31.100m-37.200m C = , Gdse = 25.4, H = , N = , Volatiles = 29.5 G: 37.200m-43.300m C = , Gdse = 25.4, H = , N = , Volatiles = 31.5 G: 47.200m-48.800m Clay & Coal G: 48.800m-50.000m Brown Clay	588	North
326017	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-2.700m Brown Sandy Clay G: 2.700m-12.500m Light Brown Sandy Clay G: 12.500m-13.400m Hard Sandstone G: 13.400m-16.800m White Clay G: 16.800m-19.500m White And Yellow Sandy Clay G: 19.500m-21.300m Brown Sandy Clay G: 21.300m-39.600m C = 61.4, Gdse = 24.55, H = 4.3, N = 0.64, Volatiles = 46.7 G: 21.300m-53.300m Brown Coal G: 39.600m-51.800m C = 63.1, Gdse = 25.47, H = 4.8, N = 0.63, Volatiles = 49.5 G: 53.300m-54.900m Ligneous Clay G: 54.900m-61.900m Fine Sand	589	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326022	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-24.700m Sandy Clay G: 24.700m-30.800m Ligneous Clay G: 30.800m-59.700m Brown Coal G: 30.800m-46.000m C = 63.6, Gdse = 25.07, H = 4.8, N = 0.6, Volatiles = 51.1 G: 46.000m-59.700m C = 63.2, Gdse = 24.91, H = 4.7, N = 0.5, Volatiles = 50.4 G: 59.700m-61.000m Ligneous Clay G: 61.000m-62.500m Grey Clay G: 62.500m-63.700m Grey Sand	599	North
326016	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-2.100m Coarse Gravel D: 2.100m-5.800m Fine Brown Cemented Sand D: 5.800m-7.300m Hard Sandstone With Thin Bands Of Clay D: 7.300m-8.800m Quartz Boulder Conglomerate D: 8.800m-9.100m Hard Sandstone D: 9.100m-16.500m White Clay D: 16.500m-25.300m Brown Clay D: 25.300m-55.800m Brown Coal G: 29.000m-45.700m C = 62.2, Gdse = 24.86, H = 4.6, N = 0.58, Volatiles = 47.5 D: 55.800m-61.900m Brown Sand	635	North
S9037886/3		Groundwater				637	North West
326019	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-2.100m Coarse Clayey Gravel G: 2.100m-8.200m Brown Clay G: 8.200m-15.500m Hardstone (Quartz) G: 15.500m-21.300m Yellow Sandy Clay G: 21.300m-22.900m Ligneous Clay G: 22.900m-60.000m Brown Coal G: 22.900m-41.100m C = 63.9, Gdse = 25.24, H = 4.8, N = 0.6, Volatiles = 50.3 G: 41.100m-56.400m C = 64.5, Gdse = 25.52, H = 4.9, N = 0.6, Volatiles = 50.6 G: 60.000m-66.100m Brown Sand	690	North
326052	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-9.400m No Details Available D: 9.400m-27.400m Brown Coal D: 27.400m-42.100m No Details Available D: 42.100m-55.100m Brown Coal D: 55.100m-72.200m No Details Available	725	North
326044	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-8.500m No Details Available D: 8.500m-18.700m Brown Coal D: 18.700m-20.800m No Details Available	754	North East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
87786	Victorian Mines Department (1909 - 1977)				D: 0.000m-0.600m Red Soil G: 0.000m-0.600m Red Soil D: 0.600m-4.600m Yellow Mottled Clay G: 0.600m-4.600m Yellow Mottled Clay D: 4.600m-6.400m Grey Mottled Clay G: 4.600m-6.400m Grey Mottled Clay D: 6.400m-7.600m Red Mottled Clay G: 6.400m-7.600m Red Mottled Clay D: 7.600m-9.400m Yellow Mottled Clay D: 7.600m-9.400m Yellow Mottled Clay D: 9.400m-10.100m Yellow Clay And Basalt G: 9.400m-10.100m Yellow Clay And Basalt G: 10.100m-16.200m Basalt D: 10.100m-16.200m Basalt D: 16.200m-19.200m Yellow Clay G: 16.200m-19.200m Yellow Clay D: 19.200m-21.000m Yellow Mottled Clay G: 19.200m-21.000m Yellow Mottled Clay D: 21.000m-22.900m Grey Mottled Clay G: 21.000m-22.900m Grey Mottled Clay D: 22.900m-26.500m Yellow Mottled Clay D: 22.900m-26.500m Yellow Mottled Clay G: 26.500m-27.100m Grey Mottled Clay D: 26.500m-27.100m Grey Mottled Clay G: 27.100m-29.000m Brown Clay D: 27.100m-29.000m Brown Clay D: 29.000m-30.500m Yellow Mottled Clay G: 29.000m-30.500m Yellow Mottled Clay G: 30.500m-32.300m Yellow Mottled Sandy Clay D: 30.500m-32.300m Yellow Mottled Sandy Clay G: 32.300m-34.100m Yellow Clayey Sand D: 32.300m-34.100m Yellow Clayey Sand G: 34.100m-35.100m Coarse Sand And Gravel D: 34.100m-35.100m Coarse Sand And Gravel D: 35.100m-36.600m Yellow Clay And Basalt G: 35.100m-36.600m Yellow Clay And Basalt G: 36.600m-60.700m Basalt D: 36.600m-60.700m Basalt G: 60.700m-64.000m Blue Mottled Mudstone D: 60.700m-64.000m Blue Mottled Mudstone D: 64.000m-65.500m Blue Sandy Clay G: 64.000m-65.500m Blue Sandy Clay D: 65.500m-70.400m Fine Sand G: 65.500m-70.400m Fine Sand D: 70.400m-94.200m Brown Coal G: 70.400m-94.200m Brown Coal D: 94.200m-100.600m Brown Coal And Sand G: 94.200m-100.600m Brown Coal And Sand D: 100.600m-103.600m Coarse Sand G: 100.600m-103.600m Coarse Sand D: 103.600m-107.000m Fine Sand G: 103.600m-107.000m Fine Sand D: 107.000m-117.700m Grey Clay G: 107.000m-117.700m Grey Clay	777	West
326020	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-4.300m Quartz Gravel G: 4.300m-32.300m Yellow Sandy Clay G: 32.300m-34.100m Ligneous Clay G: 34.100m-46.300m C = 61, Gdse = 23.89, H = 4.5, N = 0.6, Volatiles = 46.1 G: 34.100m-62.800m Brown Coal G: 46.300m-61.600m C = 63.9, Gdse = 25.21, H = 4.8, N = 0.6, Volatiles = 50 G: 62.800m-65.200m White Clay G: 65.200m-68.600m Grey Sand	798	North
326026	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-4.600m Brown Clay G: 4.600m-7.000m Grey Clayey Sand G: 7.000m-10.400m Coarse Sand And Gravel G: 10.400m-38.400m Sandy Clay G: 38.400m-39.600m Grey Sand G: 39.600m-49.100m Brown Sandy Clay G: 49.100m-71.600m Brown Coal G: 49.100m-67.300m C = 64.1, Gdse = 25.33, H = 4.8, N = 0.6, Volatiles = 49.8 G: 71.600m-72.500m Ligneous Clay G: 72.500m-73.500m Grey Sand G: 73.500m-74.400m Grey Clay	811	North
326047	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-7.600m No Details Available D: 7.600m-18.200m Brown Coal D: 18.200m-19.800m No Details Available	817	North
S9033880/1		Groundwater				819	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326024	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-2.100m Brown Clay G: 2.100m-3.400m Grey Sand G: 3.400m-4.300m Grey Sandy Clay G: 4.300m-6.400m Grey Clay G: 6.400m-9.400m Hard Stone G: 9.400m-10.400m Yellow Clay G: 10.400m-11.300m Hard Stone G: 11.300m-17.100m Grey Clay G: 17.100m-28.700m Yellow Gravelly Clay G: 28.700m-31.100m Grey Sand G: 31.100m-34.400m Grey Clay G: 34.400m-35.100m Band Pyrites G: 35.100m-39.000m Grey Clay G: 39.000m-49.400m Ligneous Clay G: 49.400m-74.100m Brown Coal G: 49.400m-70.700m C = 63.9, Gdse = 25.25, H = 4.8, N = 0.6, Volatiles = 48.9 G: 74.100m-75.600m Grey Clay	838	North
326023	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-0.900m Brown Clay G: 0.900m-4.300m Quartz Gravel And Clay G: 4.300m-4.900m Hard Stone G: 4.900m-17.100m Yellow Clayey Gravel G: 17.100m-18.000m Hard Stone G: 18.000m-24.400m Yellow Gravelly Clay G: 24.400m-26.200m Cementy Sandstone G: 26.200m-34.100m Grey Clay G: 34.100m-34.400m Iron Pyrites G: 34.400m-40.200m Ligneous Clay G: 40.200m-68.600m Brown Coal G: 68.600m-69.800m Ligneous Clay G: 69.800m-71.600m Grey Clay G: 71.600m-72.200m Grey Sand	847	North
87790		Groundwater	Irrigation		D: 0.000m-2.000m Brown Seds And Clays D: 2.000m-6.000m Water Bearing Brown Seds And Clays D: 6.000m-8.000m Brown Clays D: 8.000m-10.000m Quartz Sands 1 Inch Very Angular Rocks D: 10.000m-16.000m Gravels And Sands Decreasing In Gravel D: 16.000m-20.000m Coal And Sediments D: 20.000m-26.000m Coal And Sediments D: 26.000m-28.000m Coal D: 28.000m-34.000m Coal And Sediments D: 34.000m-40.000m Coal And Sediments D: 40.000m-46.000m Carbonatious Med Grain Seds	894	North
326035	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-2.400m Brown Clay G: 2.400m-7.000m Yellow Sandy Clay G: 7.000m-11.600m Gravel And Quartz G: 11.600m-14.600m Yellow Clay G: 14.600m-21.300m Yellow Sandy Clay G: 21.300m-22.300m Brown Sandy Clay G: 22.300m-27.400m Yellow And White Sandy Clay G: 27.400m-29.900m Hard Gravel And Quartz G: 29.900m-44.500m Brown Sandy Clay G: 44.500m-47.500m Ligneous Clay G: 47.500m-62.800m C = 63.5, Gdse = 25.05, H = 4.7, N = 0.7, Volatiles = 49.1 G: 47.500m-82.600m Brown Coal G: 62.800m-78.000m C = 66.8, Gdse = 26.56, H = 5.1, N = 0.6, Volatiles = 51.3 G: 82.600m-85.300m Brown Clay	895	North
142792		Groundwater	Groundwater Investigation		D: 0.000m-22.000m Mottled Sandy Clay D: 22.000m-51.600m Basalt	936	North West
326025	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-0.900m Brown Clay G: 0.900m-6.100m Yellow Clay G: 6.100m-9.100m Coarse Sandy Quartz G: 9.100m-30.200m Yellow Sandy Clay G: 30.200m-43.900m Grey Clay G: 43.900m-44.500m Ligneous Clay G: 44.500m-59.700m C = 59.8, Gdse = 23.32, H = 4.3, N = 0.6, Volatiles = 45.9 G: 44.500m-72.200m Brown Coal G: 59.700m-71.900m C = 61.9, Gdse = 24.32, H = 4.6, N = 0.6, Volatiles = 47.3 G: 72.200m-72.800m Ligneous Clay G: 72.800m-75.600m Grey Clay	941	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
116327		Groundwater	Groundwater Investigation		D: 0.000m-1.000m Silty Clay Red D: 1.000m-3.000m Silty Clay Brown/Grey D: 3.000m-3.800m Sandy Clay Brown D: 3.800m-6.000m Basalt Grey	982	East
326027	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-9.800m Brown Clay With Quartz Rocks G: 9.800m-10.400m Brown Sandy Clay G: 10.400m-13.400m Coarse Grey Sand And Gravel G: 13.400m-29.900m Yellow Sandy Clay G: 29.900m-42.700m Grey Sandy Clay G: 42.700m-47.200m Dark Grey Clay G: 47.200m-53.300m Ligneous Clay With Thin Bands Of Brown Coal G: 53.300m-71.900m C = 65.2, Gdse = 25.82, H = 5, N = 0.6, Volatiles = 49.8 G: 53.300m-71.900m Brown Coal G: 71.900m-74.700m Grey Clay	986	North
326032	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-2.100m Brown Clay G: 2.100m-8.200m Yellow Sandy Clay G: 8.200m-14.300m Gravel And Quartz G: 14.300m-35.700m Yellow Sandy Clay G: 35.700m-50.000m Grey Clay G: 50.000m-56.100m Ligneous Clay G: 56.100m-78.600m Brown Coal G: 56.100m-78.600m C = 63.1, Gdse = 24.88, H = 4.7, N = 0.6, Volatiles = 47.9 G: 78.600m-81.100m Ligneous Clay G: 81.100m-82.300m Brown Clay	1001	North
116328		Groundwater	Groundwater Investigation		D: 0.000m-0.800m Silty Clay Yellow/Brown D: 0.800m-1.400m Clay Grey/Brown D: 1.400m-6.000m Basalt Brown/Grey	1037	East
129731		Groundwater	Groundwater Investigation		D: 0.000m-0.500m Top Soil D: 0.500m-4.300m Stiff Grey Brown Silty Clay D: 4.300m-8.500m Firm Brown Clay Silty With Sand & Gravel	1068	North
326034	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-2.100m Brown Clay G: 2.100m-3.000m Yellow Sandy Clay G: 3.000m-3.700m Coarse Sand G: 3.700m-10.400m Yellow Clay G: 10.400m-15.500m Coarse Gravel And Quartz G: 15.500m-25.600m Grey Clay G: 25.600m-29.300m Brown Sandy Clay G: 29.300m-31.700m Hard Quartz G: 31.700m-37.800m Yellow And White Sandy Clay G: 37.800m-43.300m Ligneous Clay G: 43.300m-86.600m Brown Coal G: 43.300m-61.600m C = 59, Gdse = 22.96, H = 4.3, N = 0.5, Volatiles = 46.1 G: 61.600m-76.800m C = 66, Gdse = 26.18, H = 5, N = 0.7, Volatiles = 51.3 G: 86.600m-89.000m Ligneous Clay G: 89.000m-90.800m Grey Sandy Clay	1079	North West
116329		Groundwater	Groundwater Investigation		D: 0.000m-1.400m Silty Clay Brown D: 1.400m-6.000m Weathered Basalt Brown	1087	South East
326031	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-3.700m Brown Clay G: 3.700m-12.800m Yellow Sandy Clay G: 12.800m-15.200m Coarse Gravel And Quartz G: 15.200m-21.900m Yellow Sandy Clay G: 21.900m-23.200m Grey Sandy Gravel G: 23.200m-35.700m Sandy Clay G: 35.700m-45.100m Ligneous Clay G: 45.100m-45.700m Brown Coal G: 45.700m-50.900m Ligneous Clay G: 50.900m-66.100m C = 63.6, Gdse = 25.11, H = 4.8, N = 0.7, Volatiles = 49.7 G: 50.900m-81.100m Brown Coal G: 66.100m-78.300m C = 59.7, Gdse = 23.27, H = 4.3, N = 0.5, Volatiles = 50.2 G: 81.100m-82.300m Ligneous Clay G: 82.300m-82.600m Grey Clay	1089	North
325990	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-1.500m Black Soil D: 1.500m-7.600m Yellow Clay D: 7.600m-8.200m Sand D: 8.200m-11.900m Brown Coal D: 11.900m-21.900m Brown Coal Water Struck At 4.57 Metres	1114	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326040	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-5.200m Brown And White Mottled Clay G: 5.200m-6.100m Brown Sand G: 6.100m-9.400m Grey Sand And Gravel G: 9.400m-11.000m Yellow And White Mottled Clay G: 11.000m-14.600m Sand And Gravel G: 14.600m-35.400m Yellow And White Mottled Clay G: 35.400m-36.000m Hard Band Stone G: 36.000m-47.200m Ligneous Clay G: 47.200m-62.500m C = 58.7, Gdse = 22.66, H = 4.3, N = 0.6, Volatiles = 46.3 G: 47.200m-77.700m Brown Coal G: 62.500m-74.700m C = 55.8, Gdse = 22.64, H = 4.2, N = 0.6, Volatiles = 46.4	1137	North West
87785	Victorian Mines Department (1909 - 1977)				G: 0.000m-0.600m Red Soil G: 0.600m-4.600m Yellow Mottled Clay G: 4.600m-6.100m Grey Mottled Clay G: 6.100m-7.300m Red Mottled Clay G: 7.300m-8.200m Yellow Mottled Clay G: 8.200m-9.100m Yellow Mottled Clay And Stones G: 9.100m-9.800m Yellow Clay And Basalt G: 9.800m-15.900m Basalt G: 15.900m-21.300m Yellow Mottled Clay G: 21.300m-22.600m Grey Mottled Clay G: 22.600m-26.200m Yellow Mottled Clay G: 26.200m-26.800m Grey Mottled Clay G: 26.800m-29.600m Brown Clay G: 29.600m-30.500m Yellow Mottled Clay G: 30.500m-32.300m Yellow Clayey Sand G: 32.300m-34.100m Yellow Mottled Sandy Clay G: 34.100m-35.100m Coarse Dry Sand And Gravel G: 35.100m-35.700m Clay And Basalt G: 35.700m-36.600m Decomposed Basalt G: 36.600m-40.500m Basalt G: 40.500m-43.000m Basalt And Coarse Gravel	1151	West
87784	Victorian Mines Department (1909 - 1977)				G: 0.000m-0.600m Red Soil G: 0.600m-4.600m Yellow Mottled Clay G: 4.600m-6.100m Grey Mottled Clay G: 6.100m-7.300m Red Mottled Clay G: 7.300m-8.200m Yellow Mottled Clay G: 8.200m-9.100m Yellow Mottled Clay And Stones G: 9.100m-9.800m Yellow Clay And Basalt G: 9.800m-15.900m Soft Basalt G: 15.900m-21.300m Yellow Mottled Clay G: 21.300m-22.600m Grey Mottled Clay G: 22.600m-26.200m Yellow Mottled Clay G: 26.200m-26.800m Grey Mottled Clay G: 26.800m-29.600m Brown Clay G: 29.600m-30.500m Yellow Mottled Clay G: 30.500m-32.300m Yellow Clayey Sand G: 32.300m-34.100m Yellow Mottled Sandy Clay G: 34.100m-35.100m Coarse Sand And Gravel G: 35.100m-36.000m Clay And Basalt G: 36.000m-36.300m Basalt	1164	West
942609	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			1164	West
326028	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-12.800m Brown Clay G: 12.800m-15.500m Hard Quartz Rock And Gravel G: 15.500m-22.600m Yellow And White Sandy Clay G: 22.600m-23.500m Hard Quartz Rocks G: 23.500m-39.600m Grey Clay G: 39.600m-42.700m Dark Grey Clay G: 42.700m-57.300m Ligneous Clay G: 57.300m-72.800m C = 67.9, Gdse = 27.09, H = 5.2, N = 0.5, Volatiles = 53.6 G: 57.300m-72.800m Brown Coal G: 72.800m-74.700m Ligneous Clay G: 74.700m-75.600m Grey Clay	1164	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326033	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-2.400m Brown Clay G: 2.400m-10.700m White Clay G: 10.700m-12.800m Gravel And Quartz G: 12.800m-17.100m Grey Sand G: 17.100m-21.300m Grey Clay G: 21.300m-22.900m Hard Quartz G: 22.900m-37.800m Grey Clay G: 37.800m-39.000m Dark-Grey Clay G: 39.000m-56.100m Ligneous Clay G: 56.100m-78.300m Brown Coal G: 56.400m-78.300m C = 62.6, Gdse = 24.6, H = 4.6, N = 0.6, Volatiles = 48.1 G: 78.300m-80.200m Ligneous Clay G: 80.200m-82.300m Brown Clay	1175	North
326046	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-9.400m No Details Available D: 9.400m-19.700m Brown Coal D: 19.700m-19.800m No Details Available	1180	North
325989	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-1.500m Black Soil D: 1.500m-3.000m Grey Pug D: 3.000m-5.200m Yellow Clay D: 5.200m-6.700m Yellow Sand D: 6.700m-7.900m Blue Clay D: 7.900m-20.900m Brown Coal D: 20.900m-22.900m Brown Pug Water Struck At 3.66 Metres	1184	North
326045	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-6.700m No Details Available D: 6.700m-15.200m Brown Coal D: 15.200m-20.700m No Details Available	1212	North
326078	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			1224	West
326030	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-5.500m Brown Clay G: 5.500m-14.600m Yellow And White Sandy Clay G: 14.600m-18.000m Coarse Gravel And Quartz G: 18.000m-22.600m Yellow And White Sandy Clay With Quartz Rocks G: 22.600m-36.600m Yellow Sandy Clay G: 36.600m-49.100m Grey Clay G: 49.100m-51.800m Ligneous Clay G: 51.800m-76.200m C = 61, Gdse = 23.91, H = 4.5, N = 0.5, Volatiles = 47 G: 51.800m-76.200m Brown Coal G: 76.200m-78.000m Ligneous Clay G: 78.000m-78.600m Grey Clay	1248	North
326029	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-6.700m Brown Clay G: 6.700m-13.100m Yellow And White Sandy Clay G: 13.100m-16.200m Coarse Gravel With Quartz G: 16.200m-20.700m Yellow Sandy Clay And Quartz Rocks G: 20.700m-21.900m Hard Rock	1340	North
326003	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Loam D: 0.300m-0.600m Red Clay D: 0.600m-1.500m Basalt D: 1.500m-6.400m Clay, Gravel, And Basalt D: 6.400m-11.900m Yellow Clay D: 11.900m-12.200m Ligneous Clay D: 12.200m-21.300m Brown Coal D: 21.300m-21.900m Ligneous Clay D: 21.900m-22.900m Sandy Clay	1362	North East
87792		Groundwater	Irrigation		D: 0.000m-0.400m Rich Black Earth D: 0.400m-1.800m Black Clay D: 1.800m-4.700m Silty Yellow Clay D: 4.700m-8.600m Large Cemented Gravels D: 8.600m-21.000m Brown Coal D: 21.000m-28.600m Silty Brown Clay	1388	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326036	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-4.300m Brown Clay And Bands Of Cement Sandston G: 4.300m-13.700m Yellow And White Mottled Sandy Clay G: 13.700m-17.400m Gravel And Quartz G: 17.400m-21.900m Yellow And White Mottled Sandy Clay-Ban Of Sand G: 21.900m-34.400m Yellow And White Mottled Clayey Sand G: 34.400m-36.300m Sand And Gravel G: 36.300m-39.600m Brown Sandy Clay G: 39.600m-47.900m Ligneous Clay G: 47.900m-81.400m Brown Coal G: 81.400m-84.100m Brown Clay G: 84.100m-84.700m Brown Sand	1404	North West
129730		Groundwater	Groundwater Investigation		D: 0.000m-0.500m Top Soil D: 0.500m-3.500m Stiff Grey Brown Silt Clay D: 3.500m-8.000m Firm Brown Clayey Silt With Sandy Gravel D: 8.000m-8.500m Brown Coal	1409	North
87795		Groundwater	Domestic Miscellaneous		D: 0.000m-2.000m Topsoil & Clay D: 2.000m-4.200m Sand & Gravel	1428	North
326015	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-0.600m Red Clay D: 0.600m-0.900m Yellow Clay D: 0.900m-2.100m Clay And Gravel D: 2.100m-4.900m Yellow Clay D: 4.900m-12.200m Grey Clay D: 12.200m-14.900m Yellow Sandy Clay D: 14.900m-16.500m Sand And Gravel D: 16.500m-22.600m Yellow Sand D: 22.600m-25.900m Grey Clay D: 25.900m-30.800m Grey Sand D: 30.800m-33.500m Grey Clay D: 33.500m-35.100m Yellow Sand D: 35.100m-35.400m Grey Clay D: 35.400m-37.200m Ligneous Clay D: 37.200m-38.400m Brown Coal D: 38.400m-40.200m Grey Clay D: 40.200m-43.300m Grey Sand	1505	North
87803	Rural Water Commission / Corporation (1984 - 1995)	Groundwater	Domestic Stock		D: 0.000m-1.500m Black Top Soil D: 1.500m-4.000m Grey Clay D: 4.000m-8.000m Brown Coal D: 8.000m-12.000m River Gravels To 50Mm D: 12.000m-21.500m Grey Clay D: 21.500m-26.000m River Gravels To 100Mm	1536	North
142793		Groundwater	Groundwater Investigation		D: 0.000m-0.500m Soil & Clay D: 0.500m-30.000m Basaltic Clay D: 30.000m-45.000m Weathered Basalt D: 45.000m-58.000m Basalt D: 58.000m-63.000m Weathered Basalt	1539	West
326004	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Loam D: 0.300m-1.800m Grey Clay D: 1.800m-4.900m Grey And Yellow Clay D: 4.900m-5.200m Sand And Gravel D: 5.200m-7.900m Drift Sand And Gravel D: 7.900m-12.800m Brown Coal D: 12.800m-13.100m Ligneous Clay D: 13.100m-14.300m Yellow Clay	1541	North East
87789					D: 0.000m-2.000m Khaki Seds D: 2.000m-6.000m Khaki Seds And Grey Clays D: 6.000m-8.000m Water Bearing Khaki Seds And Clays (Grey) D: 8.000m-10.000m Coal Seam D: 10.000m-16.000m Carb. Seds And Clays D: 16.000m-24.000m Grey Sands Decreasing In Clay Content D: 24.000m-39.000m Grey Clays And Sediments And Carbonatious Material	1552	North
87788					D: 0.000m-0.500m Rich Black Earth D: 0.500m-1.500m Black Clay D: 1.500m-7.200m Sandy Yellow Clay D: 7.200m-9.000m Layer Cemented Gravel D: 9.000m-22.000m Brown Coal D: 22.000m-24.300m Fine Gravel Aquifer	1562	North
S62209/1		Groundwater	Irrigation			1581	North East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
87793	Department of Minerals and Energy (1977 - 1985)	Groundwater	Irrigation		D: 0.000m-2.000m Dark Brown Clay D: 2.000m-7.000m Light Brown Clay D: 7.000m-9.100m Gravels D: 9.100m-21.500m Coal D: 21.500m-23.900m Sand D: 23.900m-27.500m Coal-Small Bands Sand D: 27.500m-28.100m Sand D: 28.100m-33.500m Coal D: 33.500m-36.500m Fine Sand D: 36.500m-42.500m Blue Clays D: 42.500m-44.900m Coarse Sands D: 44.900m-52.500m Brown Clay D: 52.500m-53.000m Sand D: 53.000m-53.500m White Clay D: 53.500m-55.900m Fine Sand D: 55.900m-59.500m Clay	1604	North
S9030088/1		Groundwater				1607	North East
S9028898/1		Groundwater				1621	North
87791					D: 0.000m-0.600m Black Earth D: 0.600m-1.800m Black Clay D: 1.800m-6.900m Sandy Brown Clay D: 6.900m-9.000m Cemented Gravels D: 9.000m-22.200m Brown Coal D: 22.200m-24.300m Fine Gravel Aquifer	1634	North
S9027653/1		Groundwater	Domestic and Stock			1637	North
326037	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-2.100m Brown Clay G: 2.100m-3.700m Yellow Sandy Clay G: 3.700m-6.700m Yellow Clayey Sand G: 6.700m-7.900m Grey Sand G: 7.900m-12.800m Grey Clay G: 12.800m-20.100m Yellow And White Mottled Sandy Clay G: 20.100m-22.900m Gravel And Quartz G: 22.900m-25.000m Yellow Clay G: 25.000m-29.300m Grey Basalt G: 29.300m-30.200m Hard Grey Basalt	1647	North West
142794		Groundwater	Groundwater Investigation		D: 0.000m-0.300m Soil D: 0.300m-10.000m Brown/Grey Clay D: 10.000m-18.000m Basalt D: 18.000m-35.000m Granitic Sandy Clays D: 35.000m-42.500m Basalt D: 42.500m-45.000m Fine Sand Silt	1695	North West
326014	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-0.600m Red Clay D: 0.600m-4.000m Yellow Clay D: 4.000m-5.800m Clay And Gravel D: 5.800m-11.300m Clay, Sand, And Gravel D: 11.300m-13.400m Yellow Sand D: 13.400m-14.300m Sandstone D: 14.300m-15.200m Sand And Gravel D: 15.200m-17.400m Yellow Sand D: 17.400m-21.300m Grey Clay D: 21.300m-24.100m Grey Sand D: 24.100m-28.700m Grey Clay D: 28.700m-30.200m Yellow Sand D: 30.200m-33.500m Grey Clay	1697	North West
87787		Groundwater	Stock		D: 0.000m-0.600m Top Soil D: 0.600m-1.300m Red Clay D: 1.300m-12.100m Basalt Boulders D: 12.100m-18.200m Clay D: 18.200m-20.200m Sand Clay D: 20.200m-22.200m Clayey Sand And Gravel D: 22.200m-22.200m Coarse Sand D: 22.200m-22.500m Honeycomb Basalt D: 22.500m-28.900m Basalt D: 28.900m-33.200m Silurian Sand	1697	North West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
116330		Groundwater	Groundwater Investigation		D: 0.000m-2.900m Silty Clay Brown D: 2.900m-9.000m Basalt D: 9.000m-13.000m Fine Sand Some Gravel D: 13.000m-15.000m Silty Clay D: 15.000m-17.500m Silty Sand D: 17.500m-19.000m Silty Clay D: 19.000m-27.000m Basalt D: 27.000m-30.000m Silty Clay D: 30.000m-42.500m Basalt D: 42.500m-56.000m Sand Some Clayey D: 56.000m-63.000m Sand Clay/Clayey Sand D: 63.000m-68.000m Clay Silty/Dark Grey D: 68.000m-77.500m Coal Clayey	1712	East
87783	Victorian Mines Department (1909 - 1977)				G: 0.000m-0.900m Red Soil G: 0.900m-2.100m Grey Mottled Clay G: 2.100m-3.400m Yellow Mottled Clay G: 3.400m-5.500m Grey Mottled Clay G: 5.500m-6.700m Red Mottled Clay G: 6.700m-15.500m Grey Mottled Clay G: 15.500m-18.000m Grey Mottled Sandy Clay G: 18.000m-22.300m Grey Mottled Clay G: 22.300m-25.000m Yellow Mottled Clay G: 25.000m-25.600m Red Mottled Clay G: 25.600m-28.700m Grey Sandy Clay G: 28.700m-31.700m Grey Clay With Pebbles G: 31.700m-54.000m Basalt And Thin Bands Of Clay G: 54.000m-55.800m Basalt G: 55.800m-56.400m Yellow Clay And Gravel G: 56.400m-57.000m Grey Mottled Clay G: 57.000m-71.000m Grey Clay G: 71.000m-87.800m Brown Coal G: 87.800m-94.200m Grey Sand G: 94.200m-113.700m Grey Sandy Clay G: 113.700m-117.000m Coarse Clayey Sand G: 117.000m-125.600m Grey Sandy Clay G: 125.600m-126.200m Brown Sandy Clay G: 126.200m-130.800m Grey Sandy Clay G: 130.800m-131.400m Brown Sandy Clay G: 131.400m-135.900m Grey Sandy Clay G: 135.900m-136.200m Sandstone G: 136.200m-145.400m Grey Sandy Clay G: 145.400m-147.500m Brown Sandy Clay G: 147.500m-147.800m Grey Sandy Clay G: 147.800m-154.800m Grey Clay G: 154.800m-155.100m Thin Band Of Stone G: 155.100m-159.100m Grey Clay G: 159.100m-159.400m Thin Band Of Stone G: 159.400m-172.200m Grey Clay G: 172.200m-172.800m Hard Band Of Stone G: 172.800m-183.500m Grey Clay G: 183.500m-183.800m Stone G: 183.800m-185.300m Grey Clay G: 185.300m-190.800m Dark Grey Clay G: 190.800m-191.100m Band Of Stone G: 191.100m-200.900m Grey Clay G: 200.900m-203.000m Dark Grey Clay G: 203.000m-203.600m Band Of Stone G: 203.600m-206.400m Grey Clay G: 206.400m-207.000m Stone G: 207.000m-210.000m Grey Clay G: 210.000m-210.300m Stone G: 210.300m-211.800m Grey Clay G: 211.800m-214.000m Stone G: 214.000m-217.600m Grey Clay G: 217.600m-218.800m Stone G: 218.800m-222.200m Grey Clay G: 222.200m-223.100m Stone G: 223.100m-226.200m Grey Clay G: 226.200m-232.300m Blue Clay Water Struck At 150 And 303 Feet, Standi At 45 Feet	1732	West
S62109/1		Groundwater	Domestic and Stock Irrigation		D: 0.000m-1.200m Top Soil D: 1.200m-4.000m Stiff Brown Clay D: 4.000m-7.000m Sandy Clay D: 7.000m-34.000m Brown Coal D: 34.000m-67.000m Grey Silty Clayey Sands	1749	North
116326		Groundwater	Groundwater Investigation		D: 0.000m-0.200m Top Soil D: 0.200m-1.500m Silty Clay Red/Brown D: 1.500m-2.000m Sandy Clay Yellow D: 2.000m-3.000m Silty Clay Brown/Grey D: 3.000m-6.000m Basalt Brown/Grey Clay Seams	1771	East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
144973	Department of Sustainability and Environment (2003 -)	Groundwater	State Observation Network Observation			1784	North
144965	Department of Sustainability and Environment (2003 -)	Groundwater	State Observation Network Observation		D: 0.000m-3.800m Top Soil & Clays D: 3.800m-12.000m Silty Sands & Gravel	1785	North
144972	Department of Sustainability and Environment (2003 -)	Groundwater	State Observation Network Observation		D: 0.000m-2.800m Top Soil & Clay D: 2.800m-12.500m Silty Sand & Gravel	1785	North
144963	Department of Sustainability and Environment (2003 -)	Groundwater	State Observation Network Observation		D: 0.000m-3.000m Top Soil & Clay D: 3.000m-26.300m Silty Sands & Gravel	1787	North
326011	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-0.900m Red Clay D: 0.900m-9.100m Clay, Sand, And Gravel D: 9.100m-9.800m Grey Sand D: 9.800m-13.100m Yellow Sand D: 13.100m-13.700m Sandstone D: 13.700m-17.100m Yellow Sand D: 17.100m-22.600m Grey Clay D: 22.600m-24.100m Brown Clay D: 24.100m-31.100m Grey Clay D: 31.100m-31.700m Yellow Clay D: 31.700m-32.300m Ligneous Sandy Clay D: 32.300m-35.100m Brown Sand D: 35.100m-60.400m Brown Coal D: 60.400m-61.000m Ligneous Clay And Sand	1834	North
72622					D: 0.000m-13.100m Silty Sand: Very Poorly Sorted Carbonaceous D: 13.100m-18.900m Sand Silty: Silt To Medium Grained Angular Carbonaceous Dirty Unconsolidated Dark Grey Water: Static Level 22' (6.71 Metres) D: 18.900m-20.100m Coal: Brown Soft Inferior D: 20.100m-21.900m Sand: Granule To Fine Grained Very Poorly Sorted Clean, Grey Translucent Quartz Consolidated D: 21.900m-22.900m Coal: Brown Soft Inferior D: 22.900m-32.900m Sand: Fine Grained Poorly Sorted Interbedded With Coarse Grained D: 32.900m-37.800m Sand: Poorly Sorted And Pebble Size D: 37.800m-42.700m Sand: Poorly Sorted And Pebble Size D: 42.700m-43.900m Silt: Carbonaceous D: 43.900m-45.100m Sand: Very Fine Grained	1844	North
326038	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Surface Soil G: 0.300m-3.000m Brown Clay G: 3.000m-4.300m Yellow Sandy Clay, Lots Of Quartz G: 4.300m-11.300m Yellow And White Mottled Clay G: 11.300m-13.100m Gravel And Quartz G: 13.100m-19.500m Sand And Gravel G: 19.500m-24.400m Grey Sandy Clay G: 24.400m-25.000m Hard Basalt	1846	North West
325998	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-0.900m Red Clay D: 0.900m-1.500m Yellow Clay D: 1.500m-11.300m Clay And Gravel D: 11.300m-12.500m Grey Clay D: 12.500m-18.900m Yellow Sand D: 18.900m-22.900m Grey Clay D: 22.900m-23.800m Brown Clay D: 23.800m-25.300m Yellow Sand D: 25.300m-27.400m Grey Clay D: 27.400m-29.000m Yellow Sand D: 29.000m-34.400m Ligneous Sand D: 34.400m-57.900m Brown Coal D: 57.900m-58.800m Ligneous Clay And Sand Water Struck At 34.75 Metres	1873	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326013	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-0.600m Red Clay D: 0.600m-0.900m Yellow Clay D: 0.900m-1.800m Sand And Gravel D: 1.800m-3.000m Grey And Yellow Clay D: 3.000m-7.600m Clay And Gravel D: 7.600m-9.800m Clay, Sand, And Gravel D: 9.800m-11.000m Yellow Clay D: 11.000m-14.600m Sand And Gravel D: 14.600m-15.900m Grey Sand D: 15.900m-17.700m Grey Sandy Clay D: 17.700m-23.200m Clay, Sand, And Gravel D: 23.200m-24.400m Yellow Sand D: 24.400m-27.400m Grey Clay D: 27.400m-29.000m Yellow Sand D: 29.000m-32.300m Grey Clay D: 32.300m-36.600m Brown Sandy Clay D: 36.600m-39.300m Brown Sand D: 39.300m-64.000m Brown Coal D: 64.000m-65.200m Ligneous Sand	1879	North West
S9038729/1		Groundwater				1896	East
72633		Groundwater	Irrigation		D: 0.000m-1.200m Topsoil D: 1.200m-4.900m Mottled Clay D: 4.900m-5.500m Gravel	1900	North
325997	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-0.900m Red Clay D: 0.900m-1.200m Yellow Clay D: 1.200m-1.800m Red Clay D: 1.800m-5.500m Clay And Gravel D: 5.500m-13.100m Grey And Yellow Clay D: 13.100m-14.300m Clay And Gravel D: 14.300m-18.900m Sand And Gravel D: 18.900m-24.400m Grey Clay D: 24.400m-25.600m Yellow Sandy Clay D: 25.600m-30.500m Brown Clay D: 30.500m-33.500m Grey Sand D: 33.500m-34.400m Ligneous Sand D: 34.400m-58.500m Brown Coal D: 58.500m-59.100m Ligneous Sand Water Struck At 34.75 Metres	1913	North
326010	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-0.900m Red Clay D: 0.900m-4.600m Yellow Clay D: 4.600m-5.800m Clay, Sand, And Gravel D: 5.800m-8.500m Yellow Clay D: 8.500m-11.600m Gravel D: 11.600m-13.100m Yellow Sandy Clay D: 13.100m-16.200m Yellow Clay D: 16.200m-16.500m Basalt D: 16.500m-17.100m Yellow Clay D: 17.100m-22.600m Yellow Sandy Clay D: 22.600m-26.800m Grey Clay D: 26.800m-29.000m Yellow Sand D: 29.000m-29.900m Grey Clay D: 29.900m-32.900m Brown Clay D: 32.900m-33.500m Ligneous Clay D: 33.500m-36.900m Brown Sandy Clay D: 36.900m-61.300m Brown Coal D: 61.300m-62.500m Ligneous Sand And Clay	1930	North West
79212		Groundwater	Irrigation		D: 0.000m-7.600m Clays D: 7.600m-11.500m River Gravells D: 11.500m-16.500m Coal D: 16.500m-37.500m Coarse Sand D: 37.500m-58.400m White Clays D: 58.400m-0.000m Shale	1937	North
326012	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-0.600m Red Clay D: 0.600m-1.200m Yellow Clay D: 1.200m-12.800m Clay, Sand, And Gravel D: 12.800m-16.800m Grey And Yellow Clay D: 16.800m-21.300m Grey Clay D: 21.300m-23.800m Yellow Clay D: 23.800m-26.500m Yellow Sandy Clay D: 26.500m-30.500m Grey And Yellow Clay D: 30.500m-31.700m Ligneous Clay D: 31.700m-32.900m Yellow Sand D: 32.900m-33.800m Ligneous Clay D: 33.800m-34.100m Grey Clay D: 34.100m-62.800m Brown Coal D: 62.800m-63.400m Ligneous Sand And Clay	1947	North West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326005	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.200m Red Loam D: 0.200m-1.200m Red Clay D: 1.200m-1.800m Yellow Clay D: 1.800m-4.900m Clay, Sand, And Gravel D: 4.900m-11.000m Clay And Gravel D: 11.000m-20.100m Grey And Yellow Clay D: 20.100m-21.300m Yellow Sandy Clay D: 21.300m-23.200m Grey Sandy Clay D: 23.200m-24.100m Clay And Gravel D: 24.100m-26.800m Grey Clay D: 26.800m-29.300m Yellow Sand D: 29.300m-31.700m Grey Clay D: 31.700m-32.900m Grey Sand D: 32.900m-35.700m Ligneous Sand D: 35.700m-59.400m Brown Coal D: 59.400m-61.000m Ligneous Sand And Clay	1962	North West
87794		Groundwater	Domestic Stock Irrigation		D: 0.000m-0.100m Top Soil D: 0.100m-10.600m Clay D: 10.600m-13.000m River Gravel D: 13.000m-19.000m Coal D: 19.000m-48.600m Clay And Fine Sand	1963	North

Boreholes FedUni Data Source: © Federation University Australia

Historical Mining Activity - Shafts

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Historical Mining Activity - Shafts

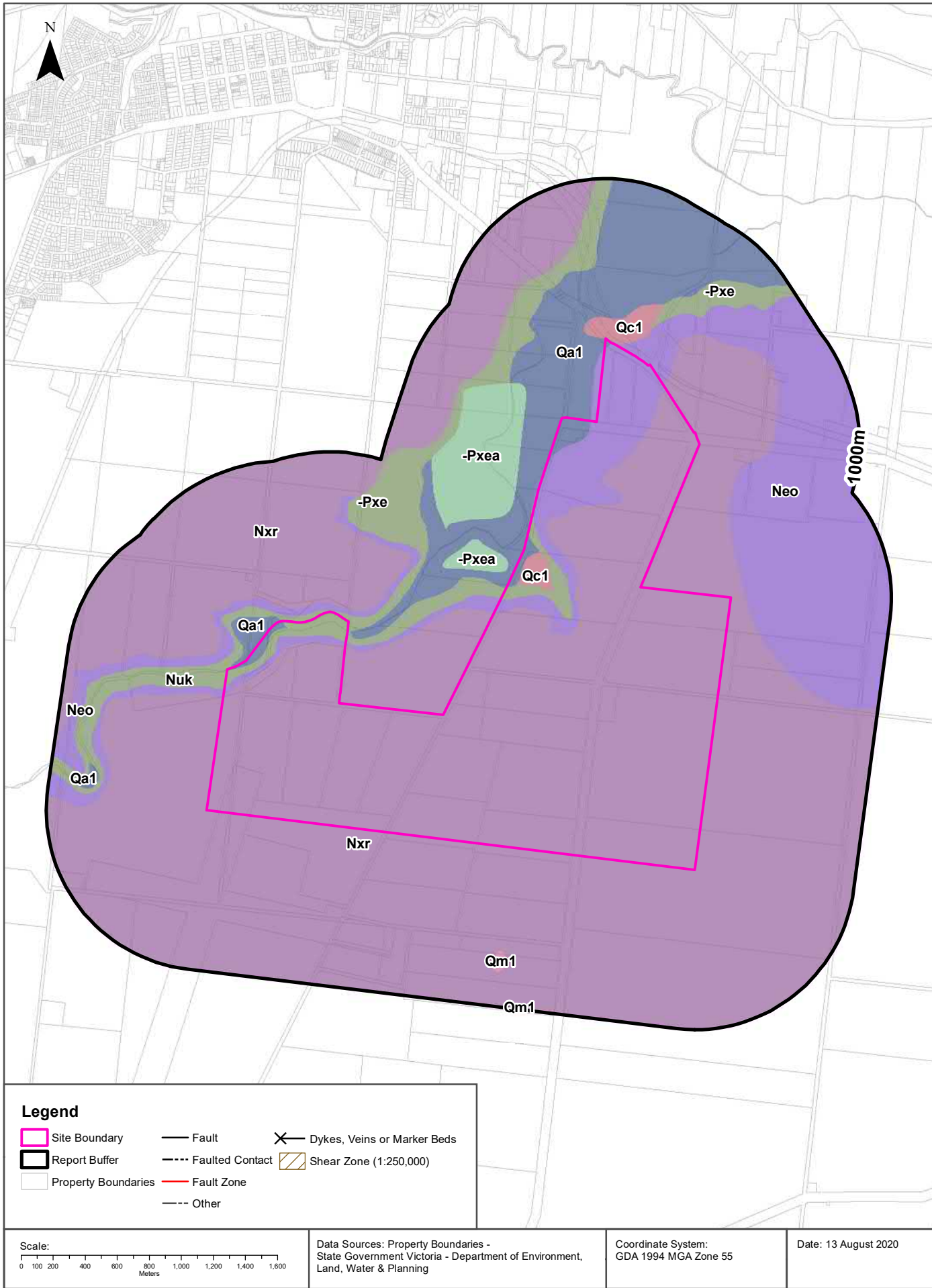
Mine Shaft Locations were collected by a variety of methods from 1869 in some areas of the state, mainly concentrating in Ballarat and Bendigo. In places a shaft may be recorded multiple times with a different source. In cases where several shaft locations are shown close together (generally with separations less than stated position errors) and they have different sources, it is possible that one shaft has been mapped several times. In cases where several shaft locations are shown close together but they have the same information source, it is possible that each shaft location represents a different shaft on the ground.

Historical Mine Shafts within the dataset buffer:

Map Id	Name	Source	Depth (m)	Collar (ft)	Fill/Cap Method	Location Desc	Location Accuracy	Distance	Direction
N/A	No records in buffer								

Historical Mining Activity Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources

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Geology

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Geological Units

What are the Geological Units onsite?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	1:50,000
Nxr	Darley Gravel (Nxr): generic	Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source	Neogene to Pleistocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
-Pxe	Werribee Formation (-Pxe): generic	Sand, silt, clay, gravel in variable proportions: generally white to pale grey; in part carbonaceous, pyritic; ferruginous bands common; contains Cinnamomum flora	Eocene to Miocene	sand (significant); silt material (significant); clay lithology (significant); gravel material (significant)	1:50,000
Qa1	alluvium(Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
Qc1	colluvium(Qc1): generic	Diamictite, gravel, sand, silt, clay, rubble: sorting variable, usually poor; generally poorly rounded; clasts locally sourced; includes channel deposits with better rounding and sorting	Pliocene to Holocene	diamictite (dominant); gravel material (significant); sand (significant); silt material (significant)	1:50,000

What are the Geological Units within the dataset buffer?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	1:50,000
Nuk	Kerrs Road Basalt (Nuk): generic	Olivine basalt: grey; fine to medium-grained; vesicular	Miocene to Miocene	basalt (all)	1:50,000
Nxr	Darley Gravel (Nxr): generic	Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source	Neogene to Pleistocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000

Symbol	Name	Description	Geological Age	Lithology	Dataset
-Pxe	Werribee Formation (-Pxe): generic	Sand, silt, clay, gravel in variable proportions: generally white to pale grey; in part carbonaceous, pyritic; ferruginous bands common; contains Cinnamomum flora	Eocene to Miocene	sand (significant); silt material (significant); clay lithology (significant); gravel material (significant)	1:50,000
-Pxea	Altona Coal Seam (-Pxea): generic	Lignite, minor clay: dark brown, locally pyritic; plant fossils common	Miocene to Miocene	lignite (major proportion); clay lithology (minor proportion)	1:50,000
Qa1	alluvium(Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
Qc1	colluvium(Qc1): generic	Diamictite, gravel, sand, silt, clay, rubble: sorting variable, usually poor; generally poorly rounded; clasts locally sourced; includes channel deposits with better rounding and sorting	Pliocene to Holocene	diamictite (dominant); gravel material (significant); sand (significant); silt material (significant)	1:50,000
Qm1	swamp and lake deposits (Qm1): generic	Grey to black carbonaceous mud, silt, clay, minor peat: generally unconsolidated; rare dolomite	Pleistocene to Holocene	mud (major proportion); silt material (significant); clay lithology (significant); peat (minor proportion)	1:50,000

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Geology

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Geological Structures

What are the Geological Faults or Faulted Contacts onsite?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:50,000

What are the Dykes, Marker Beds and Veins onsite?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:50,000

What are the Shear Zones onsite (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

What are the Geological Faults or Faulted Contacts within the dataset buffer?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:50,000

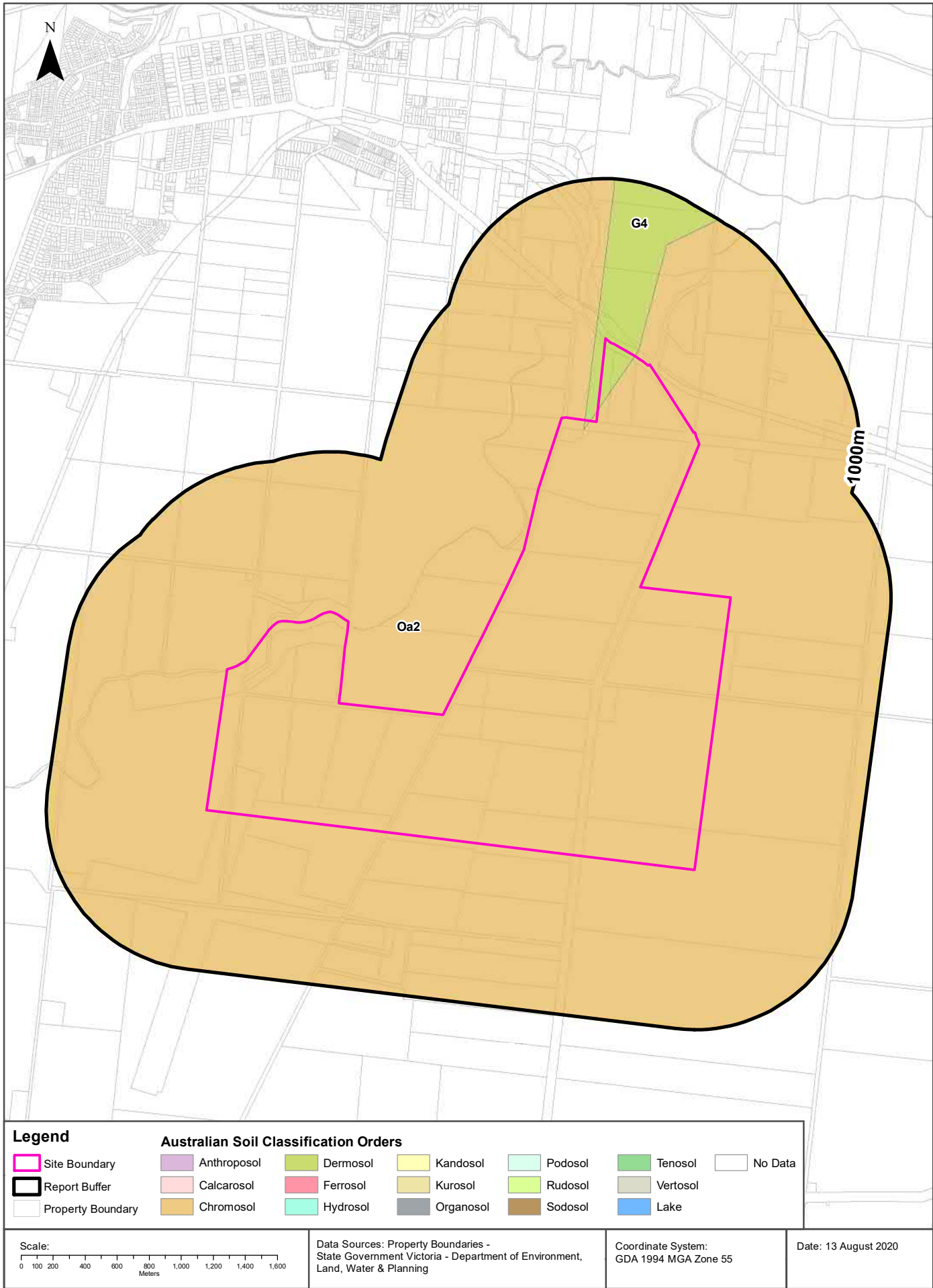
What are the Dykes, Marker Beds and Veins within the dataset buffer?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:50,000

What are the Shear Zones within the dataset buffer (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

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Soil Landscapes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

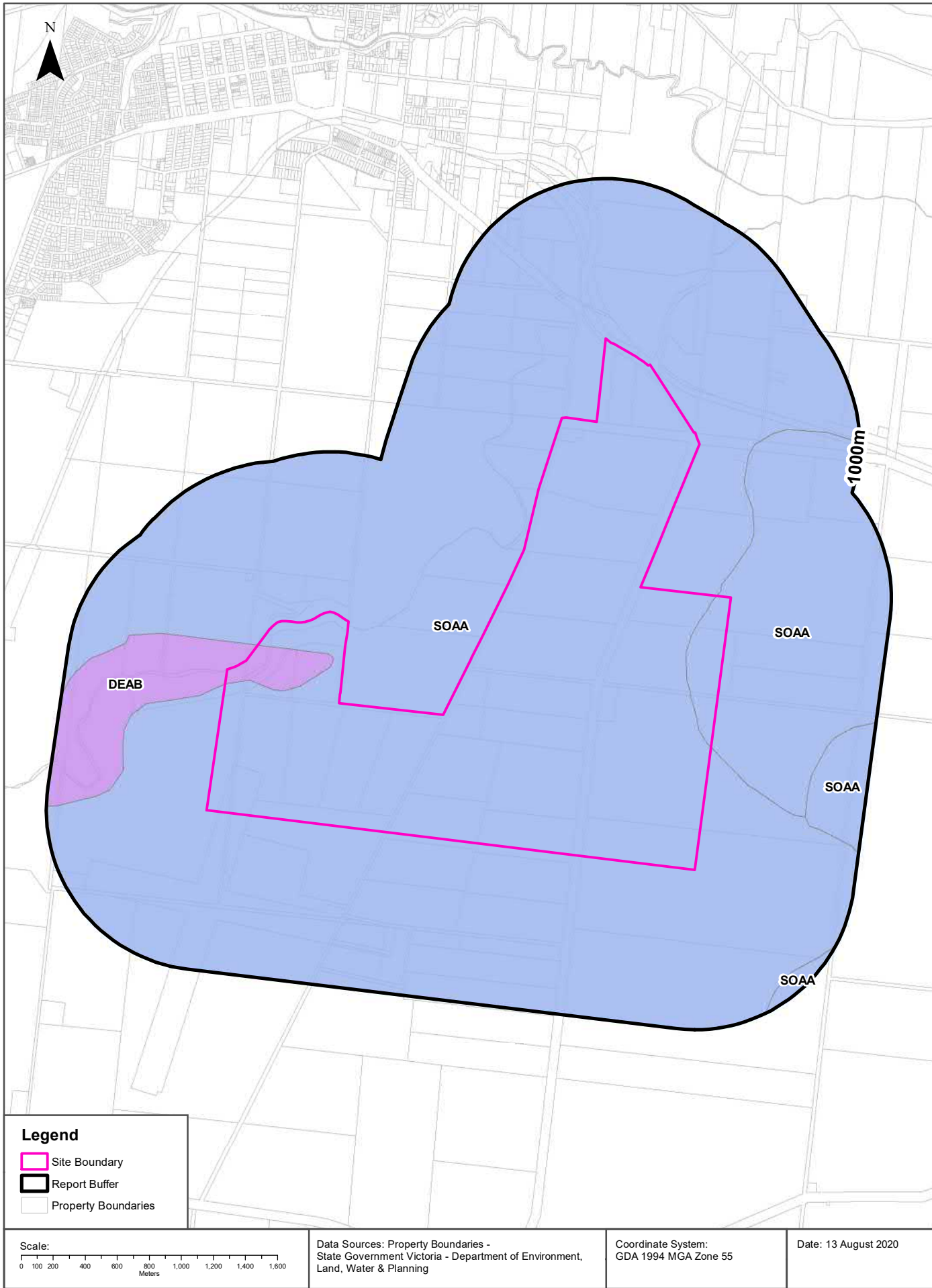
Atlas of Australian Soils

Australian soil types within the dataset buffer:

Symbol	Soil Order	Map Unit Description	Distance
G4	Dermosol	Plains: floodplains and low terraces of various friable loamy soils (Um6), friable earths (Gn4), and other soils including (Dd) and (Dy); area has a relatively high water-table. Remnants of higher terraces of hard alkaline red soils (Dr2.23) occur also.	0m
Oa2	Chromosol	Dissected plateaux at low elevation: plains of hard alkaline red soils (Dr2.13) often in gilgai micro- association with dark cracking clays (Ug5.1), and grey and brown cracking clays (Ug5.2 and Ug5.3), small areas of other soils such as (Dr2.33), (Dy3.43), and (Dd1.l); also with (1) low, broad, sprawling stony rises of (Dr2.13), (2) low rounded hills of various (D) soils such as (Db1.23) with boulder strewn slopes, and (3) incised, often gorge-like, stream valleys of undescribed soils.	0m

Atlas of Australian Soils: CSIRO

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Soils Landscapes

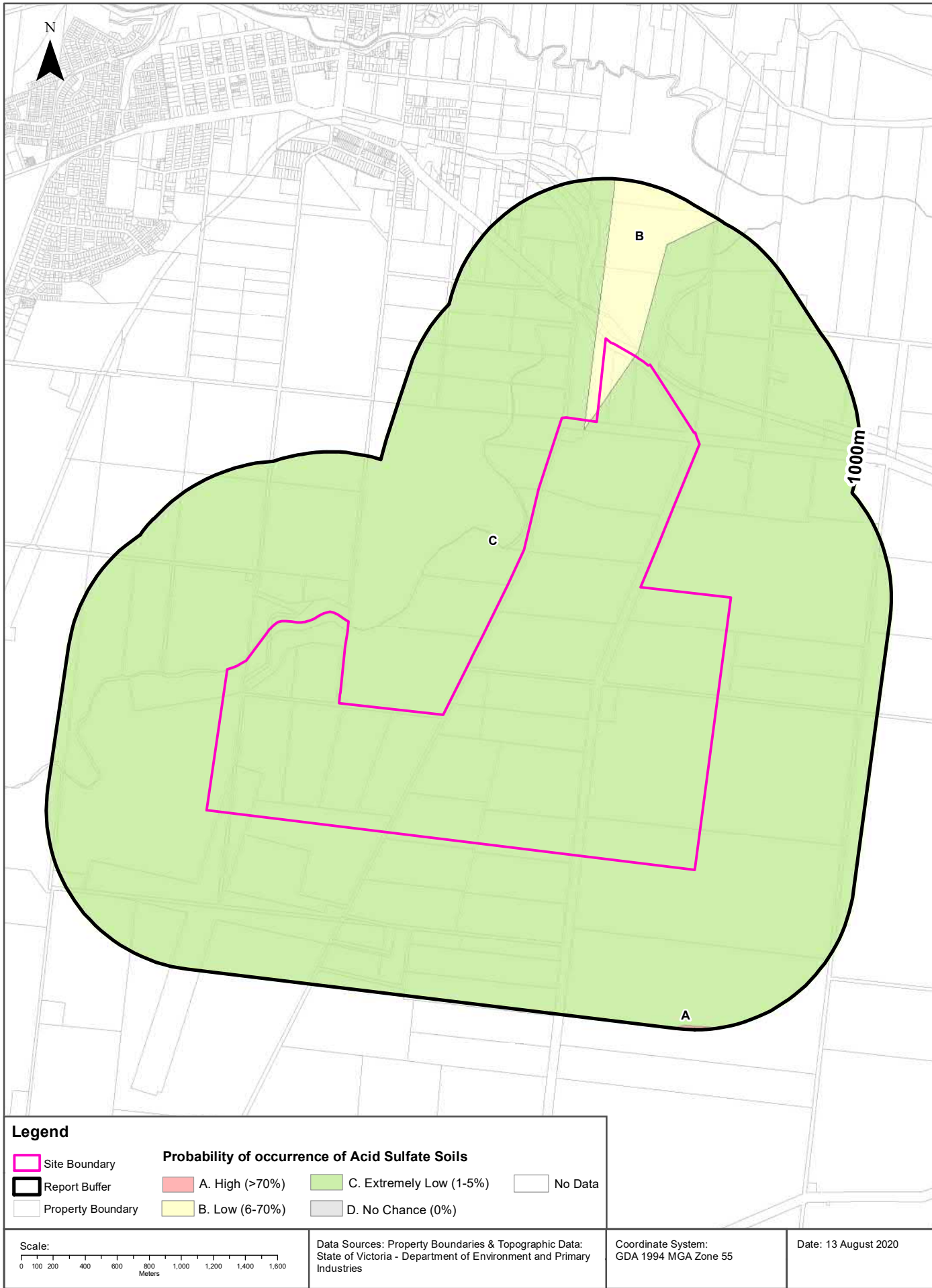
Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Victorian Soil Type Mapping

Victorian Soil Types within the dataset buffer:

Symbol	Description	Distance
DEAB	Brown Dermosols	0m
SOAA	Red Sodosols	0m

Victorian Soil Type Mapping Data Source: Department of Economic Development, Jobs, Transport and Resources
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Acid Sulfate Soils

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Atlas of Australian Acid Sulfate Soils

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

PROBCLASS	Description	Distance
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m
A	High Probability of occurrence. >70% chance of occurrence.	969m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Acid Sulfate Soils

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Coastal Acid Sulfate Soils

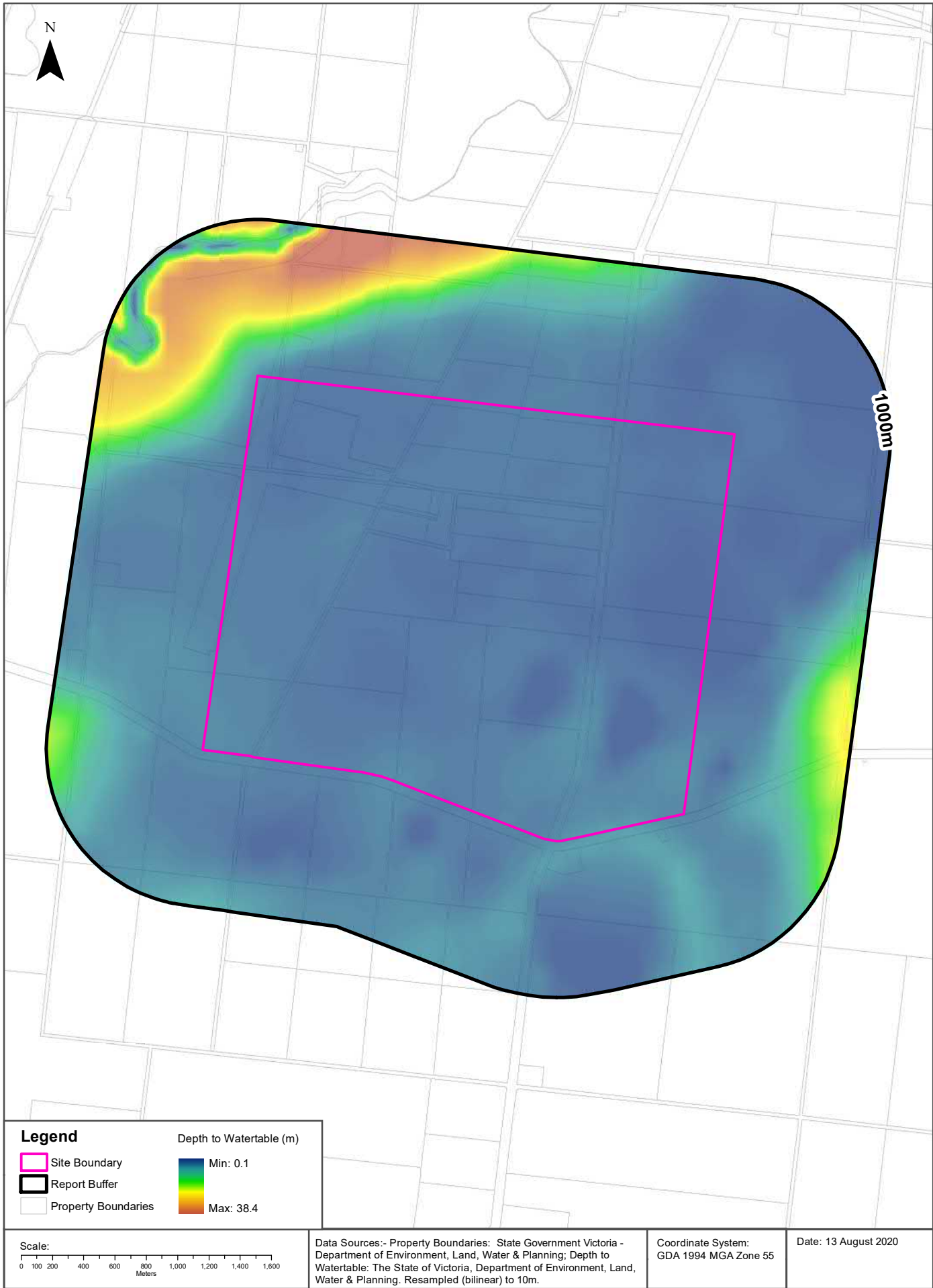
What are the on-site Coastal Acid Sulfate Soil types?

Coastal Acid Sulfate Soil Types
There are no Acid Sulfate areas onsite

What are the Coastal Acid Sulfate Soil types within the dataset buffer?

Coastal Acid Sulfate Soil Types	Distance	Direction
There are no Acid Sulfate areas within the report buffer		

Coastal Acid Sulfate Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Hydrogeology & Groundwater

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Fractured or fissured, extensive aquifers of low to moderate productivity	0m	Onsite

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

On-site Groundwater Salinity:

Groundwater Salinity	Percent Of Site Area
7,000 - 13,000 mg/l	100

Depth to Watertable

On-site Depth to Watertable:

Depth to Watertable	Percent Of Site Area
Less than 5 metres	100

Surface Elevation

Approximate on-site Surface Elevation:

Surface Elevation
141 AHDm to 156 AHDm

Basement Elevation

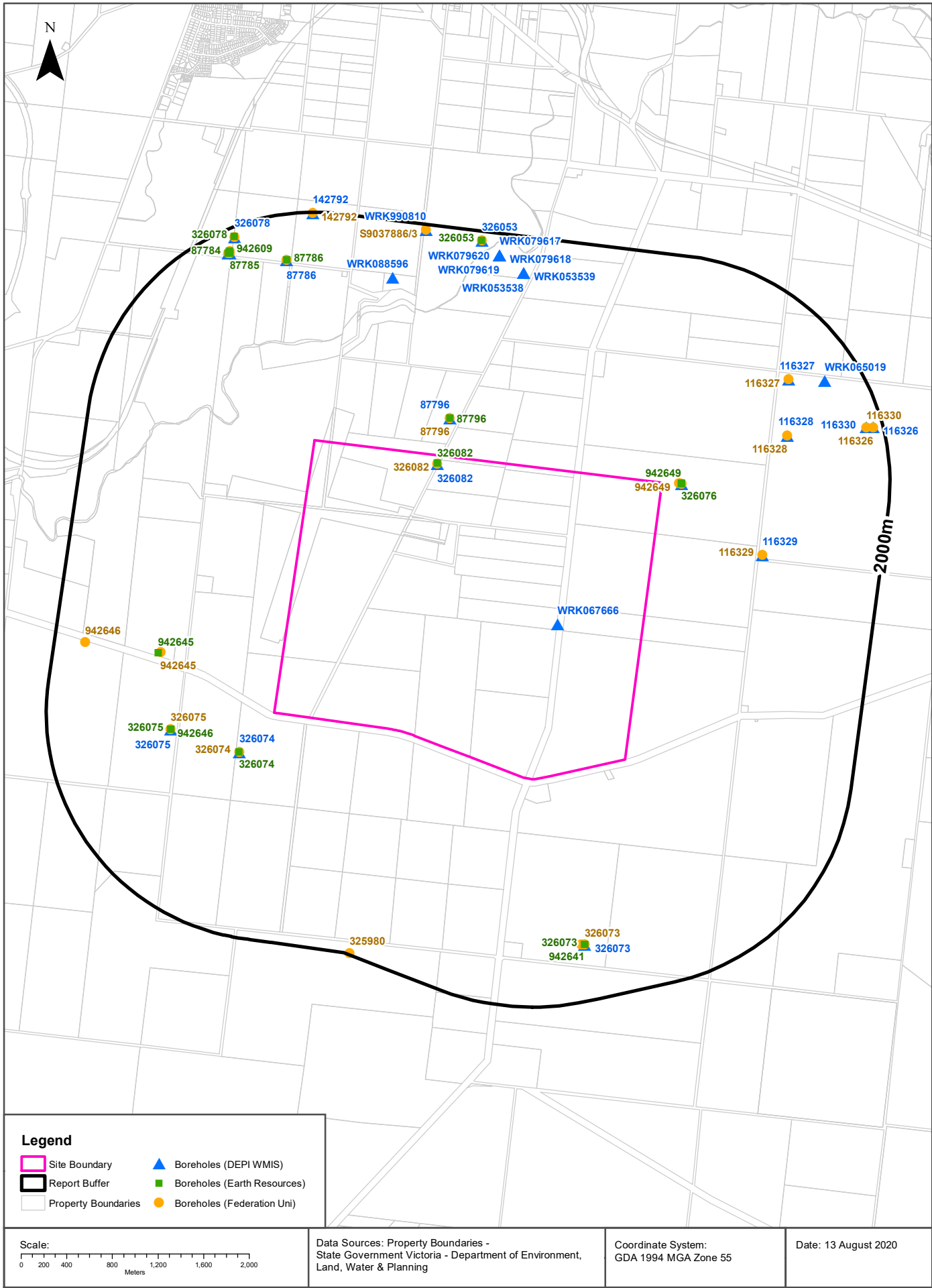
Approximate on-site Basement Elevation:

Basement Elevation - Basement Rocks comprise Lower Palaeozoic basement rocks that form the highlands and the crystalline basement; and Mesozoic rocks of the Otway and Gippsland basins both outcropping and subsurface
-30 AHDm to 7 AHDm

Groundwater Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Boreholes (DELWP WMIS)

Boreholes from the Department of Environment, Land, Water & Planning's Water Measurement Information System, within the dataset buffer:

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
326082	Non Groundwater					1984-03-12	0	Onsite
WRK067666	Observation	0.00m-8.60m CLAY 8.60m-40.60m BASALT 40.60m-50.20m CLAY 50.20m-59.30m BASALT 59.30m-80.60m CLAY 80.60m-83.60m COAL 83.60m-88.10m CLAY 88.10m-136.10m COAL 136.10m-143.00m SAND	0.00m-104.00m INNER LINING - CASING = Pvc 104.00m-128.00m INNER LINING - SCREEN = Pvc Class 18 128.00m-134.00m INNER LINING - CASING = Pvc 0.00m-88.00m OUTER LINING - GRAVEL = Cement 88.00m-90.00m OUTER LINING - GRAVEL = Bentonite 90.00m-134.00m OUTER LINING - GRAVEL = Gravel 134.00m-143.00m OUTER LINING - GRAVEL = Bentonite		128.00m-134.00m Coal	2012-07-15	0	Onsite
326076	Non Groundwater					1981-10-29	173	North East
87796	Not Known					1987-06-01	333	North
326074	Non Groundwater					1981-09-29	463	South West
326075	Non Groundwater					1981-09-30	920	South West
116329	Groundwater Investigation	0.00m-1.40m SILTY CLAY BROWN 1.40m-6.00m WEATHERED BASALT BROWN	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 2.50m-3.50m OUTER LINING - GRAVEL = Bentonite 3.50m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-07	958	East
116328	Groundwater Investigation	0.00m-0.80m SILTY CLAY YELLOW/BROWN 0.80m-1.40m CLAY GREY/BROWN 1.40m-6.00m BASALT BROWN/GREY	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 1.50m-2.50m OUTER LINING - GRAVEL = Bentonite 2.50m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-06	1176	North East
116327	Groundwater Investigation	0.00m-1.00m SILTY CLAY RED 1.00m-3.00m SILTY CLAY BROWN/GREY 3.00m-3.80m SANDY CLAY BROWN 3.80m-6.00m BASALT GREY	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 2.00m-3.00m OUTER LINING - GRAVEL = Bentonite 3.00m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-06	1432	North East
WRK088596	Investigation		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2016-05-11	1501	North
326073	Non Groundwater					1981-10-20	1509	South
87786	Not Known					1959-12-11	1597	North West
WRK053538	Observation	0.00m-1.00m fill 1.00m-16.00m yellow clay 16.00m-67.00m coal 67.00m-74.00m sand	0.50m-19.00m INNER LINING - CASING = Steel 19.00m-71.00m INNER LINING - CASING = Pvc 71.00m-74.00m INNER LINING - SLOT = Pvc 0.00m-69.50m OUTER LINING - GRAVEL = Cement 69.50m-71.50m OUTER LINING - GRAVEL = Bentonite 71.50m-74.00m OUTER LINING - GRAVEL = Gravel		0.50m-19.00m Clay 19.00m-71.00m Coal 71.00m-74.00m Sand	2010-05-28	1678	North

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
WRK053539	Observation	0.00m-4.00m fill 4.00m-28.00m clay 28.00m-62.00m coal 62.00m-69.00m sand	0.50m-30.00m INNER LINING - CASING = Steel 30.00m-66.00m INNER LINING - CASING = Pvc 66.00m-69.00m INNER LINING - SCREEN = Pvc 0.00m-62.00m OUTER LINING - GRAVEL = Cement 62.00m-65.50m OUTER LINING - GRAVEL = Bentonite 65.50m-69.00m OUTER LINING - GRAVEL = Gravel		0.50m-30.00m Clay 30.00m-66.00m Coal 66.00m-69.00m Sand	2010-06-03	1678	North
WRK065019	Observation	0.00m-1.80m SOIL 1.80m-22.00m SCORIA 22.00m-34.00m BASALT	0.00m-29.00m INNER LINING - CASING = Pvc 29.00m-32.00m INNER LINING - SCREEN = Pvc 0.00m-26.50m OUTER LINING - GRAVEL = Cement 26.50m-28.50m OUTER LINING - GRAVEL = Bentonite 28.50m-32.00m OUTER LINING - GRAVEL = Gravel		0.00m-29.00m Basalt 29.00m-32.00m Basalt	2011-07-20	1685	North East
87785	Not Known					1959-10-21	1796	North West
87784	Not Known					1959-09-07	1804	North West
WRK079620	Observation	0.00m-10.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-10.00m OUTER LINING - GRAVEL = Gravel		7.00m-10.00m Clay	2014-05-13	1806	North
WRK079618	Observation	0.00m-11.00m CLAY	0.00m-8.00m INNER LINING - CASING = Pvc 8.00m-11.00m INNER LINING - SCREEN = Pvc 0.00m-6.00m OUTER LINING - GRAVEL = Cement 6.00m-7.00m OUTER LINING - GRAVEL = Bentonite 7.00m-11.00m OUTER LINING - GRAVEL = Gravel		8.00m-11.00m Clay	2014-05-13	1806	North
WRK079617	Observation	0.00m-9.50m CLAY	0.00m-6.50m INNER LINING - CASING = Pvc 6.50m-9.50m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-9.50m OUTER LINING - GRAVEL = Gravel		6.50m-9.50m Clay	2014-05-13	1806	North
WRK079619	Observation	0.00m-10.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-10.00m OUTER LINING - GRAVEL = Gravel		7.00m-10.00m Clay	2014-05-13	1806	North
116330	Groundwater Investigation	0.00m-2.90m SILTY CLAY BROWN 2.90m-9.00m BASALT 9.00m-13.00m FINE SAND SOME GRAVEL 13.00m-15.00m SILTY CLAY 15.00m-17.50m SILTY SAND 17.50m-19.00m SILTY CLAY 19.00m-27.00m BASALT 27.00m-30.00m SILTY CLAY 30.00m-42.50m BASALT 42.50m-56.00m SAND SOME CLAYEY 56.00m-63.00m SAND CLAY/CLAYEY SAND 63.00m-68.00m CLAY SILTY/DARK GREY 68.00m-77.50m COAL CLAYEY	-0.50m-55.00m INNER LINING - CASING = Pvc 55.00m-58.00m INNER LINING - SCREEN = Pvc 58.00m-73.00m INNER LINING - CASING = Pvc 73.00m-76.00m INNER LINING - SCREEN = Pvc 0.00m-36.00m OUTER LINING - GRAVEL = Cement 36.00m-39.00m OUTER LINING - GRAVEL = Bentonite 39.00m-76.00m OUTER LINING - GRAVEL = Gravel			1993-07-12	1856	North East
116326	Groundwater Investigation	0.00m-0.15m TOP SOIL 0.15m-1.50m SILTY CLAY RED/BROWN 1.50m-2.00m SANDY CLAY YELLOW 2.00m-3.00m SILTY CLAY BROWN/GREY 3.00m-6.00m BASALT BROWN/GREY CLAY SEAMS	-0.50m-4.90m INNER LINING - CASING = Pvc 4.90m-6.00m INNER LINING - SCREEN = Pvc 1.90m-2.90m OUTER LINING - GRAVEL = Bentonite 2.90m-5.90m OUTER LINING - GRAVEL = Gravel			1993-07-06	1913	North East
326078	Non Groundwater					1983-11-16	1914	North West

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
326053	Non Groundwater					1960-07-22	1916	North
WRK990810							1949	North
142792	Groundwater Investigation	0.00m-22.00m MOTTLED SANDY CLAY 22.00m-51.60m BASALT	0.00m-51.60m INNER LINING - CASING = Not Known 45.60m-51.60m INNER LINING - SCREEN = Not Known 0.00m-1.00m OUTER LINING - GRAVEL = Cement 43.00m-44.00m OUTER LINING - GRAVEL = Bentonite 44.00m-51.60m OUTER LINING - GRAVEL = Gravel		45.60m-51.60m Basalt	1999-01-29	1991	North

Boreholes WMIS Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Boreholes (Earth Resources Database)

Boreholes from the Earth Resources dataset, within the dataset buffer:

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
326082		Private Individual/Corporation		Rotary (diamond/drag bit)		12/03/1984	129.70	150.00	300	0	Onsite
326076		Private Individual/Corporation		Rotary (diamond/drag bit)		29/10/1981	134.00	140.00	300	171	North East
942649		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	29/10/1981	134.00	141.14	25	172	North East
87796		Private Individual/Corporation		Air Percussion/Air Rotary	Abandoned	01/06/1987	42.00		100	333	North
326074		Private Individual/Corporation		Reverse Circulation		29/09/1981	13.00	162.00	300	463	South West
326075		Private Individual/Corporation		Rotary (diamond/drag bit)		30/09/1981	238.00	170.00	300	922	South West
942646		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	30/09/1981	238.00	166.11	25	922	South West
942645		Private Individual/Corporation		Percussion	Abandoned	01/10/1981	13.00		100	1084	West
942641		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	20/10/1981	116.00	152.17	25	1508	South
326073		Private Individual/Corporation		Rotary (diamond/drag bit)		20/10/1981	116.00	150.00	300	1508	South
87786		Department of Manufacturing & Industry Development		Percussion (cable)		11/12/1959	117.65	152.40	10	1598	North West
87785		Department of Manufacturing & Industry Development		Percussion (cable)		21/10/1959	42.98	155.80	10	1796	North West
87784		Department of Manufacturing & Industry Development		Percussion (cable)		07/09/1959	36.27	155.80	10	1805	North West
942609		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	16/11/1983	103.87	151.37	110	1815	North West
326078		Private Individual/Corporation		Rotary (diamond/drag bit)		16/11/1983	103.87	155.00	300	1915	North West
326053		Private Individual/Corporation				22/07/1960	55.80	103.00	10	1916	North

Boreholes Earth Resources Data Source: © The State of Victoria, Department of Economic Development, Jobs, Transport and Resources 2015. Creative Commons Attribution 3.0 Australia

Boreholes (Federation University)

Boreholes from the Federation University Australia dataset, within the dataset buffer:

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326082	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		D: 0.000m-3.000m Clay - Red Brown Clay. Little Moisture, Fair Consistency D: 3.000m-6.000m Soil - Red Brown Earth D: 6.000m-29.000m Basalt - The Basalt Is Scoria, Weathered, With Large Vesicles Throughout Becomes More Massive Until 26M Where A Fine Red Brown Clay Layer Is Present. At 27M Basalt Is Vesicular, Partly Weathered Grey Colour D: 29.000m-43.000m Clay - Ochre Coloured Then A Lighter Orange At 33M, Little Moisture, Slightly Silty. At 34.5M Clay Turns A Reddy Colour. At 35M Clay Becomes Whiter And More Silty. 37.5M Clay Is Very Silty And A Distinctly Ochre Colour. At 39M Clay Is Very Silty And Orang D: 43.000m-57.000m Silt/Sand - Silt As Described Above With Sand ~ 1Mm Average Angular To Sub-Angular Well Sorted D: 57.000m-62.500m Clay - Good Consistency, Ochre To Orange Colour - White And Fawn D: 62.500m-63.000m Carbonaceous Clay - Dark Black To Brown - Good Consistency, High Moisture Content D: 63.000m-67.200m Brown Coal - Start Coring - 63.5M 63.5 - 64.9 No Recovery 64.9 - 66.4 2.1M Recovery 66.4 - 69.4 3.09M Recovery D: 67.200m-73.100m Clay - Grey Clay, Good Consistency, Good Moisture - Contains Bands Of Pyrite 69.4 - 72.4 2.04M Recovery Clay Also Contains Fine Shell Material 72.4 - 75.4 3.1M Recovery Last 0.6M Of Clay Has Abundant Pyrite And Some Rounded Quartz Grains ~ 3Mm To <1Mm D: 73.100m-121.100m Brown Coal - Black To Dark Brown Slightly Clayey For 73.06 - 73.56M Abundant Lignite Material 75.4 - 78.4 3.0M Recovery 78.4 - 81.4 3.0M Recovery 81.4 - 84.4 3.0M Recovery 84.4 - 87.4 3.0M Recovery Coal Is Much Drier And Less Clayier 87.4 - 90.4 3.0M Reco D: 121.100m-129.700m Silty Clay - Fawn Coloured Clay With Silty Particles Within - Good Consistency Silt Becomes More Abundant At 120.2M. Some Parts Of The Bed Are Clayier And Others Siltier 117.7 - 120.7 2.7M Recovery 0.8M Coal 1.8M Non Coal 120.7 - 123.7 1.7M Recovery 123.7	0	Onsite
942649	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			151	North East
326076	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		D: 0.000m-2.000m Clay - Light Red/Brown To Orange/Brown Stiff, Silty Clay With Occasional Ochre/Brown, Very Weathered Rounded Basalt Fragments D: 2.000m-4.000m Clay - Light Grey To Buff Slightly Silty Stiff Clay D: 4.000m-6.000m Clay - Light Grey To Buff, Slightly Silty Stiff Clay With Some Dark Grey/Brown To Dark Brown Well Weathered Basalt Fragments D: 6.000m-14.000m Basalt - Brown/Grey Weathered Basalt With Occasional Off White Crystalline Small Grains (Chalcedone?) D: 14.000m-22.000m Basalt - Dark Brown To Dark Red/Brown Well Weathered Basalt, With Some Red/Brown To Red Claystone Rock Fragments. Occasional Stiff Light Brown Clay. Some Brown Silty Friable Clay Below 20 Metres D: 22.000m-24.000m Clay - Light Brown, Moderately Soft, Smooth To Silty, With Occasional Rare Weathered Basalt (?) Rock Fragments, Some Approaching Friable. Possibly Paleosal. D: 24.000m-28.000m Clay - All As Above, With Some Brown And Grey Friable, Very Silty Clay D: 28.000m-30.000m Silt - Extremely Fine, Orange/Brown With Some Light Grey To Light Brown Moderately Soft Silty Clay D: 30.000m-32.000m Sand - Very Fine, Ochre Stained Quartz Sand With Some Fine To Coarse Sub-Rounded To Rounded Ochre Stained Quartz Grains. Occasional Light Brown Silty Clay D: 32.000m-34.000m Basalt - Dark Brown To Dark Grey Brown, Very Weathered Basalt Fragments With Some Fine To Pebble Sized, Ochre Stained, Sub-Rounded Quartz Grains. Occasional Dark Brown Sandy Friable To Firm Clay D: 34.000m-36.000m Gravel - Coarse, Orange/Brown To Ochre Stained, Sub-Angular To Rounded Quartz Pebbles, Mainly 2X2X1 Cm Size, With Some Dark Brown Weathered Basalt Rock Fragments. Some Light Grey Firm, Slightly Silty Clay. Occasional Fine To Coarse Ochre Stained Sand D: 36.000m-46.000m Basalt - Dark Grey/Brown, Becoming Dark Grey With Depth, Well Weathered Basalt, With Some Ochre Fragile Slightly Silty Rounded Rock Fragments. Occasional Light Brown And Ochre Soft Clay. Occasional White To Ochre Stained Quartz Grains (Vein Quartz?) - Rou D: 46.000m-48.000m Clay - Very Soft, Silty, Red Clay. Some Dark Brown Grey To Dark Red/Brown Weathered Basalt Rock Fragments. Occasional Ochre Fine Grey Slightly Silty	173	North East

				<p>Rock Fragments. Occasional Medium Grained Quartz Sand - Sub-Angular To Sub-Rounded Ochre Stained</p> <p>D: 48.000m-52.000m Clay - Ochre And Red Silty Soft Clay With Some Ochre, Moderately Soft, Sandy Clay, And Some Dark Grey To Dark Brown Weathered Basalt Fragments. Rare, Sub-Rounded, Medium Grained, Ochre Stained Quartz Sand</p> <p>D: 52.000m-54.000m Clay - Ochre, Moderately Soft, Sandy Clay. Abundant Dark Brown Soft Carbonaceous Clay (Some Possibly Ligneous), And Some Dark Grey To Dark Brown Weathered Basalt Fragments. Occasional Ochre Stained, Angular Clean Quartz Grains</p> <p>D: 54.000m-56.000m Carbonaceous Clay - Dark Brown, Moderately Soft, With Some Ochre Sandy Clay. Some Dark Grey Brown Weathered Basalt Fragments. Occasional Medium Grained, Sub-Rounded, Ochre Stained Quartz Grains</p> <p>D: 56.000m-58.000m Brown Coal - Slightly Ligneous With Some Dark Brown Carbonaceous Clay - Soft. Some Ochre Stained Sandy Clay. Occasional Medium Grained Ochre Stained Quartz Sand</p> <p>D: 58.000m-60.000m Carbonaceous Clay - Dark Brown, Moderately Soft With Some Ochre Sandy Clay. Some Dark Grey Brown Weathered Basalt Fragments. Occasional Medium Grained, Sub-Rounded, Ochre Stained Quartz Grains</p> <p>D: 60.000m-68.000m Clay - Medium Grained Soft, Smooth Clay, With Some Medium Grained, Sub-Rounded, Ochre Stained Quartz Sand. Occasional Dark Grey Basalt Fragments And Occasional Dark Brown Carbonaceous Clay Increasing Down</p> <p>D: 68.000m-76.000m Brown Coal (?) - Very Soft, With Some Dark Brown Soft Carbonaceous Clay And Occasional Fine To Medium Grained, Sub-Rounded Quartz Sand. Occasional Medium Grey, Moderately Soft, Smooth Clay And Occasional Ligneous Fragments</p> <p>D: 76.000m-84.000m Brown Coal (?) - Some Ligneous Fragments And Some Dark Brown, Soft Carbonaceous Clay. Rare Fine To Medium Quartz Sand</p> <p>D: 84.000m-90.000m Clay - Dark Brown Carbonaceous Clay, Very Soft, With Some Soft Smooth Brown-Grey Clay And Rare Ochre And Red Friable Clay. Occasional Ligneous Fragments</p> <p>D: 90.000m-102.000m Brown Coal - Some Ligneous Dark Brown Fragments Increasing Downwards. Some Dark Brown Soft Carbonaceous Clay</p> <p>D: 102.000m-108.000m Brown Coal (?) - Some Ligneous Fragments And Occasional Light Grey Soft, Smooth Clay</p> <p>D: 108.000m-114.000m Carbonaceous Clay - Soft, Dark Brown Carbonaceous Clay With Some Moderately Firm Brown Coal And Some Ligneous Fragments. From 112M Downwards Some Fine To Medium Clean Quartz Sand, Moderately Sorted And Sub-Angular To Sub-Rounded</p> <p>D: 114.000m-120.000m Carbonaceous Clay - Dark Brown, Very Soft Carbonaceous Clay. Occasional Beige Soft Smooth. Occasional Fine To Medium Clean Quartz Sand. Occasional Ligneous Fragments</p> <p>D: 120.000m-124.000m Sand - Very Fine To Medium Grained Poorly Sorted Clean Quartz Sand - Sub-Angular To Sub-Rounded. Some Very Soft Carbonaceous Clay And Some Very Soft Light Grey And Beige Smooth Clay. Occasional Ligneous Fragments</p> <p>D: 124.000m-128.000m Sand - Fine To Med But Becoming Coarser Downwards. Sub-Angular To Sub-Rounded Moderately Sorted Quartz Sand With Some Grey/Brown And Light Grey Very Soft Smooth Clay. Occasional Brown Coal And Ligneous Fragments</p> <p>D: 128.000m-134.000m Sand - Fine To Medium Grained, Becoming Coarser Downwards, Sub-Angular To Sub-Rounded Sand. Some Light Grey, Very Stiff Clay</p>		
87796				<p>D: 0.000m-0.300m Black Topsoil</p> <p>D: 0.300m-3.000m Basalt Floaters</p> <p>D: 3.000m-6.000m Honeycomb Basalt</p> <p>D: 6.000m-31.000m Basalt</p> <p>D: 31.000m-36.000m Fine Sands To 1Inch River Grave Ls No Water-Abandoned</p>	333	North
326074	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		462	South West
326075	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		920	South West
116329		Groundwater	Groundwater Investigation		958	East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
942645	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			1063	West
116328		Groundwater	Groundwater Investigation		D: 0.000m-0.800m Silty Clay Yellow/Brown D: 0.800m-1.400m Clay Grey/Brown D: 1.400m-6.000m Basalt Brown/Grey	1176	North East
116327		Groundwater	Groundwater Investigation		D: 0.000m-1.000m Silty Clay Red D: 1.000m-3.000m Silty Clay Brown/Grey D: 3.000m-3.800m Sandy Clay Brown D: 3.800m-6.000m Basalt Grey	1432	North East
942641	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			1500	South
326073	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			1509	South
87786	Victorian Mines Department (1909 - 1977)				D: 0.000m-0.600m Red Soil G: 0.000m-0.600m Red Soil D: 0.600m-4.600m Yellow Mottled Clay G: 0.600m-4.600m Yellow Mottled Clay D: 4.600m-6.400m Grey Mottled Clay G: 4.600m-6.400m Grey Mottled Clay D: 6.400m-7.600m Red Mottled Clay G: 6.400m-7.600m Red Mottled Clay D: 7.600m-9.400m Yellow Mottled Clay G: 7.600m-9.400m Yellow Mottled Clay D: 9.400m-10.100m Yellow Clay And Basalt G: 9.400m-10.100m Yellow Clay And Basalt D: 10.100m-16.200m Basalt G: 10.100m-16.200m Basalt D: 16.200m-19.200m Yellow Clay G: 16.200m-19.200m Yellow Clay D: 19.200m-21.000m Yellow Mottled Clay G: 19.200m-21.000m Yellow Mottled Clay D: 21.000m-22.900m Grey Mottled Clay G: 21.000m-22.900m Grey Mottled Clay D: 22.900m-26.500m Yellow Mottled Clay G: 22.900m-26.500m Yellow Mottled Clay D: 26.500m-27.100m Grey Mottled Clay G: 26.500m-27.100m Grey Mottled Clay D: 27.100m-29.000m Brown Clay G: 27.100m-29.000m Brown Clay D: 29.000m-30.500m Yellow Mottled Clay G: 29.000m-30.500m Yellow Mottled Clay D: 30.500m-32.300m Yellow Mottled Sandy Clay G: 30.500m-32.300m Yellow Mottled Sandy Clay D: 32.300m-34.100m Yellow Clayey Sand G: 32.300m-34.100m Yellow Clayey Sand D: 34.100m-35.100m Coarse Sand And Gravel G: 34.100m-35.100m Coarse Sand And Gravel D: 35.100m-36.600m Yellow Clay And Basalt G: 35.100m-36.600m Yellow Clay And Basalt D: 36.600m-60.700m Basalt G: 36.600m-60.700m Basalt D: 60.700m-64.000m Blue Mottled Mudstone G: 60.700m-64.000m Blue Mottled Mudstone D: 64.000m-65.500m Blue Sandy Clay G: 64.000m-65.500m Blue Sandy Clay D: 65.500m-70.400m Fine Sand G: 65.500m-70.400m Fine Sand D: 70.400m-94.200m Brown Coal G: 70.400m-94.200m Brown Coal D: 94.200m-100.600m Brown Coal And Sand G: 94.200m-100.600m Brown Coal And Sand D: 100.600m-103.600m Coarse Sand G: 100.600m-103.600m Coarse Sand D: 103.600m-107.000m Fine Sand G: 103.600m-107.000m Fine Sand D: 107.000m-117.700m Grey Clay G: 107.000m-117.700m Grey Clay	1597	North West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
942646	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater		g: 0.000m-6.000m Clay g: 6.000m-42.000m Basalt g: 42.000m-54.000m Silty Clay, Clay g: 54.000m-65.000m Basalt g: 65.000m-70.000m Silty Clay, Clay g: 70.000m-78.000m Basalt g: 78.000m-82.500m Silty Clay, Clay g: 82.500m-89.000m Sand g: 89.000m-98.500m Silty Clay, Sand g: 98.500m-126.000m Coal g: 126.000m-140.500m Sand, Minor Clay Interbeds g: 140.500m-238.000m Silty Clay, Clay, Minor Sand Beds	1729	West
87785	Victorian Mines Department (1909 - 1977)				G: 0.000m-0.600m Red Soil G: 0.600m-4.600m Yellow Mottled Clay G: 4.600m-6.100m Grey Mottled Clay G: 6.100m-7.300m Red Mottled Clay G: 7.300m-8.200m Yellow Mottled Clay G: 8.200m-9.100m Yellow Mottled Clay And Stones G: 9.100m-9.800m Yellow Clay And Basalt G: 9.800m-15.900m Basalt G: 15.900m-21.300m Yellow Mottled Clay G: 21.300m-22.600m Grey Mottled Clay G: 22.600m-26.200m Yellow Mottled Clay G: 26.200m-26.800m Grey Mottled Clay G: 26.800m-29.600m Brown Clay G: 29.600m-30.500m Yellow Mottled Clay G: 30.500m-32.300m Yellow Clayey Sand G: 32.300m-34.100m Yellow Mottled Sandy Clay G: 34.100m-35.100m Coarse Dry Sand And Gravel G: 35.100m-35.700m Clay And Basalt G: 35.700m-36.600m Decomposed Basalt G: 36.600m-40.500m Basalt G: 40.500m-43.000m Basalt And Coarse Gravel	1796	North West
87784	Victorian Mines Department (1909 - 1977)				G: 0.000m-0.600m Red Soil G: 0.600m-4.600m Yellow Mottled Clay G: 4.600m-6.100m Grey Mottled Clay G: 6.100m-7.300m Red Mottled Clay G: 7.300m-8.200m Yellow Mottled Clay G: 8.200m-9.100m Yellow Mottled Clay And Stones G: 9.100m-9.800m Yellow Clay And Basalt G: 9.800m-15.900m Soft Basalt G: 15.900m-21.300m Yellow Mottled Clay G: 21.300m-22.600m Grey Mottled Clay G: 22.600m-26.200m Yellow Mottled Clay G: 26.200m-26.800m Grey Mottled Clay G: 26.800m-29.600m Brown Clay G: 29.600m-30.500m Yellow Mottled Clay G: 30.500m-32.300m Yellow Clayey Sand G: 32.300m-34.100m Yellow Mottled Sandy Clay G: 34.100m-35.100m Coarse Sand And Gravel G: 35.100m-36.000m Clay And Basalt G: 36.000m-36.300m Basalt	1804	North West
942609	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			1813	North West
116330		Groundwater	Groundwater Investigation		D: 0.000m-2.900m Silty Clay Brown D: 2.900m-9.000m Basalt D: 9.000m-13.000m Fine Sand Some Gravel D: 13.000m-15.000m Silty Clay D: 15.000m-17.500m Silty Sand D: 17.500m-19.000m Silty Clay D: 19.000m-27.000m Basalt D: 27.000m-30.000m Silty Clay D: 30.000m-42.500m Basalt D: 42.500m-56.000m Sand Some Clayey D: 56.000m-63.000m Sand Clay/Clayey Sand D: 63.000m-68.000m Clay Silty/Dark Grey D: 68.000m-77.500m Coal Clayey	1856	North East
116326		Groundwater	Groundwater Investigation		D: 0.000m-0.200m Top Soil D: 0.200m-1.500m Silty Clay Red/Brown D: 1.500m-2.000m Sandy Clay Yellow D: 2.000m-3.000m Silty Clay Brown/Grey D: 3.000m-6.000m Basalt Brown/Grey Clay Seams	1913	North East
326078	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			1914	North West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326053	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Silty Soil G: 0.600m-3.700m Brown Silty Clay G: 3.700m-5.800m Mottled Silty Clay G: 5.800m-6.400m Yellow Sandy Clay G: 6.400m-7.300m Gravel Wet G: 7.300m-8.700m Clayey Gravel Wet G: 8.700m-9.700m Ligneous Clay G: 9.700m-12.800m Inferior Coal G: 12.800m-14.300m Coal Brown G: 14.300m-15.800m Inferior Coal G: 15.800m-17.400m Coal Brown G: 17.400m-25.000m Inferior Coal G: 25.000m-26.500m Coal Brown G: 26.500m-28.000m Inferior Coal G: 28.000m-31.100m Coal Brown G: 31.100m-32.600m Inferior Coal G: 32.600m-52.400m Coal Brown G: 52.400m-53.900m Inferior Coal G: 53.900m-55.800m Ligneous Sandy Clay G: 55.800m-55.800m Sand	1916	North
S9037886/3		Groundwater				1949	North
325980	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater		G: 0.000m-74.400m Strata Not Recorded	1984	South
142792		Groundwater	Groundwater Investigation		D: 0.000m-22.000m Mottled Sandy Clay D: 22.000m-51.600m Basalt	1991	North

Boreholes FedUni Data Source: © Federation University Australia

Historical Mining Activity - Shafts

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Historical Mining Activity - Shafts

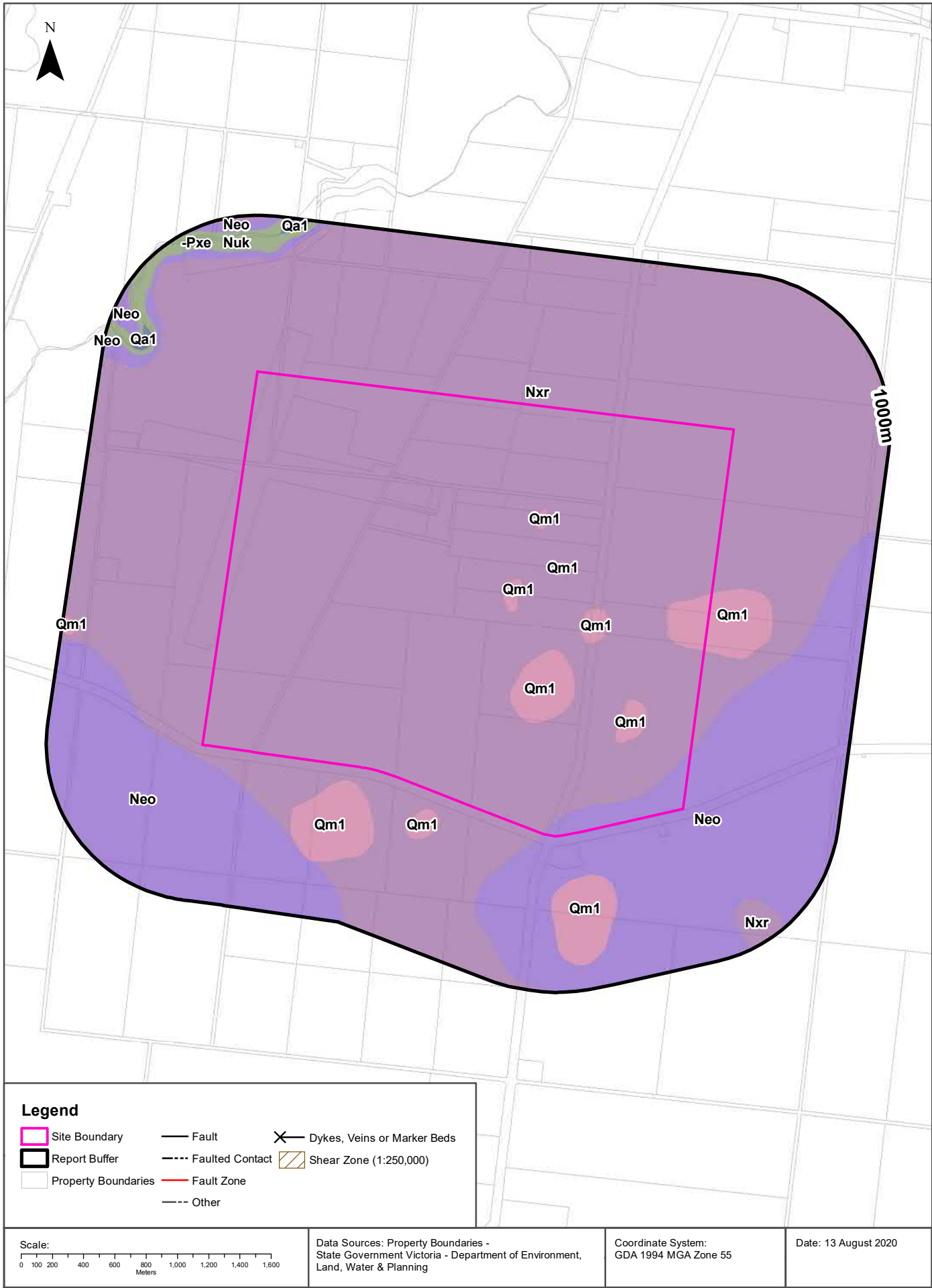
Mine Shaft Locations were collected by a variety of methods from 1869 in some areas of the state, mainly concentrating in Ballarat and Bendigo. In places a shaft may be recorded multiple times with a different source. In cases where several shaft locations are shown close together (generally with separations less than stated position errors) and they have different sources, it is possible that one shaft has been mapped several times. In cases where several shaft locations are shown close together but they have the same information source, it is possible that each shaft location represents a different shaft on the ground.

Historical Mine Shafts within the dataset buffer:

Map Id	Name	Source	Depth (m)	Collar (ft)	Fill/Cap Method	Location Desc	Location Accuracy	Distance	Direction
N/A	No records in buffer								

Historical Mining Activity Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources

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Geology

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Geological Units

What are the Geological Units onsite?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	1:50,000
Nxr	Darley Gravel (Nxr): generic	Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source	Neogene to Pleistocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
Qm1	swamp and lake deposits (Qm1): generic	Grey to black carbonaceous mud, silt, clay, minor peat: generally unconsolidated; rare dolomite	Pleistocene to Holocene	mud (major proportion); silt material (significant); clay lithology (significant); peat (minor proportion)	1:50,000

What are the Geological Units within the dataset buffer?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	1:50,000
Nuk	Kerrs Road Basalt (Nuk): generic	Olivine basalt: grey; fine to medium-grained; vesicular	Miocene to Miocene	basalt (all)	1:50,000
Nxr	Darley Gravel (Nxr): generic	Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source	Neogene to Pleistocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
-Pxe	Werribee Formation (-Pxe): generic	Sand, silt, clay, gravel in variable proportions: generally white to pale grey; in part carbonaceous, pyritic; ferruginous bands common; contains Cinnamomum flora	Eocene to Miocene	sand (significant); silt material (significant); clay lithology (significant); gravel material (significant)	1:50,000
Qa1	alluvium(Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000

Symbol	Name	Description	Geological Age	Lithology	Dataset
Qm1	swamp and lake deposits (Qm1): generic	Grey to black carbonaceous mud, silt, clay, minor peat: generally unconsolidated; rare dolomite	Pleistocene to Holocene	mud (major proportion); silt material (significant); clay lithology (significant); peat (minor proportion)	1:50,000

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Geology

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Geological Structures

What are the Geological Faults or Faulted Contacts onsite?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:50,000

What are the Dykes, Marker Beds and Veins onsite?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:50,000

What are the Shear Zones onsite (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

What are the Geological Faults or Faulted Contacts within the dataset buffer?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:50,000

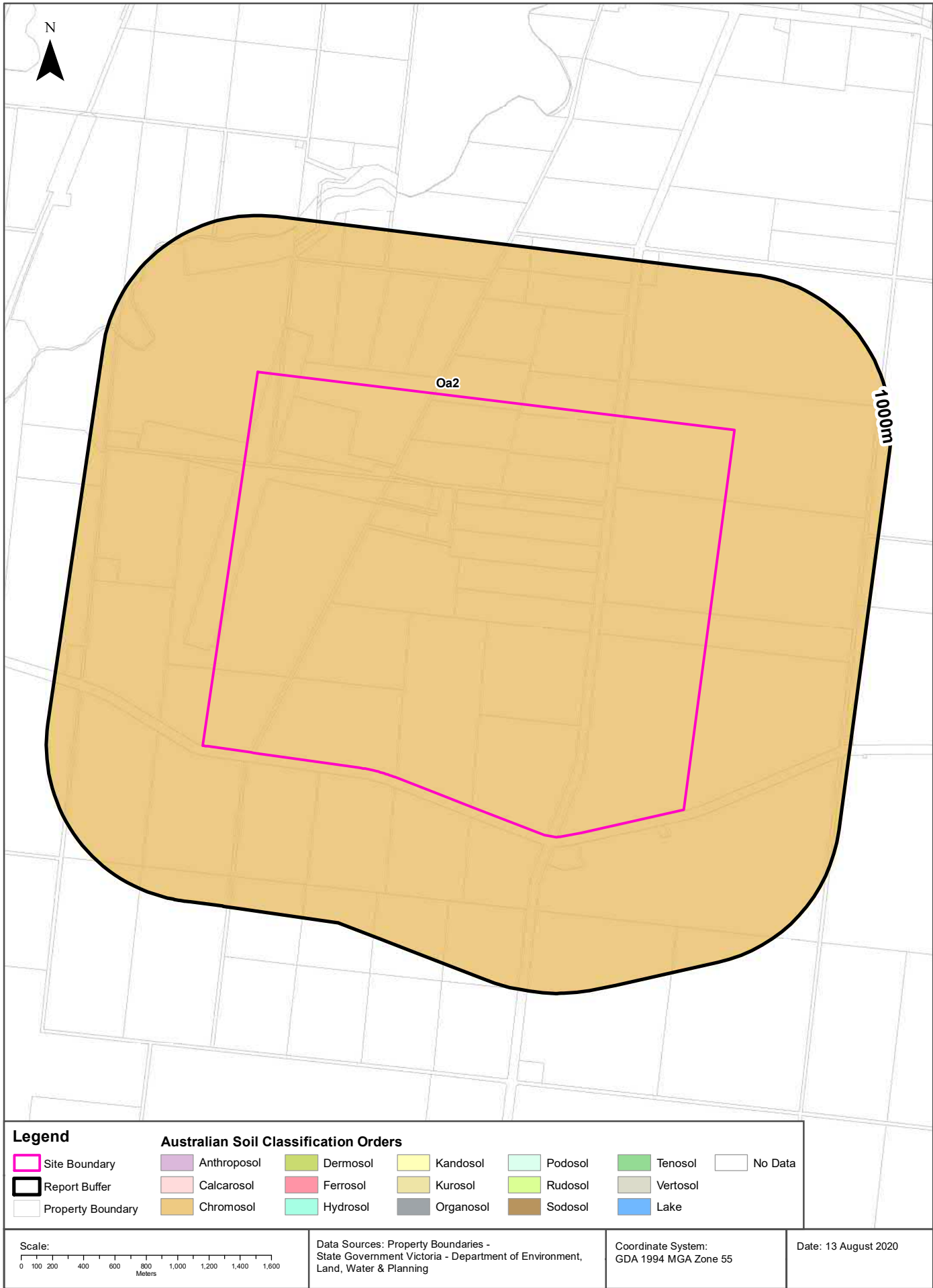
What are the Dykes, Marker Beds and Veins within the dataset buffer?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:50,000

What are the Shear Zones within the dataset buffer (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Soil Landscapes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

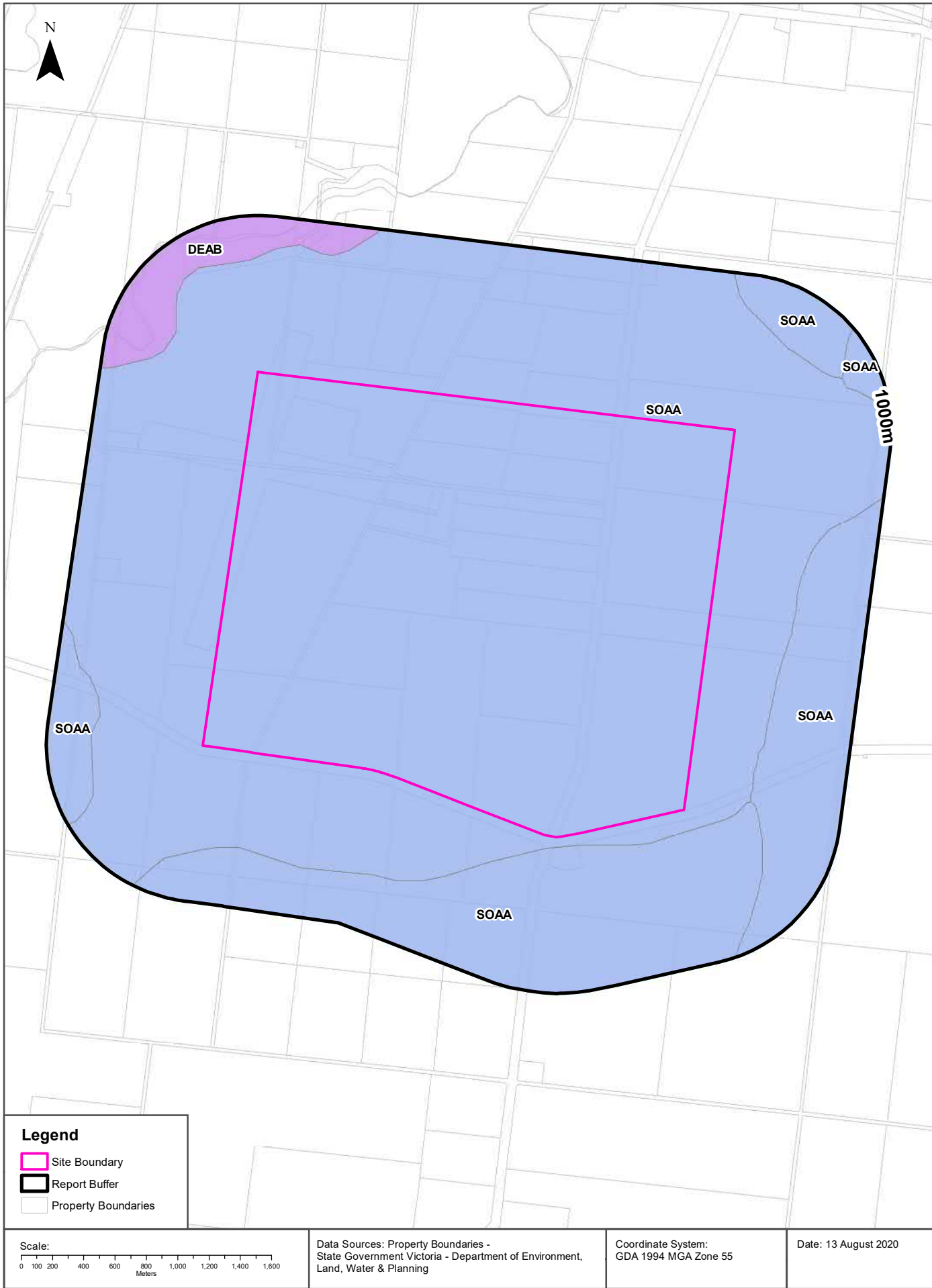
Atlas of Australian Soils

Australian soil types within the dataset buffer:

Symbol	Soil Order	Map Unit Description	Distance
Oa2	Chromosol	Dissected plateaux at low elevation: plains of hard alkaline red soils (Dr2.13) often in gilgai micro- association with dark cracking clays (Ug5.1), and grey and brown cracking clays (Ug5.2 and Ug5.3), small areas of other soils such as (Dr2.33), (Dy3.43), and (Dd1.1); also with (1) low, broad, sprawling stony rises of (Dr2.13), (2) low rounded hills of various (D) soils such as (Db1.23) with boulder strewn slopes, and (3) incised, often gorge-like, stream valleys of undescribed soils.	0m

Atlas of Australian Soils: CSIRO

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Soils Landscapes

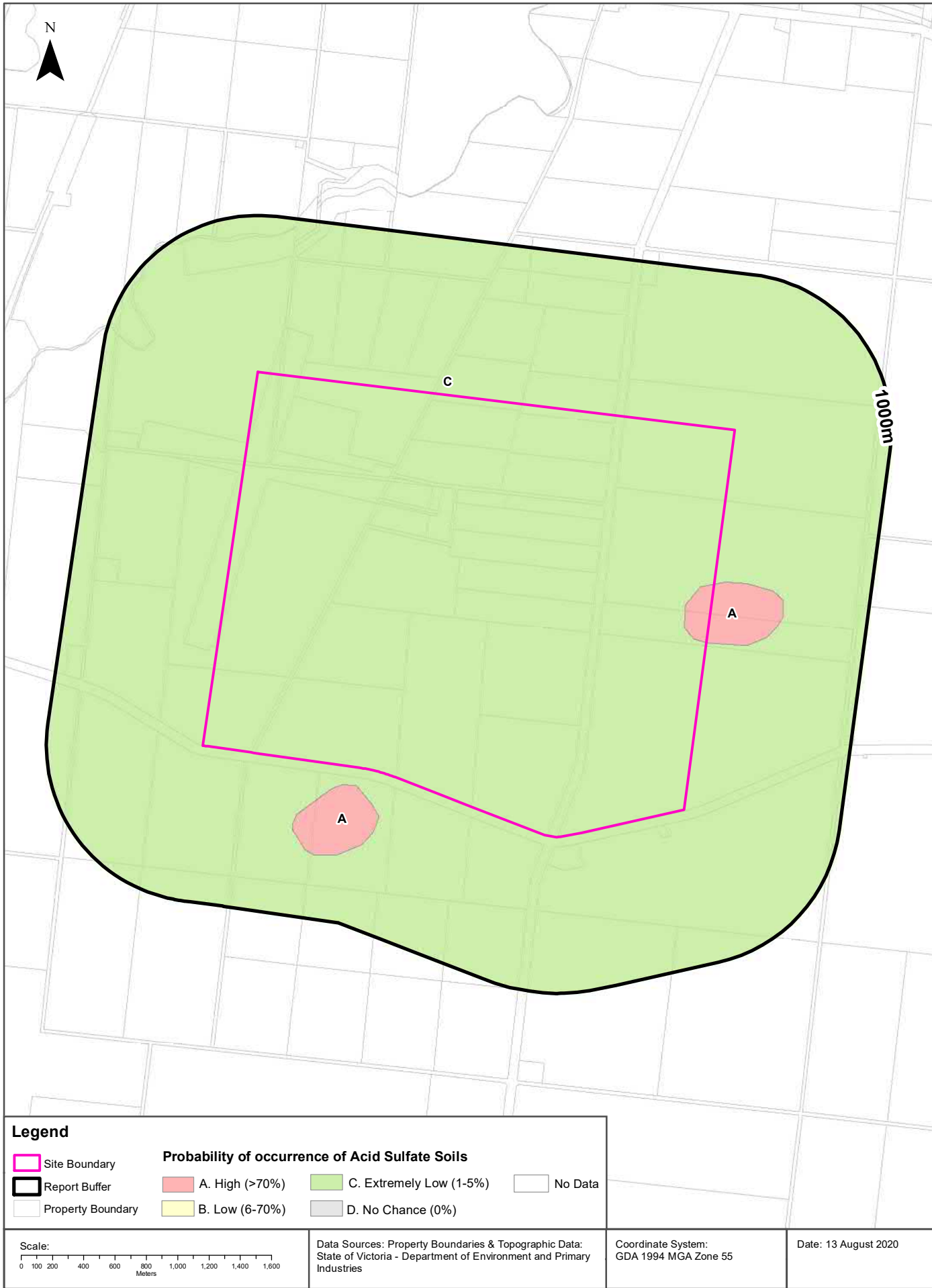
Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Victorian Soil Type Mapping

Victorian Soil Types within the dataset buffer:

Symbol	Description	Distance
SOAA	Red Sodosols	0m
DEAB	Brown Dermosols	579m

Victorian Soil Type Mapping Data Source: Department of Economic Development, Jobs, Transport and Resources
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Acid Sulfate Soils

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Atlas of Australian Acid Sulfate Soils

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

PROBCLASS	Description	Distance
A	High Probability of occurrence. >70% chance of occurrence.	0m
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Acid Sulfate Soils

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Coastal Acid Sulfate Soils

What are the on-site Coastal Acid Sulfate Soil types?

Coastal Acid Sulfate Soil Types
There are no Acid Sulfate areas onsite

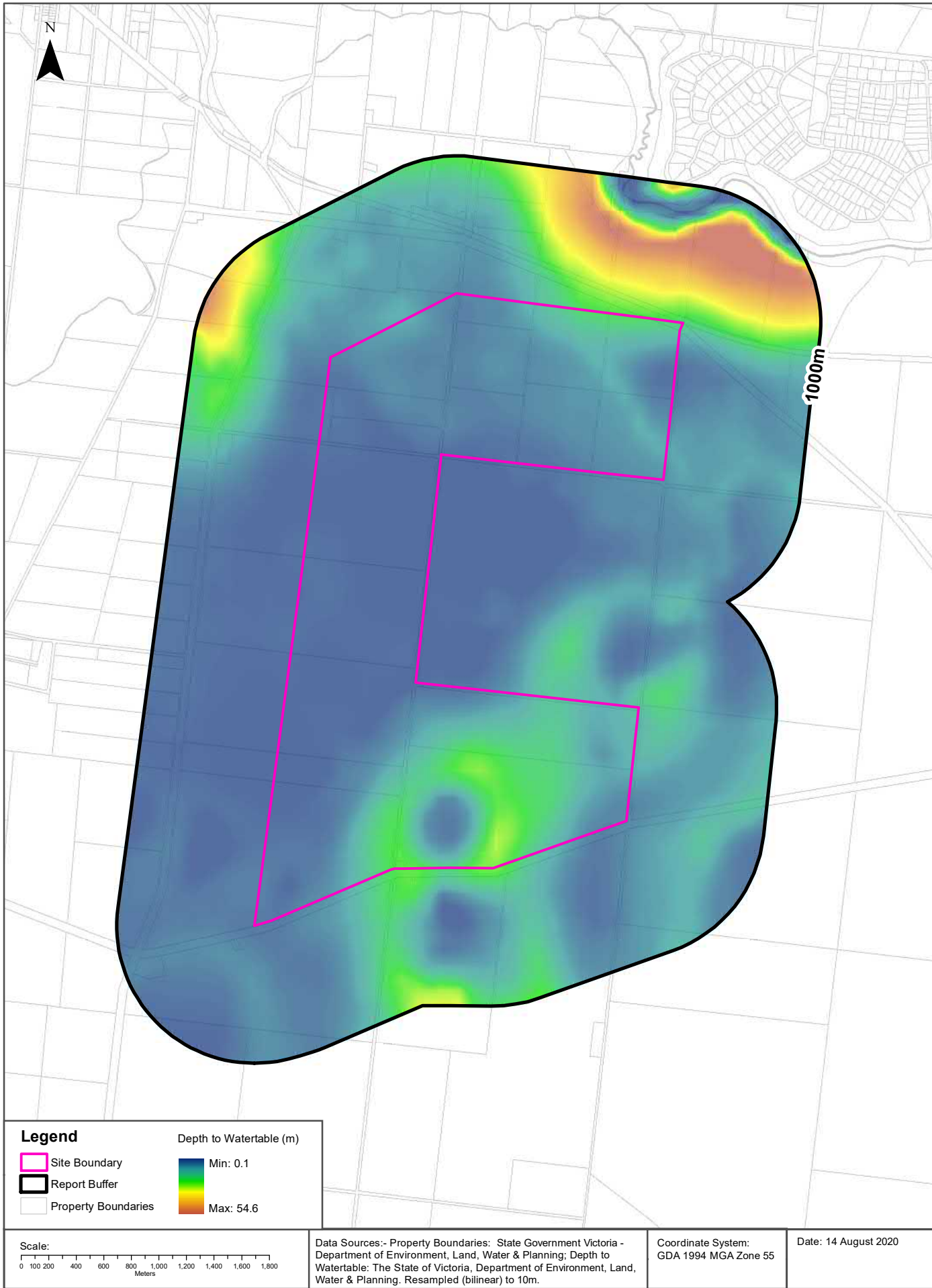
What are the Coastal Acid Sulfate Soil types within the dataset buffer?

Coastal Acid Sulfate Soil Types	Distance	Direction
There are no Acid Sulfate areas within the report buffer		

Coastal Acid Sulfate Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Depth to Watertable

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Hydrogeology & Groundwater

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Fractured or fissured, extensive aquifers of low to moderate productivity	0m	Onsite

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

On-site Groundwater Salinity:

Groundwater Salinity	Percent Of Site Area
7,000 - 13,000 mg/l	100

Depth to Watertable

On-site Depth to Watertable:

Depth to Watertable	Percent Of Site Area
Less than 5 metres	60
10 to 20 metres	17
5 to 10 metres	15
20 to 50 metres	3

Surface Elevation

Approximate on-site Surface Elevation:

Surface Elevation
136 AHDm to 172 AHDm

Basement Elevation

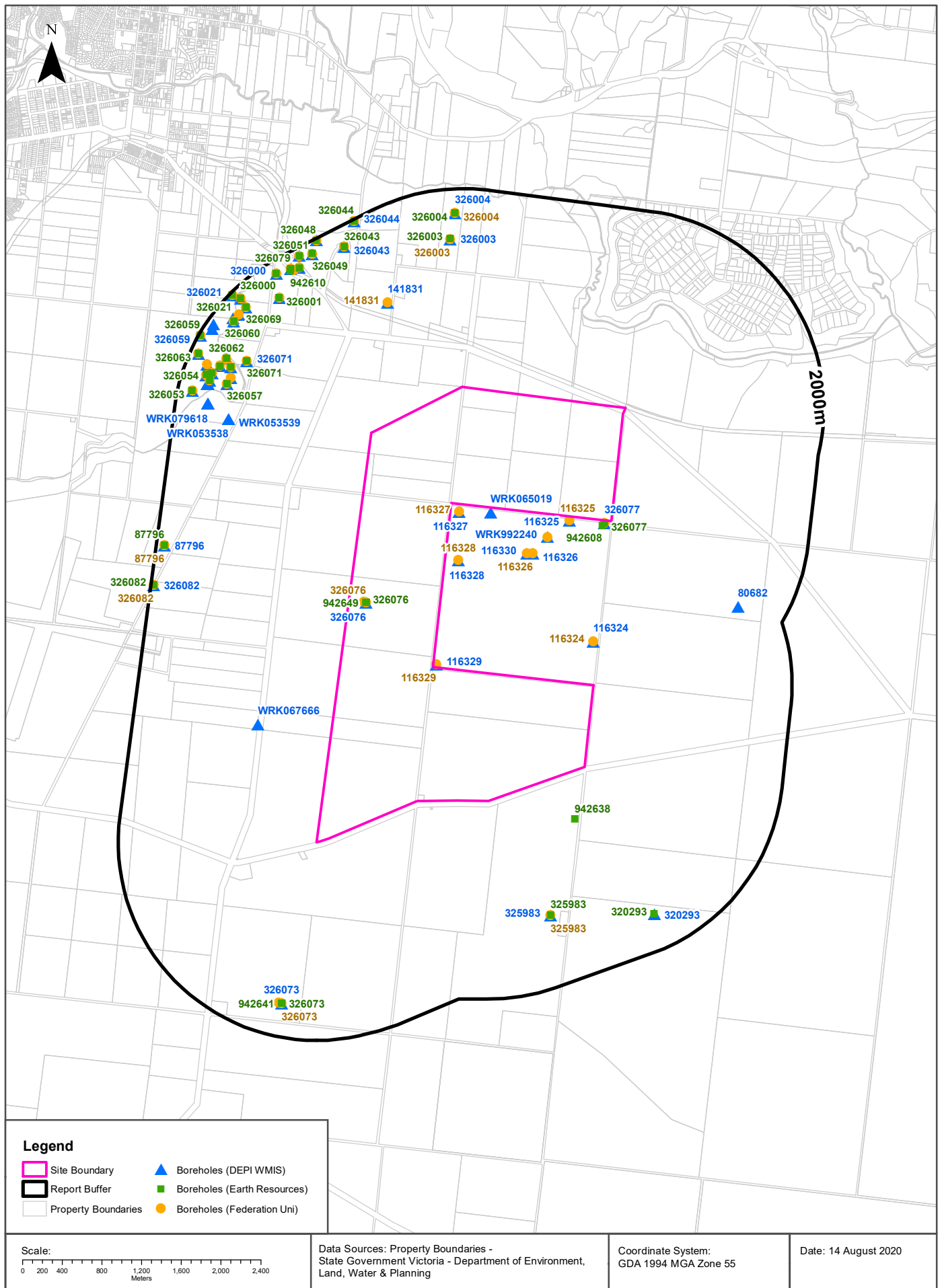
Approximate on-site Basement Elevation:

Basement Elevation - Basement Rocks comprise Lower Palaeozoic basement rocks that form the highlands and the crystalline basement; and Mesozoic rocks of the Otway and Gippsland basins both outcropping and subsurface
-3 AHDm to 50 AHDm

Groundwater Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Boreholes (DELWP WMIS)

Boreholes from the Department of Environment, Land, Water & Planning's Water Measurement Information System, within the dataset buffer:

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
326076	Non Groundwater					1981-10-29	0	Onsite
326077	Non Groundwater					1983-11-12	29	North East
116329	Groundwater Investigation	0.00m-1.40m SILTY CLAY BROWN 1.40m-6.00m WEATHERED BASALT BROWN	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 2.50m-3.50m OUTER LINING - GRAVEL = Bentonite 3.50m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-07	30	South
116325	Groundwater Investigation	0.00m-0.80m SILTY CLAY RED/YELLOW 0.80m-6.00m BASALT MOSTLY GREY	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 2.00m-3.00m OUTER LINING - GRAVEL = Bentonite 3.00m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-06	42	North East
WRK065019	Observation	0.00m-1.80m SOIL 1.80m-22.00m SCORIA 22.00m-34.00m BASALT	0.00m-29.00m INNER LINING - CASING = Pvc 29.00m-32.00m INNER LINING - SCREEN = Pvc 0.00m-26.50m OUTER LINING - GRAVEL = Cement 26.50m-28.50m OUTER LINING - GRAVEL = Bentonite 28.50m-32.00m OUTER LINING - GRAVEL = Gravel		0.00m-29.00m Basalt 29.00m-32.00m Basalt	2011-07-20	52	North
116327	Groundwater Investigation	0.00m-1.00m SILTY CLAY RED 1.00m-3.00m SILTY CLAY BROWN/GREY 3.00m-3.80m SANDY CLAY BROWN 3.80m-6.00m BASALT GREY	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 2.00m-3.00m OUTER LINING - GRAVEL = Bentonite 3.00m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-06	78	North
116328	Groundwater Investigation	0.00m-0.80m SILTY CLAY YELLOW/BROWN 0.80m-1.40m CLAY GREY/BROWN 1.40m-6.00m BASALT BROWN/GREY	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 1.50m-2.50m OUTER LINING - GRAVEL = Bentonite 2.50m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-06	134	North
WRK992240							230	North East
116326	Groundwater Investigation	0.00m-0.15m TOP SOIL 0.15m-1.50m SILTY CLAY RED/BROWN 1.50m-2.00m SANDY CLAY YELLOW 2.00m-3.00m SILTY CLAY BROWN/GREY 3.00m-6.00m BASALT BROWN/GREY CLAY SEAMS	-0.50m-4.90m INNER LINING - CASING = Pvc 4.90m-6.00m INNER LINING - SCREEN = Pvc 1.90m-2.90m OUTER LINING - GRAVEL = Bentonite 2.90m-5.90m OUTER LINING - GRAVEL = Gravel			1993-07-06	412	North East

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
116330	Groundwater Investigation	0.00m-2.90m SILTY CLAY BROWN 2.90m-9.00m BASALT 9.00m-13.00m FINE SAND SOME GRAVEL 13.00m-15.00m SILTY CLAY 15.00m-17.50m SILTY SAND 17.50m-19.00m SILTY CLAY 19.00m-27.00m BASALT 27.00m-30.00m SILTY CLAY 30.00m-42.50m BASALT 42.50m-56.00m SAND SOME CLAYEY 56.00m-63.00m SAND CLAY/CLAYEY SAND 63.00m-68.00m CLAY SILTY/DARK GREY 68.00m-77.50m COAL CLAYEY	-0.50m-55.00m INNER LINING - CASING = Pvc 55.00m-58.00m INNER LINING - SCREEN = Pvc 58.00m-73.00m INNER LINING - CASING = Pvc 73.00m-76.00m INNER LINING - SCREEN = Pvc 0.00m-36.00m OUTER LINING - GRAVEL = Cement 36.00m-39.00m OUTER LINING - GRAVEL = Bentonite 39.00m-76.00m OUTER LINING - GRAVEL = Gravel			1993-07-12	419	North East
116324	Groundwater Investigation	0.00m-6.00m SILTY CLAY BROWN SOEM GREY/RED	-0.50m-5.00m INNER LINING - CASING = Pvc 5.00m-6.00m INNER LINING - SCREEN = Pvc 2.50m-3.50m OUTER LINING - GRAVEL = Bentonite 3.50m-6.00m OUTER LINING - GRAVEL = Gravel			1993-07-07	433	East
WRK067666	Observation	0.00m-8.60m CLAY 8.60m-40.60m BASALT 40.60m-50.20m CLAY 50.20m-59.30m BASALT 59.30m-80.60m CLAY 80.60m-83.60m COAL 83.60m-88.10m CLAY 88.10m-136.10m COAL 136.10m-143.00m SAND	0.00m-104.00m INNER LINING - CASING = Pvc 104.00m-128.00m INNER LINING - SCREEN = Pvc Class 18 128.00m-134.00m INNER LINING - CASING = Pvc 0.00m-88.00m OUTER LINING - GRAVEL = Cement 88.00m-90.00m OUTER LINING - GRAVEL = Bentonite 90.00m-134.00m OUTER LINING - GRAVEL = Gravel 134.00m-143.00m OUTER LINING - GRAVEL = Bentonite		128.00m-134.00m Coal	2012-07-15	742	South West
141831	Domestic, Stock	0.00m-36.00m HARD FRACTURED BASALT 36.00m-62.00m HARD PRACTURED BASALT 62.00m-99.00m ORANGE/BROWN CLAY 99.00m-144.00m BROWN LIGNEOUS CLAY/SAND, SALTY FINE SAND 144.00m-167.00m HARD BLUE SANDSTONE	0.00m-36.00m INNER LINING - CASING = Steel 40.00m-144.00m INNER LINING - CASING = Steel 142.00m-144.00m INNER LINING - SCREEN = Steel 130.00m-144.00m OUTER LINING - GRAVEL = Gravel			1999-12-05	1096	North
325983	Non Groundwater					1926-12-31	1298	South
WRK053539	Observation	0.00m-4.00m fill 4.00m-28.00m clay 28.00m-62.00m coal 62.00m-69.00m sand	0.50m-30.00m INNER LINING - CASING = Steel 30.00m-66.00m INNER LINING - CASING = Pvc 66.00m-69.00m INNER LINING - SCREEN = Pvc 0.00m-62.00m OUTER LINING - GRAVEL = Cement 62.00m-65.50m OUTER LINING - GRAVEL = Bentonite 65.50m-69.00m OUTER LINING - GRAVEL = Gravel		0.50m-30.00m Clay 30.00m-66.00m Coal 66.00m-69.00m Sand	2010-06-03	1442	North West
WRK053538	Observation	0.00m-1.00m fill 1.00m-16.00m yellow clay 16.00m-67.00m coal 67.00m-74.00m sand	0.50m-19.00m INNER LINING - CASING = Steel 19.00m-71.00m INNER LINING - CASING = Pvc 71.00m-74.00m INNER LINING - SLOT = Pvc 0.00m-69.50m OUTER LINING - GRAVEL = Cement 69.50m-71.50m OUTER LINING - GRAVEL = Bentonite 71.50m-74.00m OUTER LINING - GRAVEL = Gravel		0.50m-19.00m Clay 19.00m-71.00m Coal 71.00m-74.00m Sand	2010-05-28	1442	North West
326071	Non Groundwater					1949-07-19	1445	North West
326003	Non Groundwater					1944-12-31	1496	North
WRK990808							1517	North West
326057	Non Groundwater					1960-07-15	1535	North West
80682	Not Known					1967-11-10	1541	East
326056	Non Groundwater					1960-07-12	1561	North West
326062	Non Groundwater					1947-08-12	1639	North West

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
320293	Non Groundwater					1981-08-28	1644	South East
326001	Non Groundwater					1943-12-31	1646	North West
326073	Non Groundwater					1981-10-20	1663	South West
326055	Non Groundwater					1960-07-05	1665	North West
WRK079619	Observation	0.00m-10.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-10.00m OUTER LINING - GRAVEL = Gravel		7.00m-10.00m Clay	2014-05-13	1672	North West
WRK079618	Observation	0.00m-11.00m CLAY	0.00m-8.00m INNER LINING - CASING = Pvc 8.00m-11.00m INNER LINING - SCREEN = Pvc 0.00m-6.00m OUTER LINING - GRAVEL = Cement 6.00m-7.00m OUTER LINING - GRAVEL = Bentonite 7.00m-11.00m OUTER LINING - GRAVEL = Gravel		8.00m-11.00m Clay	2014-05-13	1672	North West
WRK079620	Observation	0.00m-10.00m CLAY	0.00m-7.00m INNER LINING - CASING = Pvc 7.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-10.00m OUTER LINING - GRAVEL = Gravel		7.00m-10.00m Clay	2014-05-13	1672	North West
WRK079617	Observation	0.00m-9.50m CLAY	0.00m-6.50m INNER LINING - CASING = Pvc 6.50m-9.50m INNER LINING - SCREEN = Pvc 0.00m-5.00m OUTER LINING - GRAVEL = Cement 5.00m-6.00m OUTER LINING - GRAVEL = Bentonite 6.00m-9.50m OUTER LINING - GRAVEL = Gravel		6.50m-9.50m Clay	2014-05-13	1672	North West
326058	Non Groundwater					1960-07-22	1710	North West
326072	Non Groundwater					1949-07-15	1714	North West
WRK069602	Observation					2012-08-03	1720	North West
WRK069601	Observation	0.00m-40.50m FILL	0.00m-34.00m INNER LINING - CASING = Steel 34.00m-40.50m INNER LINING - SCREEN = Stainless Steel 0.00m-31.50m OUTER LINING - GRAVEL = Bentonite 31.50m-40.50m OUTER LINING - GRAVEL = Gravel		34.00m-40.50m Fill	2012-07-02	1721	North West
WRK069600	Observation	0.00m-60.80m FILL	0.00m-52.70m INNER LINING - CASING = Steel 52.70m-60.70m INNER LINING - SCREEN = Stainless Steel 0.00m-48.20m OUTER LINING - GRAVEL = Bentonite 48.20m-50.70m OUTER LINING - GRAVEL = Bentonite 50.70m-60.70m OUTER LINING - GRAVEL = Gravel		52.70m-60.70m Fill	2012-07-19	1721	North West
WRK069603	Observation	0.00m-9.50m CLAY 9.50m-22.50m SILT 22.50m-29.50m SAND 29.50m-35.00m CLAY 35.00m-36.00m SAND 36.00m-47.00m GRAVEL 47.00m-49.50m COAL	0.00m-38.00m INNER LINING - CASING = Pvc 38.00m-47.00m INNER LINING - SLOT = Pvc 0.00m-34.00m OUTER LINING - GRAVEL = Cement 34.00m-37.00m OUTER LINING - GRAVEL = Bentonite 37.00m-47.00m OUTER LINING - GRAVEL = Bentonite 47.00m-49.50m OUTER LINING - GRAVEL = Bentonite		38.00m-47.00m Gravel	2012-10-12	1721	North West
326004	Non Groundwater					1944-12-31	1751	North

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
326054	Non Groundwater					1960-06-29	1763	North West
326060	Non Groundwater					1947-08-07	1785	North West
326069	Non Groundwater					1948-07-31	1786	North West
WRK043014	Dewatering, Industrial, Irrigation, Stock					1800-01-01	1789	North West
WRK990809							1792	North West
326043	Non Groundwater					1947-05-31	1795	North
WRK110063	Industrial or Commercial		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2018-11-01	1810	North West
326050	Non Groundwater					1947-05-31	1810	North West
326079	Non Groundwater					1984-02-11	1838	North West
326053	Non Groundwater					1960-07-22	1852	North West
326000	Non Groundwater					1943-12-31	1869	North West
326049	Non Groundwater					1947-05-31	1877	North
326041	Sec Bores (Use Unidentified)					1979-09-20	1887	North West
WRK057606	Observation		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2012-01-01	1913	North West
87796	Not Known					1987-06-01	1915	West
326063	Non Groundwater					1947-08-14	1915	North West
326051	Non Groundwater					1947-05-31	1917	North West
WRK057605	Observation		0.00m-0.00m OUTER LINING - GRAVEL = Not Known			2012-01-01	1932	North West
326082	Non Groundwater					1984-03-12	1969	West
326021	Non Groundwater					1953-12-31	1972	North West
326048	Non Groundwater					1947-05-31	1979	North
326059	Non Groundwater					1947-07-31	1979	North West
326044	Non Groundwater					1947-05-31	1982	North

Boreholes WMIS Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Boreholes (Earth Resources Database)

Boreholes from the Earth Resources dataset, within the dataset buffer:

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
326076		Private Individual/Corporation		Rotary (diamond/drag bit)		29/10/1981	134.00	140.00	300	0	Onsite
942649		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	29/10/1981	134.00	141.14	25	0	Onsite
326077		Private Individual/Corporation		Rotary (diamond/drag bit)		12/11/1983	122.80	140.00	300	29	North East
942608		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	12/11/1983	122.80	144.08	110	55	North East
942638		Private Individual/Corporation		Diamond core	Completed	01/10/1981	118.00		100	464	South East
325983		Department of Manufacturing & Industry Development				31/12/1926	147.83	171.00	10	1296	South
326071		Private Individual/Corporation				19/07/1949	57.90	100.00	10	1446	North West
326003		Department of Manufacturing & Industry Development				31/12/1944	22.86	120.00	10	1497	North
326057		Private Individual/Corporation				15/07/1960	54.90	100.70	10	1537	North West
326056		Private Individual/Corporation				12/07/1960	51.80	99.40	10	1563	North West
326062		Private Individual/Corporation				12/08/1947	12.20	100.00	10	1640	North West
320293		Private Individual/Corporation		Rotary (diamond/drag bit)		28/08/1981	118.00	150.00	300	1643	South East
326001		Department of Manufacturing & Industry Development				31/12/1943	53.95	109.73	10	1647	North West
326073		Private Individual/Corporation		Rotary (diamond/drag bit)		20/10/1981	116.00	150.00	300	1663	South West
942641		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	20/10/1981	116.00	152.17	25	1663	South West
326055		Private Individual/Corporation				05/07/1960	51.80	100.20	10	1667	North West
326058		Private Individual/Corporation				22/07/1960	56.10	102.50	10	1712	North West
326072		Private Individual/Corporation				15/07/1949	64.60	105.00	10	1716	North West
326004		Department of Manufacturing & Industry Development				31/12/1944	14.33	86.26	10	1751	North

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
326054		Private Individual/Corporation				29/06/1960	53.90	100.90	10	1765	North West
326060		Private Individual/Corporation				07/08/1947	47.50	110.00	10	1786	North West
326069		Private Individual/Corporation				31/07/1948	123.70	100.00	10	1788	North West
326043		Private Individual/Corporation				31/05/1947	28.05	101.90	10	1796	North
326050		Private Individual/Corporation				31/05/1947	24.70	98.50	10	1811	North West
942610		CRA Exploration Pty Ltd		Rotary mud drilling	Completed	11/02/1984	74.70	120.08	110	1825	North West
326079		Private Individual/Corporation		Rotary (diamond/drag bit)		11/02/1984	74.70	100.00	300	1839	North West
326053		Private Individual/Corporation				22/07/1960	55.80	103.00	10	1854	North West
326000		Department of Manufacturing & Industry Development				31/12/1943	40.54	97.84	10	1871	North West
326049		Private Individual/Corporation				31/05/1947	13.11	96.60	10	1878	North
326041		State Electricity Commission of Victoria				20/09/1979	45.50	96.40	10	1889	North West
326063		Private Individual/Corporation				14/08/1947	12.20	100.00	10	1917	North West
87796		Private Individual/Corporation		Air Percussion/Air Rotary	Abandoned	01/06/1987	42.00		100	1917	West
326051		Private Individual/Corporation				31/05/1947	35.98	95.40	10	1918	North West
326082		Private Individual/Corporation		Rotary (diamond/drag bit)		12/03/1984	129.70	150.00	300	1971	West
326021		Department of Manufacturing & Industry Development				31/12/1953	59.44	107.60	10	1973	North West
326048		Private Individual/Corporation				31/05/1947	31.10	94.20	10	1981	North
326059		Private Individual/Corporation				31/07/1947	50.00	110.00	10	1981	North West
326044		Private Individual/Corporation				31/05/1947	20.77	91.10	10	1983	North

Boreholes Earth Resources Data Source: © The State of Victoria, Department of Economic Development, Jobs, Transport and Resources 2015. Creative Commons Attribution 3.0 Australia

Boreholes (Federation University)

Boreholes from the Federation University Australia dataset, within the dataset buffer:

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326076	Department of		Non		D: 0.000m-2.000m Clay - Light Red/Brown To Orange/Brown	0	Onsite

Minerals and Energy (1977 - 1985)	Groundwater	<p>Stiff, Silty Clay With Occasional Ochre/Brown, Very Weathered Rounded Basalt Fragments</p> <p>D: 2.000m-4.000m Clay - Light Grey To Buff Slightly Silty Stiff Clay</p> <p>D: 4.000m-6.000m Clay - Light Grey To Buff, Slightly Silty Stiff Clay With Some Dark Grey/Brown To Dark Brown Well Weathered Basalt Fragments</p> <p>D: 6.000m-14.000m Basalt - Brown/Grey Weathered Basalt With Occasional Off White Crystalline Small Grains (Chalcedone?)</p> <p>D: 14.000m-22.000m Basalt - Dark Brown To Dark Red/Brown Well Weathered Basalt, With Some Red/Brown To Red Claystone Rock Fragments. Occasional Stiff Light Brown Clay. Some Brown Silty Friable Clay Below 20 Metres</p> <p>D: 22.000m-24.000m Clay - Light Brown, Moderately Soft, Smooth To Silty, With Occasional Rare Weathered Basalt (?) Rock Fragments, Some Approaching Friable. Possibly Paleosal.</p> <p>D: 24.000m-28.000m Clay - All As Above, With Some Brown And Grey Friable, Very Silty Clay</p> <p>D: 28.000m-30.000m Silt - Extremely Fine, Orange/Brown With Some Light Grey To Light Brown Moderately Soft Silty Clay</p> <p>D: 30.000m-32.000m Sand - Very Fine, Ochre Stained Quartz Sand With Some Fine To Coarse Sub-Rounded To Rounded Ochre Stained Quartz Grains. Occasional Light Brown Silty Clay</p> <p>D: 32.000m-34.000m Basalt - Dark Brown To Dark Grey Brown, Very Weathered Basalt Fragments With Some Fine To Pebble Sized, Ochre Stained, Sub-Rounded Quartz Grains. Occasional Dark Brown Sandy Friable To Firm Clay</p> <p>D: 34.000m-36.000m Gravel - Coarse, Orange/Brown To Ochre Stained, Sub-Angular To Rounded Quartz Pebbles, Mainly 2X2X1 Cm Size, With Some Dark Brown Weathered Basalt Rock Fragments. Some Light Grey Firm, Slightly Silty Clay. Occasional Fine To Coarse Ochre Stained Sand</p> <p>D: 36.000m-46.000m Basalt - Dark Grey/Brown, Becoming Dark Grey With Depth, Well Weathered Basalt, With Some Ochre Fragile Slightly Silty Rounded Rock Fragments. Occasional Light Brown And Ochre Soft Clay. Occasional White To Ochre Stained Quartz Grains (Vein Quartz?) - Rou</p> <p>D: 46.000m-48.000m Clay - Very Soft, Silty, Red Clay. Some Dark Brown Grey To Dark Red/Brown Weathered Basalt Rock Fragments. Occasional Ochre Fine Grey Slightly Silty Rock Fragments. Occasional Medium Grained Quartz Sand - Sub-Angular To Sub-Rounded Ochre Stained</p> <p>D: 48.000m-52.000m Clay - Ochre And Red Silty Soft Clay With Some Ochre, Moderately Soft, Sandy Clay, And Some Dark Grey To Dark Brown Weathered Basalt Fragments. Rare, Sub-Rounded, Medium Grained, Ochre Stained Quartz Sand</p> <p>D: 52.000m-54.000m Clay - Ochre, Moderately Soft, Sandy Clay. Abundant Dark Brown Soft Carbonaceous Clay (Some Possibly Ligneous), And Some Dark Grey To Dark Brown Weathered Basalt Fragments. Occasional Ochre Stained, Angular Clean Quartz Grains</p> <p>D: 54.000m-56.000m Carbonaceous Clay - Dark Brown, Moderately Soft, With Some Ochre Sandy Clay. Some Dark Grey Brown Weathered Basalt Fragments. Occasional Medium Grained, Sub-Rounded, Ochre Stained Quartz Grains</p> <p>D: 56.000m-58.000m Brown Coal - Slightly Ligneous With Some Dark Brown Carbonaceous Clay - Soft. Some Ochre Stained Sandy Clay. Occasional Medium Grained Ochre Stained Quartz Sand</p> <p>D: 58.000m-60.000m Carbonaceous Clay - Dark Brown, Moderately Soft With Some Ochre Sandy Clay. Some Dark Grey Brown Weathered Basalt Fragments. Occasional Medium Grained, Sub-Rounded, Ochre Stained Quartz Grains</p> <p>D: 60.000m-68.000m Clay - Medium Grained Soft, Smooth Clay, With Some Medium Grained, Sub-Rounded, Ochre Stained Quartz Sand. Occasional Dark Grey Basalt Fragments And Occasional Dark Brown Carbonaceous Clay Increasing Down</p> <p>D: 68.000m-76.000m Brown Coal (?) - Very Soft, With Some Dark Brown Soft Carbonaceous Clay And Occasional Fine To Medium Grained, Sub-Rounded Quartz Sand. Occasional Medium Grey, Moderately Soft, Smooth Clay And Occasional Ligneous Fragments</p> <p>D: 76.000m-84.000m Brown Coal (?) - Some Ligneous Fragments And Some Dark Brown, Soft Carbonaceous Clay. Rare Fine To Medium Quartz Sand</p> <p>D: 84.000m-90.000m Clay - Dark Brown Carbonaceous Clay, Very Soft, With Some Soft Smooth Brown-Grey Clay And Rare Ochre And Red Friable Clay. Occasional Ligneous Fragments</p> <p>D: 90.000m-102.000m Brown Coal - Some Ligneous Dark Brown Fragments Increasing Downwards. Some Dark Brown Soft Carbonaceous Clay</p> <p>D: 102.000m-108.000m Brown Coal (?) - Some Ligneous Fragments And Occasional Light Grey Soft, Smooth Clay</p> <p>D: 108.000m-114.000m Carbonaceous Clay - Soft, Dark Brown Carbonaceous Clay With Some Moderately Firm Brown</p>
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				Coal And Some Ligneous Fragments. From 112M Downwards Some Fine To Medium Clean Quartz Sand, Moderately Sorted And Sub-Angular To Sub-Rounded D: 114.000m-120.000m Carbonaceous Clay - Dark Brown, Very Soft Carbonaceous Clay. Occasional Beige Soft Smooth. Occasional Fine To Medium Clean Quartz Sand. Occasional Ligneous Fragments D: 120.000m-124.000m Sand - Very Fine To Medium Grained Poorly Sorted Clean Quartz Sand - Sub-Angular To Sub-Rounded. Some Very Soft Carbonaceous Clay And Some Very Soft Light Grey And Beige Smooth Clay. Occasional Ligneous Fragments D: 124.000m-128.000m Sand - Fine To Med But Becoming Coarser Downwards. Sub-Angular To Sub-Rounded Moderately Sorted Quartz Sand With Some Grey/Brown And Light Grey Very Soft Smooth Clay. Occasional Brown Coal And Ligneous Fragments D: 128.000m-134.000m Sand - Fine To Medium Grained, Becoming Coarser Downwards, Sub-Angular To Sub-Rounded Sand. Some Light Grey, Very Stiff Clay		
942649	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater		0	Onsite
326077	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		29	North East
116329		Groundwater	Groundwater Investigation	D: 0.000m-1.400m Silty Clay Brown D: 1.400m-6.000m Weathered Basalt Brown	30	South
116325		Groundwater	Groundwater Investigation	D: 0.000m-0.800m Silty Clay Red/Yellow D: 0.800m-6.000m Basalt Mostly Grey	42	North East
116327		Groundwater	Groundwater Investigation	D: 0.000m-1.000m Silty Clay Red D: 1.000m-3.000m Silty Clay Brown/Grey D: 3.000m-3.800m Sandy Clay Brown D: 3.800m-6.000m Basalt Grey	78	North
116328		Groundwater	Groundwater Investigation	D: 0.000m-0.800m Silty Clay Yellow/Brown D: 0.800m-1.400m Clay Grey/Brown D: 1.400m-6.000m Basalt Brown/Grey	134	North
S9038729/1		Groundwater			230	North East
116326		Groundwater	Groundwater Investigation	D: 0.000m-0.200m Top Soil D: 0.200m-1.500m Silty Clay Red/Brown D: 1.500m-2.000m Sandy Clay Yellow D: 2.000m-3.000m Silty Clay Brown/Grey D: 3.000m-6.000m Basalt Brown/Grey Clay Seams	412	North East
116330		Groundwater	Groundwater Investigation	D: 0.000m-2.900m Silty Clay Brown D: 2.900m-9.000m Basalt D: 9.000m-13.000m Fine Sand Some Gravel D: 13.000m-15.000m Silty Clay D: 15.000m-17.500m Silty Sand D: 17.500m-19.000m Silty Clay D: 19.000m-27.000m Basalt D: 27.000m-30.000m Silty Clay D: 30.000m-42.500m Basalt D: 42.500m-56.000m Sand Some Clayey D: 56.000m-63.000m Sand Clay/Clayey Sand D: 63.000m-68.000m Clay Silty/Dark Grey D: 68.000m-77.500m Coal Clayey	419	North East
116324		Groundwater	Groundwater Investigation	D: 0.000m-6.000m Silty Clay Brown Soem Grey/Red	433	East
141831		Groundwater	Domestic Stock	D: 0.000m-36.000m Hard Fractured Basalt D: 36.000m-62.000m Hard Practured Basalt D: 62.000m-99.000m Orange/Brown Clay D: 99.000m-144.000m Brown Ligneous Clay/Sand D: 144.000m-167.000m Hard Blue Sandstone	1096	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
325983	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.900m Soil And Clay D: 0.900m-1.800m Clay And Basalt Boulders D: 1.800m-22.900m Basalt D: 22.900m-25.000m Basalt, Decomposed D: 25.000m-58.200m Basalt D: 58.200m-61.600m Basalt, Decomposed D: 61.600m-74.400m Basalt D: 74.400m-82.900m Clay, Sandy D: 82.900m-89.300m Clay, Sandy, With Bands Of Limestone D: 89.300m-93.000m Clay, Sandy D: 93.000m-93.300m Clay, Ligneous D: 93.300m-96.900m Brown Coal G: 93.300m-96.900m C = , Gdse = , H = , N = , Volatiles = 23.3 D: 96.900m-102.700m Clay, Blue, Fossiliferous D: 102.700m-104.500m Sand G: 104.500m-107.600m C = , Gdse = , H = , N = , Volatiles = 34.1 D: 104.500m-142.600m Brown Coal G: 107.600m-110.600m C = , Gdse = , H = , N = , Volatiles = 32.8 G: 110.600m-113.700m C = , Gdse = , H = , N = , Volatiles = 33.3 G: 113.700m-116.700m C = , Gdse = , H = , N = , Volatiles = 35.1 G: 116.700m-119.800m C = , Gdse = , H = , N = , Volatiles = 31.7 G: 119.800m-122.800m C = , Gdse = , H = , N = , Volatiles = 39.7 G: 122.800m-125.900m C = , Gdse = , H = , N = , Volatiles = 44.1 G: 125.900m-128.900m C = , Gdse = , H = , N = , Volatiles = 44.3 G: 128.900m-132.000m C = , Gdse = , H = , N = , Volatiles = 45.7 G: 132.000m-135.000m C = , Gdse = , H = , N = , Volatiles = 45.7 G: 135.000m-138.100m C = , Gdse = , H = , N = , Volatiles = 45.5 G: 138.100m-141.100m C = , Gdse = , H = , N = , Volatiles = 44 G: 141.100m-142.600m C = , Gdse = , H = , N = , Volatiles = 43.8 D: 142.600m-143.300m Sand, Fine D: 143.300m-147.500m Brown Coal D: 147.500m-147.800m Hard Rock (No Sample) Water Struck At 103.33 Metres, Standing At 84.73 Metres	1298	South
326071	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-11.000m Sand & Clay G: 11.000m-53.300m Coal Brown G: 53.300m-56.100m Clay G: 56.100m-57.900m Sand	1445	North West
326003	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Loam D: 0.300m-0.600m Red Clay D: 0.600m-1.500m Basalt D: 1.500m-6.400m Clay, Gravel, And Basalt D: 6.400m-11.900m Yellow Clay D: 11.900m-12.200m Ligneous Clay D: 12.200m-21.300m Brown Coal D: 21.300m-21.900m Ligneous Clay D: 21.900m-22.900m Sandy Clay	1496	North
S9037886/1		Groundwater				1517	North West
326057	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-5.800m Silt G: 5.800m-7.900m Gravel G: 7.900m-9.400m Clayey Silt G: 9.400m-26.200m Inferior Coal G: 26.200m-29.300m Coal Brown G: 29.300m-30.800m Inferior Coal G: 30.800m-35.400m Coal Brown G: 35.400m-36.900m Inferior Coal G: 36.900m-49.000m Coal Brown G: 49.000m-50.600m Inferior Coal G: 50.600m-52.100m Coal Brown G: 52.100m-53.600m Inferior Coal G: 53.600m-54.900m Ligneous Silty Clay	1535	North West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326056	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-2.700m Silty Soil G: 2.700m-3.700m Yellow Silty Clay G: 3.700m-4.300m Yellow Clayey Sand G: 4.300m-4.900m Sandy Clay G: 4.900m-8.800m Gravel Wet G: 8.800m-9.400m Mottled Clay & Gravel G: 9.400m-17.000m Inferior Coal G: 17.000m-49.000m Coal Brown G: 49.000m-50.600m Inferior Coal G: 50.600m-51.800m Ligneous Silty Clay	1561	North West
326062	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-1.200m Soil G: 1.200m-4.600m Clay G: 4.600m-8.800m Gravel Wet G: 8.800m-12.200m Coal Brown	1639	North West
326001	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.600m Red Sandy Loam D: 0.600m-1.200m Red Sand D: 1.200m-1.800m Red Sandy Clay D: 1.800m-8.500m Red Clay D: 8.500m-9.800m Clay And Gravel D: 9.800m-13.100m Grey And Yellow Clay D: 13.100m-14.000m Yellow Sand D: 14.000m-17.100m Grey Clay D: 17.100m-20.100m Dark Green Pug D: 20.100m-23.200m Yellow Sand D: 23.200m-52.700m Brown Coal D: 52.700m-53.000m Ligneous Clay D: 53.000m-54.000m Yellow Clay Water Struck At 20.12 Metres	1646	North West
326073	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			1663	South West
326055	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-0.900m Silty Soil G: 0.900m-2.100m Silt G: 2.100m-2.700m Silty Clay G: 2.700m-5.200m Mottled Clay G: 5.200m-7.000m Gravel G: 7.000m-8.500m Clayey Silt G: 8.500m-9.400m Gravel Wet G: 9.400m-15.500m Inferior Coal G: 15.500m-17.000m Coal Brown G: 17.000m-20.100m Inferior Coal G: 20.100m-24.700m Coal Brown G: 24.700m-27.700m Inferior Coal G: 27.700m-29.300m Coal Brown G: 29.300m-32.300m Inferior Coal G: 32.300m-33.800m Coal Brown G: 33.800m-35.400m Inferior Coal G: 35.400m-38.400m Coal Brown G: 38.400m-41.500m Inferior Coal G: 41.500m-43.000m Coal Brown G: 43.000m-50.600m Inferior Coal G: 50.600m-51.800m Ligneous Silty Clay	1665	North West
942641	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			1667	South West
326058	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Soil G: 0.300m-3.400m Silt G: 3.400m-6.400m Brown Silty Clay G: 6.400m-9.900m Gravel Wet G: 9.900m-26.500m Inferior Coal G: 26.500m-29.600m Coal Brown G: 29.600m-32.600m Inferior Coal G: 32.600m-46.300m Coal Brown G: 46.300m-47.900m Inferior Coal G: 47.900m-52.400m Coal Brown G: 52.400m-53.900m Inferior Coal G: 53.900m-55.500m Ligneous Silty Clay G: 55.500m-56.100m Inferior Coal Silty	1710	North West
326072	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-9.100m Clay & Gravel G: 9.100m-9.800m Ligneous Sand G: 9.800m-57.900m Coal Brown G: 57.900m-58.500m Fine Sand G: 58.500m-64.600m Clay	1714	North West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326004	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Loam D: 0.300m-1.800m Grey Clay D: 1.800m-4.900m Grey And Yellow Clay D: 4.900m-5.200m Sand And Gravel D: 5.200m-7.900m Drift Sand And Gravel D: 7.900m-12.800m Brown Coal D: 12.800m-13.100m Ligneous Clay D: 13.100m-14.300m Yellow Clay	1751	North
326054	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Soil G: 0.600m-1.200m Silty Soil G: 1.200m-3.400m Silt G: 3.400m-4.900m Mottled Clay G: 4.900m-5.800m Mottled Silty Clay G: 5.800m-6.400m Clay & Large Stones G: 6.400m-7.000m Gravel Wet G: 7.000m-7.900m Clayey Silt G: 7.900m-9.400m Inferior Coal G: 9.400m-11.000m Coal Brown G: 11.000m-12.500m Inferior Coal G: 12.500m-14.000m Coal Brown G: 14.000m-17.000m Inferior Coal G: 17.000m-23.200m Coal Brown G: 23.200m-24.700m Inferior Coal G: 24.700m-26.200m Coal Brown G: 26.200m-35.400m Inferior Coal G: 35.400m-38.400m Coal Brown G: 38.400m-39.900m Inferior Coal G: 39.900m-41.500m Coal Brown G: 41.500m-44.500m Inferior Coal G: 44.500m-50.600m Coal Brown G: 50.600m-52.100m Inferior Coal Silty G: 52.100m-53.900m Ligneous Silty Clay G: 53.900m-53.900m Sand	1763	North West
326060	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Soil G: 0.300m-5.500m Clay G: 5.500m-6.100m Sand G: 6.100m-7.000m Sand & Gravel G: 7.000m-7.600m Clay & Gravel G: 7.600m-9.800m Gravel Wet G: 9.800m-44.800m Coal Brown G: 12.200m-17.700m C = , Gdse = 25.24, H = , N = , Volatiles = 30.5 G: 17.700m-24.300m C = , Gdse = 25.35, H = , N = , Volatiles = 28.9 G: 24.300m-31.100m C = , Gdse = 25.4, H = , N = , Volatiles = 30.4 G: 31.100m-37.700m C = , Gdse = 25.28, H = , N = , Volatiles = 31.5 G: 44.800m-45.700m Coal & Sand G: 45.700m-47.500m Clay G: 47.500m-47.500m Sand Wet	1785	North West
326069	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.900m Soil G: 0.900m-3.400m Black Sandy Clay G: 3.400m-4.900m Clay & Gravel G: 4.900m-6.100m Black Sandy Clay G: 6.100m-7.900m Grey Sandy Clay G: 7.900m-11.600m Gravel Wet G: 11.600m-12.200m Fine Sand Wet G: 12.200m-13.700m Ligneous Silt G: 13.700m-42.700m Coal Brown G: 15.200m-30.500m C = 60.8, Gdse = 25.77, H = 4.3, N = 0.61, Volatiles = 50.5 G: 30.500m-42.700m C = 62, Gdse = 26.47, H = 4.4, N = 0.58, Volatiles = 52.6 G: 42.700m-45.700m Ligneous Silt G: 45.700m-50.300m Coarse Sand Wet G: 50.300m-51.800m Ligneous Silt G: 51.800m-52.700m Coal Brown G: 52.700m-56.700m Ligneous Silt G: 56.700m-58.200m Fine Sand Wet G: 58.200m-59.700m Ligneous Silt Cont Quartz G: 59.700m-60.000m Fine Sand & Quartz G: 60.000m-61.300m Fine Sand Wet G: 61.300m-101.500m Grey Clay G: 101.500m-101.800m Sandstone G: 101.800m-114.300m Grey Clay G: 114.300m-117.300m Ligneous Clay G: 117.300m-123.400m Grey Clay G: 123.400m-123.700m Sandstone [End Of Hole :- Unconsolidated : Coarse Sand Wet]	1786	North West
140688		Groundwater	Stock Irrigation Dewatering			1789	North West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
S9037886/2		Groundwater				1792	North West
326043	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-21.600m No Details Available D: 21.600m-21.600m Brown Coal D: 21.600m-28.100m No Details Available	1795	North
326050	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-11.800m No Details Available D: 11.800m-22.400m Brown Coal D: 22.400m-24.700m No Details Available	1810	North West
942610	Exploration Company - Minerals and Petroleum	Coal	Non Groundwater			1814	North West
326079	Department of Minerals and Energy (1977 - 1985)		Non Groundwater			1838	North West
326053	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Silty Soil G: 0.600m-3.700m Brown Silty Clay G: 3.700m-5.800m Mottled Silty Clay G: 5.800m-6.400m Yellow Sandy Clay G: 6.400m-7.300m Gravel Wet G: 7.300m-8.700m Clayey Gravel Wet G: 8.700m-9.700m Ligneous Clay G: 9.700m-12.800m Inferior Coal G: 12.800m-14.300m Coal Brown G: 14.300m-15.800m Inferior Coal G: 15.800m-17.400m Coal Brown G: 17.400m-25.000m Inferior Coal G: 25.000m-26.500m Coal Brown G: 26.500m-28.000m Inferior Coal G: 28.000m-31.100m Coal Brown G: 31.100m-32.600m Inferior Coal G: 32.600m-52.400m Coal Brown G: 52.400m-53.900m Inferior Coal G: 53.900m-55.800m Ligneous Sandy Clay G: 55.800m-55.800m Sand	1852	North West
326000	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-0.300m Red Loam D: 0.300m-1.800m Red Sand D: 1.800m-4.300m Clay, Sand, And Gravel D: 4.300m-4.900m Sand D: 4.900m-8.200m Grey And Yellow Clay D: 8.200m-9.800m Sand And Gravel D: 9.800m-10.100m Yellow Clay D: 10.100m-39.900m Brown Coal D: 39.900m-40.200m Ligneous Clay D: 40.200m-40.500m Brown Clay Water Struck At 4.57 Metres Standing At 4.57 Metres	1869	North West
326049	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-13.100m No Details Available - No Coal Found	1877	North
326041	State Electricity Commission (1919 - 1993)		SEC Bores (Use unidentified)		G: 0.000m-0.500m Mottled Clay G: 0.500m-9.200m Sand & Gravel G: 9.200m-9.400m Inferior Coal G: 9.400m-10.800m Sand & Gravel G: 10.800m-42.000m Coal Brown G: 14.000m-14.600m C = 62.2, Gdse = 24.17, H = 4.4, N = 0.56, Volatiles = 47.4 G: 18.000m-18.600m C = 63.5, Gdse = 24.74, H = 4.6, N = 0.58, Volatiles = 48.8 G: 21.000m-21.700m C = 65.3, Gdse = 25.06, H = 4.6, N = 0.59, Volatiles = 49 G: 26.400m-26.800m C = 65.6, Gdse = 26.01, H = 4.9, N = 0.59, Volatiles = 50.5 G: 27.000m-27.300m C = 65.3, Gdse = 25.95, H = 4.9, N = 0.57, Volatiles = 51.2 G: 29.500m-30.000m C = 66.2, Gdse = 26.38, H = 5, N = 0.43, Volatiles = 50 G: 31.400m-31.700m C = 66.1, Gdse = 25.72, H = 4.6, N = 0.62, Volatiles = 48.5 G: 33.000m-33.300m C = 66.9, Gdse = 26.7, H = 5.2, N = 0.57, Volatiles = 53.4 G: 37.000m-37.600m C = 66.5, Gdse = 26.63, H = 5.2, N = 0.56, Volatiles = 53.1 G: 40.000m-40.600m C = 66.4, Gdse = 26.3, H = 4.9, N = 0.57, Volatiles = 50.5 G: 42.000m-43.800m Inferior Coal G: 43.800m-44.600m Brown Sandy Clay G: 44.600m-45.500m Sand & Pyrites	1887	North West

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326063	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-1.200m Soil G: 1.200m-6.100m Clay G: 6.100m-6.700m Sand G: 6.700m-8.800m Gravel Wet G: 8.800m-12.200m Coal Brown	1915	North West
87796					D: 0.000m-0.300m Black Topsoil D: 0.300m-3.000m Basalt Floaters D: 3.000m-6.000m Honeycomb Basalt D: 6.000m-31.000m Basalt D: 31.000m-36.000m Fine Sands To 1Inch River Grave Ls No Water-Abandoned	1915	West
326051	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-9.400m No Details Available D: 9.400m-17.400m Brown Coal D: 17.400m-36.000m No Details Available	1917	North West
326082	Department of Minerals and Energy (1977 - 1985)		Non Groundwater		D: 0.000m-3.000m Clay - Red Brown Clay. Little Moisture, Fair Consistency D: 3.000m-6.000m Soil - Red Brown Earth D: 6.000m-29.000m Basalt - The Basalt Is Scoria, Weathered, With Large Vesicles Throughout Becomes More Massive Until 26M Where A Fine Red Brown Clay Layer Is Present. At 27M Basalt Is Vesicular, Partly Weathered Grey Colour D: 29.000m-43.000m Clay - Ochre Coloured Then A Lighter Orange At 33M, Little Moisture, Slightly Silty. At 34.5M Clay Turns A Reddy Colour. At 35M Clay Becomes Whiter And More Silty. 37.5M Clay Is Very Silty And A Distinctly Ochre Colour. At 39M Clay Is Very Silty And Orang D: 43.000m-57.000m Silt/Sand - Silt As Described Above With Sand ~ 1Mm Average Angular To Sub-Angular Well Sorted D: 57.000m-62.500m Clay - Good Consistency, Ochre To Orange Colour - White And Fawn D: 62.500m-63.000m Carbonaceous Clay - Dark Black To Brown - Good Consistency, High Moisture Content D: 63.000m-67.200m Brown Coal - Start Coring - 63.5M 63.5 - 64.9 No Recovery 64.9 - 66.4 2.1M Recovery 66.4 - 69.4 3.09M Recovery D: 67.200m-73.100m Clay - Grey Clay, Good Consistency, Good Moisture - Contains Bands Of Pyrite 69.4 - 72.4 2.04M Recovery Clay Also Contains Fine Shell Material 72.4 - 75.4 3.1M Recovery Last 0.6M Of Clay Has Abundant Pyrite And Some Rounded Quartz Grains ~ 3Mm To ≪1Mm D: 73.100m-121.100m Brown Coal - Black To Dark Brown Slightly Clayey For 73.06 - 73.56M Abundant Lignite Material 75.4 - 78.4 3.0M Recovery 78.4 - 81.4 3.0M Recovery 81.4 - 84.4 3.0M Recovery 84.4 - 87.4 3.0M Recovery Coal Is Much Drier And Less Clayier 87.4 - 90.4 3.0M Reco D: 121.100m-129.700m Silty Clay - Fawn Coloured Clay With Silty Particles Within - Good Consistency Silt Becomes More Abundant At 120.2M. Some Parts Of The Bed Are Clayier And Others Siltier 117.7 - 120.7 2.7M Recovery 0.8M Coal 1.8M Non Coal 120.7 - 123.7 1.7M Recovery 123.7	1969	West
326021	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.600m Surface Soil G: 0.600m-2.700m Brown Sandy Clay G: 2.700m-6.400m Grey Sandy Clay G: 6.400m-11.000m Hard Quartz G: 11.000m-12.800m Yellow Sand G: 12.800m-14.000m White Sandy Clay G: 14.000m-15.200m Grey Sandy Clay G: 15.200m-15.900m Ligneous Clay G: 15.900m-56.100m Brown Coal G: 21.900m-37.200m C = 64.3, Gdse = 24.75, H = 4.6, N = 0.6, Volatiles = 48.5 G: 37.200m-49.400m C = 64.8, Gdse = 25.62, H = 4.9, N = 0.6, Volatiles = 49.6 G: 56.100m-57.900m Ligneous Clay G: 57.900m-59.400m Grey Sand	1972	North West
326048	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-9.400m No Details Available D: 9.400m-11.500m Brown Coal D: 11.500m-31.100m No Details Available	1979	North

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
326059	Victorian Mines Department (1909 - 1977)		Non Groundwater		G: 0.000m-0.300m Soil G: 0.300m-6.400m Clay G: 6.400m-7.600m Gravel G: 7.600m-9.800m Coal Brown G: 9.800m-10.400m Clay G: 10.400m-47.200m Coal Brown G: 12.800m-18.900m C = , Gdse = 25.19, H = , N = , Volatiles = 30.7 G: 18.900m-25.000m C = , Gdse = 25.4, H = , N = , Volatiles = 30.2 G: 25.000m-31.100m C = , Gdse = 25.33, H = , N = , Volatiles = 30.9 G: 31.100m-37.200m C = , Gdse = 25.4, H = , N = , Volatiles = 29.5 G: 37.200m-43.300m C = , Gdse = 25.4, H = , N = , Volatiles = 31.5 G: 47.200m-48.800m Clay & Coal G: 48.800m-50.000m Brown Clay	1979	North West
326044	Victorian Mines Department (1909 - 1977)		Non Groundwater		D: 0.000m-8.500m No Details Available D: 8.500m-18.700m Brown Coal D: 18.700m-20.800m No Details Available	1982	North

Boreholes FedUni Data Source: © Federation University Australia

Historical Mining Activity - Shafts

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Historical Mining Activity - Shafts

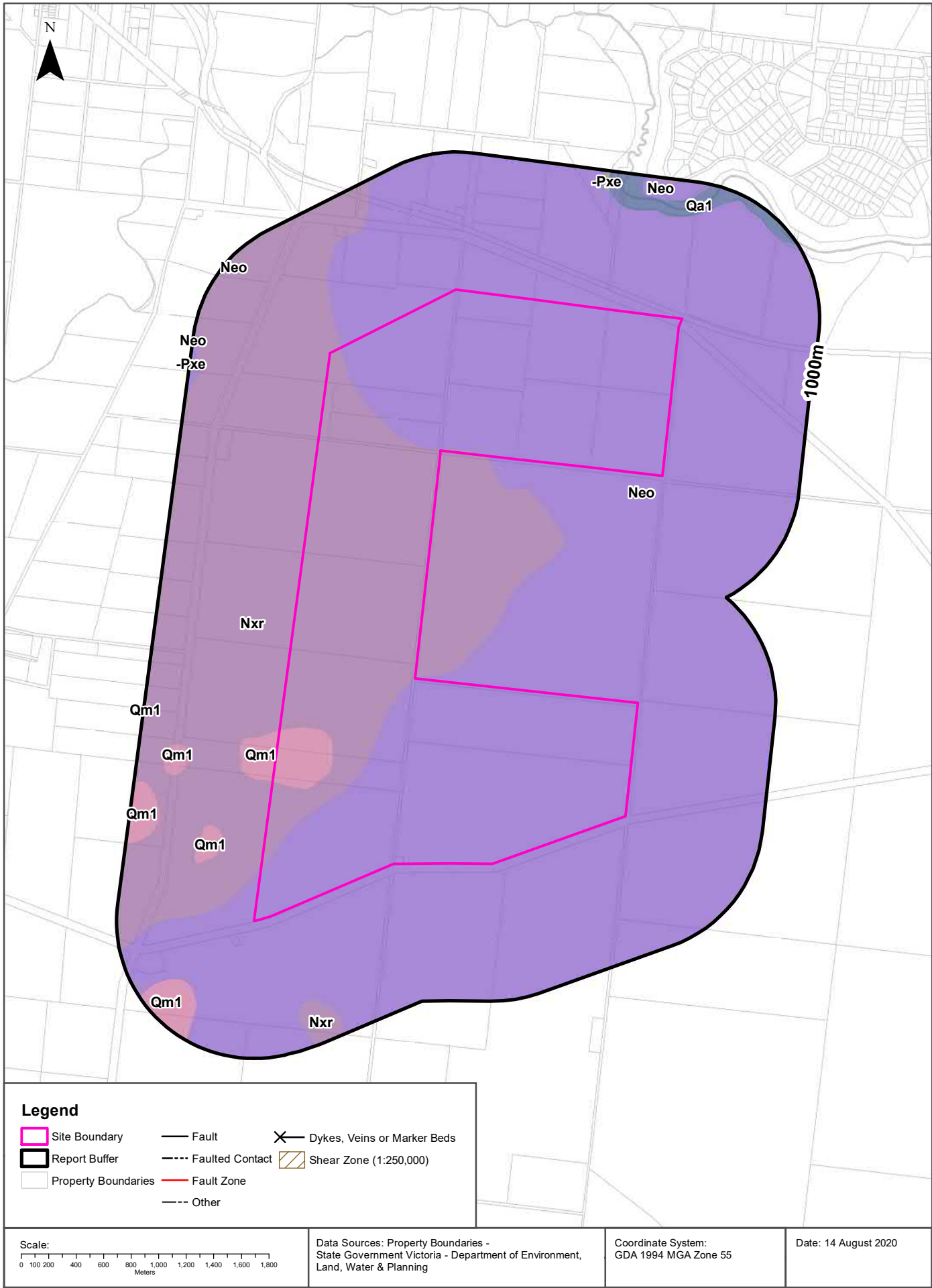
Mine Shaft Locations were collected by a variety of methods from 1869 in some areas of the state, mainly concentrating in Ballarat and Bendigo. In places a shaft may be recorded multiple times with a different source. In cases where several shaft locations are shown close together (generally with separations less than stated position errors) and they have different sources, it is possible that one shaft has been mapped several times. In cases where several shaft locations are shown close together but they have the same information source, it is possible that each shaft location represents a different shaft on the ground.

Historical Mine Shafts within the dataset buffer:

Map Id	Name	Source	Depth (m)	Collar (ft)	Fill/Cap Method	Location Desc	Location Accuracy	Distance	Direction
N/A	No records in buffer								

Historical Mining Activity Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources

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Geology

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Geological Units

What are the Geological Units onsite?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	1:50,000
Nxr	Darley Gravel (Nxr): generic	Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source	Neogene to Pleistocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
Qm1	swamp and lake deposits (Qm1): generic	Grey to black carbonaceous mud, silt, clay, minor peat: generally unconsolidated; rare dolomite	Pleistocene to Holocene	mud (major proportion); silt material (significant); clay lithology (significant); peat (minor proportion)	1:50,000

What are the Geological Units within the dataset buffer?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	1:50,000
Nxr	Darley Gravel (Nxr): generic	Gravel, sand, silt: gravel red to pale colours; rounding and sorting moderate to good; moderately consolidated; massive to trough cross-bedded; gravel clasts of vein quartz, sandstone, basalt, ironstone in proportions that reflect the local source	Neogene to Pleistocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000
-Pxe	Werribee Formation (-Pxe): generic	Sand, silt, clay, gravel in variable proportions: generally white to pale grey; in part carbonaceous, pyritic; ferruginous bands common; contains Cinnamomum flora	Eocene to Miocene	sand (significant); silt material (significant); clay lithology (significant); gravel material (significant)	1:50,000
Qa1	alluvium(Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	1:50,000

Symbol	Name	Description	Geological Age	Lithology	Dataset
Qm1	swamp and lake deposits (Qm1): generic	Grey to black carbonaceous mud, silt, clay, minor peat: generally unconsolidated; rare dolomite	Pleistocene to Holocene	mud (major proportion); silt material (significant); clay lithology (significant); peat (minor proportion)	1:50,000

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Geology

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Geological Structures

What are the Geological Faults or Faulted Contacts onsite?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:50,000

What are the Dykes, Marker Beds and Veins onsite?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:50,000

What are the Shear Zones onsite (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

What are the Geological Faults or Faulted Contacts within the dataset buffer?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:50,000

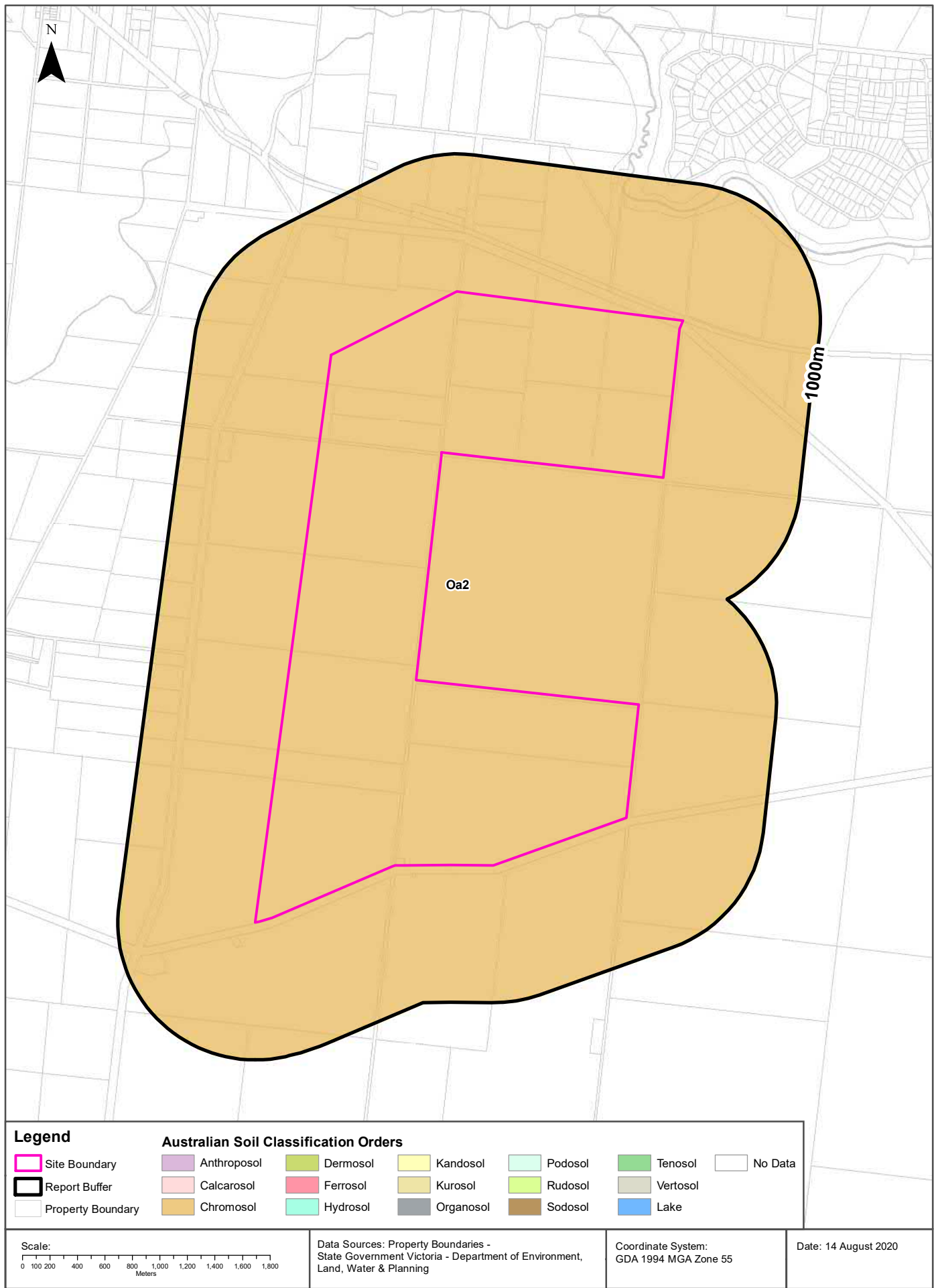
What are the Dykes, Marker Beds and Veins within the dataset buffer?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:50,000

What are the Shear Zones within the dataset buffer (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>



Soil Landscapes

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

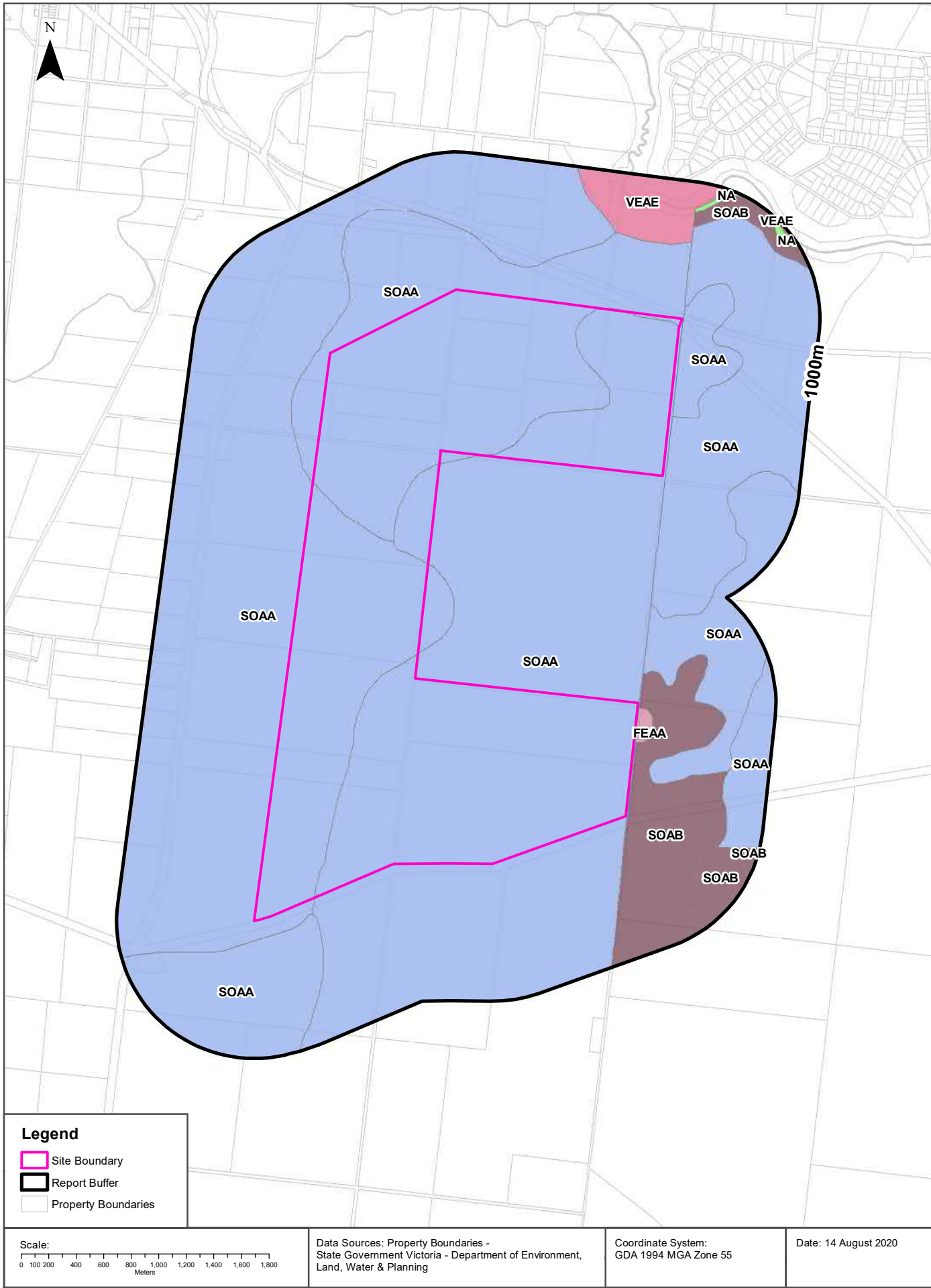
Atlas of Australian Soils

Australian soil types within the dataset buffer:

Symbol	Soil Order	Map Unit Description	Distance
Oa2	Chromosol	Dissected plateaux at low elevation: plains of hard alkaline red soils (Dr2.13) often in gilgai micro- association with dark cracking clays (Ug5.1), and grey and brown cracking clays (Ug5.2 and Ug5.3), small areas of other soils such as (Dr2.33), (Dy3.43), and (Dd1.1); also with (1) low, broad, sprawling stony rises of (Dr2.13), (2) low rounded hills of various (D) soils such as (Db1.23) with boulder strewn slopes, and (3) incised, often gorge-like, stream valleys of undescribed soils.	0m

Atlas of Australian Soils: CSIRO

Creative Commons Attribution 4.0 International © Commonwealth of Australia <http://creativecommons.org/licenses/by/4.0/>



Soils Landscapes

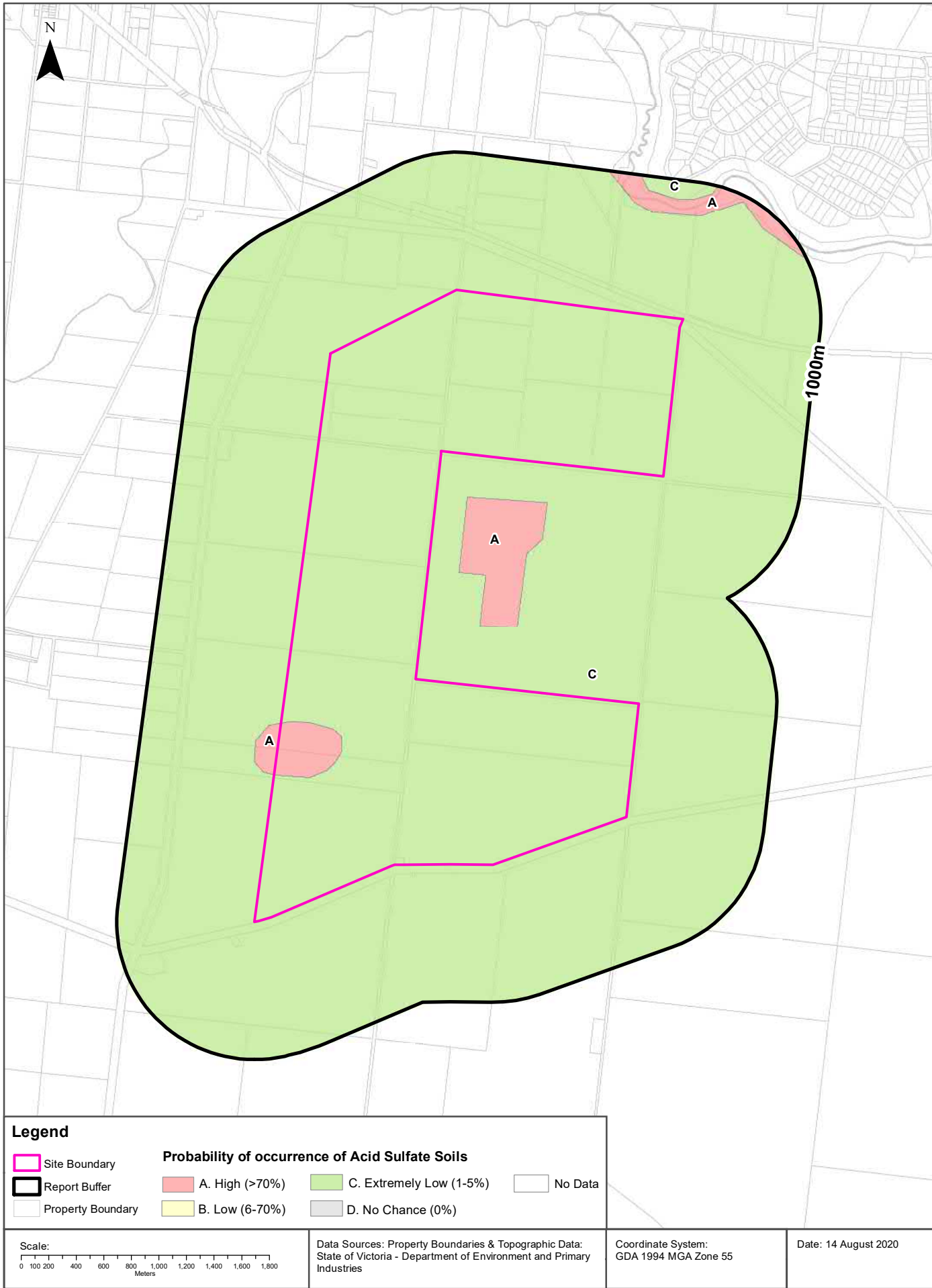
Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Victorian Soil Type Mapping

Victorian Soil Types within the dataset buffer:

Symbol	Description	Distance
SOAA	Red Sodosols	0m
FEAA	Red Ferrosols	2m
SOAB	Brown Sodosols	2m
VEAE	Black Vertosols	528m
NA	Unassigned	777m

Victorian Soil Type Mapping Data Source: Department of Economic Development, Jobs, Transport and Resources
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Acid Sulfate Soils

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Atlas of Australian Acid Sulfate Soils

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

PROBCLASS	Description	Distance
A	High Probability of occurrence. >70% chance of occurrence.	0m
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Acid Sulfate Soils

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Coastal Acid Sulfate Soils

What are the on-site Coastal Acid Sulfate Soil types?

Coastal Acid Sulfate Soil Types
There are no Acid Sulfate areas onsite

What are the Coastal Acid Sulfate Soil types within the dataset buffer?

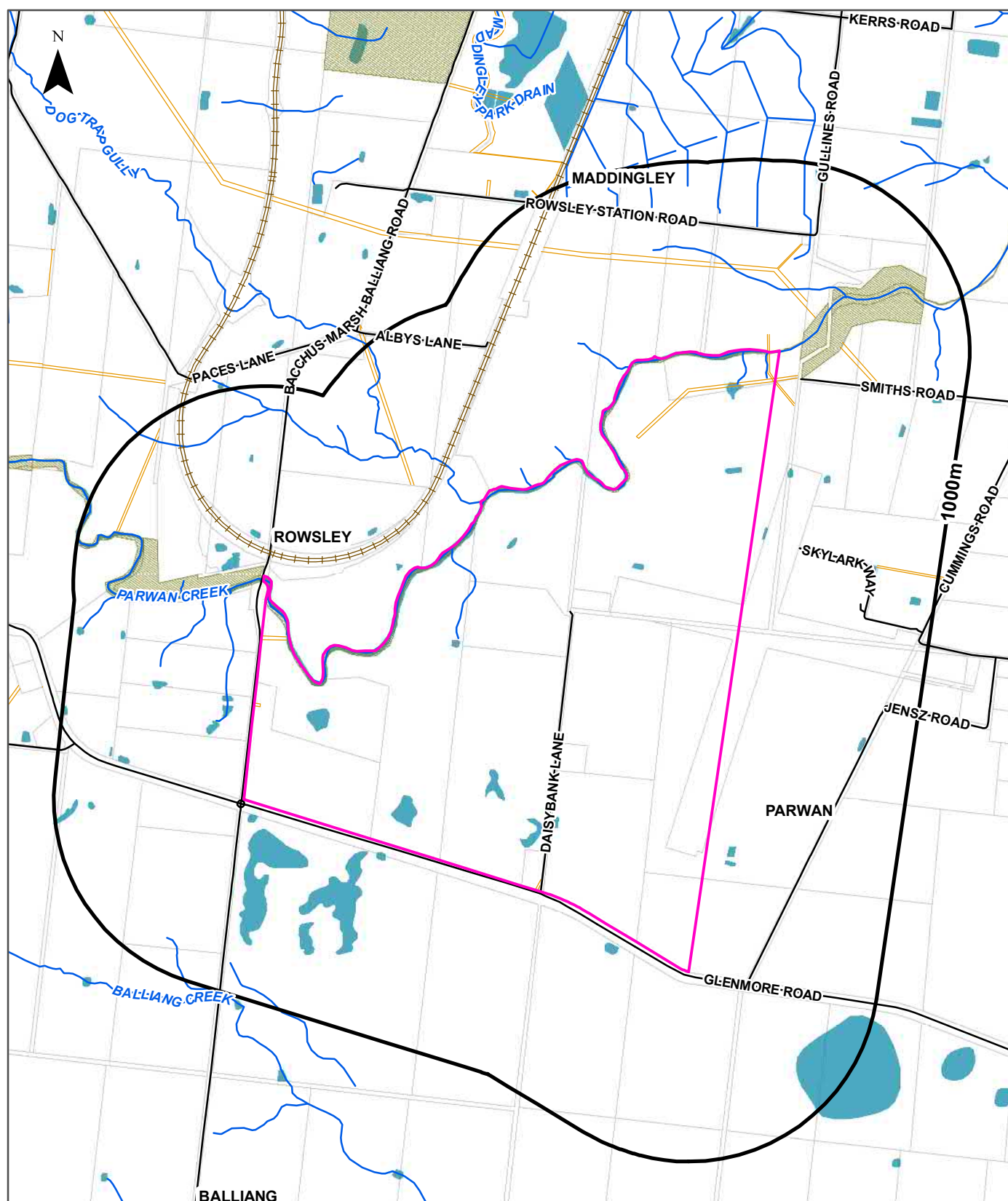
Coastal Acid Sulfate Soil Types	Distance	Direction
There are no Acid Sulfate areas within the report buffer		

Coastal Acid Sulfate Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Appendix D Surface Water

Topographic Data

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Legend

Site Boundary	Water Area	Major Road	Railway	Watercourse
Report Buffer	Crown or Commonwealth Land	Road	Light Rail	Easement
Property Boundaries	Statewide Forest	Track/Pathway	Rail - Underground/Tunnel	

Scale:
0 100 200 400 600 800 1,000 1,200 1,400
Meters

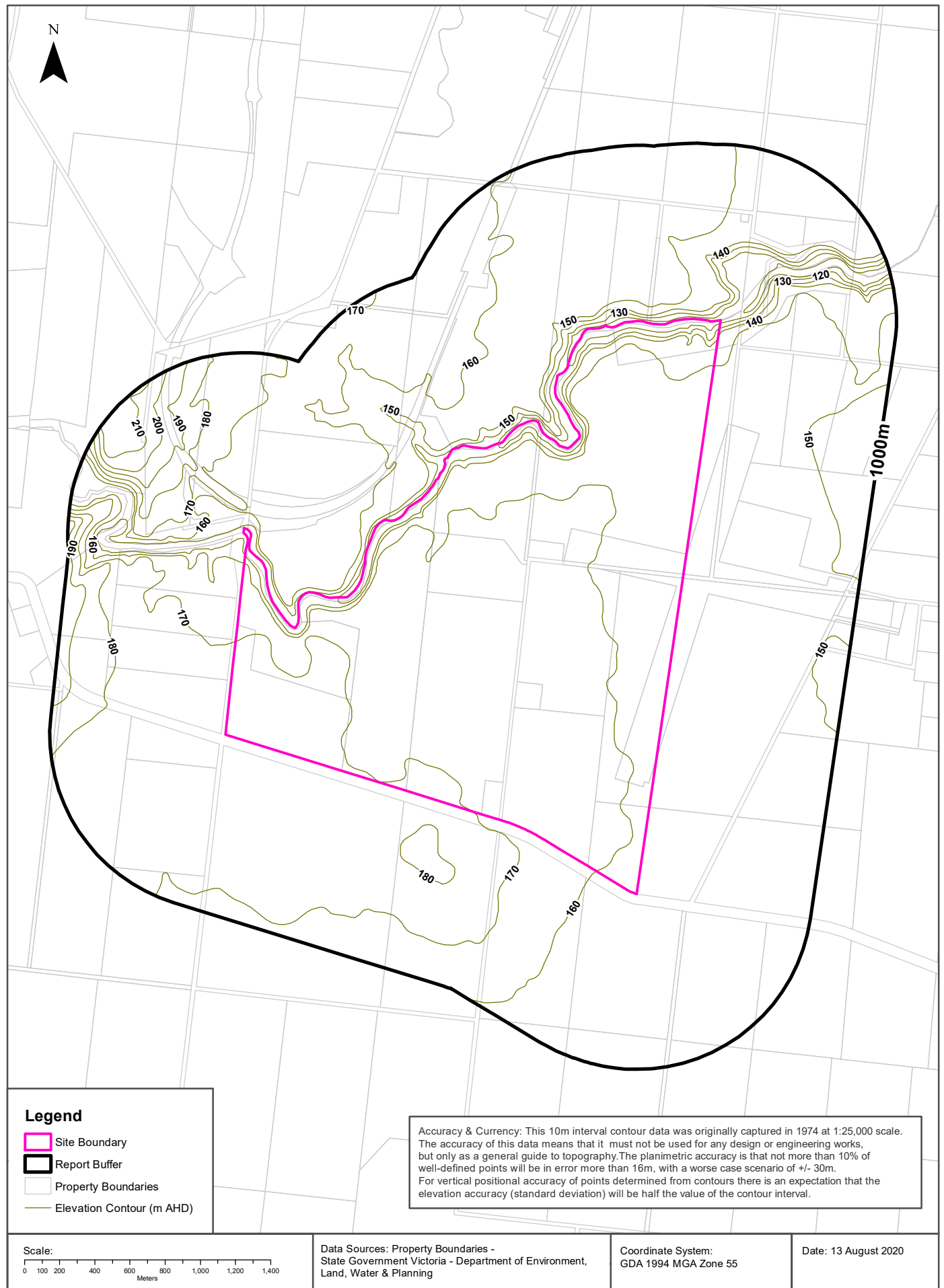
Data Sources: Property Boundaries -
State Government Victoria - Department of Environment,
Land, Water & Planning

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August 2020

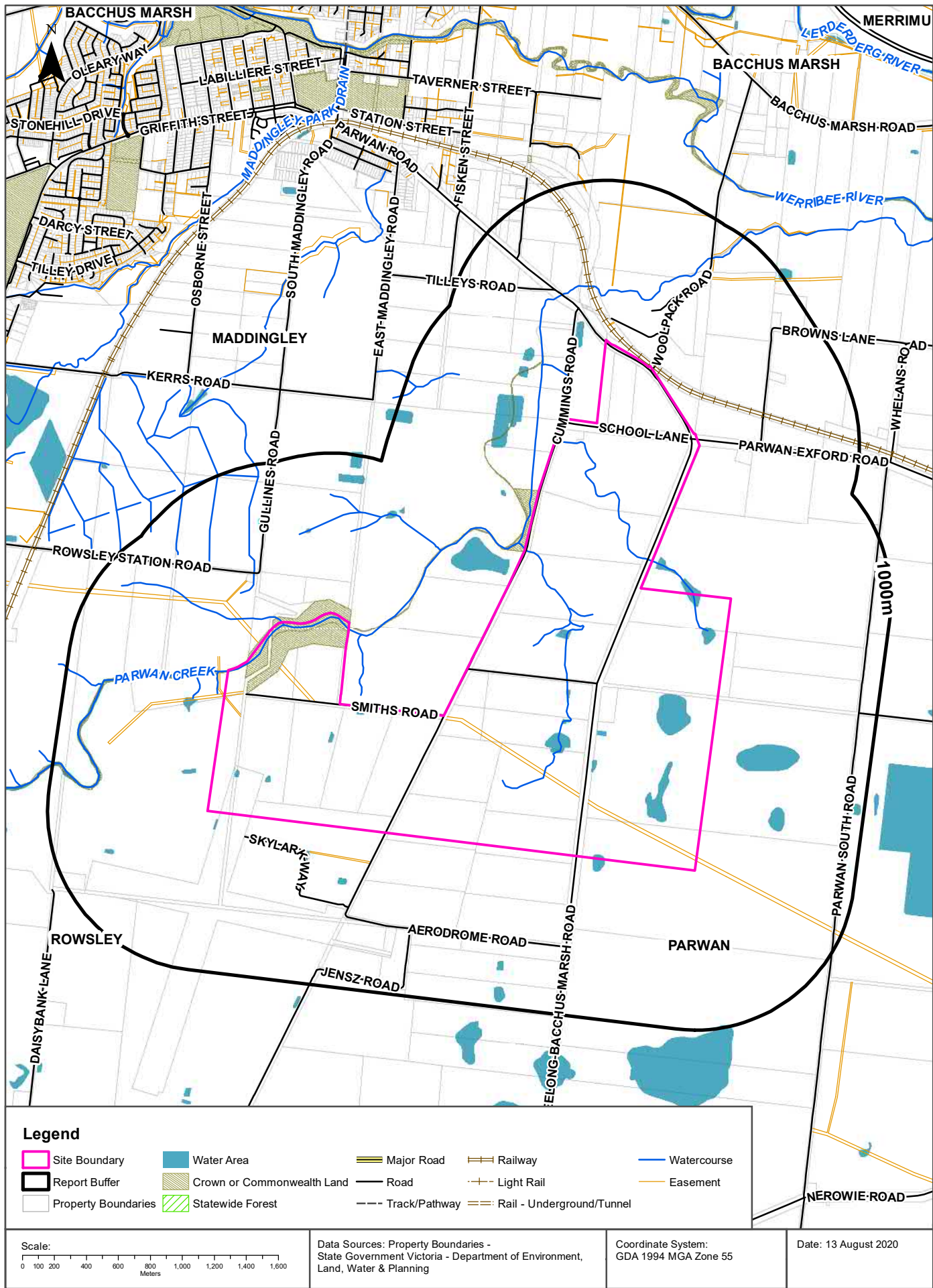
Elevation Contours (m AHD) 10m Interval at 1:25,000

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



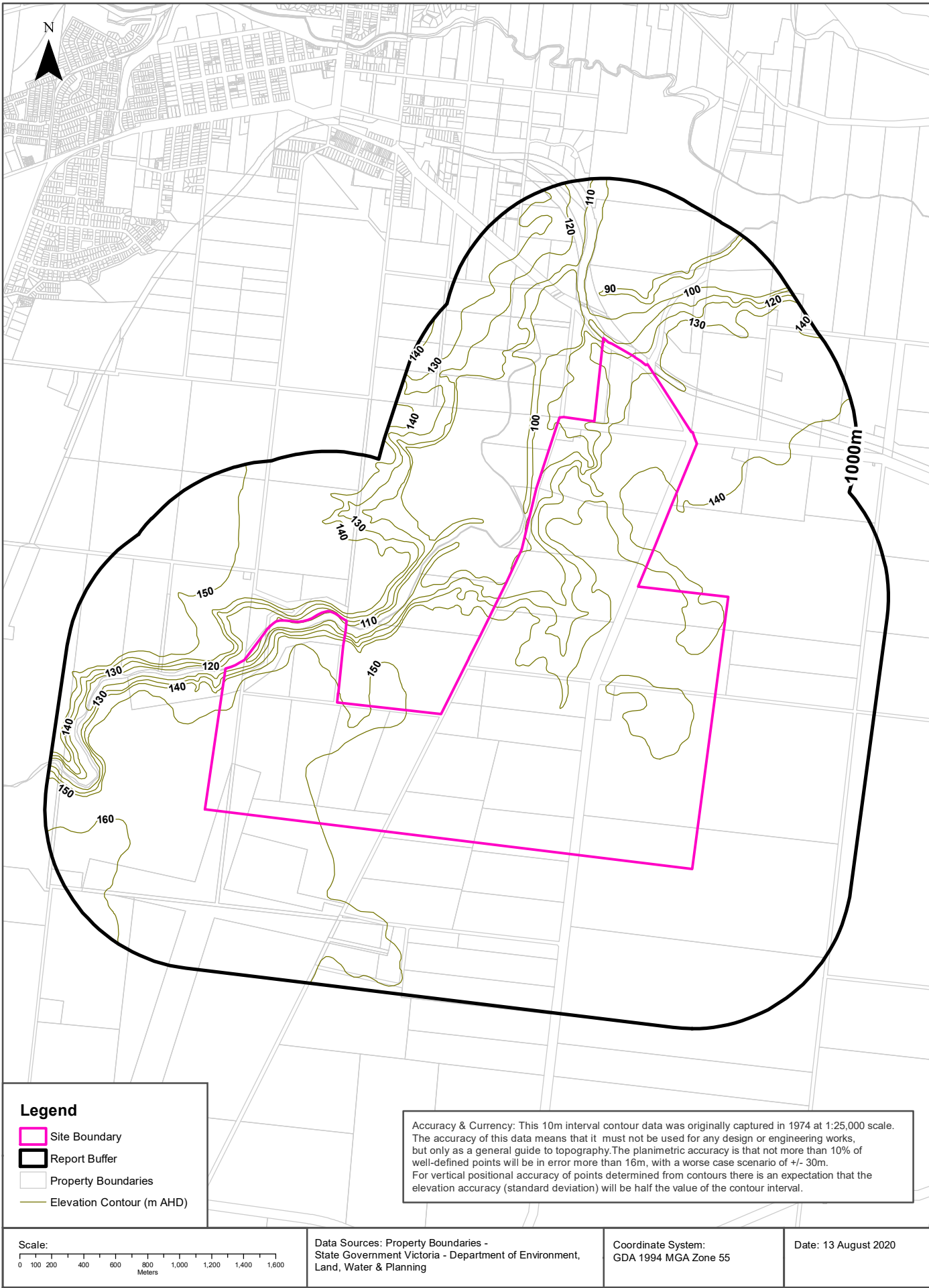
Topographic Data

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



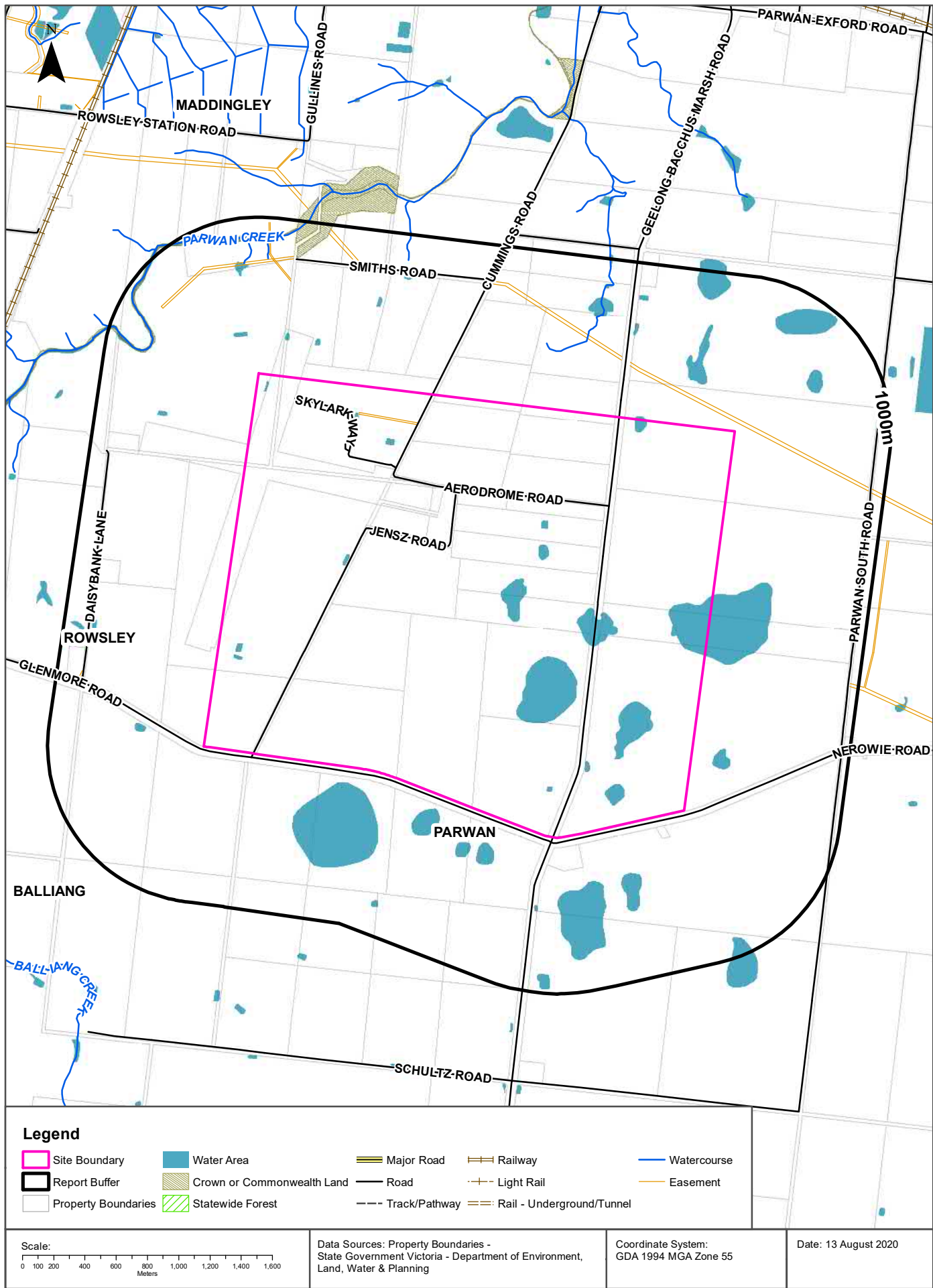
Elevation Contours (m AHD) 10m Interval at 1:25,000

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Topographic Data

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



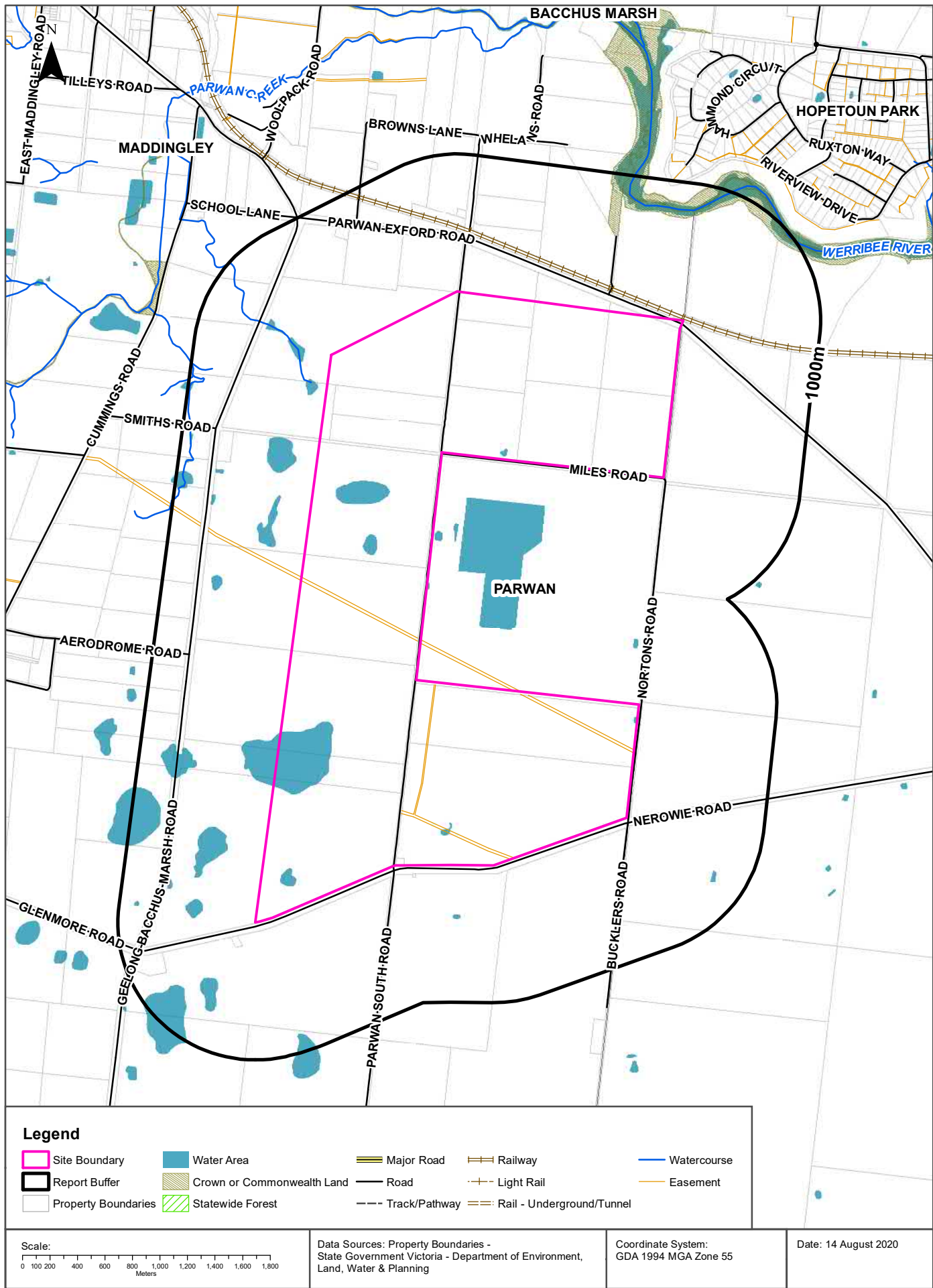
Elevation Contours (m AHD) 10m Interval at 1:25,000

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Topographic Data

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

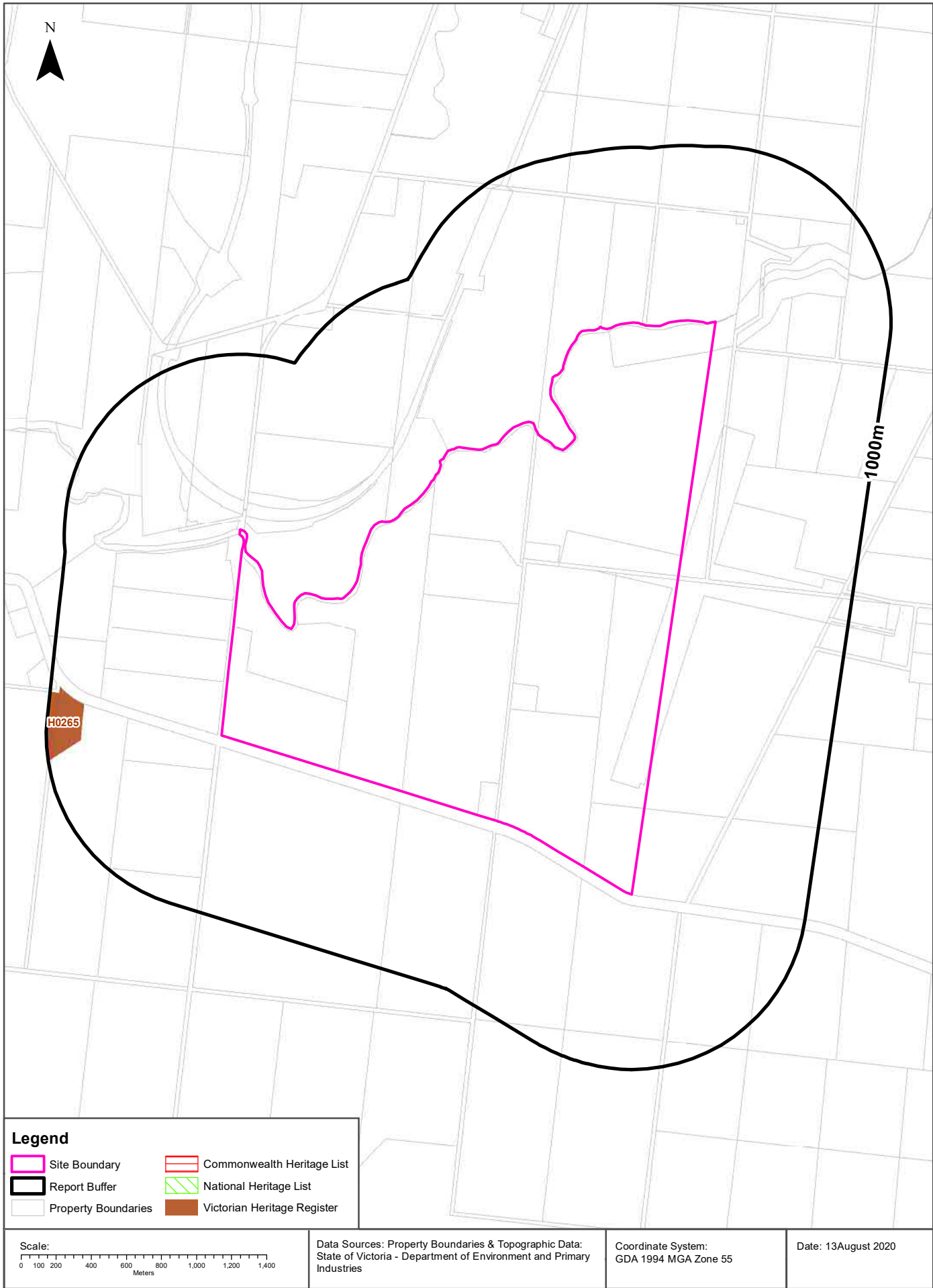


Elevation Contours (m AHD) 10m Interval at 1:25,000

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Appendix E Cultural Heritage



Heritage

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

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
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

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
N/A	No records in buffer							

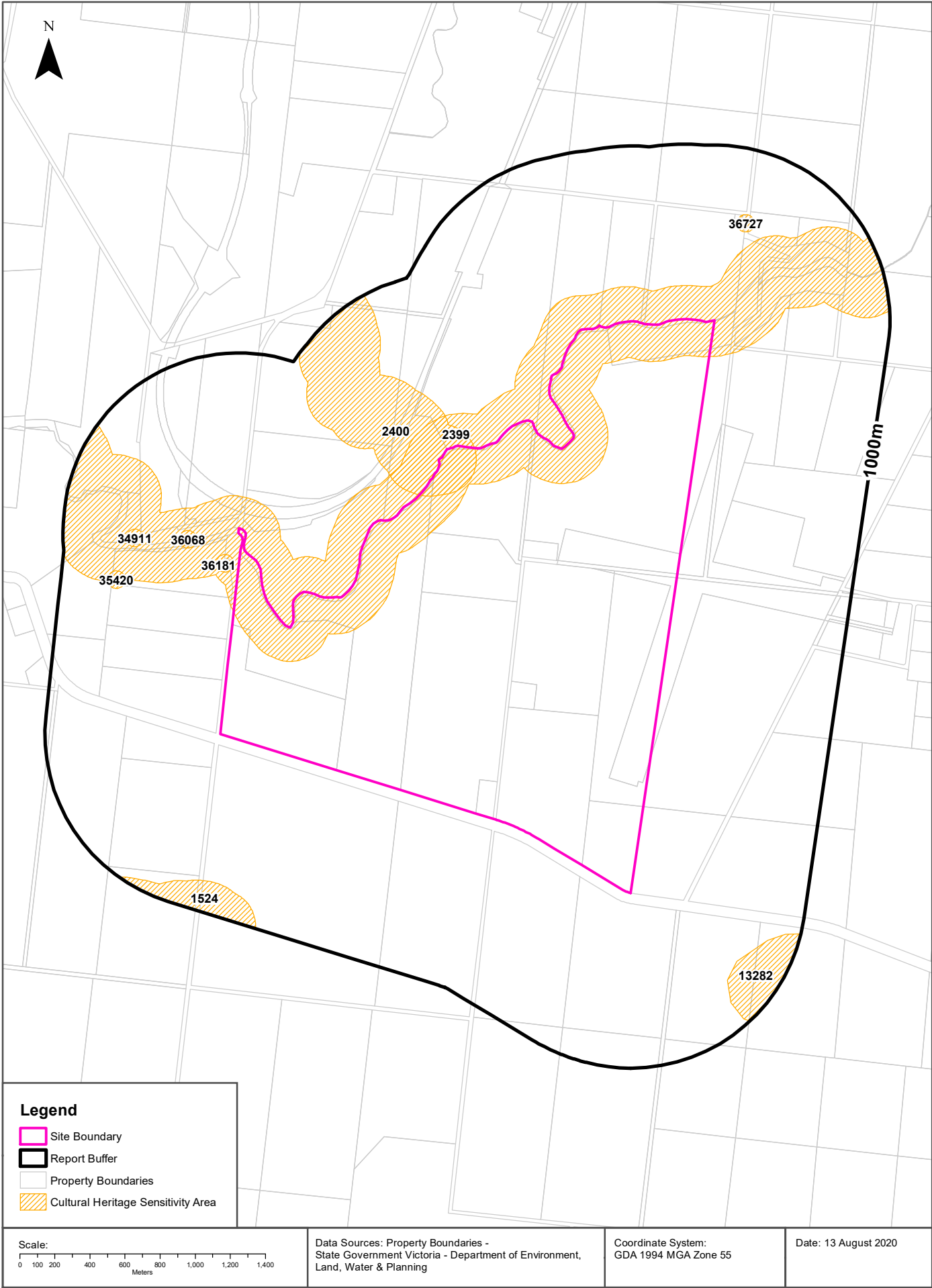
Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

Victorian Heritage Register

What are the Victorian Heritage Register items located within the dataset buffer?:

VHR Number	Description	Distance	Direction
H0265	GREYSTONES HOMESTEAD AND OUTBUILDINGS	798m	West

Victorian Heritage Register Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
Creative Commons Attribution 4.0 International © Commonwealth of Australia <http://creativecommons.org/licenses/by/4.0/>



Heritage

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

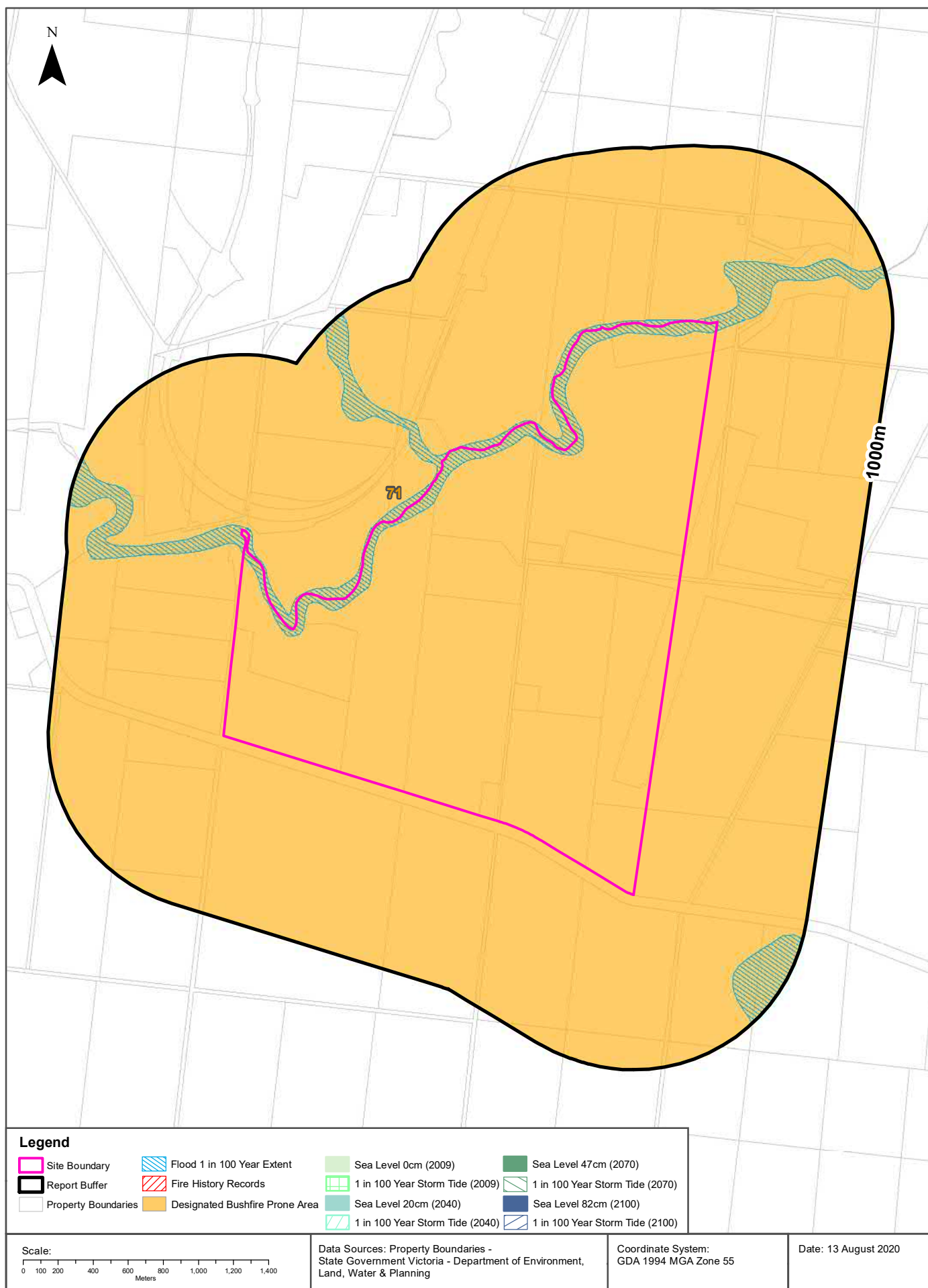
Cultural Heritage Sensitivity

Areas of Cultural Heritage Sensitivity as specified in Division 3 of Part 2 in the Victorian Aboriginal Heritage Regulations 2018, within the dataset buffer:

Map Id	Distance	Direction
2399	0m	Onsite
2400	0m	Onsite
36181	29m	West
36068	239m	West
36727	532m	North East
34911	541m	West
35420	634m	West
13282	720m	South East
1524	818m	South

Cultural Heritage Sensitivity Data Custodian: State Government Victoria - Department of Premier and Cabinet
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Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Heritage

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

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
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

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
N/A	No records in buffer							

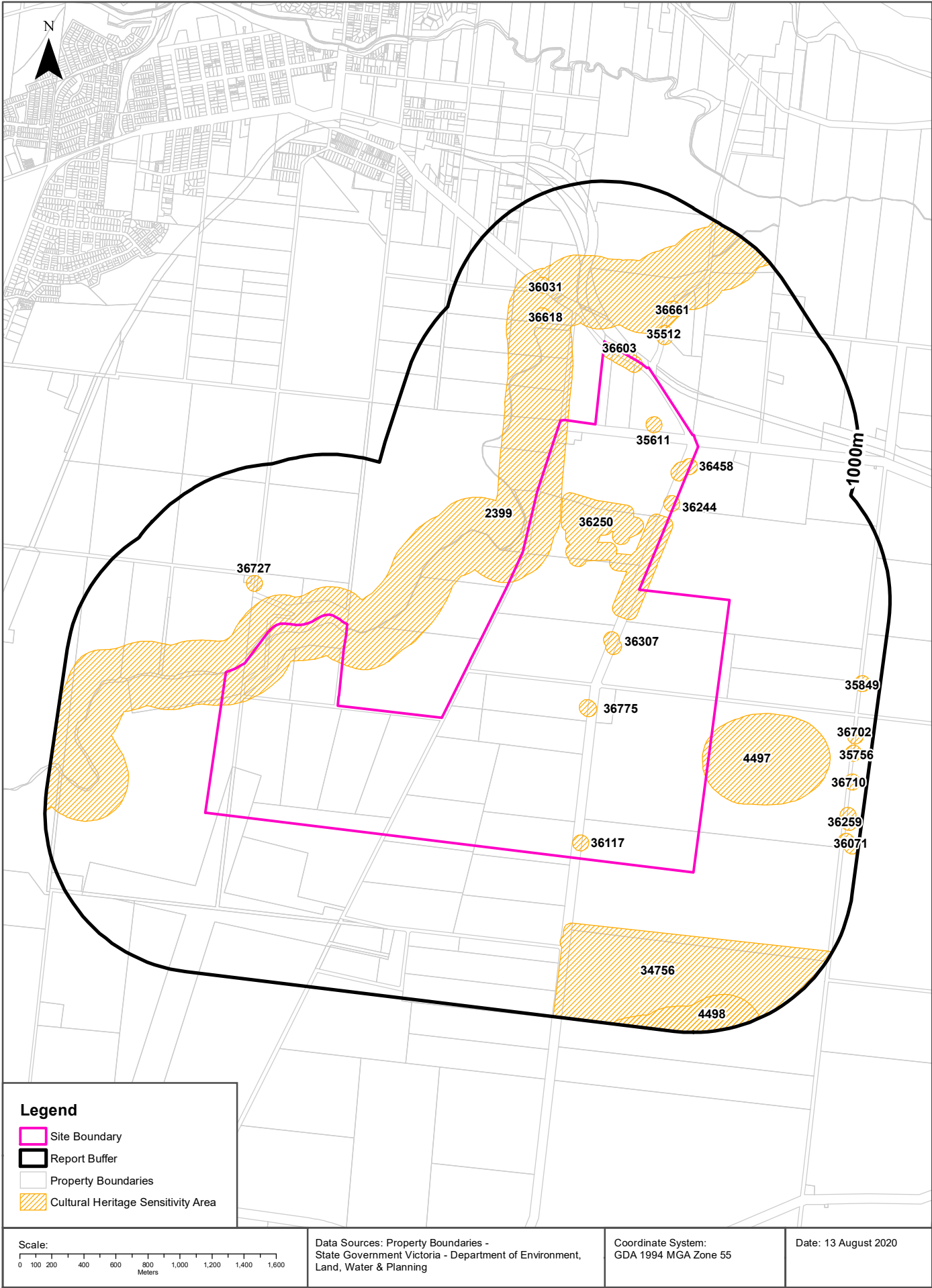
Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

Victorian Heritage Register

What are the Victorian Heritage Register items located within the dataset buffer?:

VHR Number	Description	Distance	Direction
N/A	No records within buffer		

Victorian Heritage Register Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
Creative Commons Attribution 4.0 International © Commonwealth of Australia <http://creativecommons.org/licenses/by/4.0/>



Heritage

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Cultural Heritage Sensitivity

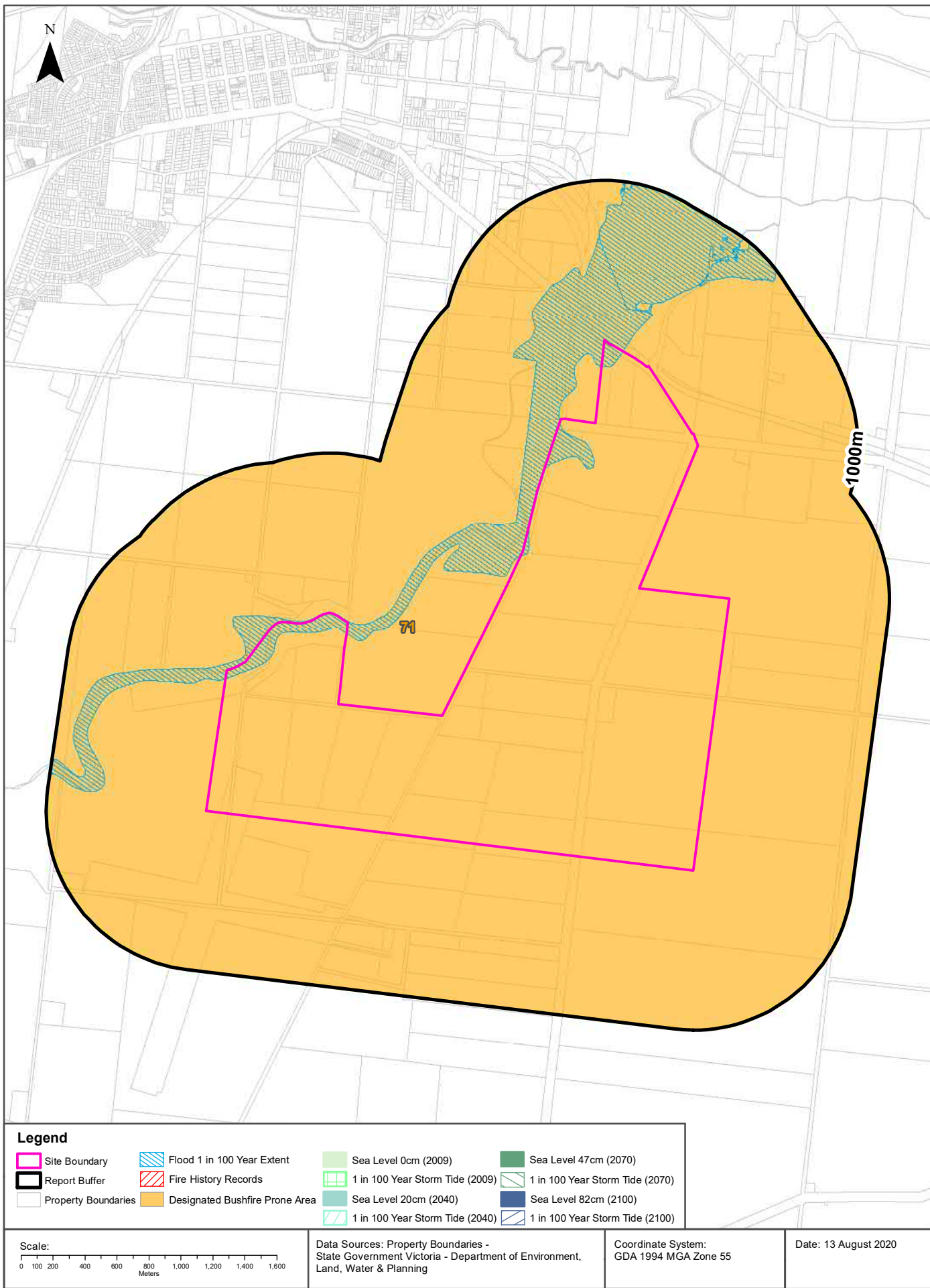
Areas of Cultural Heritage Sensitivity as specified in Division 3 of Part 2 in the Victorian Aboriginal Heritage Regulations 2018, within the dataset buffer:

Map Id	Distance	Direction
2399	0m	Onsite
36250	0m	Onsite
36603	0m	Onsite
36307	0m	Onsite
36458	0m	Onsite
36117	0m	Onsite
35611	0m	Onsite
36775	0m	Onsite
4497	0m	Onsite
36244	0m	Onsite
35512	166m	North East
36727	244m	West
36661	343m	North
36618	368m	North
34756	397m	South
36031	470m	North
4498	779m	South East
35849	839m	East
36702	840m	East
35756	842m	East
36710	858m	East
36259	860m	South East
36071	869m	South East

Cultural Heritage Sensitivity Data Custodian: State Government Victoria - Department of Premier and Cabinet
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Natural Hazards

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Heritage

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

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
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

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
N/A	No records in buffer							

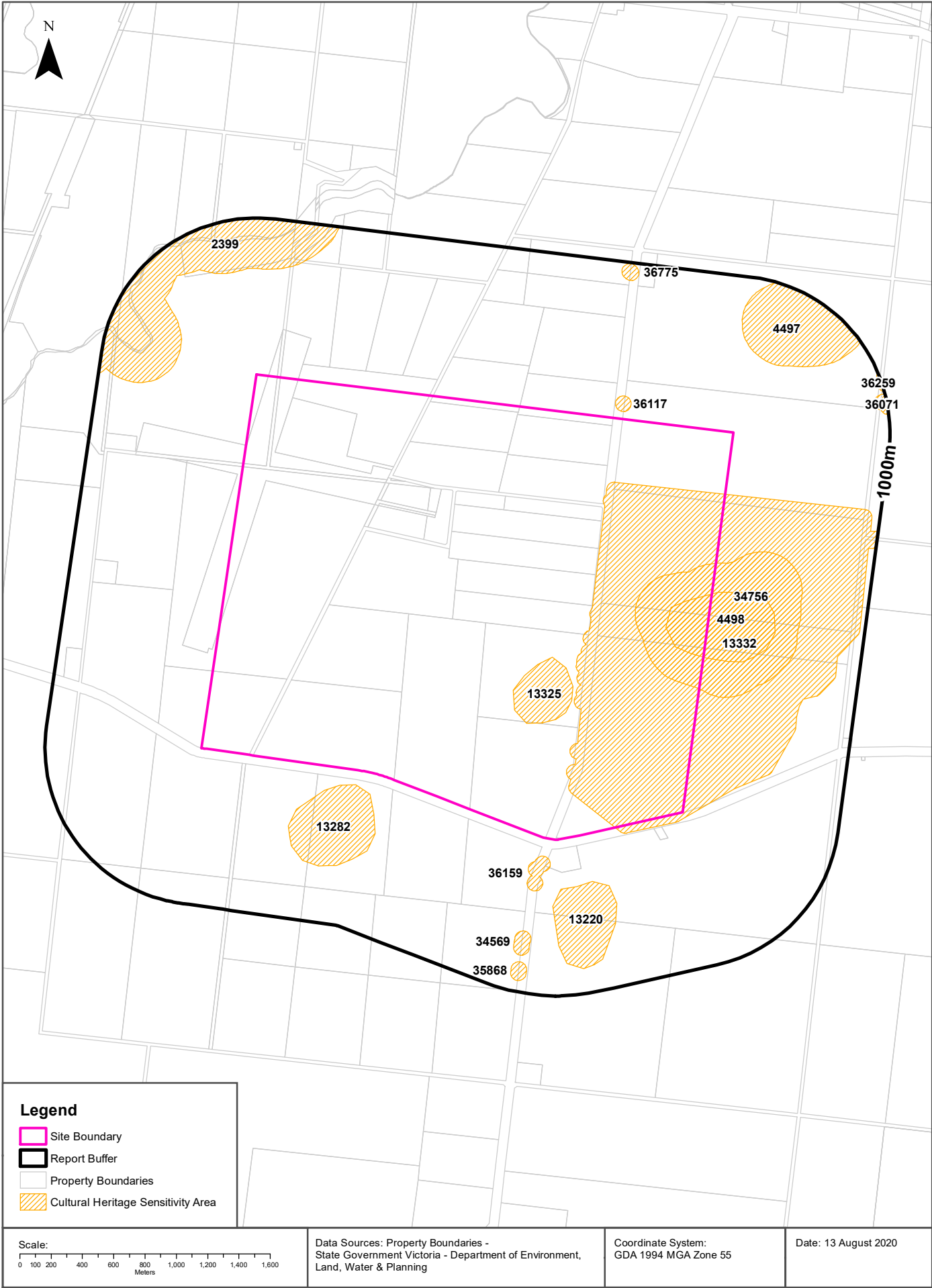
Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

Victorian Heritage Register

What are the Victorian Heritage Register items located within the dataset buffer?:

VHR Number	Description	Distance	Direction
N/A	No records within buffer		

Victorian Heritage Register Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
Creative Commons Attribution 4.0 International © Commonwealth of Australia <http://creativecommons.org/licenses/by/4.0/>



Heritage

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Cultural Heritage Sensitivity

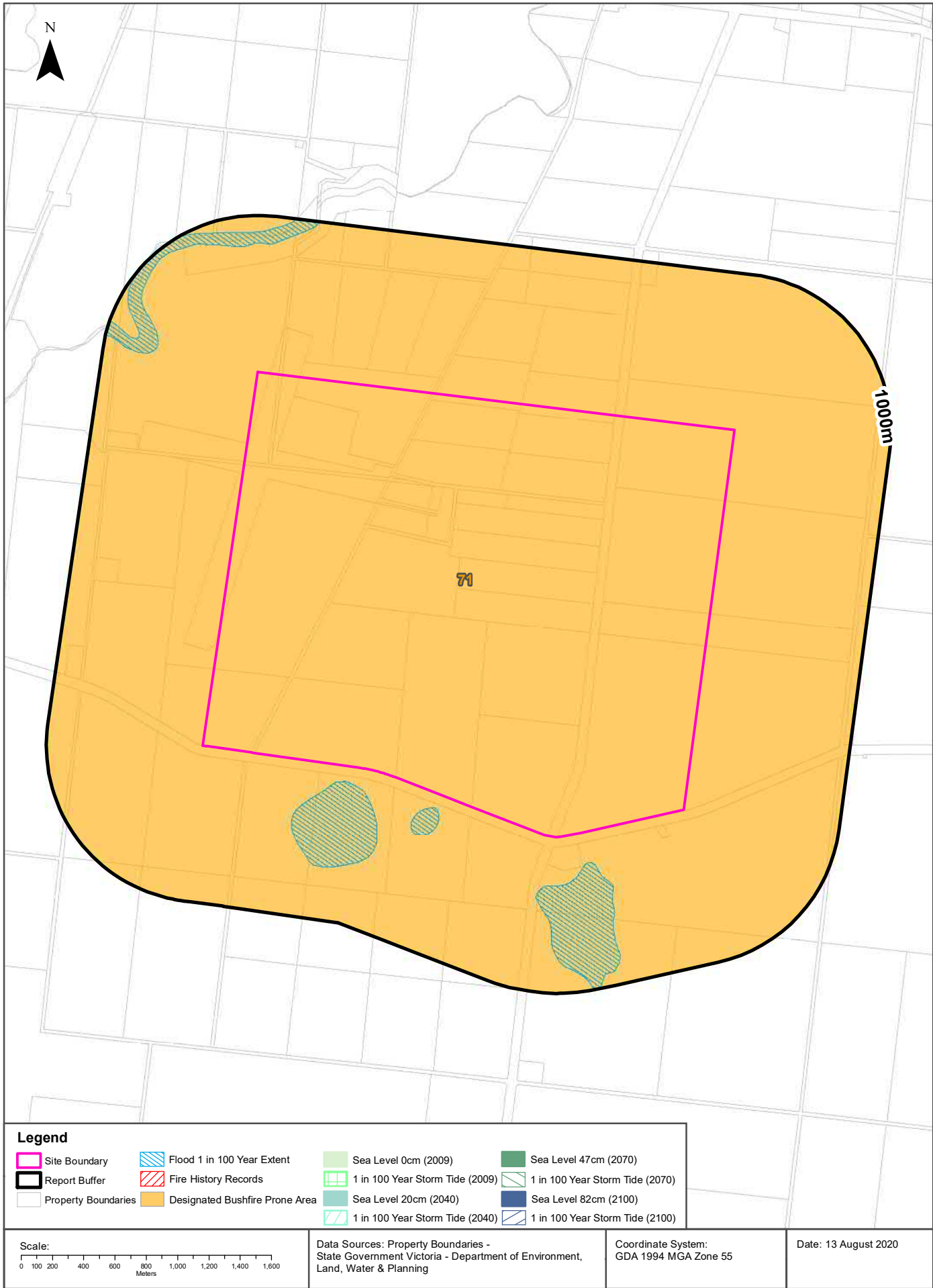
Areas of Cultural Heritage Sensitivity as specified in Division 3 of Part 2 in the Victorian Aboriginal Heritage Regulations 2018, within the dataset buffer:

Map Id	Distance	Direction
34756	0m	Onsite
4498	0m	Onsite
13325	0m	Onsite
13332	0m	Onsite
36117	48m	North East
13282	93m	South West
36159	118m	South
13220	304m	South
4497	504m	North East
2399	511m	North West
34569	611m	South
35868	809m	South
36775	886m	North East
36071	923m	North East
36259	970m	North East

Cultural Heritage Sensitivity Data Custodian: State Government Victoria - Department of Premier and Cabinet
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Natural Hazards

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Heritage

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

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
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

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
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
Creative Commons 3.0 © Commonwealth of Australia <https://creativecommons.org/licenses/by/3.0/au/deed.en>

Victorian Heritage Register

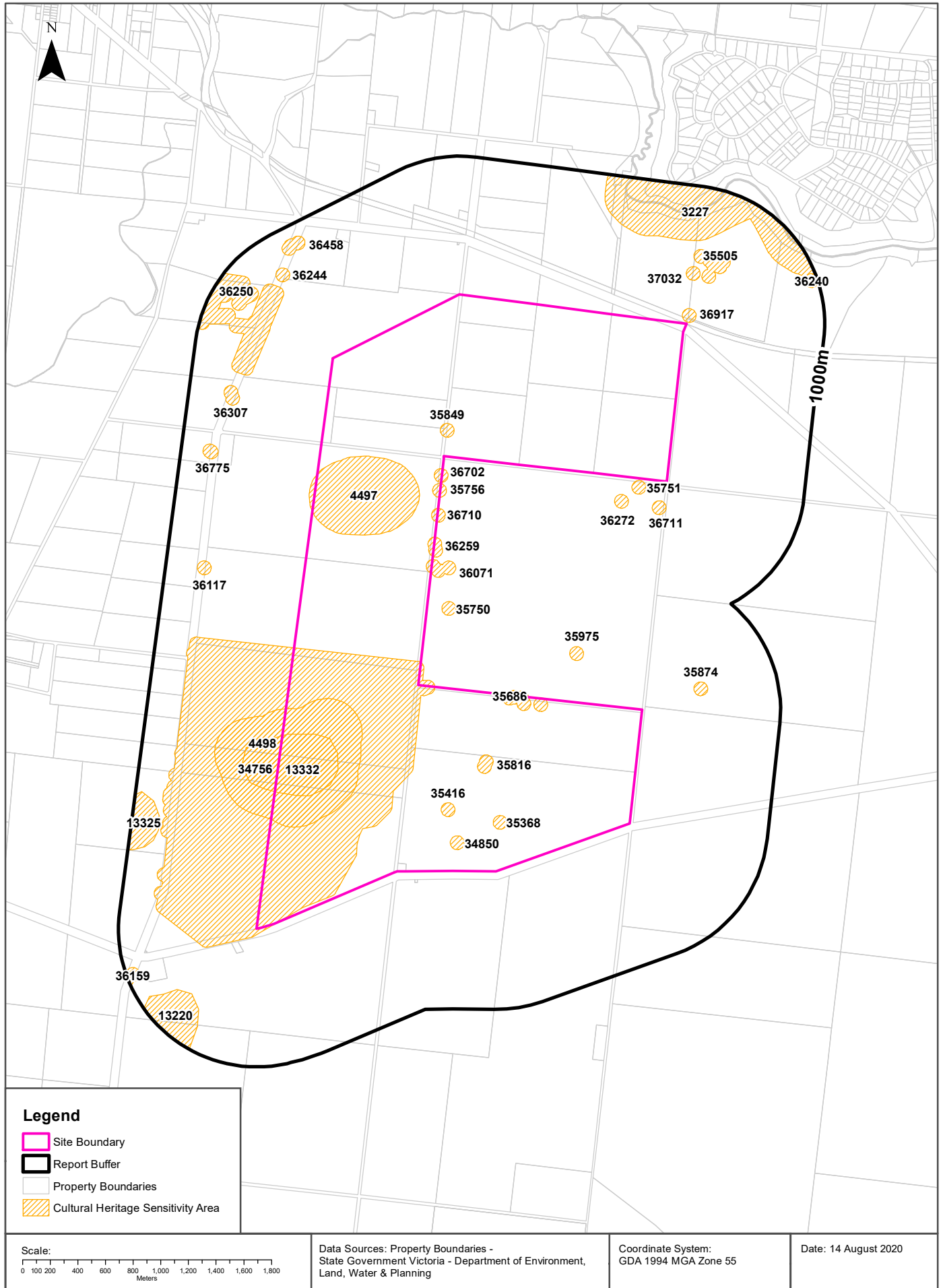
What are the Victorian Heritage Register items located within the dataset buffer?:

VHR Number	Description	Distance	Direction
N/A	No records within buffer		

Victorian Heritage Register Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Cultural Heritage Sensitivity

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Heritage

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Cultural Heritage Sensitivity

Areas of Cultural Heritage Sensitivity as specified in Division 3 of Part 2 in the Victorian Aboriginal Heritage Regulations 2018, within the dataset buffer:

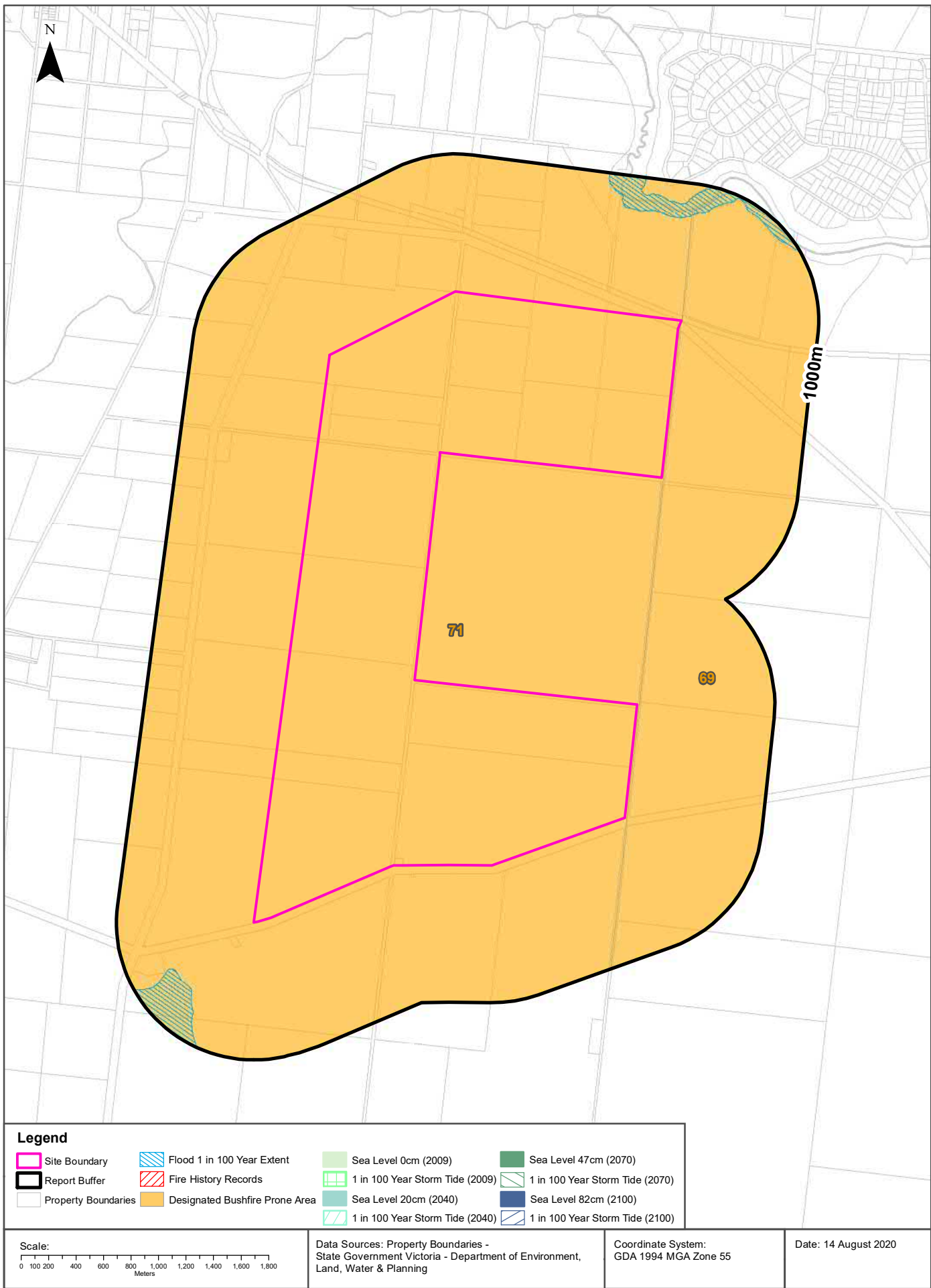
Map Id	Distance	Direction
34756	0m	Onsite
4498	0m	Onsite
4497	0m	Onsite
13332	0m	Onsite
35686	0m	Onsite
35756	0m	Onsite
35816	0m	Onsite
35824	0m	Onsite
35849	0m	Onsite
34850	0m	Onsite
35368	0m	Onsite
35416	0m	Onsite
36259	0m	Onsite
36702	0m	Onsite
36710	0m	North
36071	0m	North
36917	14m	North East
35751	16m	North East
35750	108m	South
36272	130m	North East
36711	145m	North East
35975	302m	East
37032	318m	North East
35505	330m	North East
35874	400m	East
36250	499m	North West
3227	595m	North West
36307	630m	North West
36244	654m	North West
13220	664m	South West

Map Id	Distance	Direction
36117	671m	West
36775	732m	North West
13325	796m	South West
36458	802m	North West
36159	904m	South West
36240	908m	North East

Cultural Heritage Sensitivity Data Custodian: State Government Victoria - Department of Premier and Cabinet
Creative Commons Attribution 4.0 International © Commonwealth of Australia <http://creativecommons.org/licenses/by/4.0/>

Natural Hazards

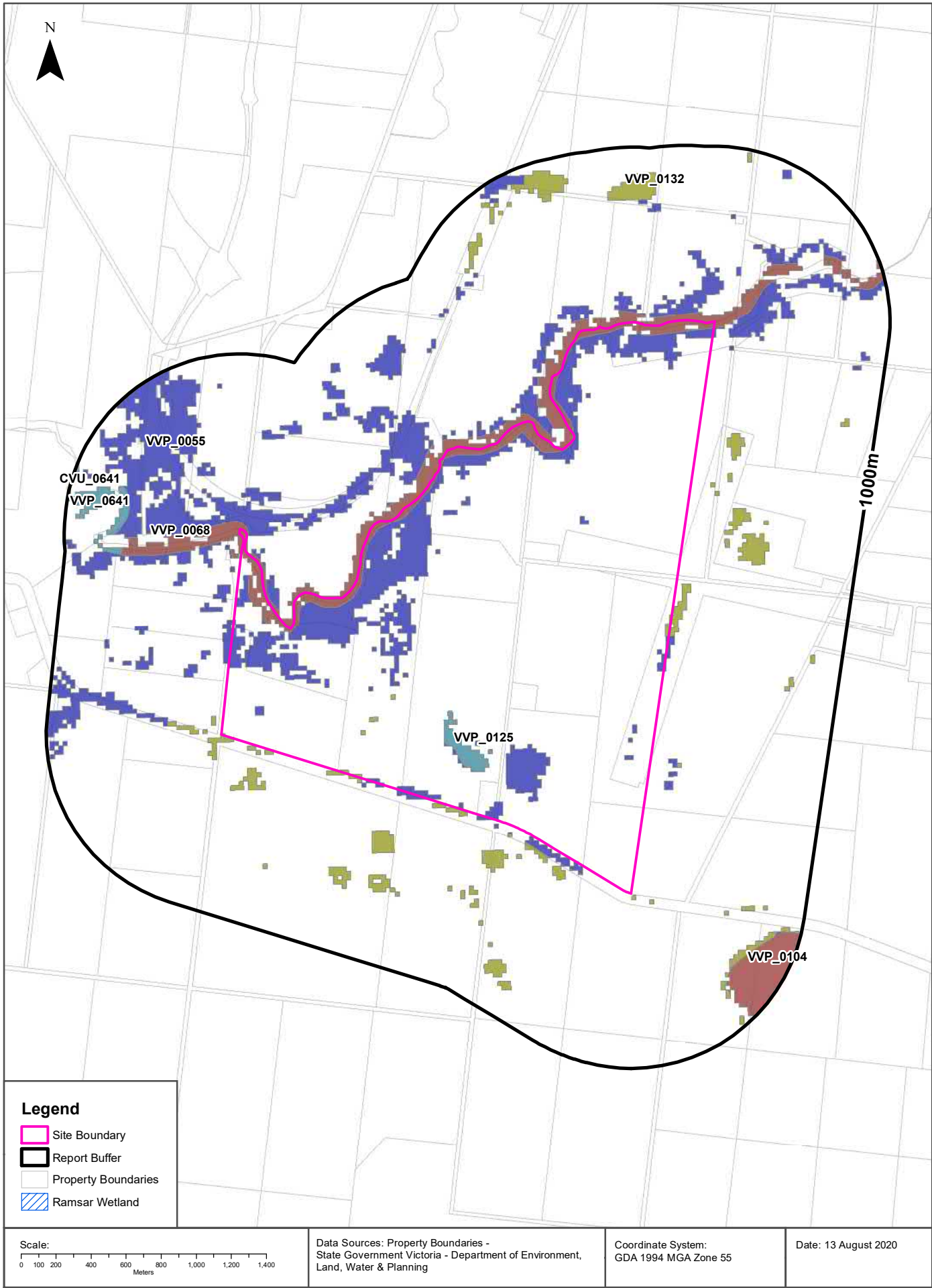
Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Appendix F Environmental Constraints

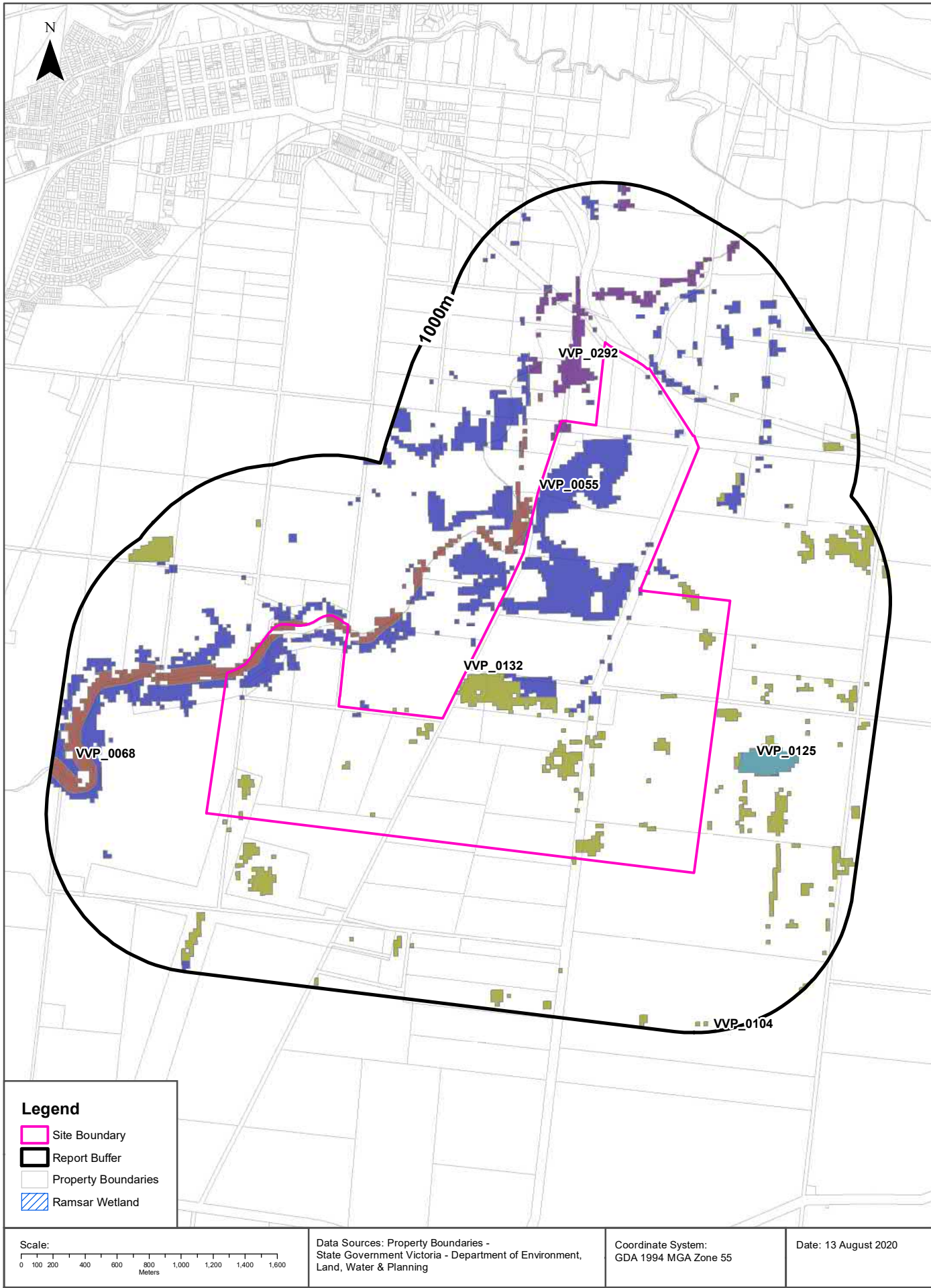
Ecological Constraints - Native Vegetation 2005 & Ramsar Wetlands

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Ecological Constraints - Native Vegetation 2005 & Ramsar Wetlands

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



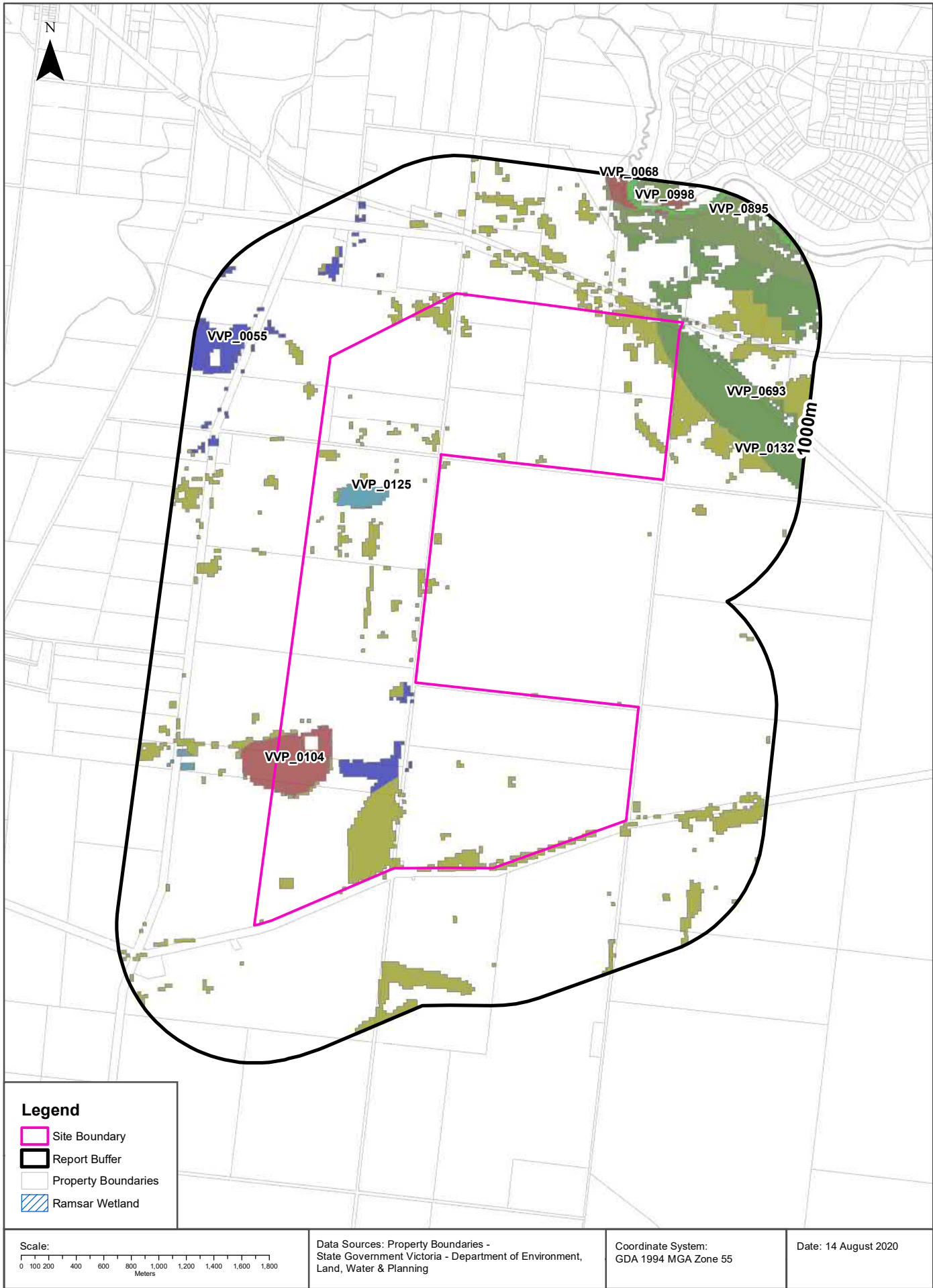
Ecological Constraints - Native Vegetation 2005 & Ramsar Wetlands

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Ecological Constraints - Native Vegetation 2005 & Ramsar Wetlands

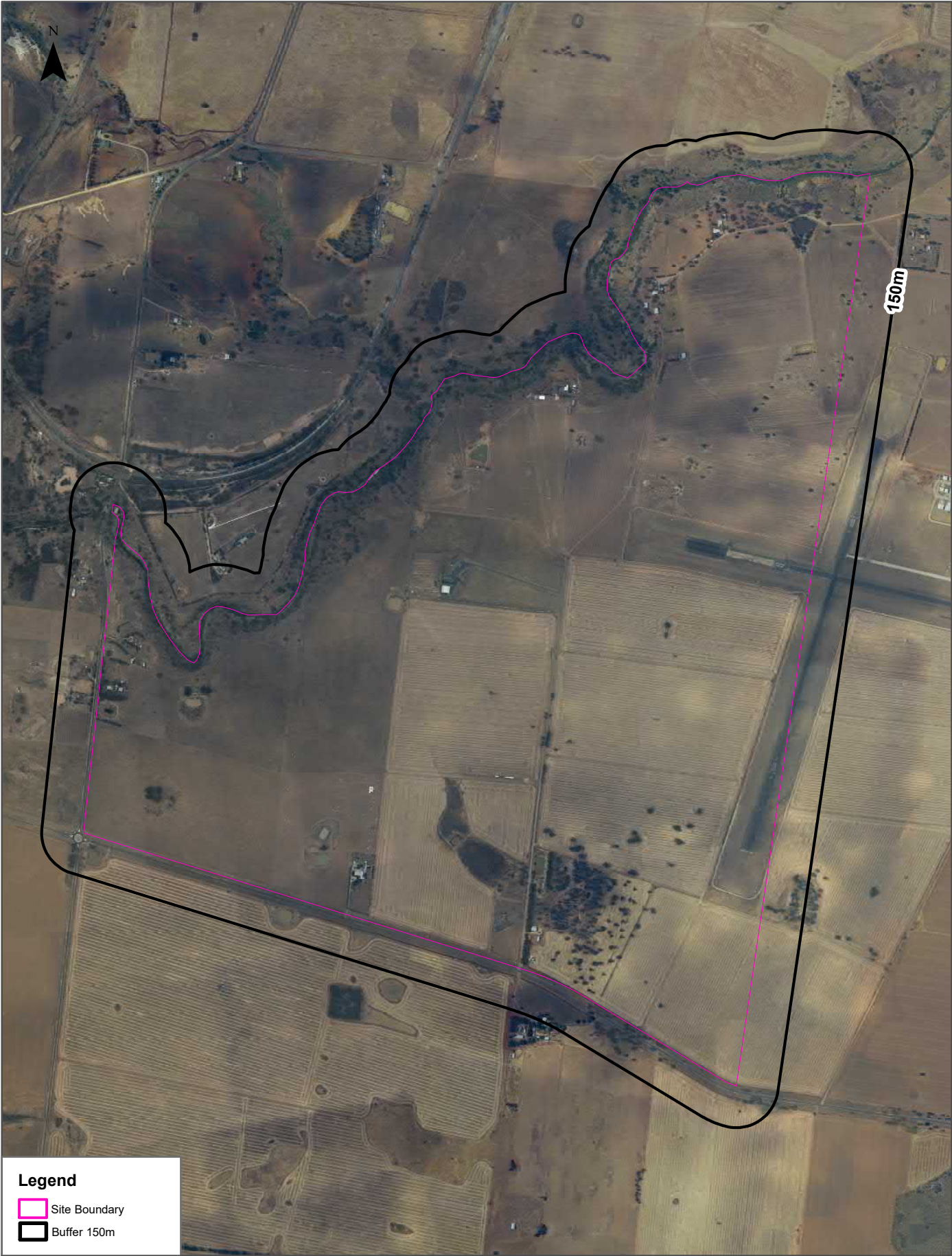
Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Appendix G Historical Aerial Photographs

Aerial Imagery 2019

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Scale: 0 220 440 660 880 Meters	Data Sources: Aerial Imagery © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 55	Date: 13 August 2020
---------------------------------------	---	--	----------------------

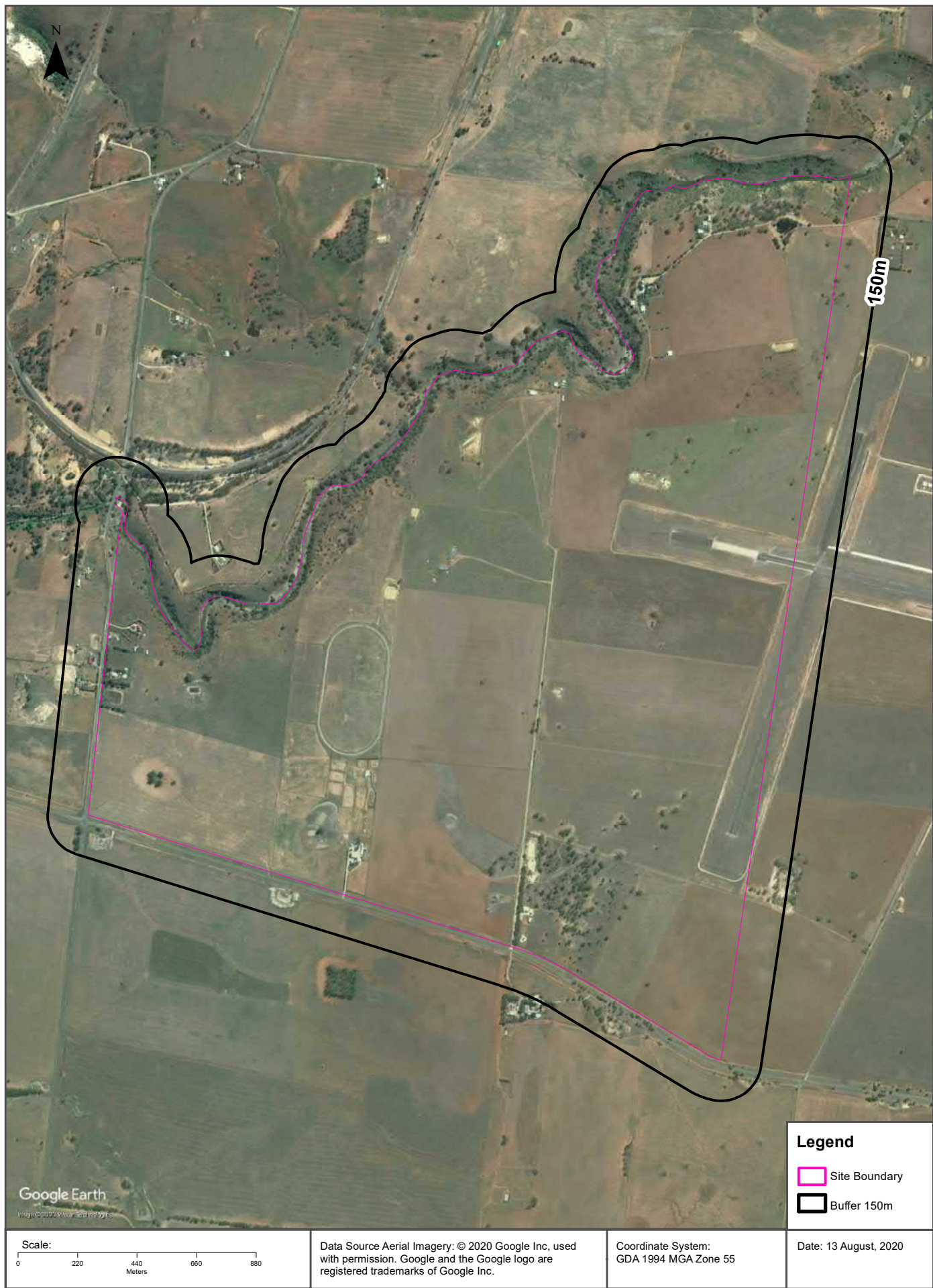
Aerial Imagery 2015

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 2010

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



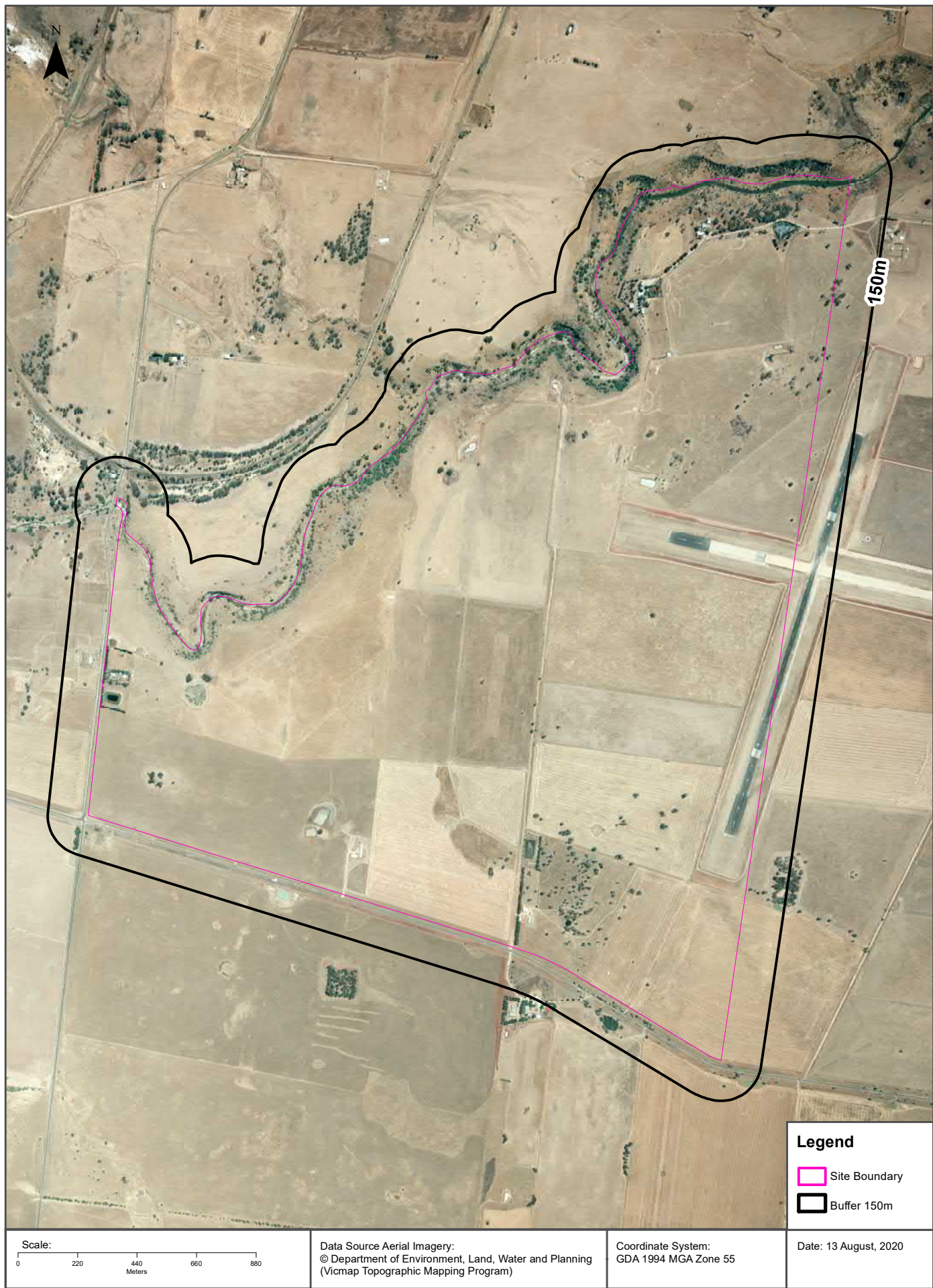
Aerial Imagery 2006

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 1990

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



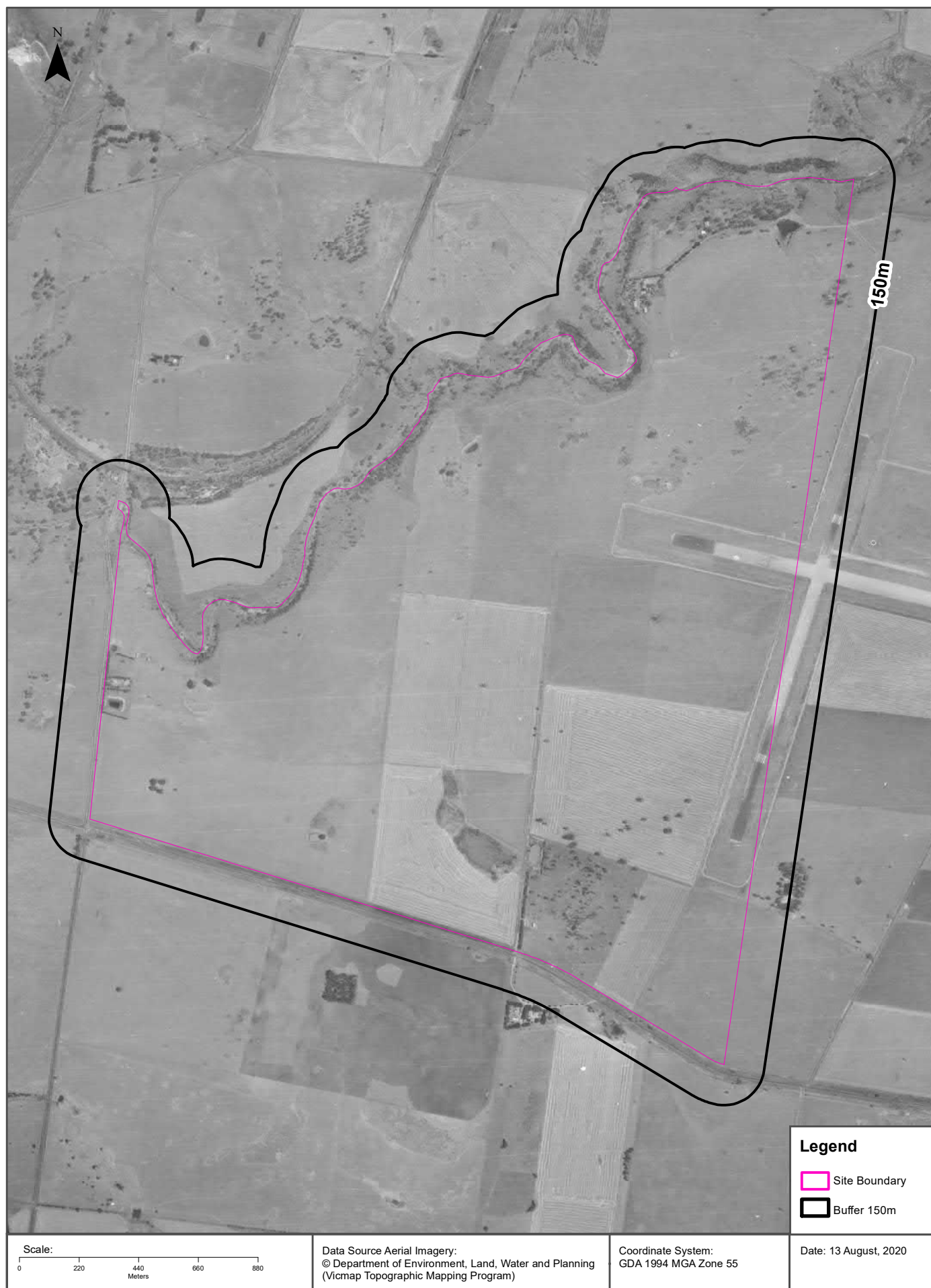
Aerial Imagery 1986

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



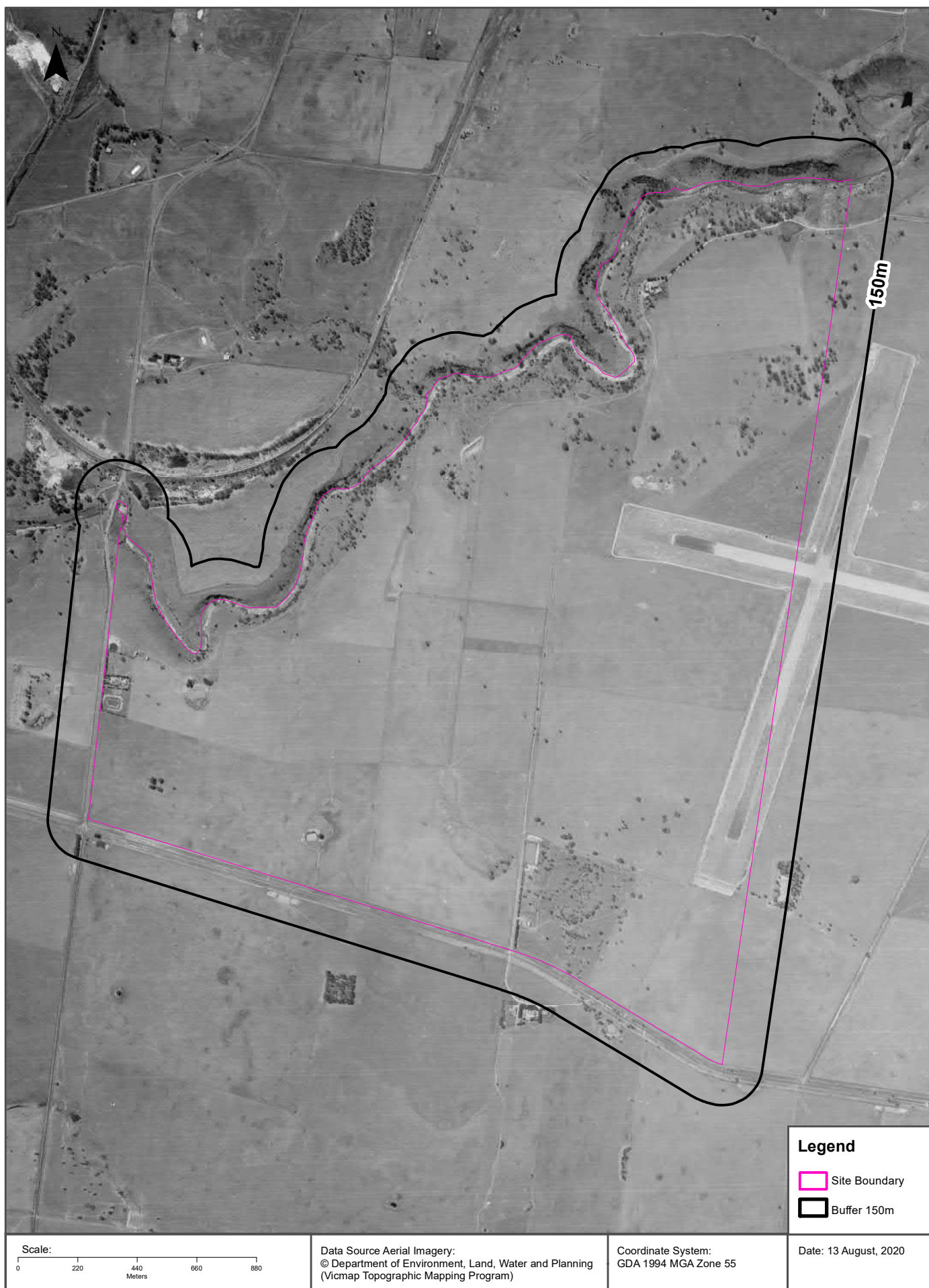
Aerial Imagery 1979

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



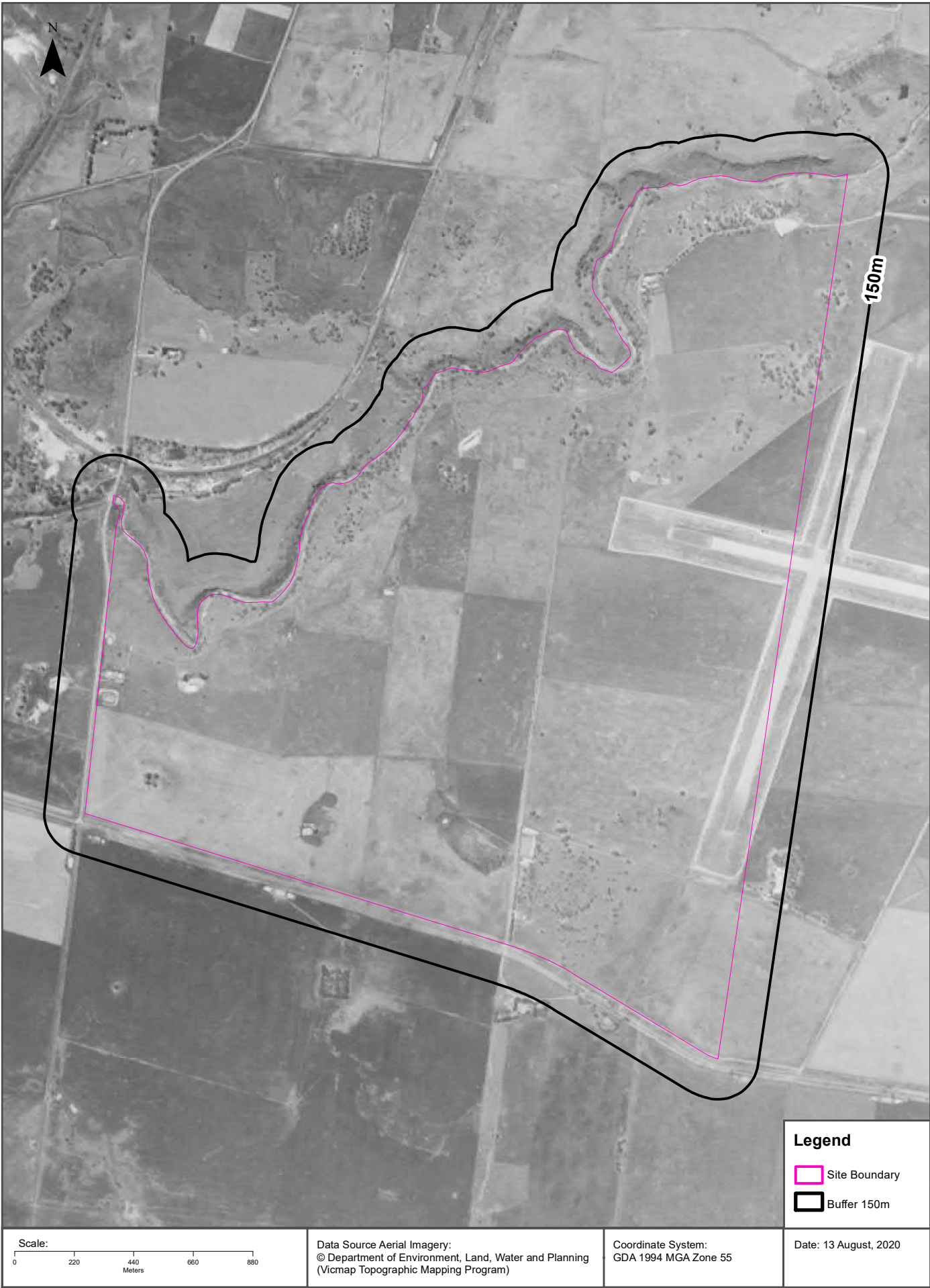
Aerial Imagery 1970

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 1968

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



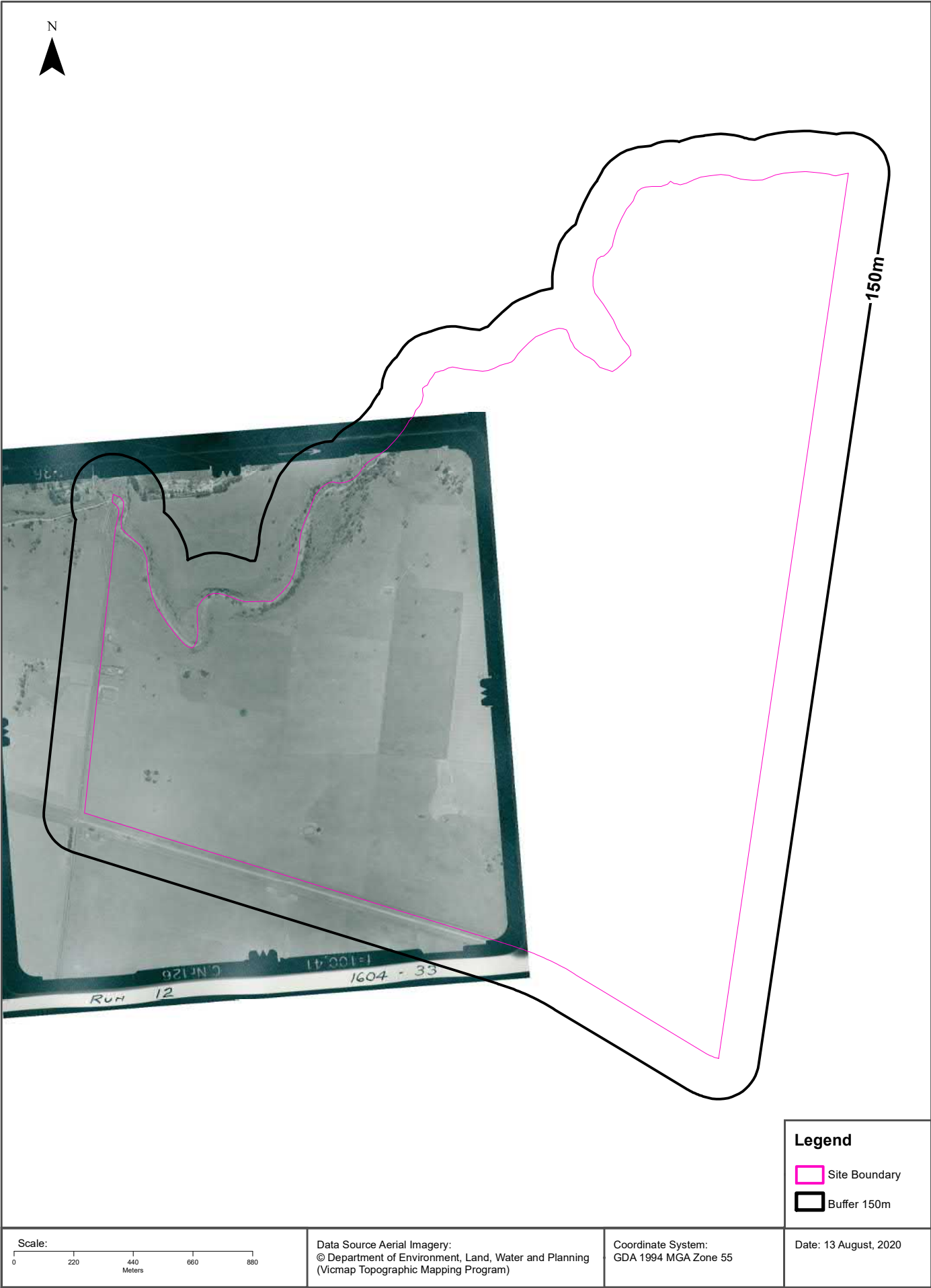
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



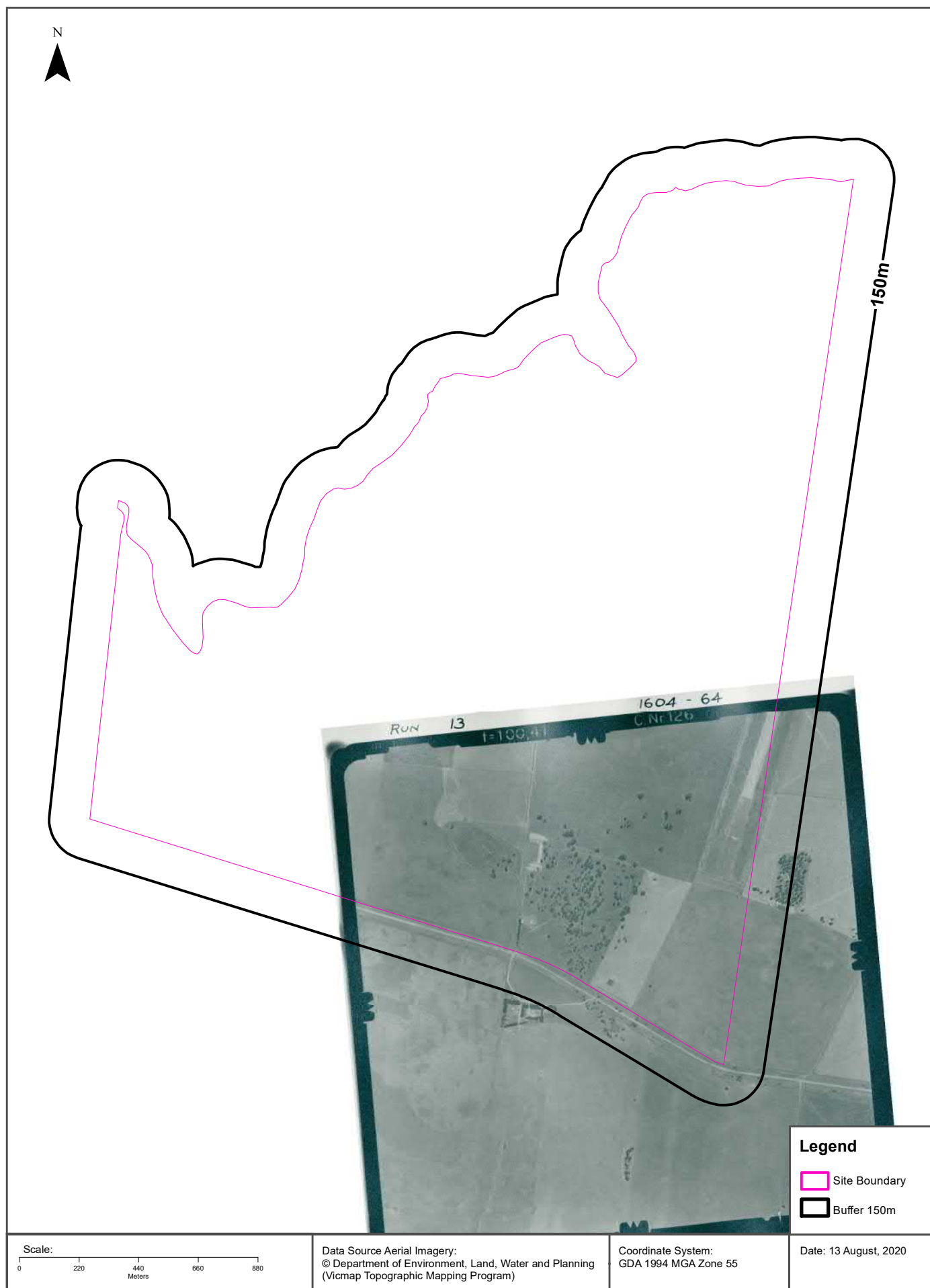
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



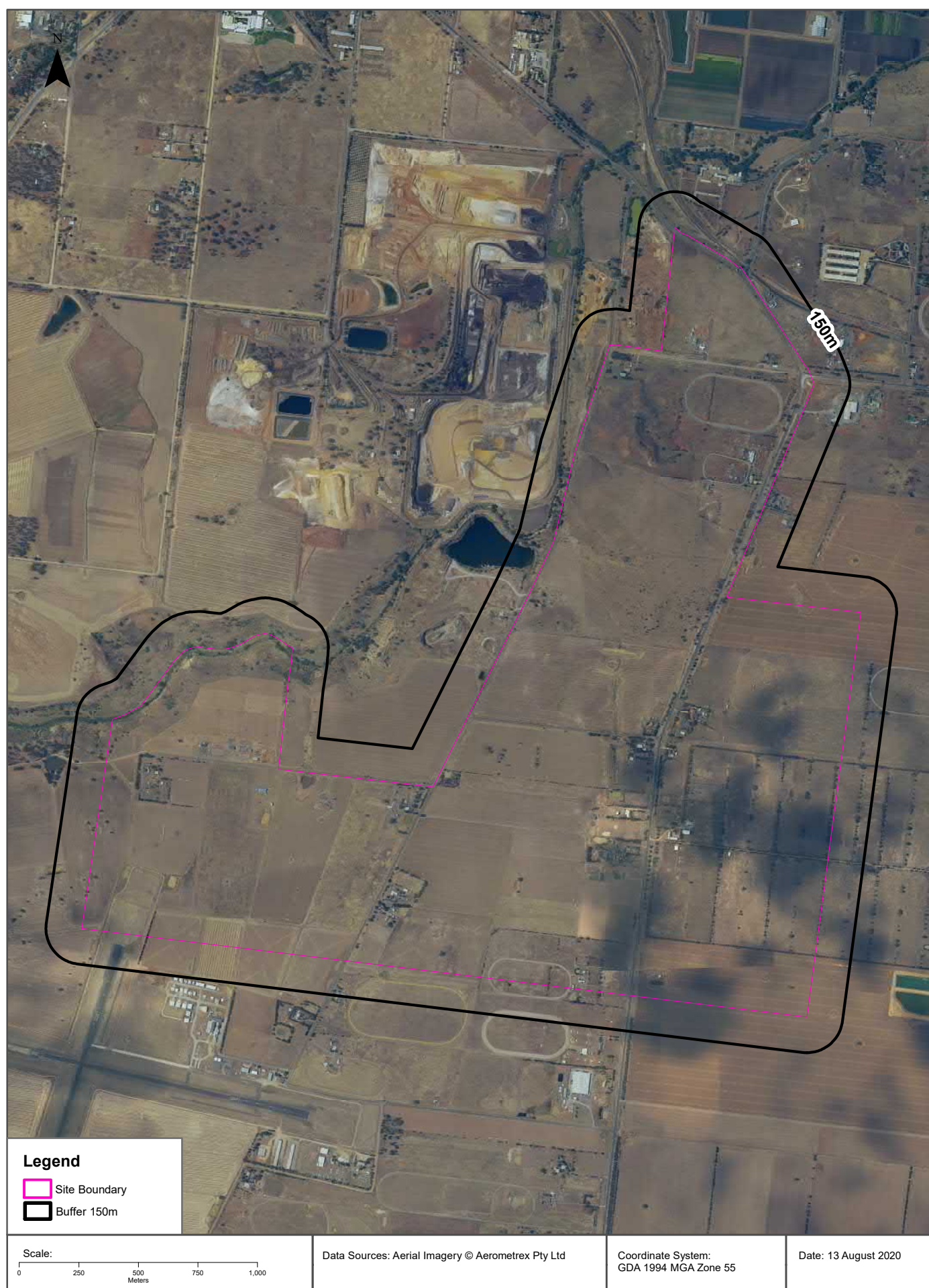
Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Aerial Imagery 2019

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 2014

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 2010

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 2006

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1990

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1990

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1986

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1986

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1985

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Legend

-  Site Boundary
-  Buffer 150m

Scale:

0 250 500 750 1,000
Meters

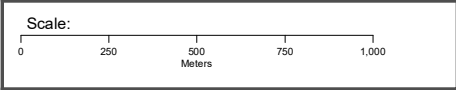
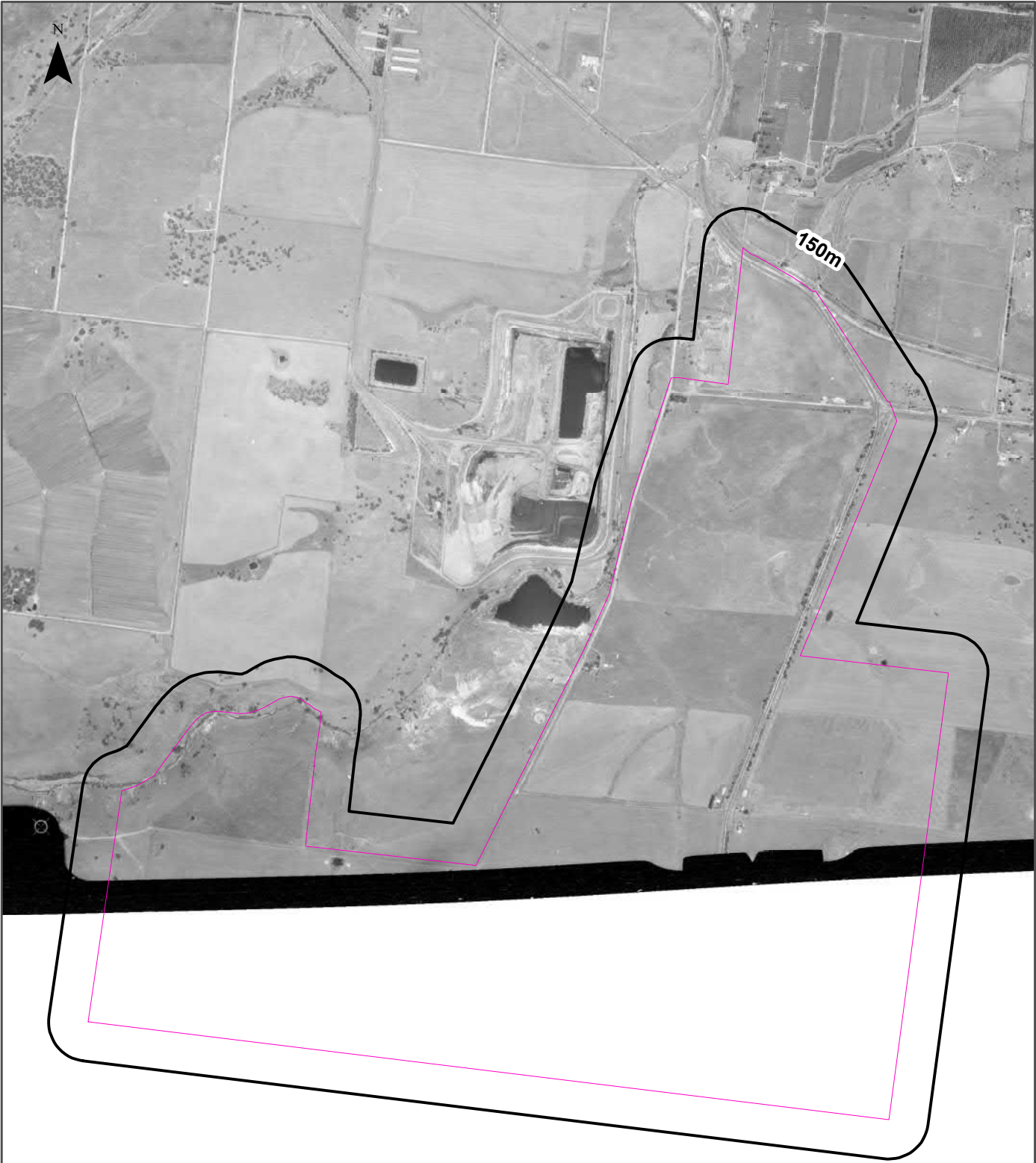
Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August, 2020

Aerial Imagery 1979

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Legend

- Site Boundary
- Buffer 150m

Date: 14 August, 2020

Aerial Imagery 1979

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1979

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)





Aerial Imagery 1970

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Legend

 Site Boundary

 Buffer 150m

<p>Scale:</p> <p>0 250 500 750 1,000</p> <p>Meters</p>	<p>Data Source Aerial Imagery:</p> <p>© Department of Environment, Land, Water and Planning</p> <p>(Vicmap Topographic Mapping Program)</p>	<p>Coordinate System:</p> <p>GDA 1994 MGA Zone 55</p>	<p>Date: 13 August, 2020</p>
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Aerial Imagery 1970

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



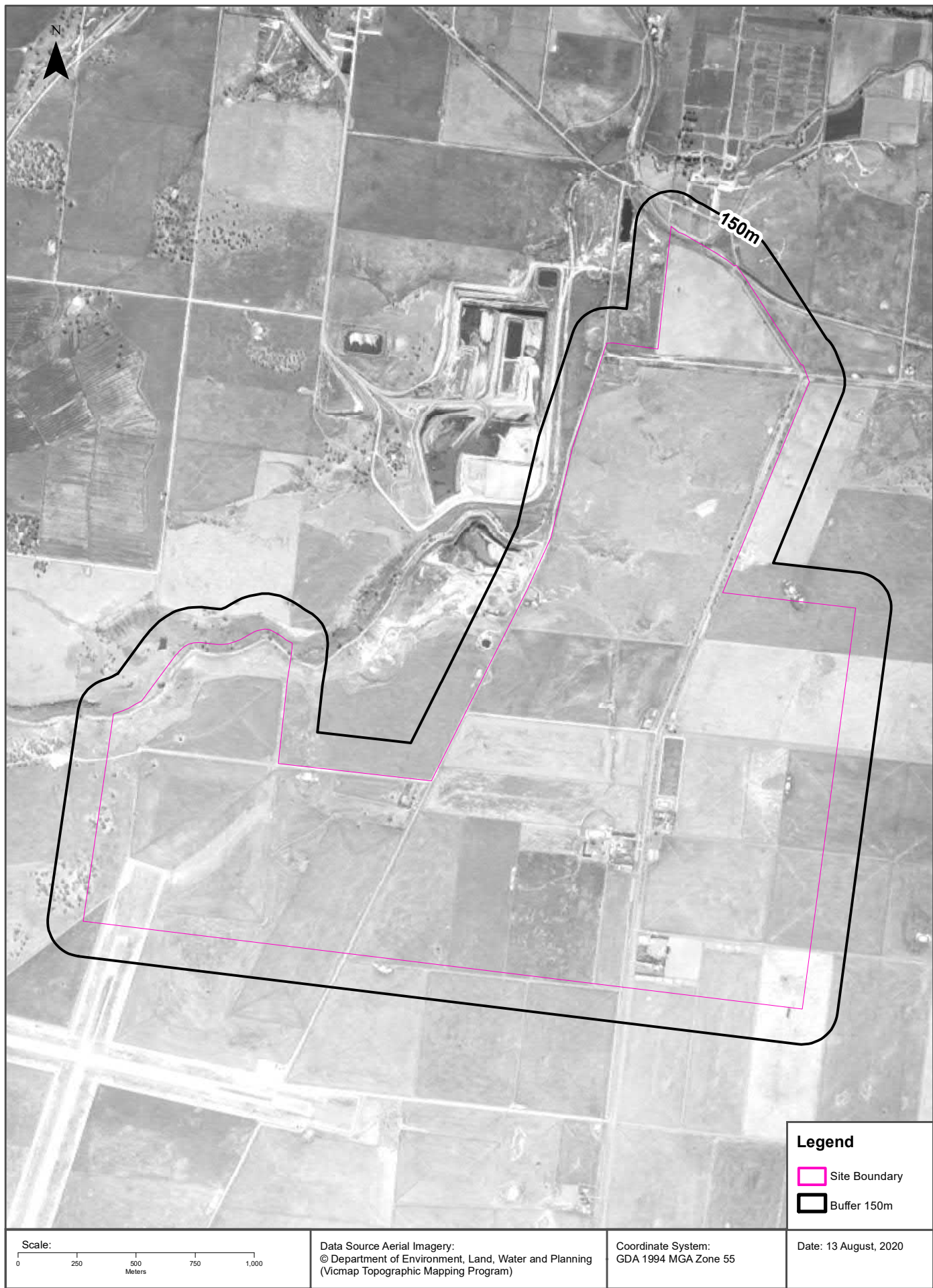
Aerial Imagery 1970

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



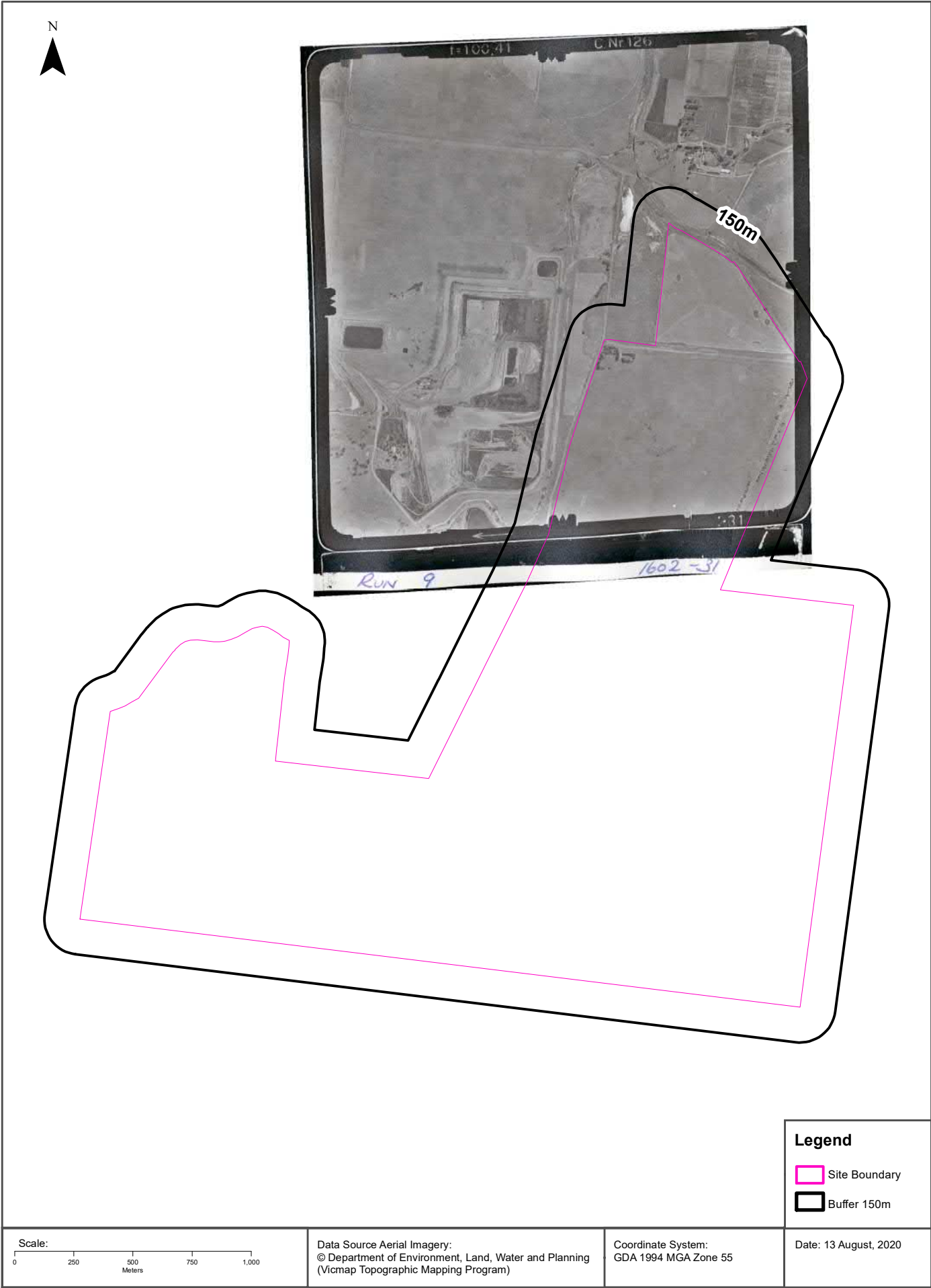
Aerial Imagery 1968

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Legend

- Site Boundary
- Buffer 150m

Scale:
0 250 500 750 1,000
Meters

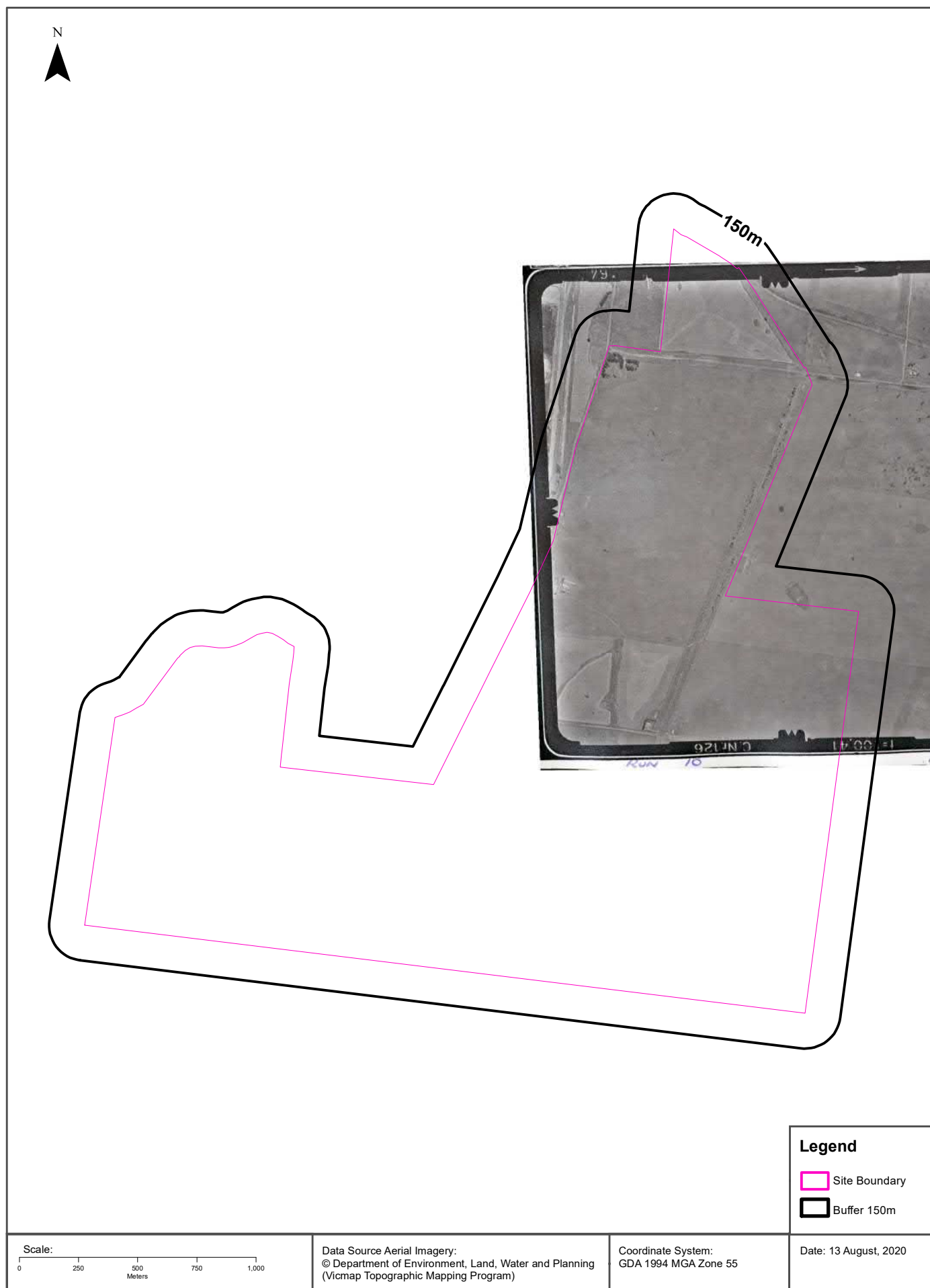
Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August, 2020

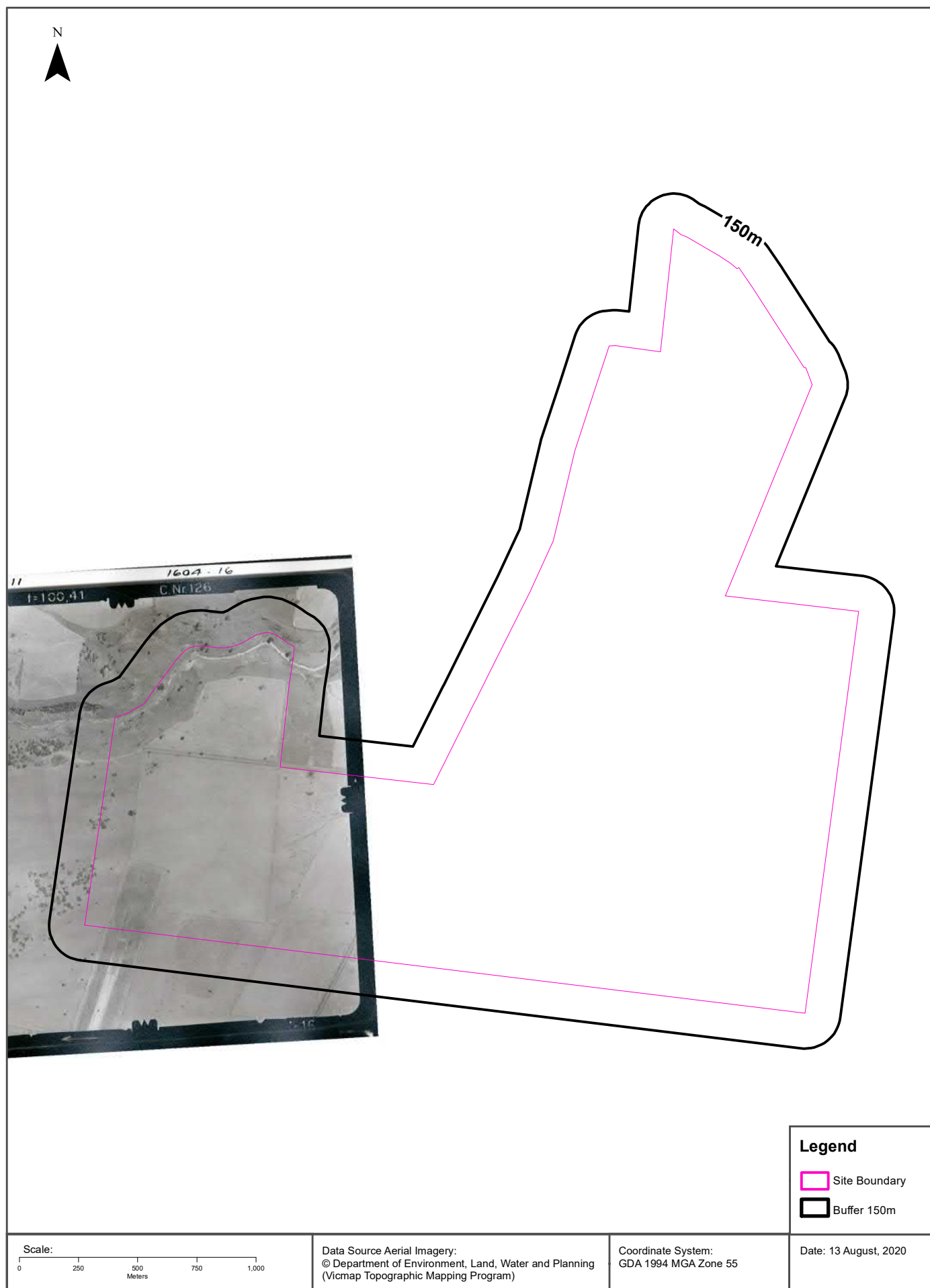
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



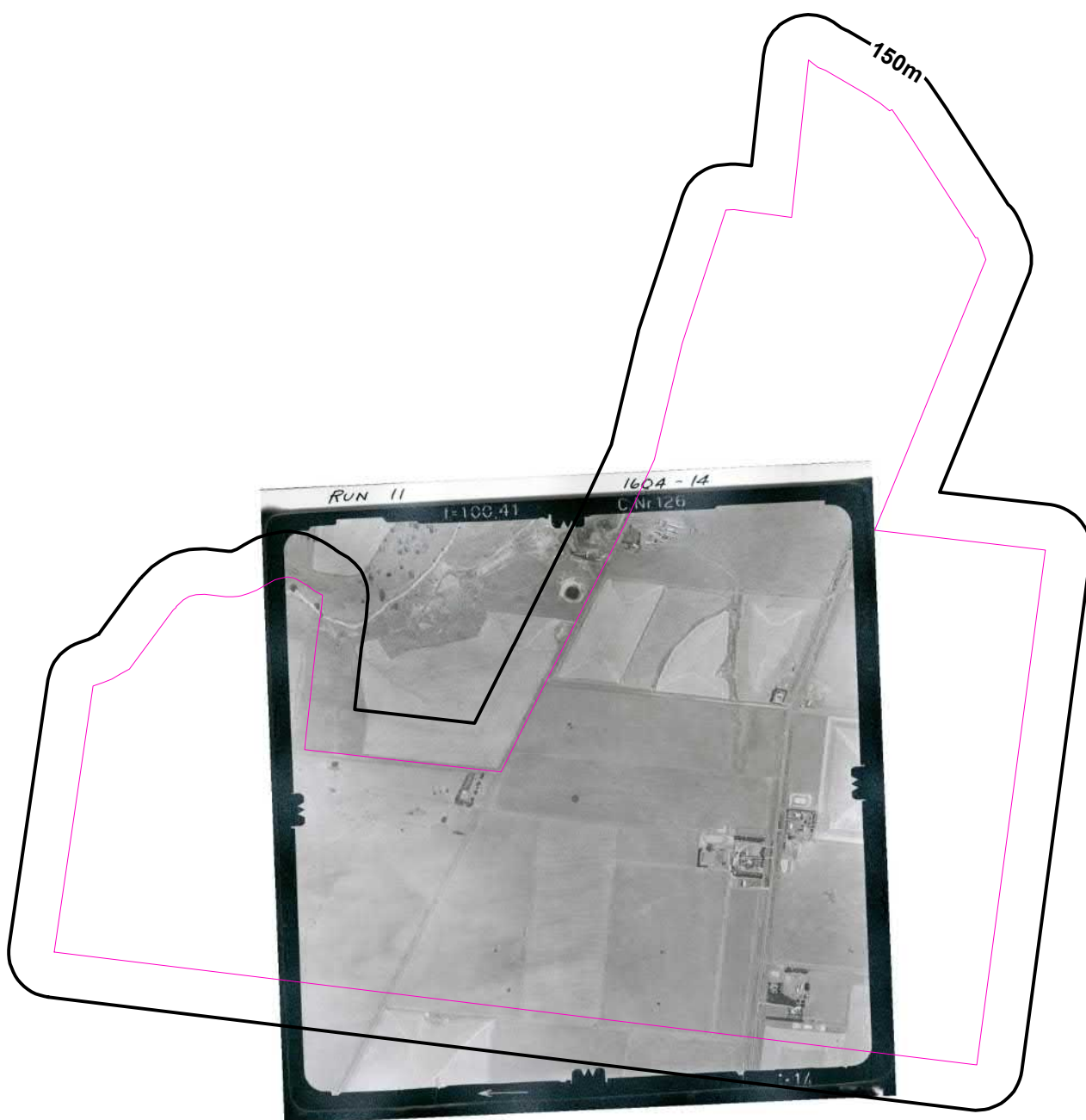
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1961

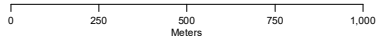
Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Legend

-  Site Boundary
-  Buffer 150m

Scale:



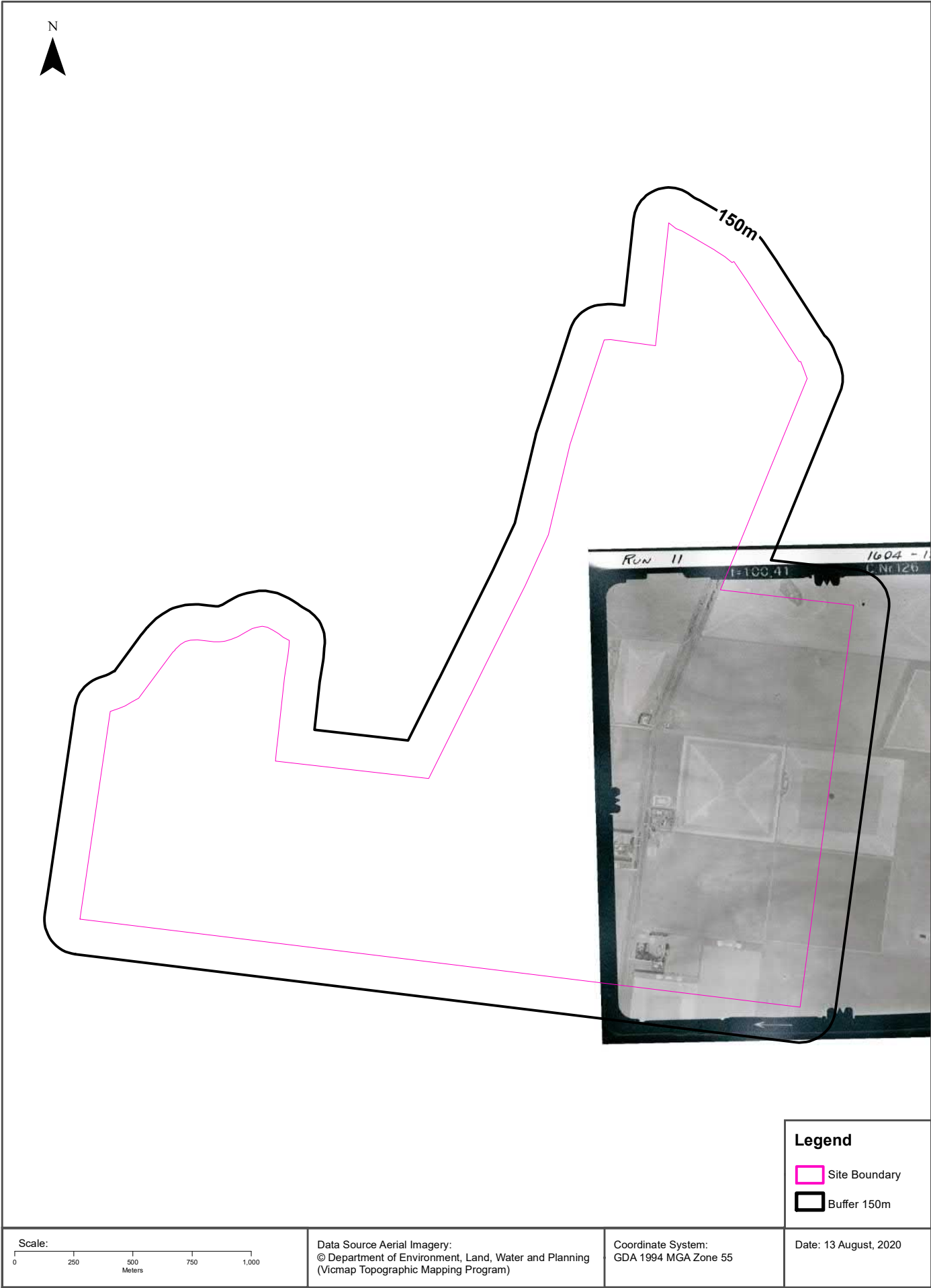
Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August, 2020

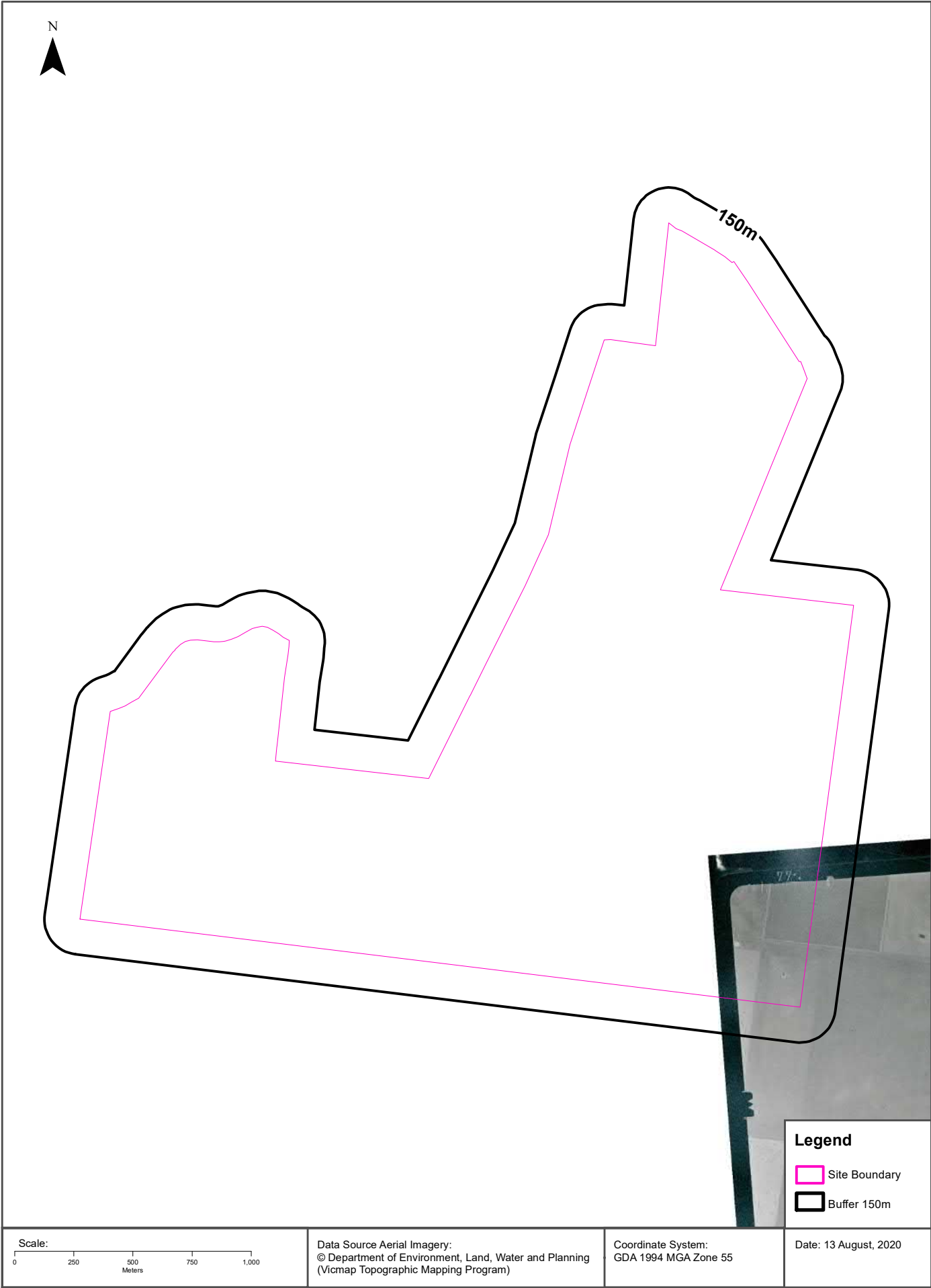
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



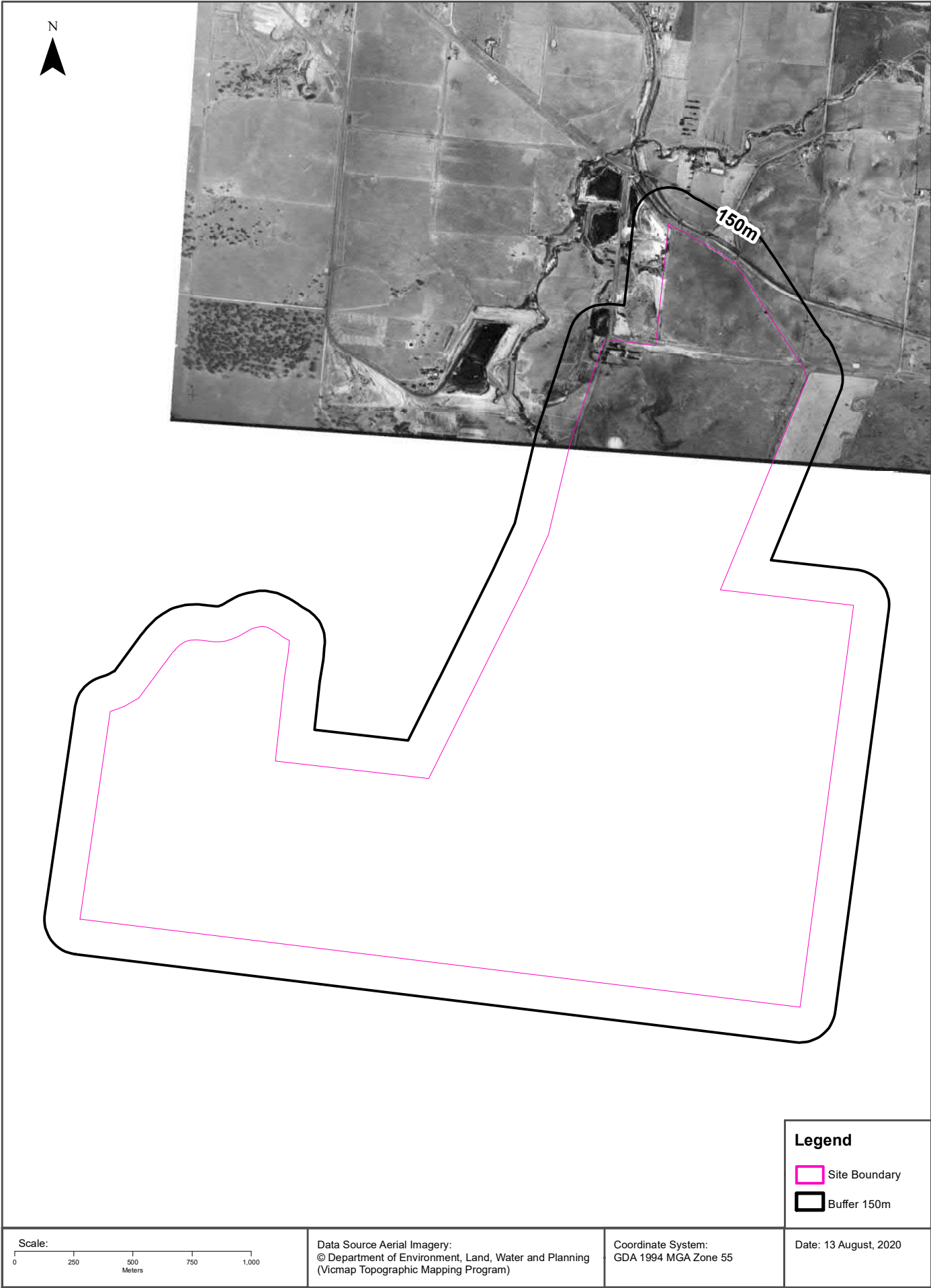
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



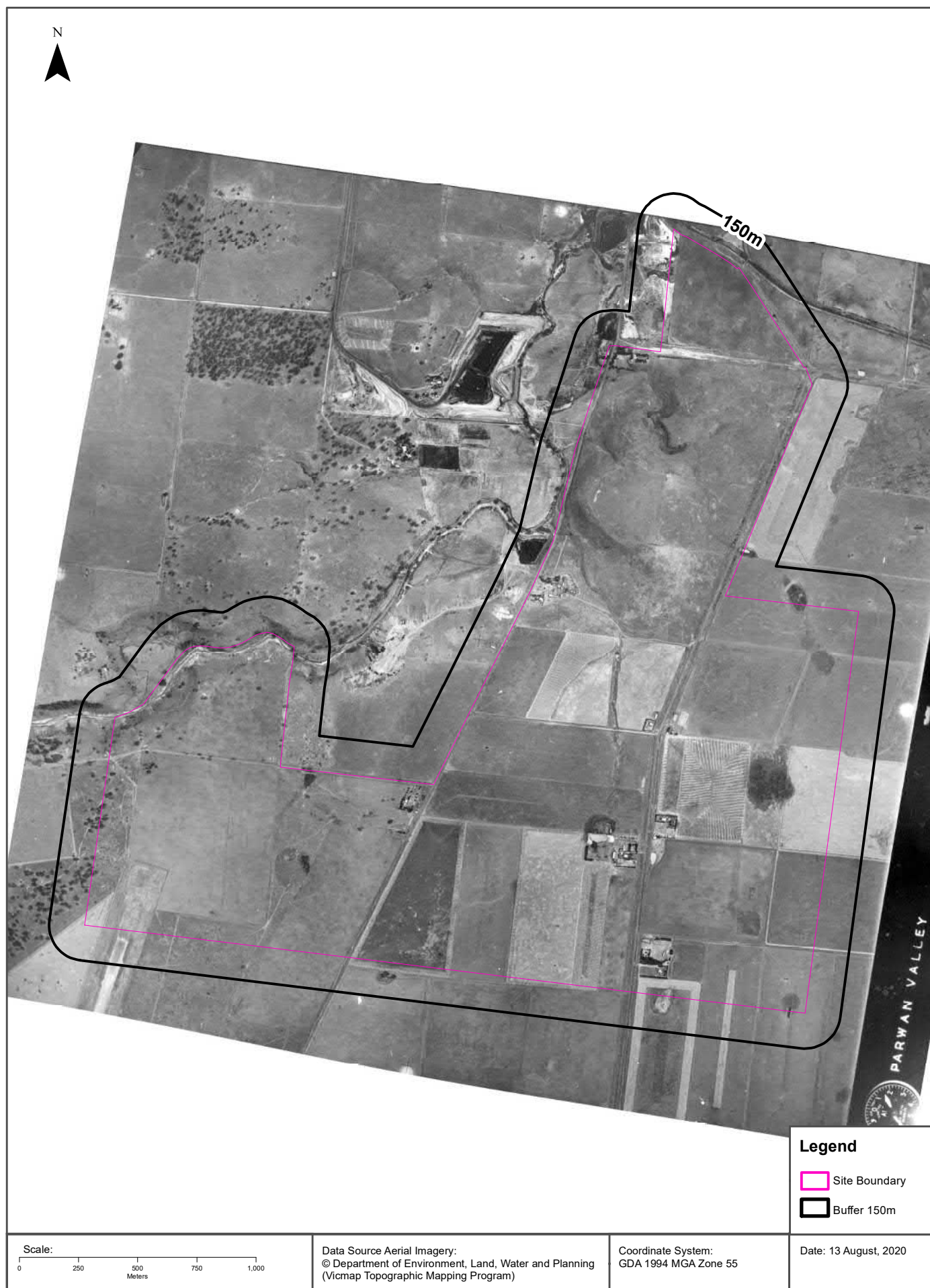
Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Aerial Imagery 2019

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 2014

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 2010

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 2006

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Google Earth

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Images are not to scale.

Legend

- Site Boundary
- Buffer 150m

Scale:

0 260 520 780 1,040
Meters

Data Source Aerial Imagery: © 2020 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August, 2020

Aerial Imagery 1990

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 1986

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



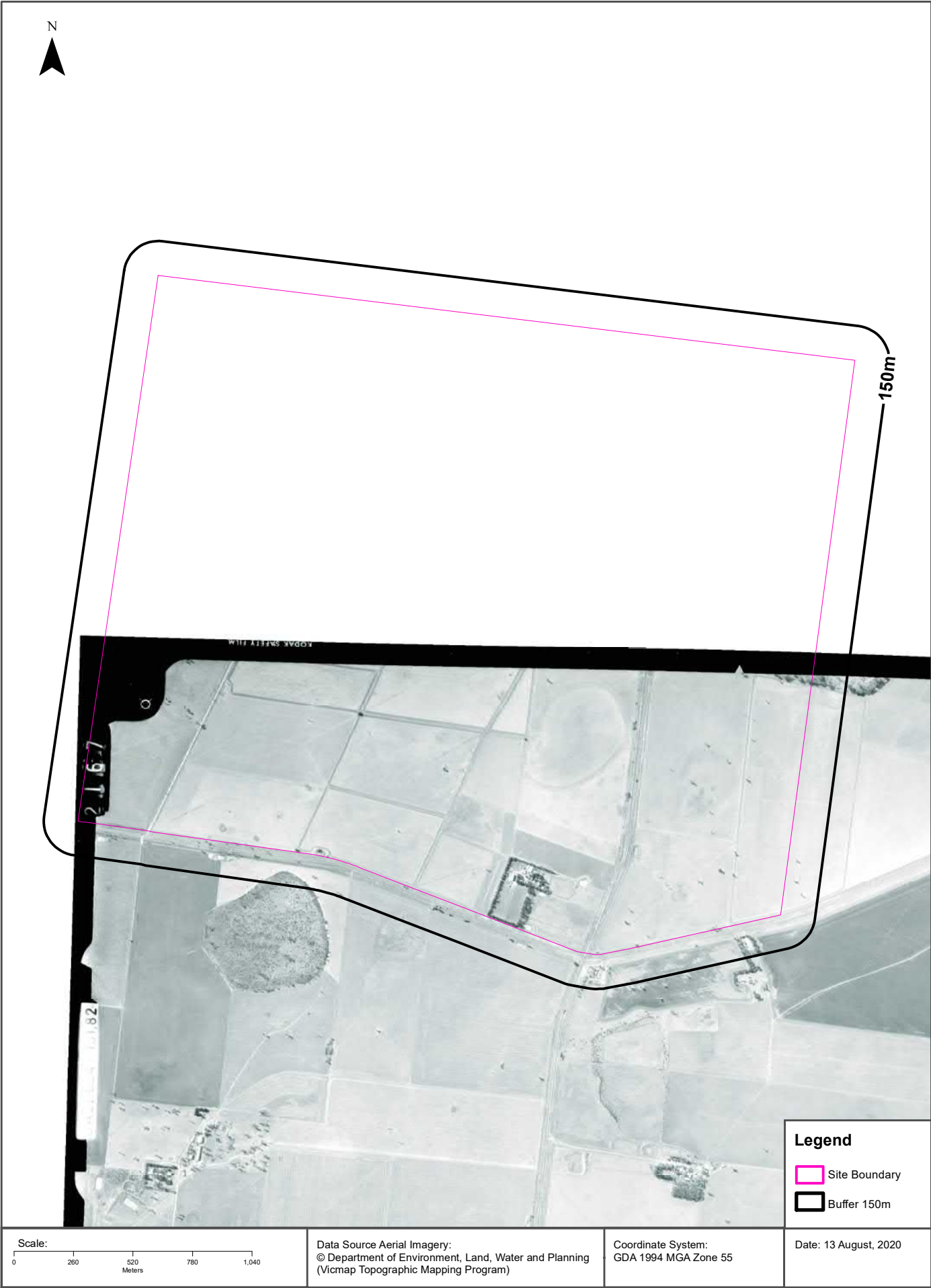
Aerial Imagery 1986

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 1986

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



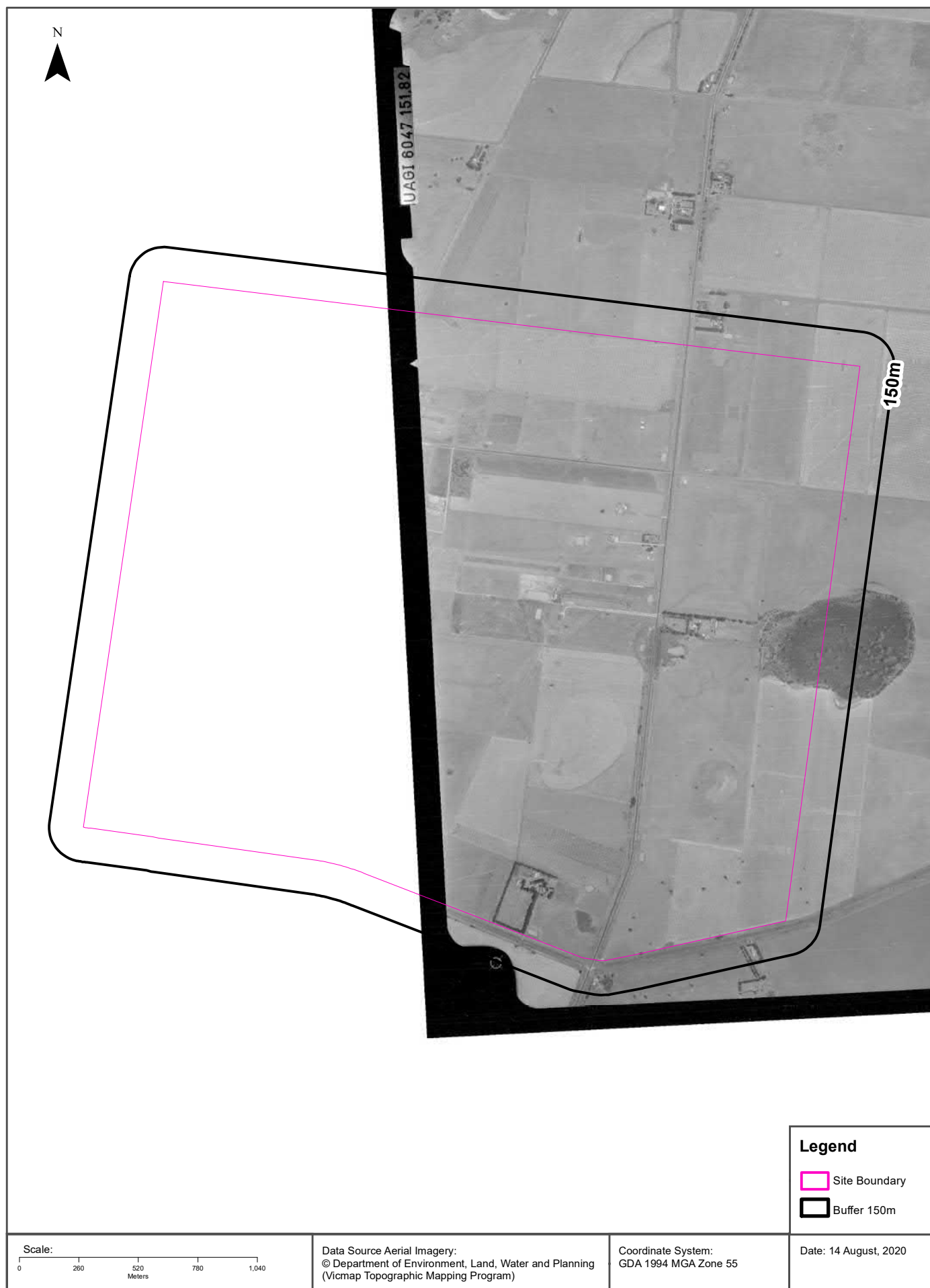
Aerial Imagery 1979

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 1979

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 1979

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 1970

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Scale:	0	260	520	780	1,040
			Meters		

Data Source Aerial Imagery: © Department of Environment, Land, Water and Planning (Vicmap Topographic Mapping Program)
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Coordinate System: GDA 1994 MGA Zone 55
--

Date: 14 August, 2020

Aerial Imagery 1970

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Scale:
0 260 520 780 1,040
Meters

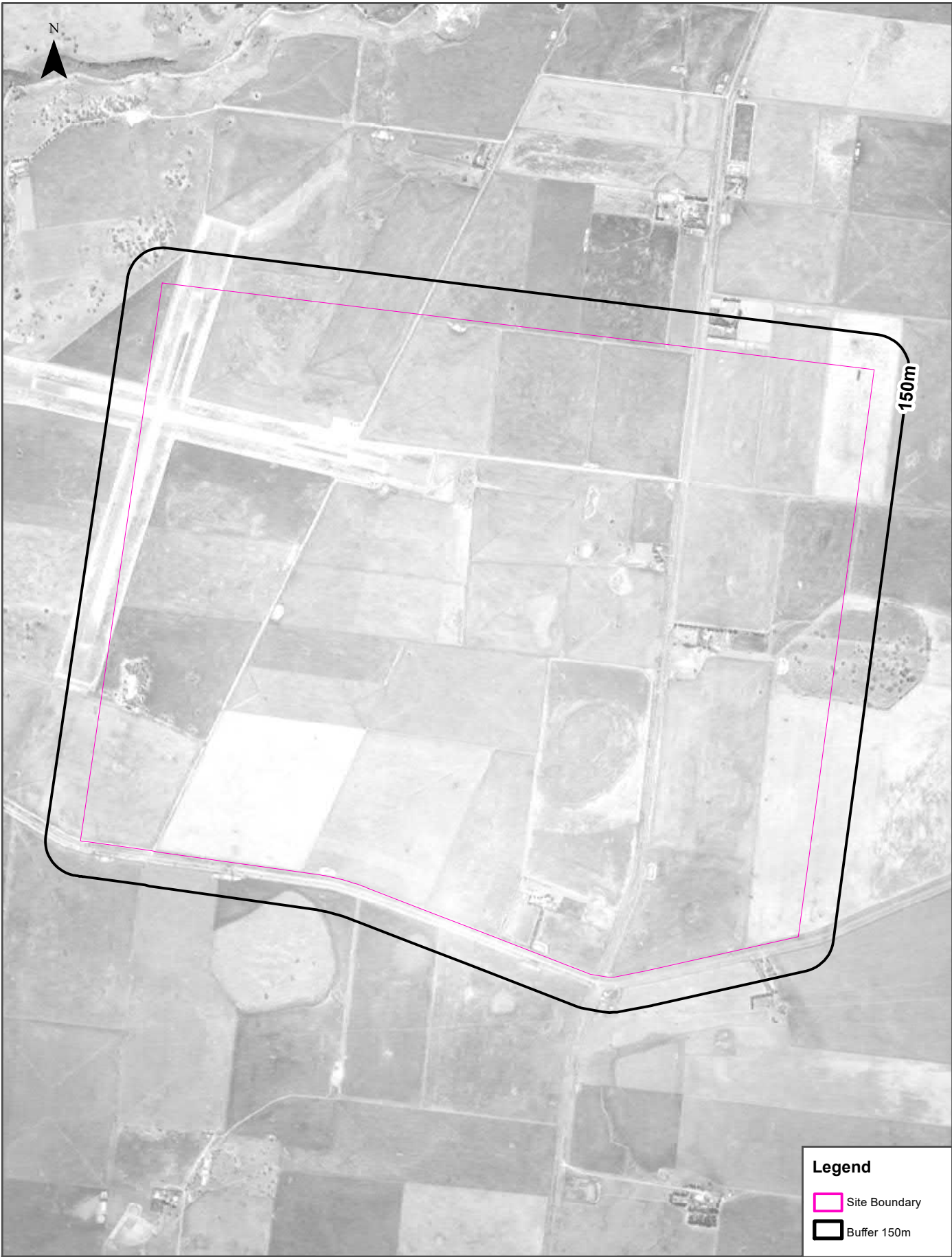
Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 14 August, 2020

Aerial Imagery 1968

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Legend

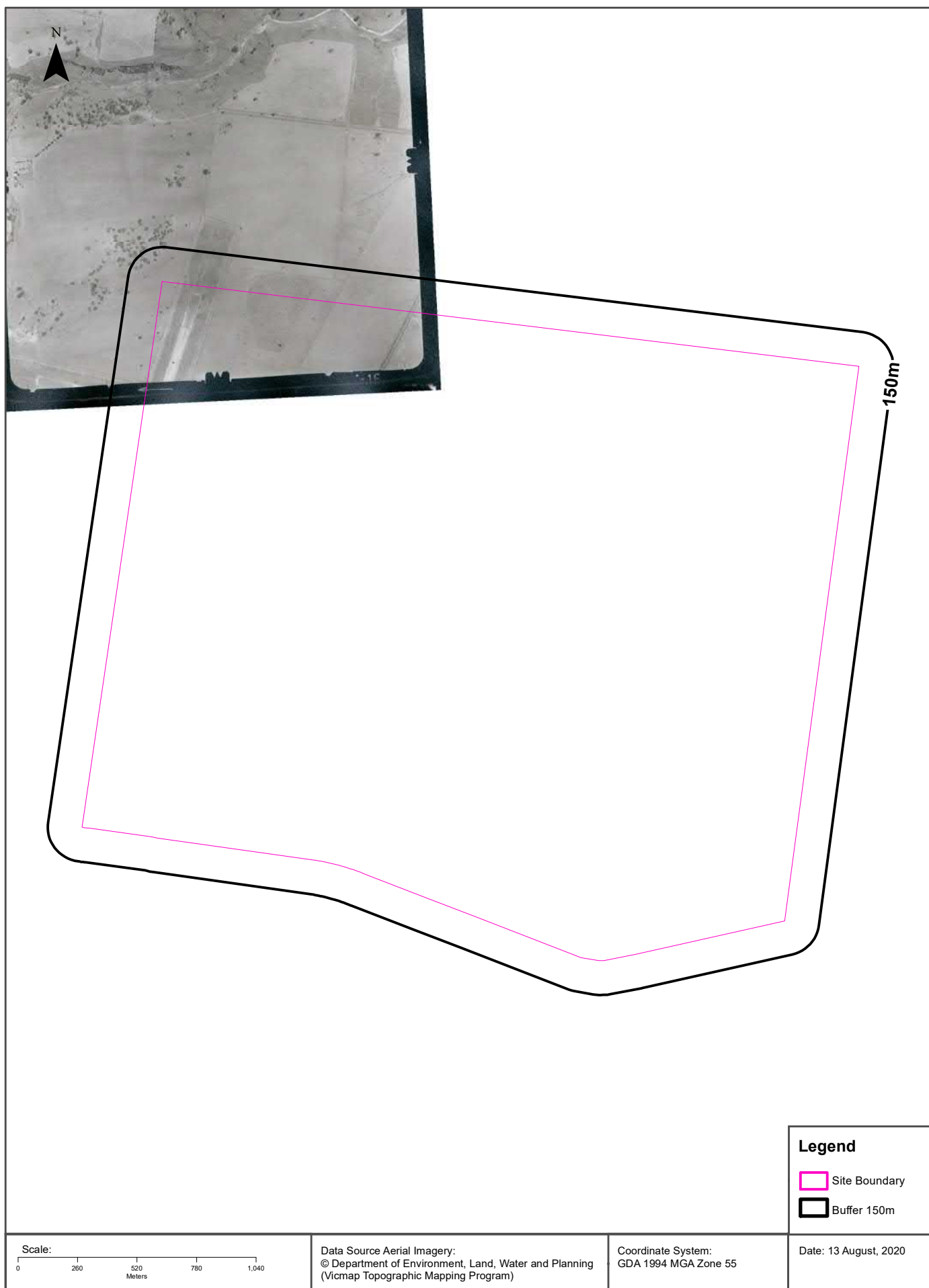
Site Boundary

Buffer 150m

<p>Scale:</p> <p>0 260 520 780 1,040</p> <p>Meters</p>	<p>Data Source Aerial Imagery:</p> <p>© Department of Environment, Land, Water and Planning</p> <p>(Vicmap Topographic Mapping Program)</p>	<p>Coordinate System:</p> <p>GDA 1994 MGA Zone 55</p>	<p>Date: 13 August, 2020</p>
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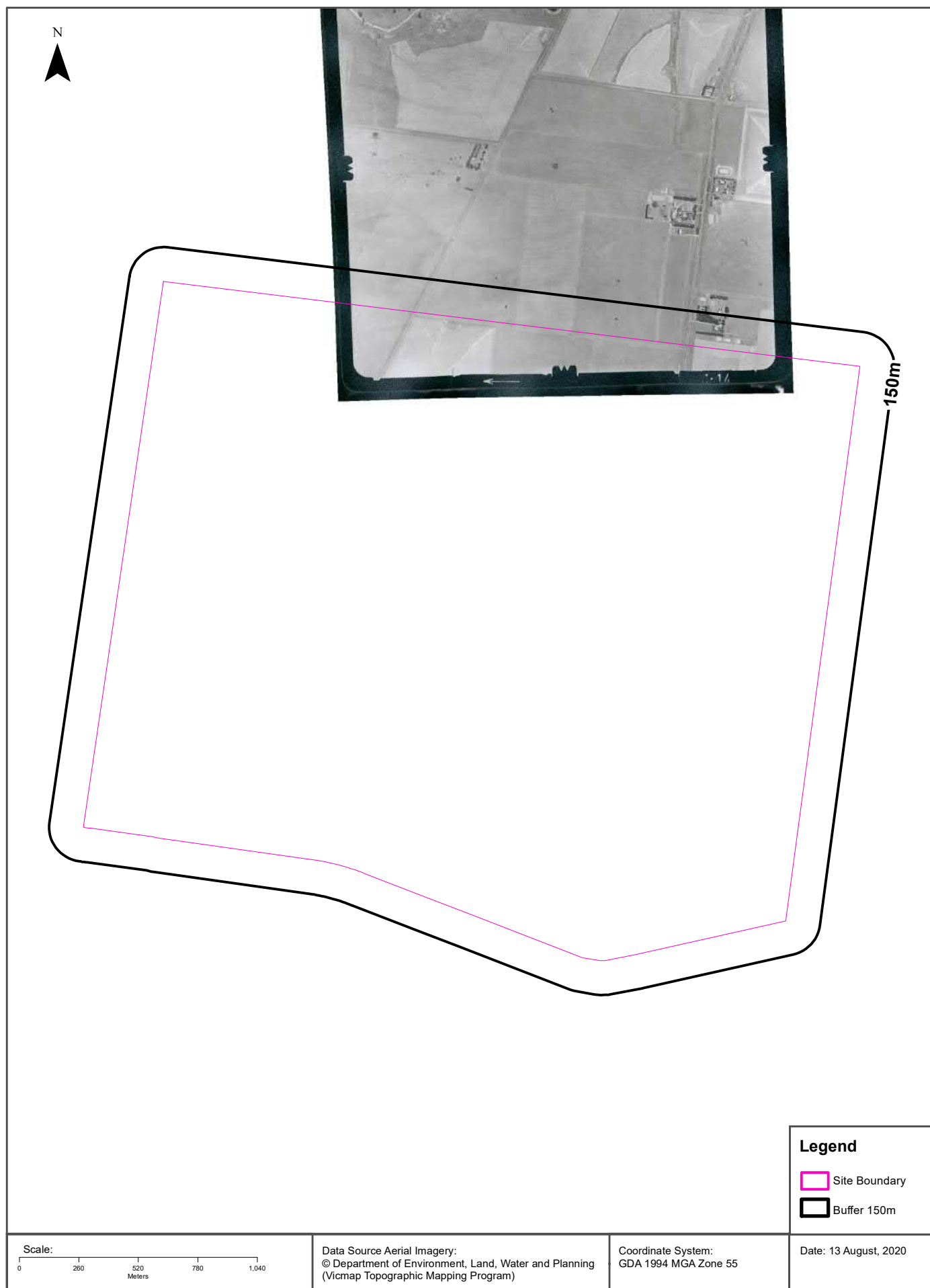
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



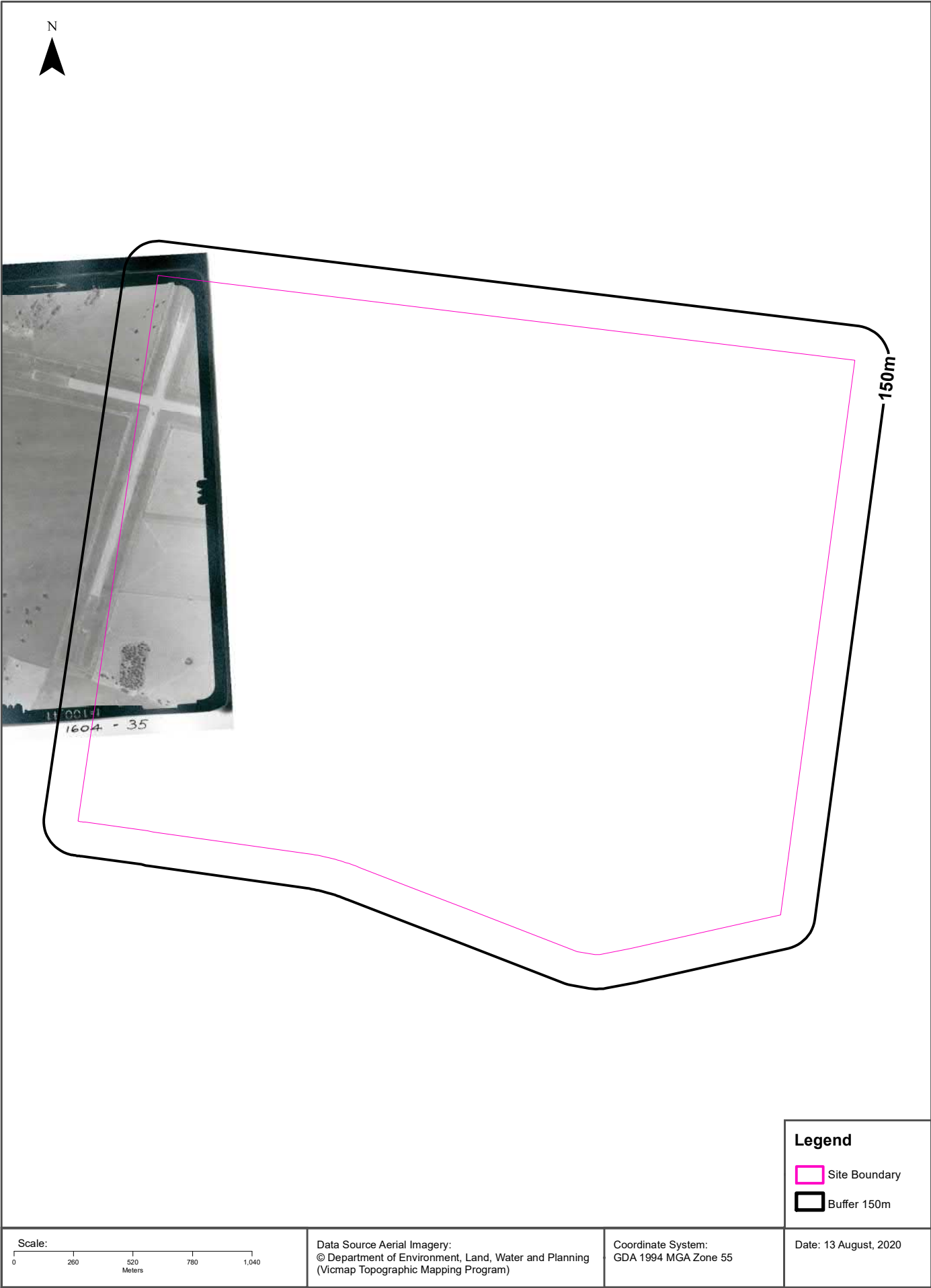
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



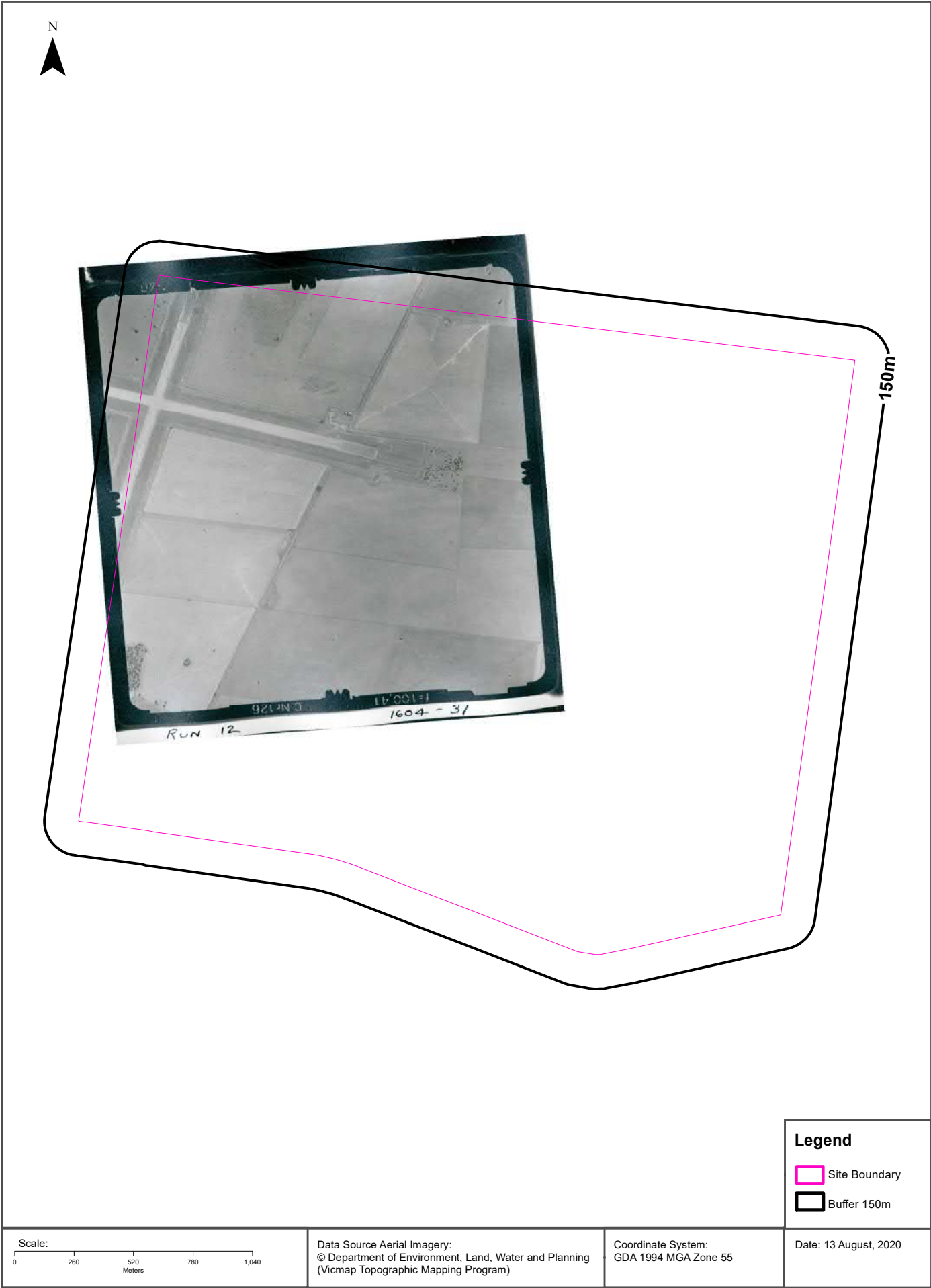
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



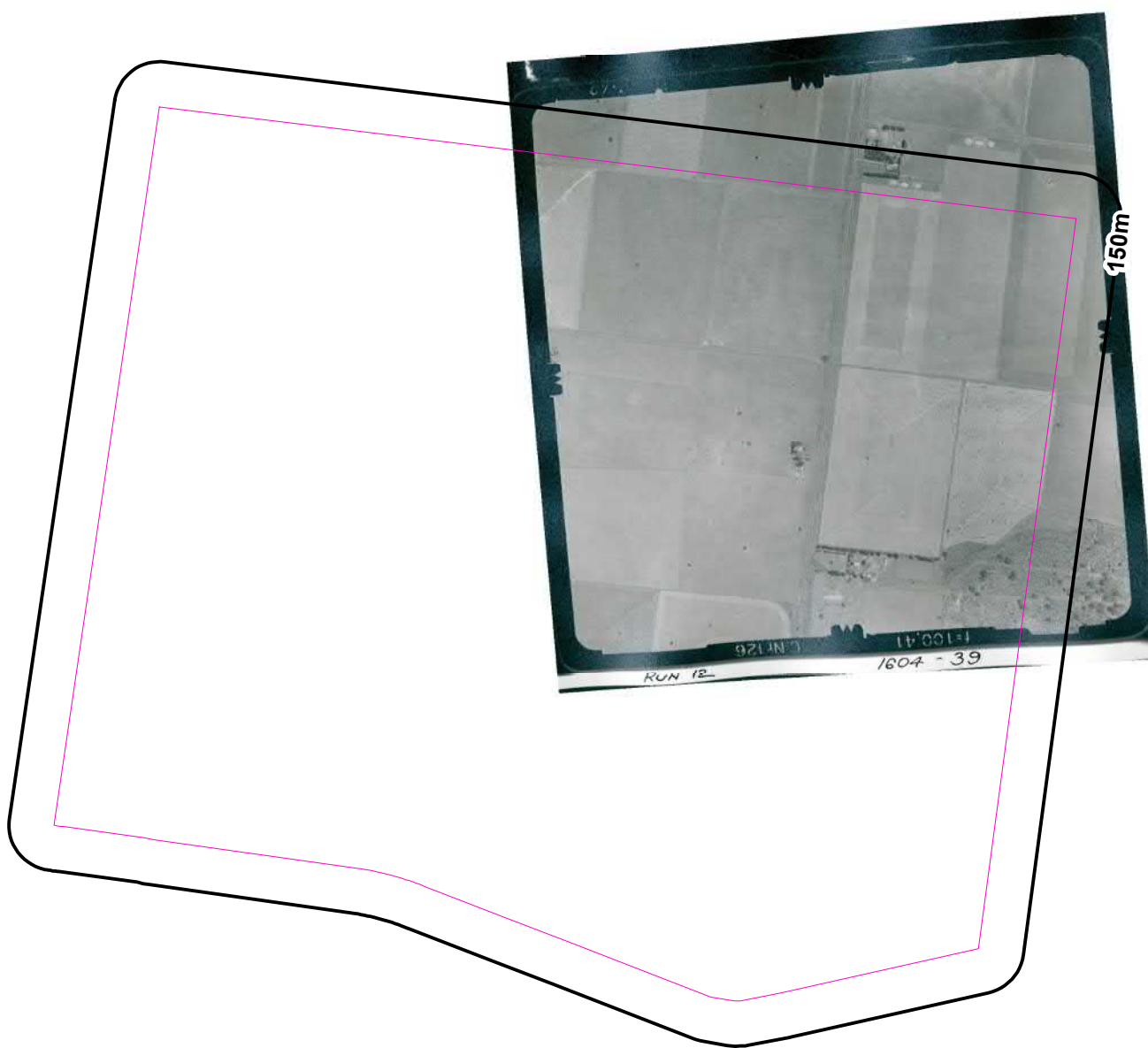
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Legend

-  Site Boundary
-  Buffer 150m

Scale:

0 260 520 780 1,040
Meters

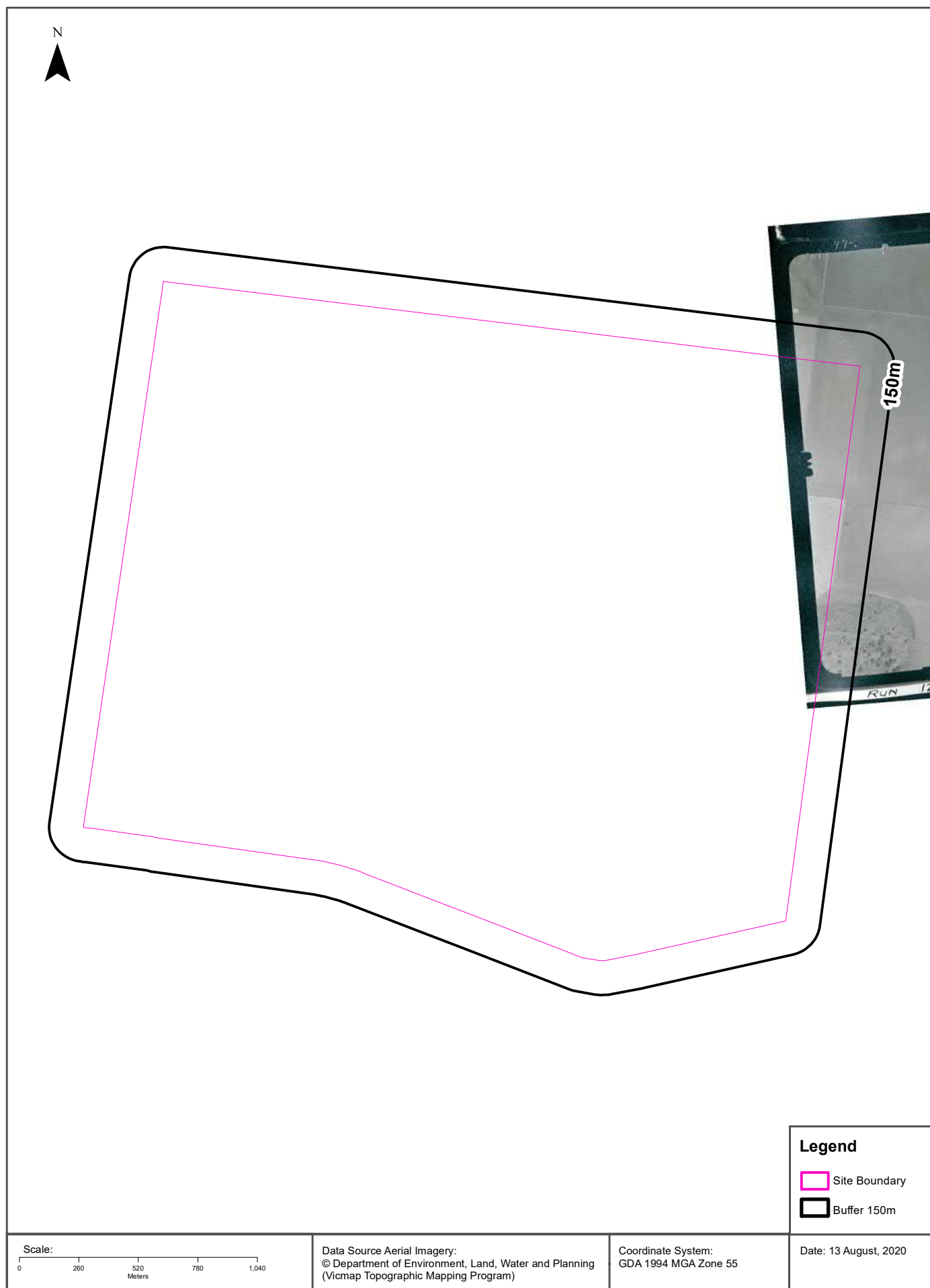
Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August, 2020

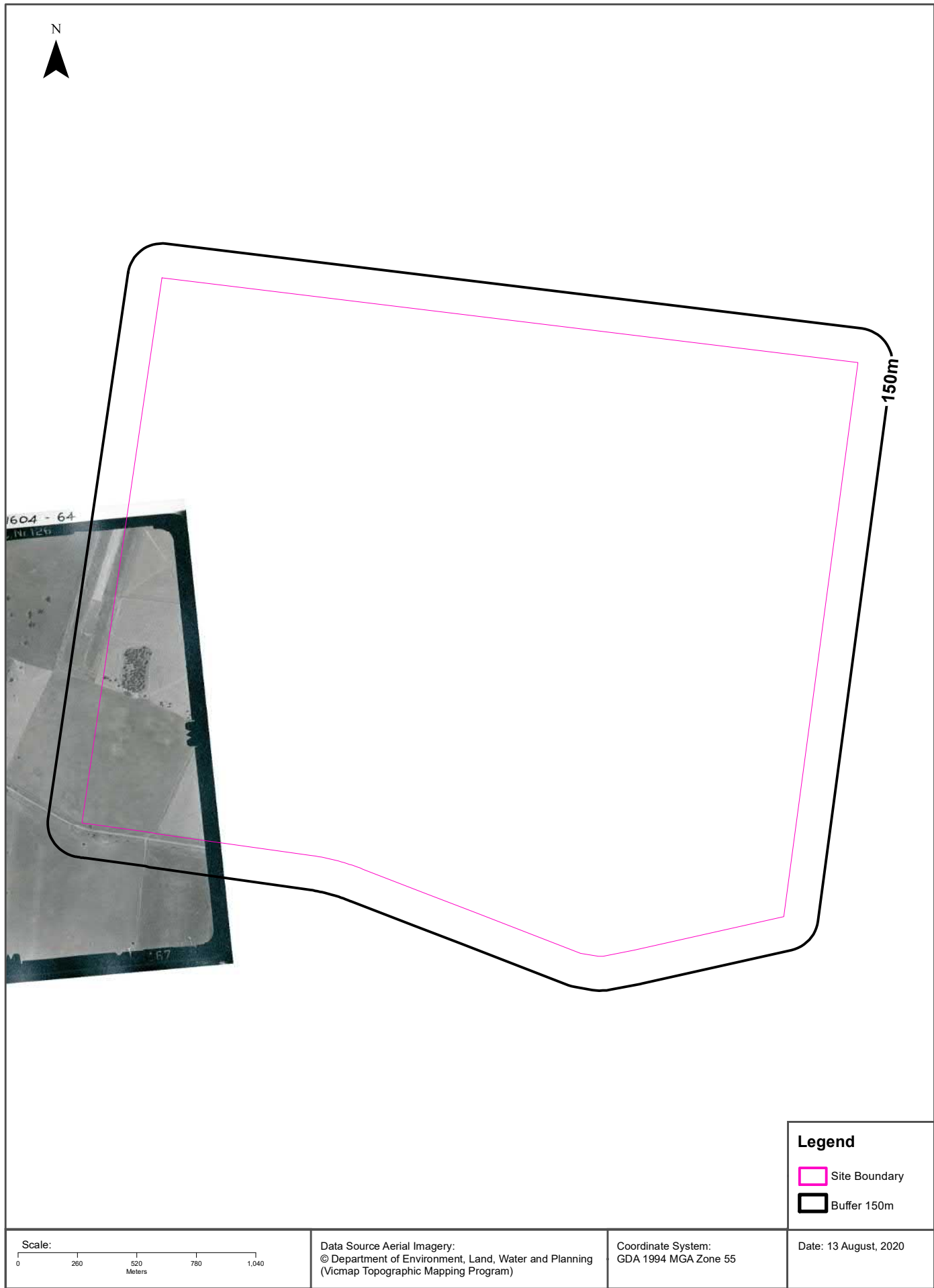
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



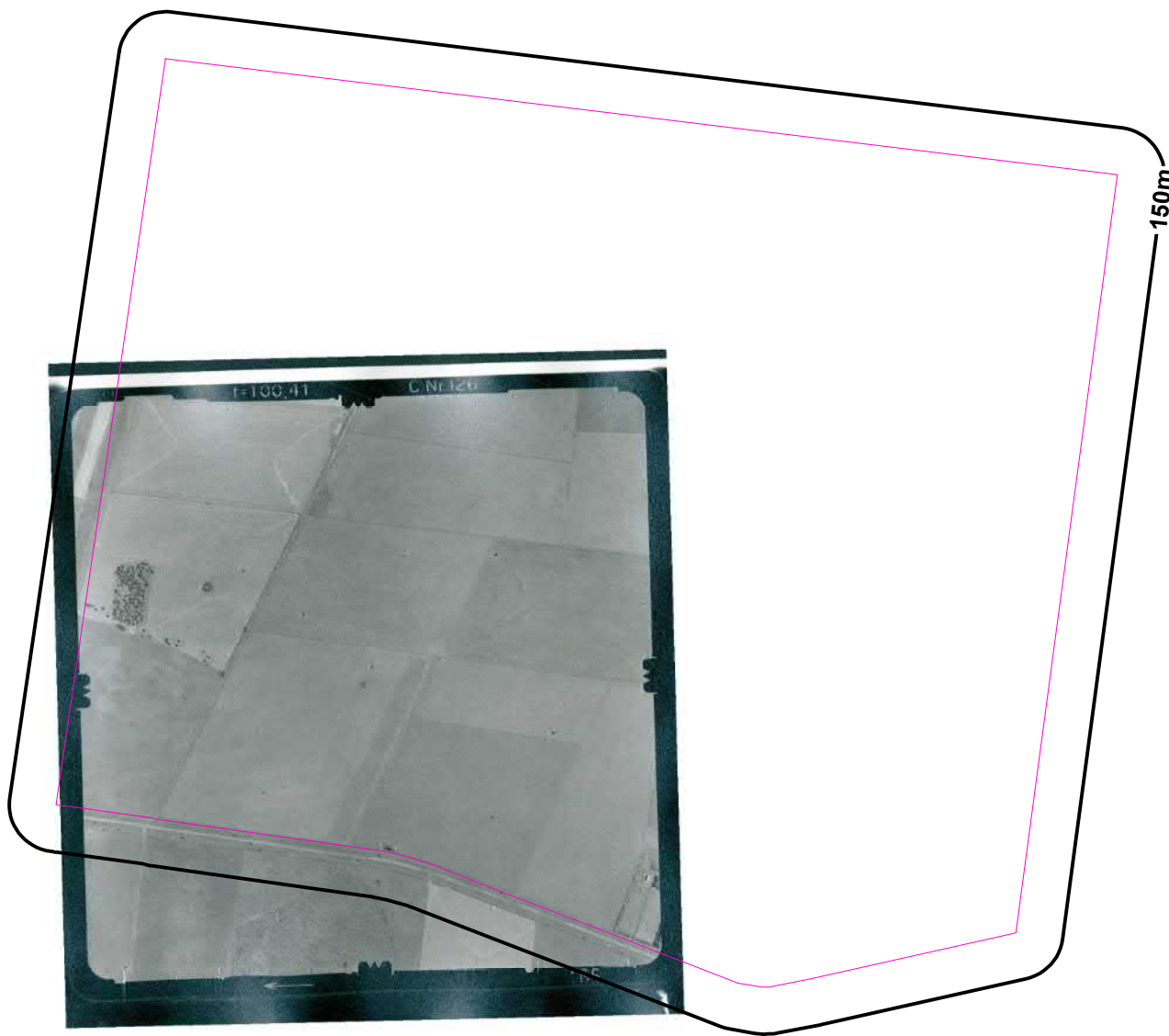
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 1961

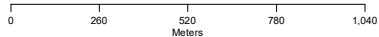
Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Legend

-  Site Boundary
-  Buffer 150m

Scale:



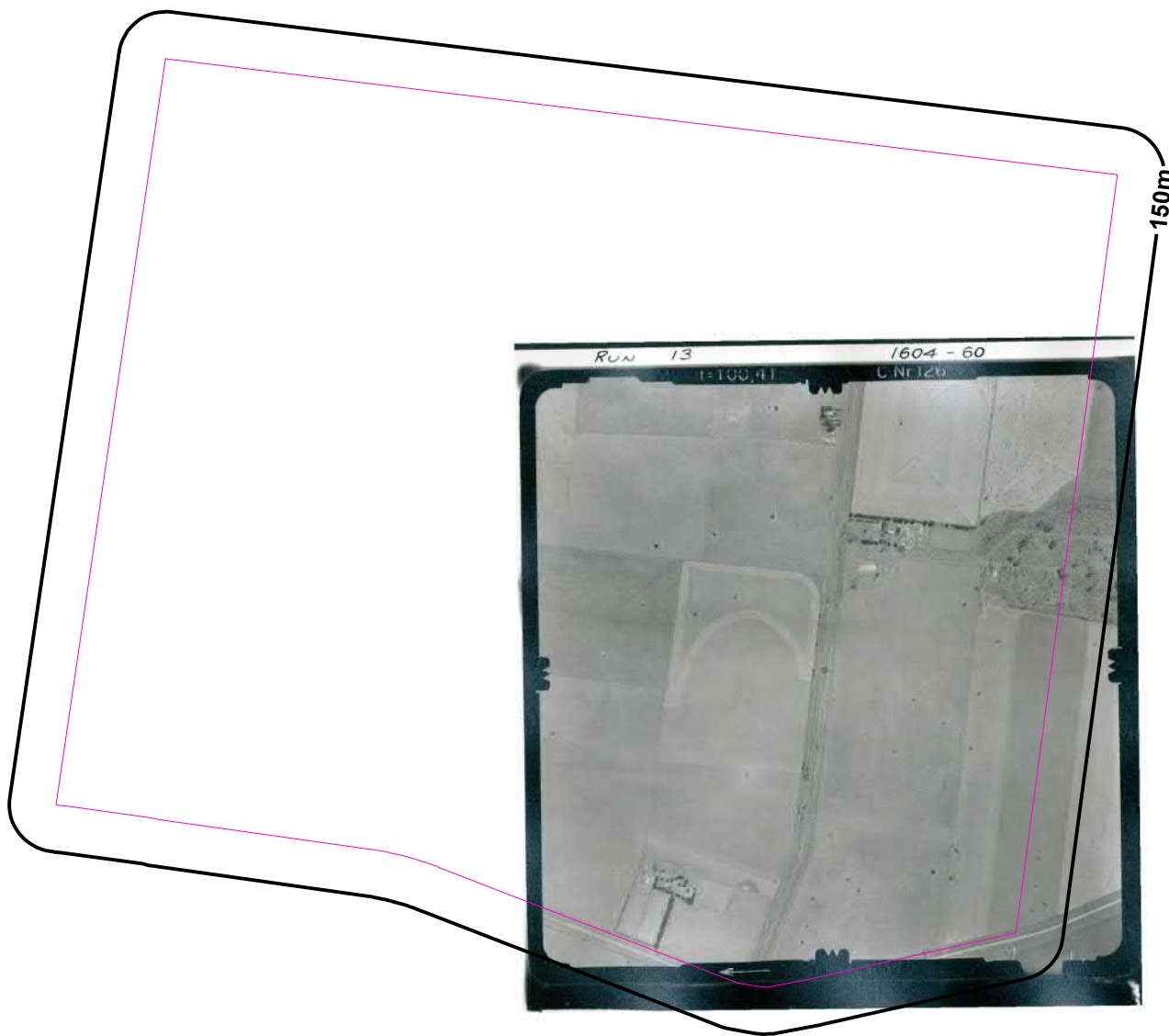
Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August, 2020

Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Legend

-  Site Boundary
-  Buffer 150m

Scale:

0 260 520 780 1,040
Meters

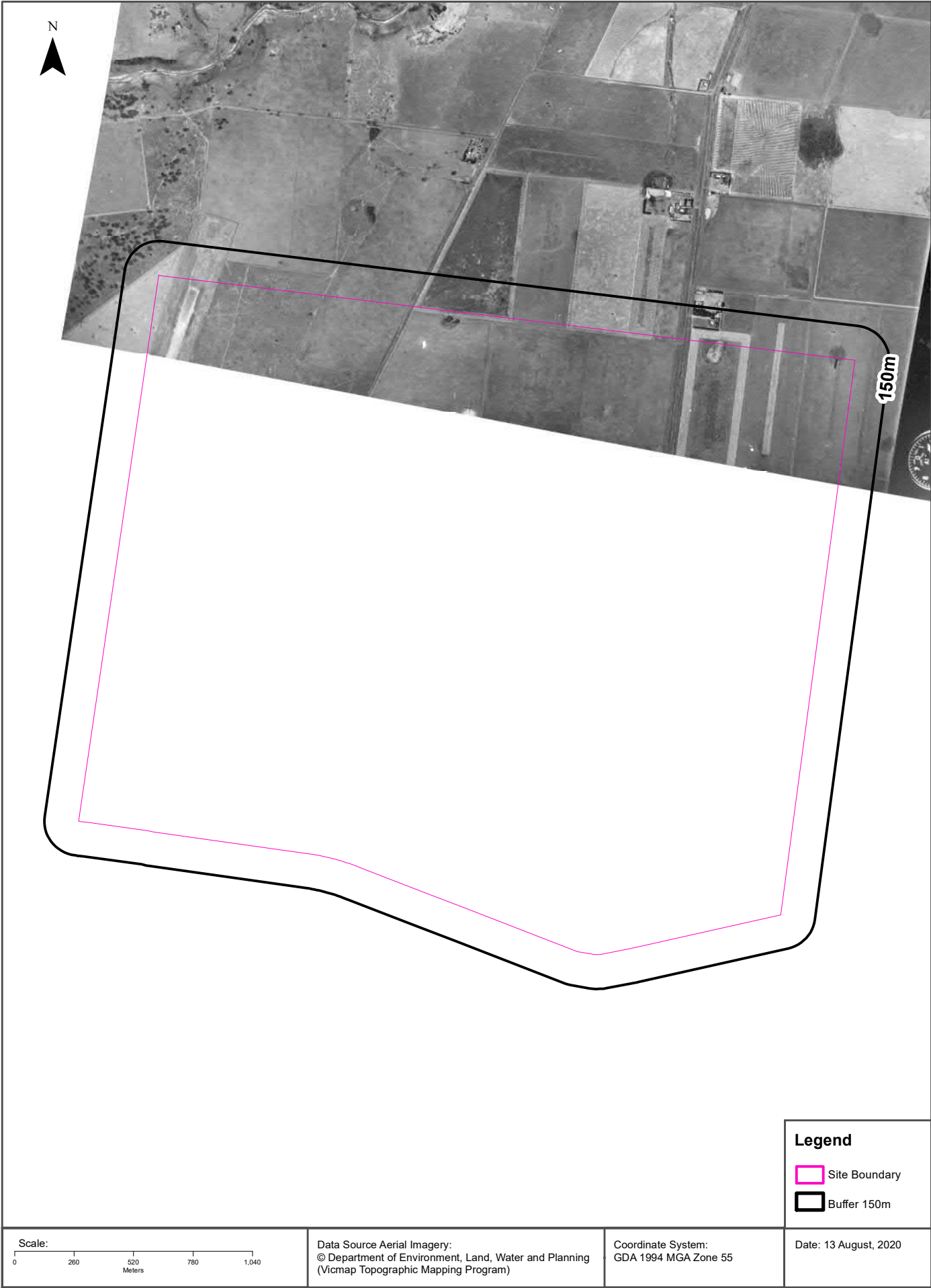
Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August, 2020

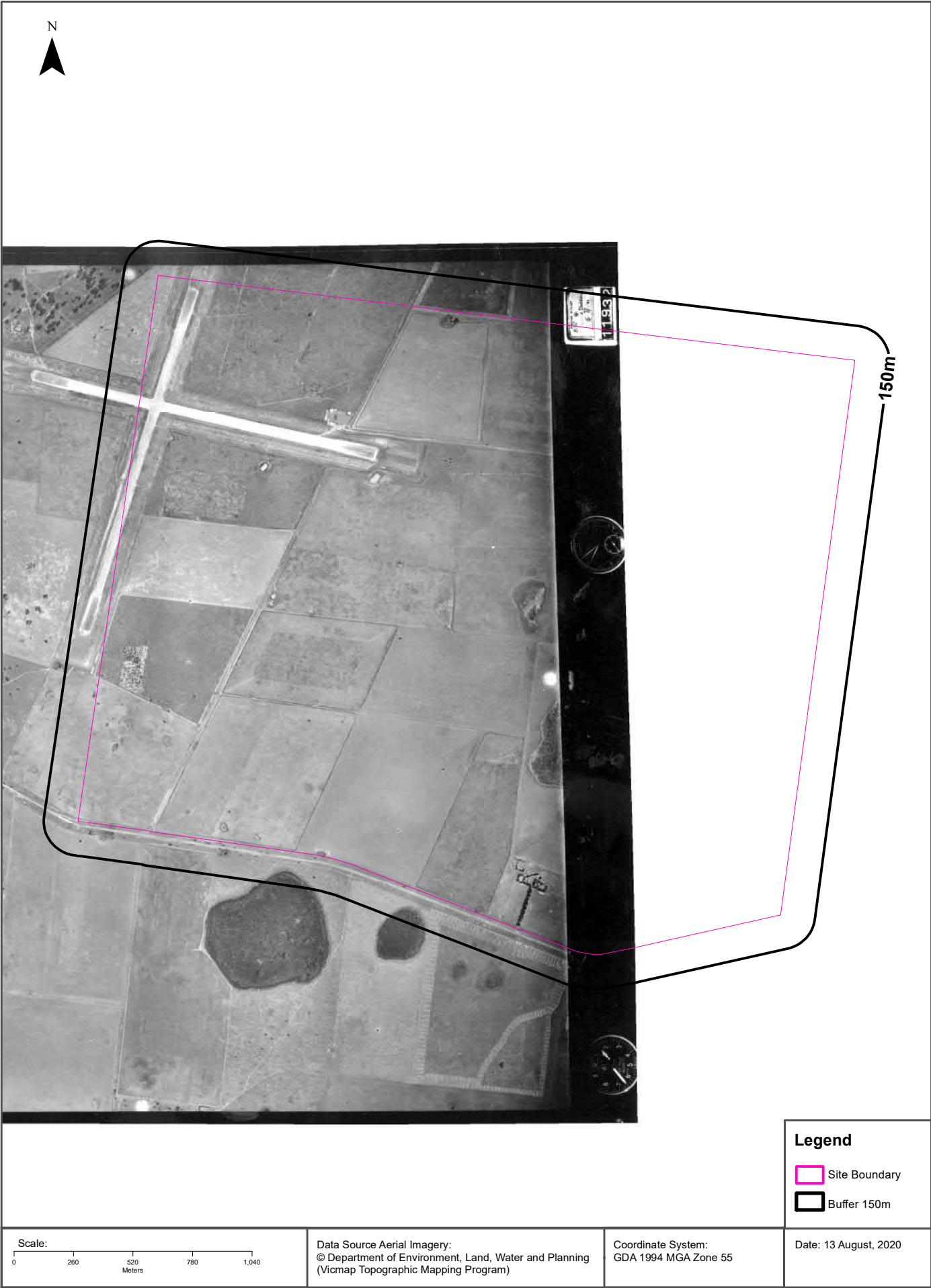
Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



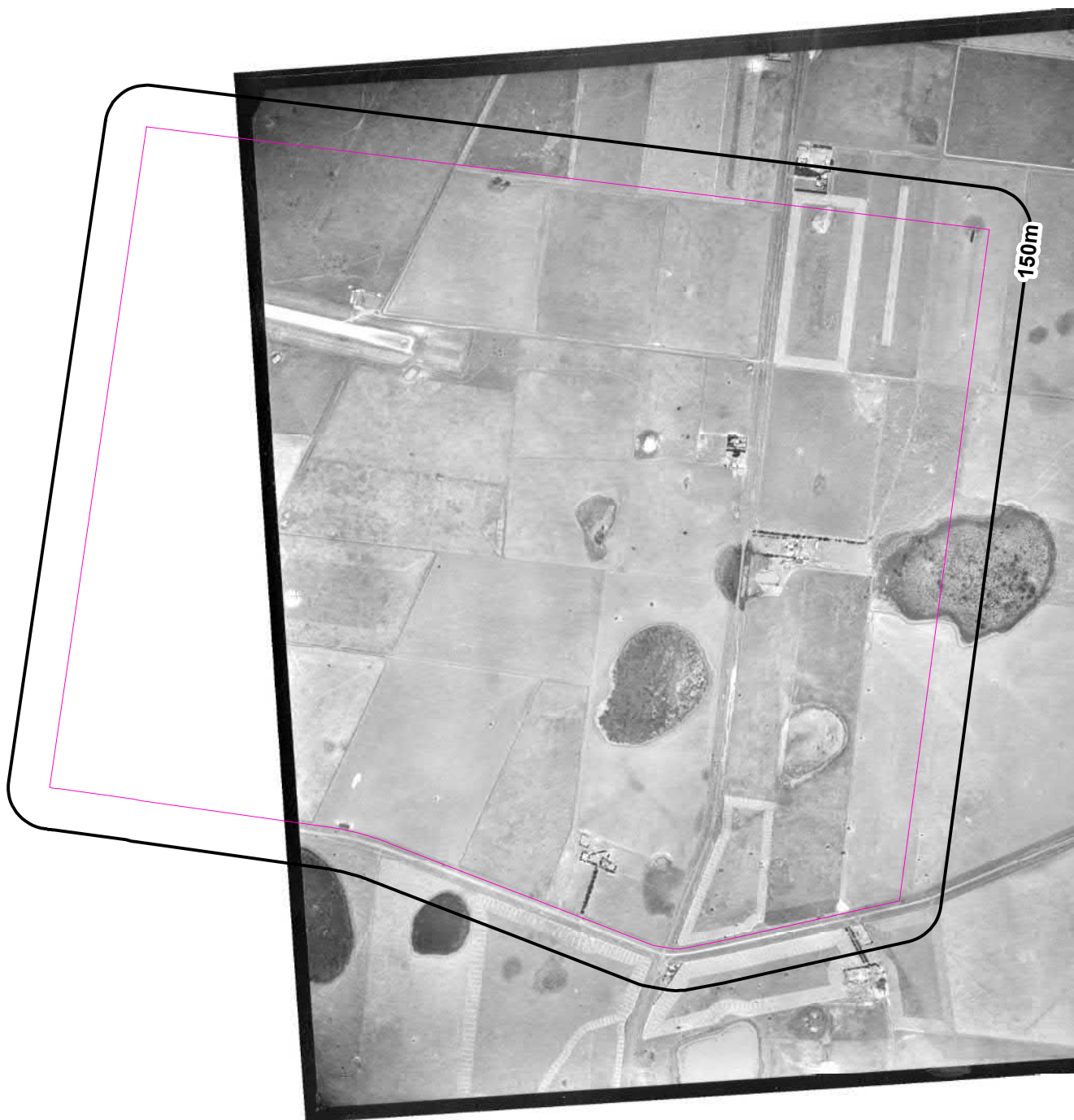
Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Aerial Imagery 1951

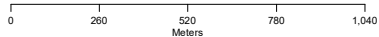
Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Legend

-  Site Boundary
-  Buffer 150m

Scale:



Data Source Aerial Imagery:
© Department of Environment, Land, Water and Planning
(Vicmap Topographic Mapping Program)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13 August, 2020

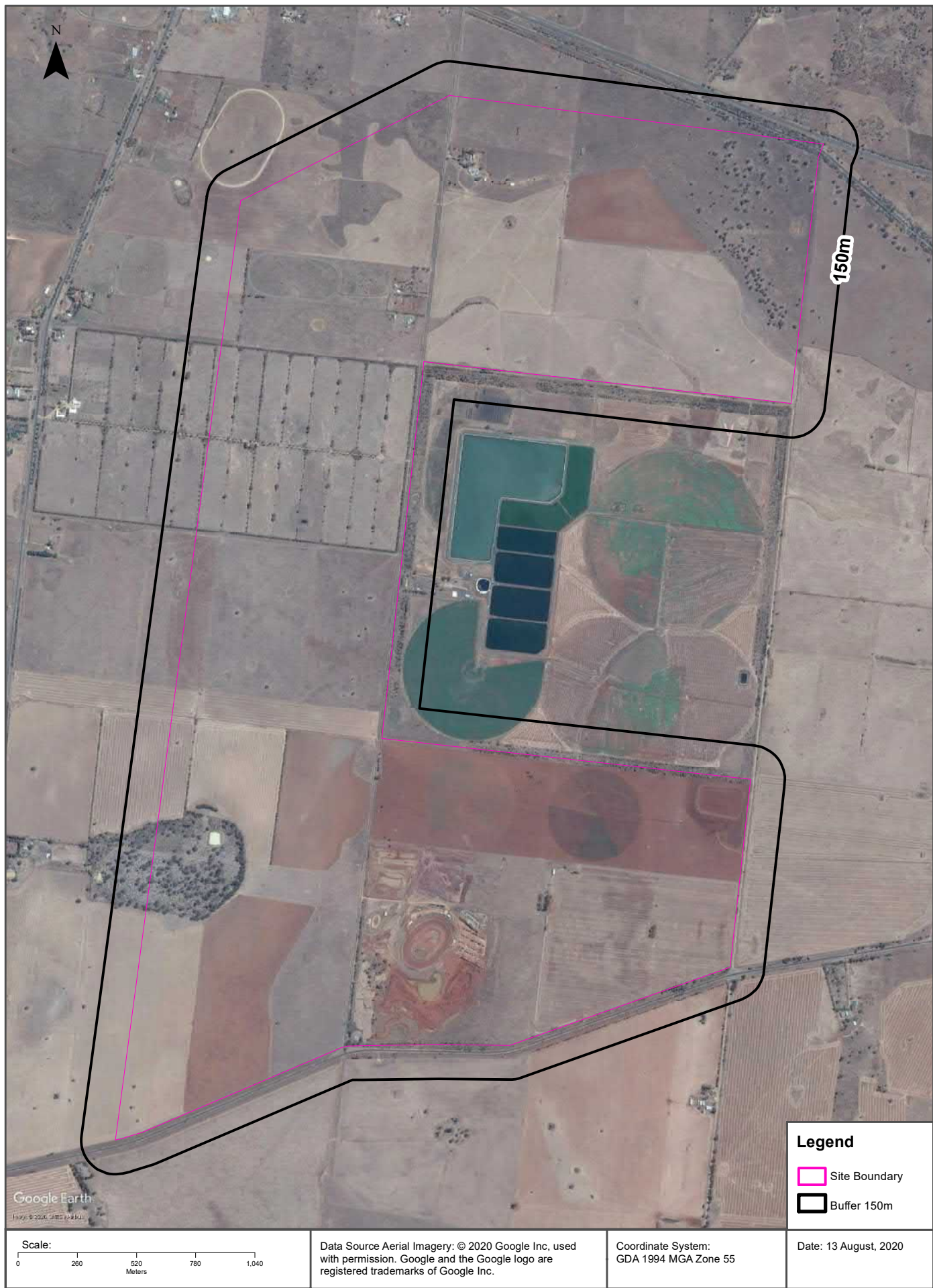
Aerial Imagery 2019

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



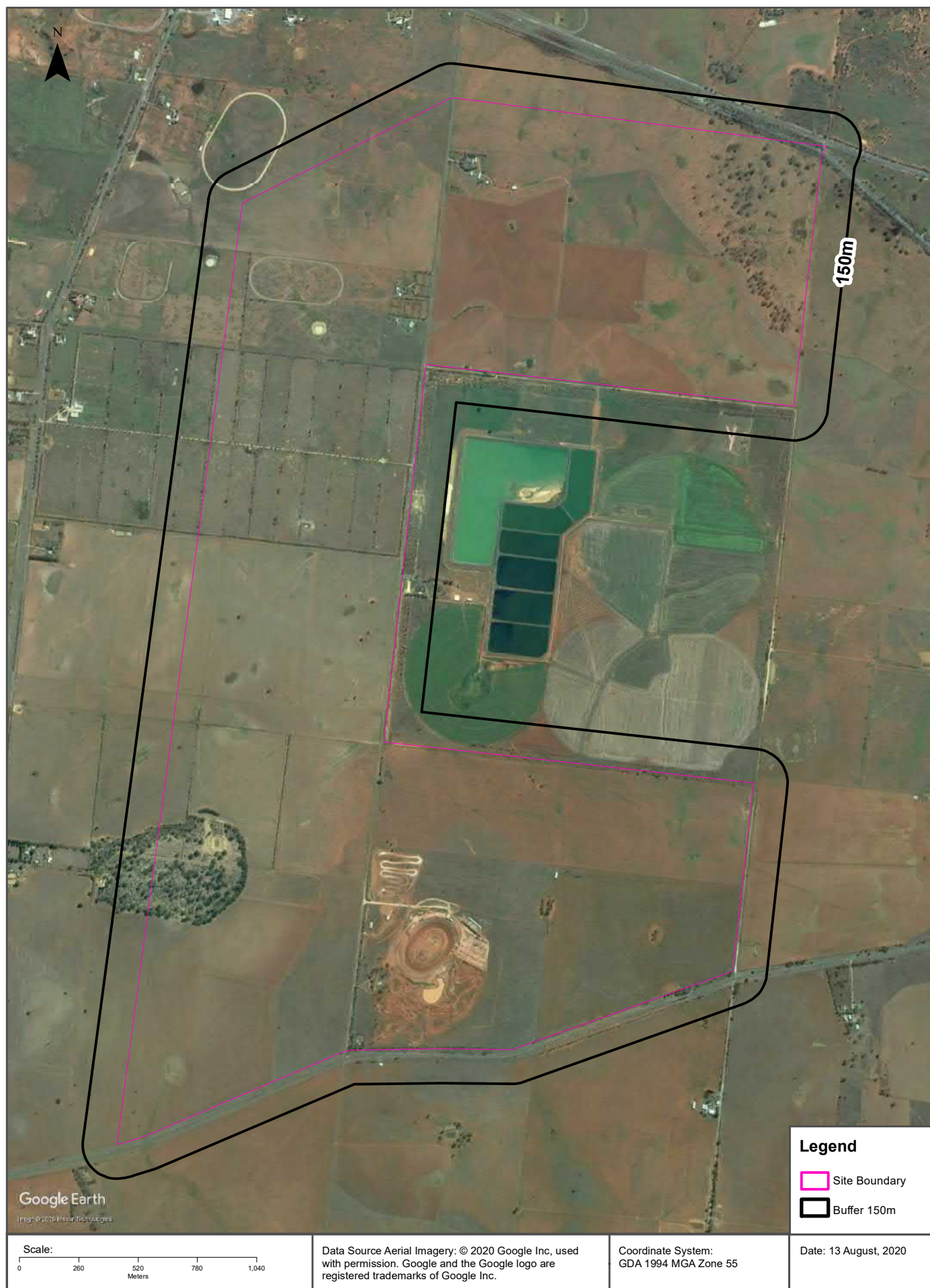
Aerial Imagery 2014

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



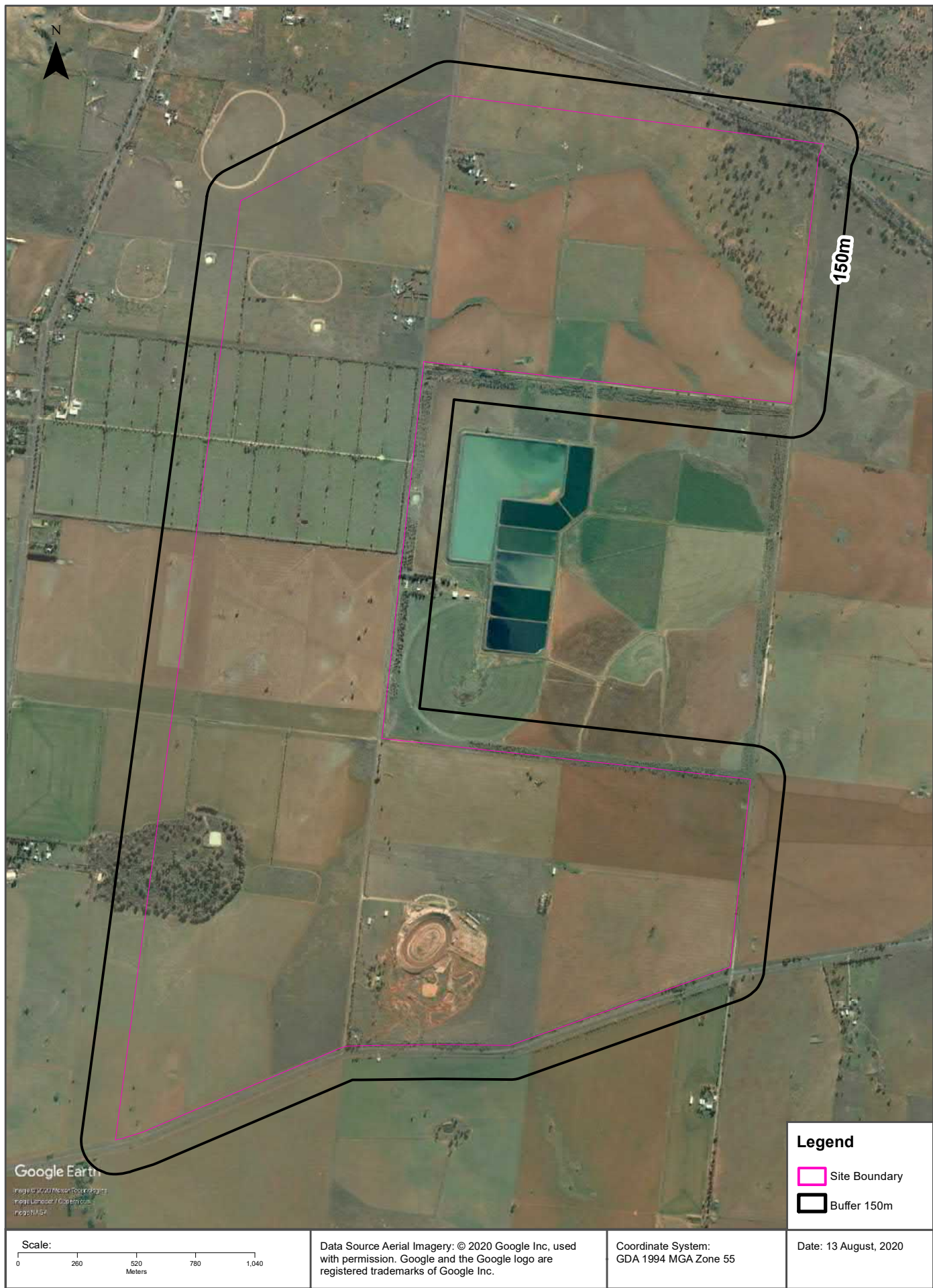
Aerial Imagery 2010

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 2006

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1990

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1986

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1979

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1970

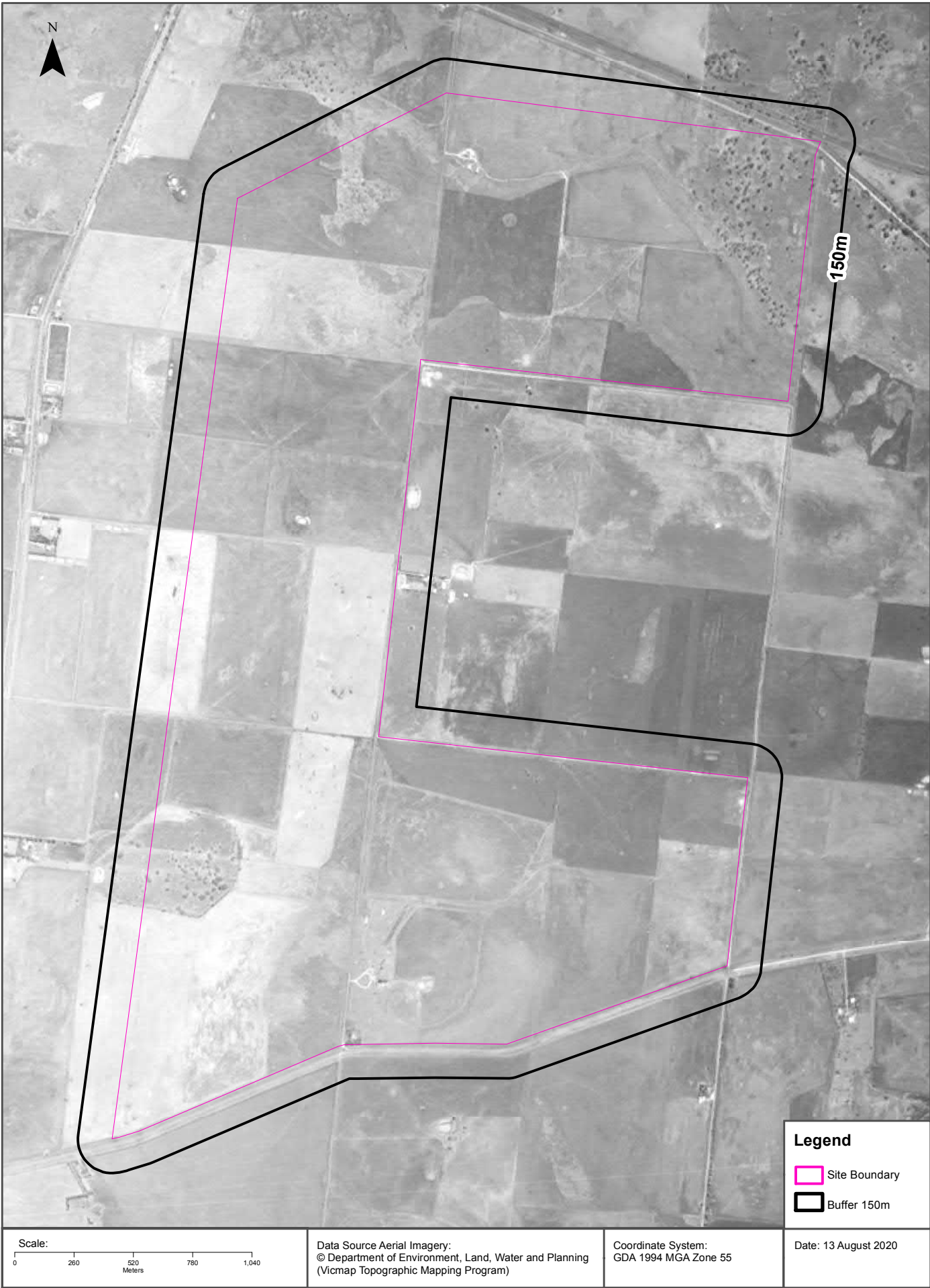
Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Scale: 0 260 520 780 1,040 Meters	Data Source Aerial Imagery: © Department of Environment, Land, Water and Planning (Vicmap Topographic Mapping Program)	Coordinate System: GDA 1994 MGA Zone 55	Date: 14 August, 2020
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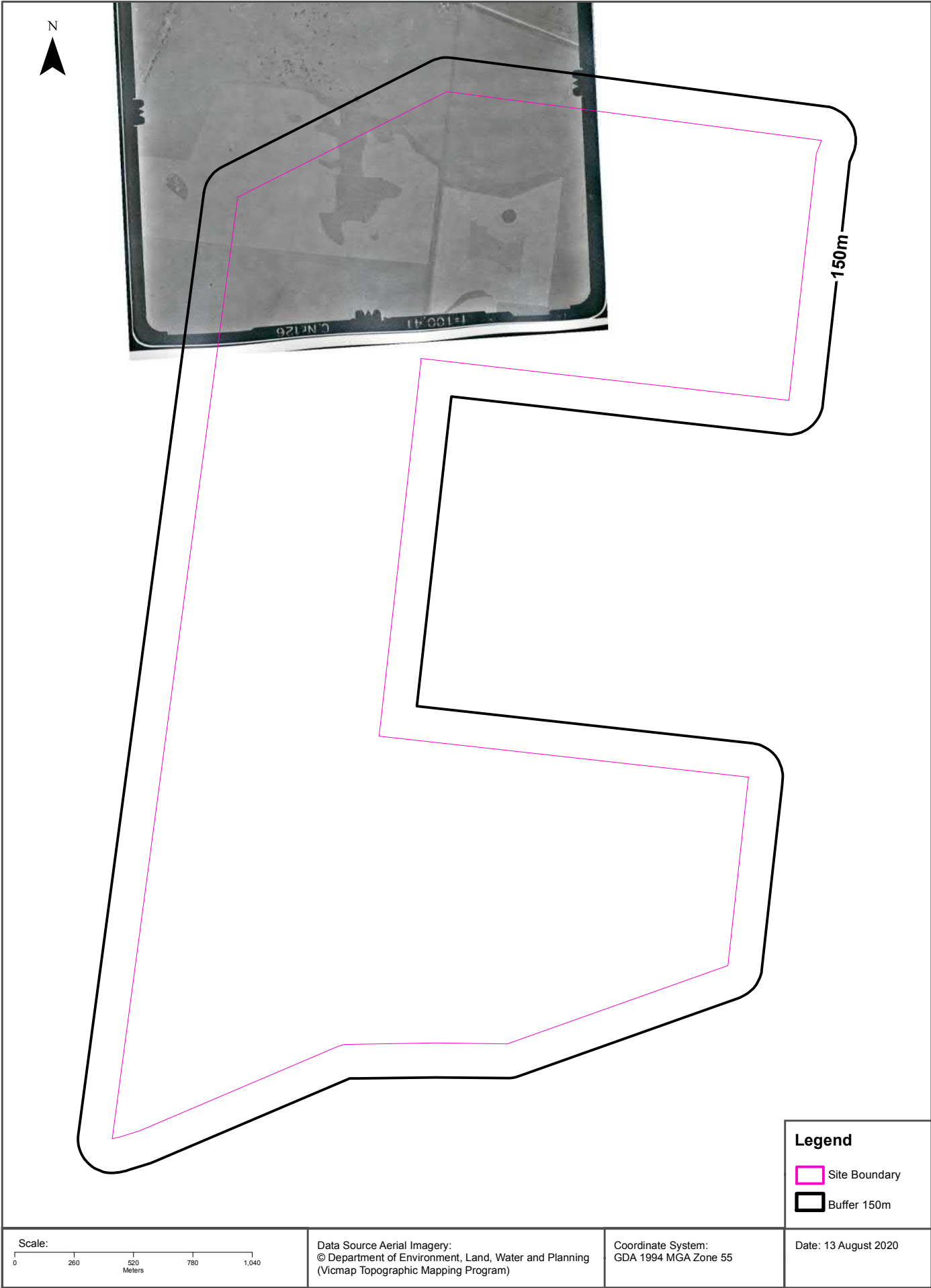
Aerial Imagery 1968

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



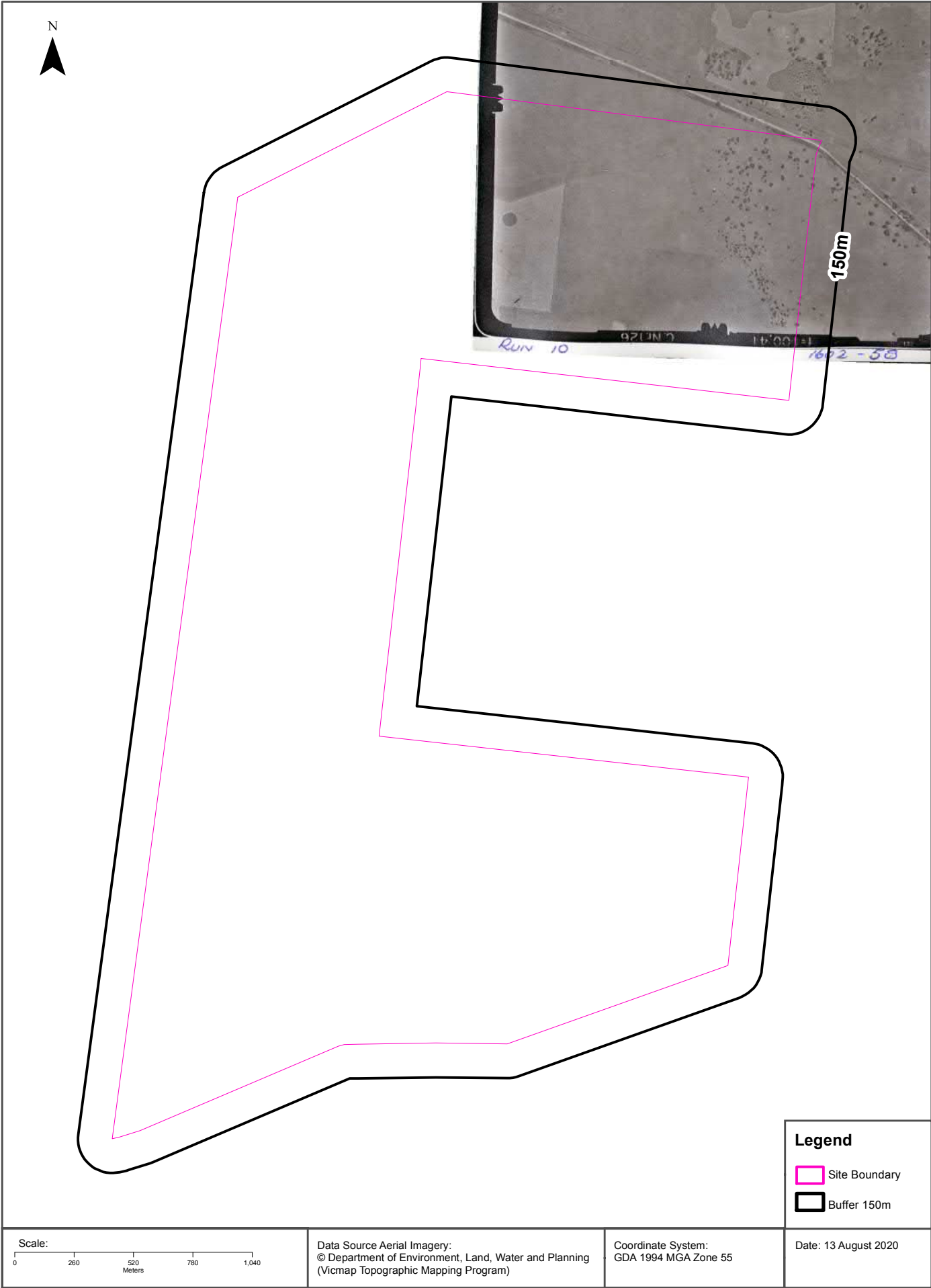
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



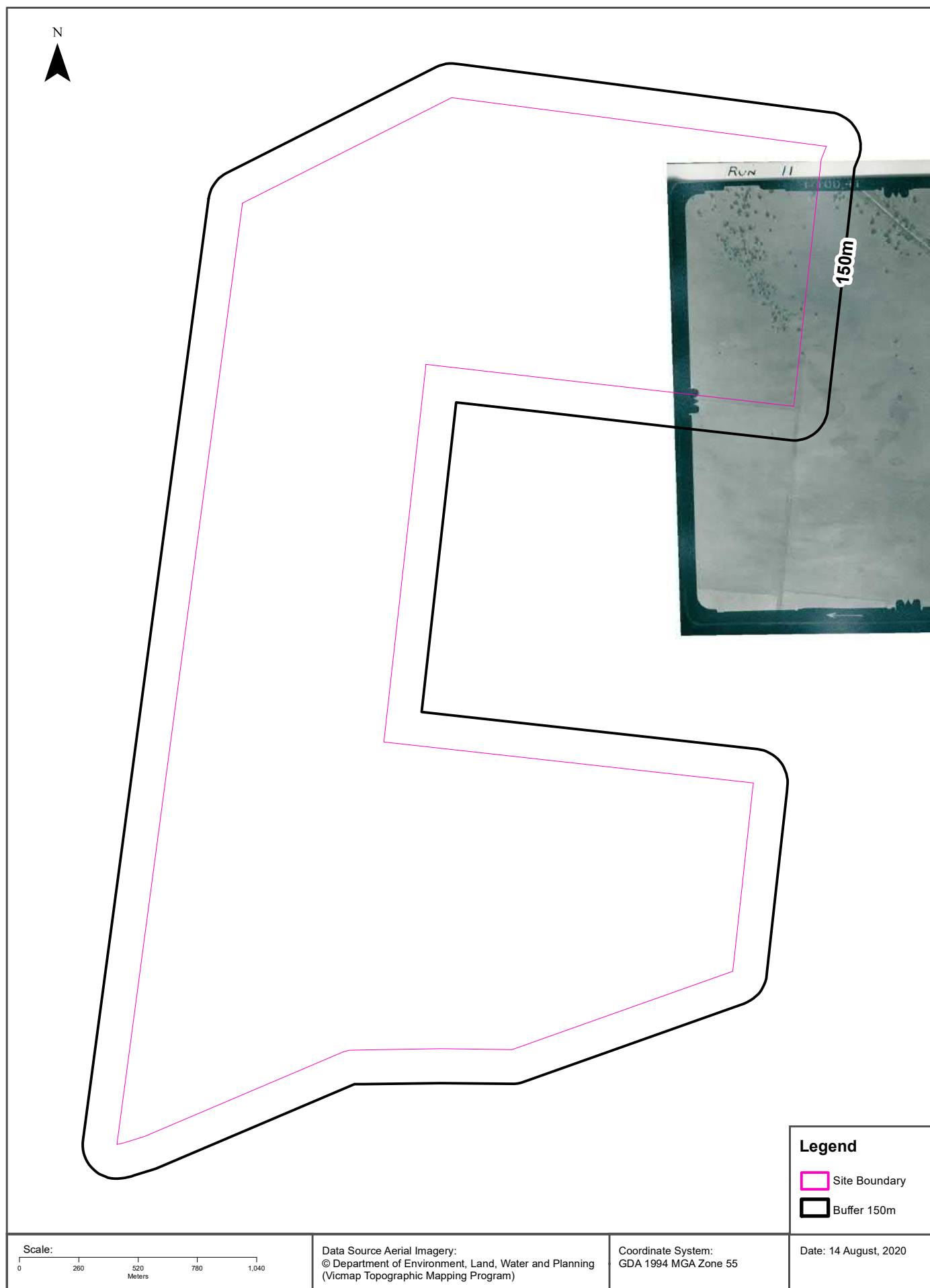
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



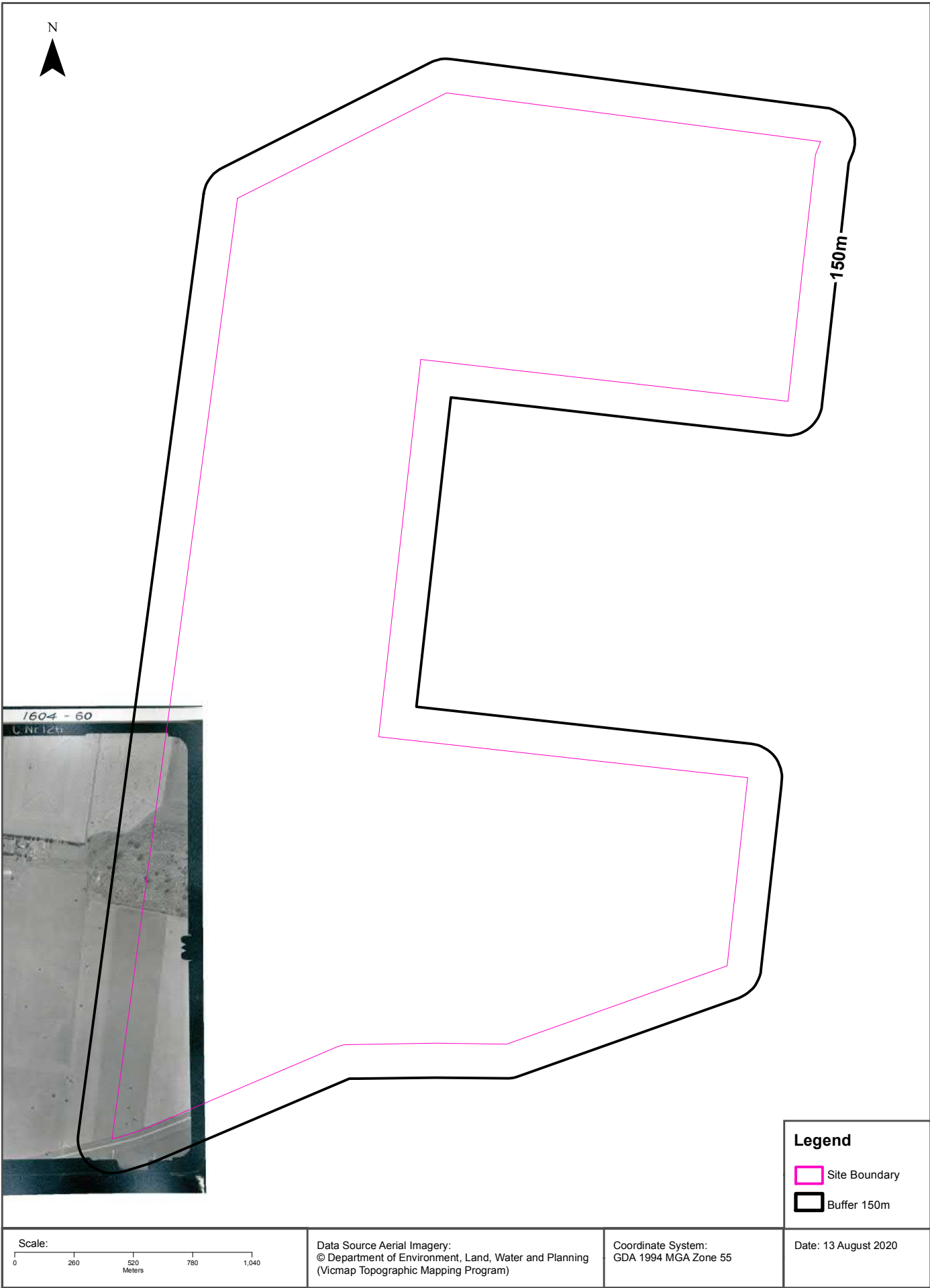
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



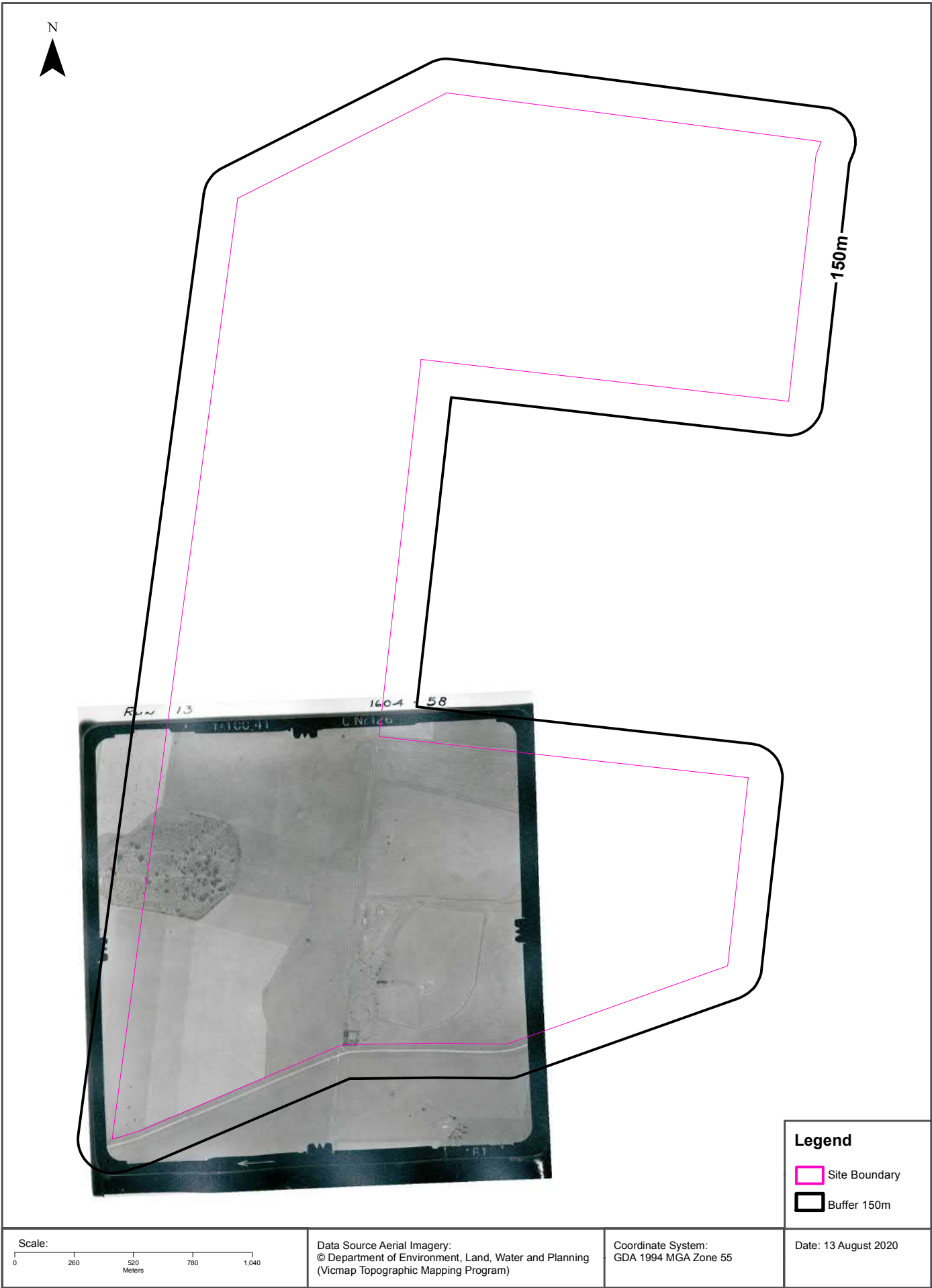
Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1961

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



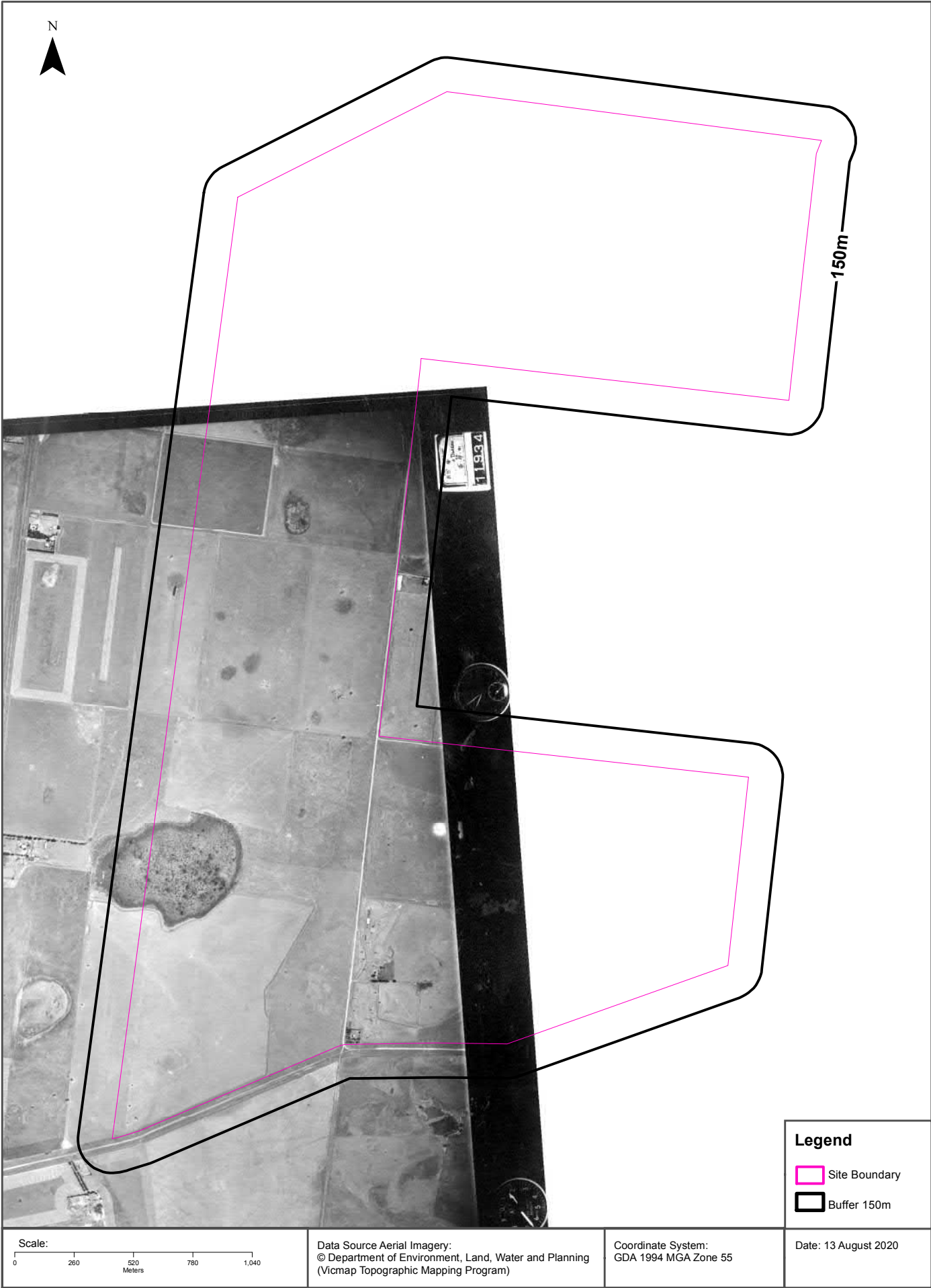
Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



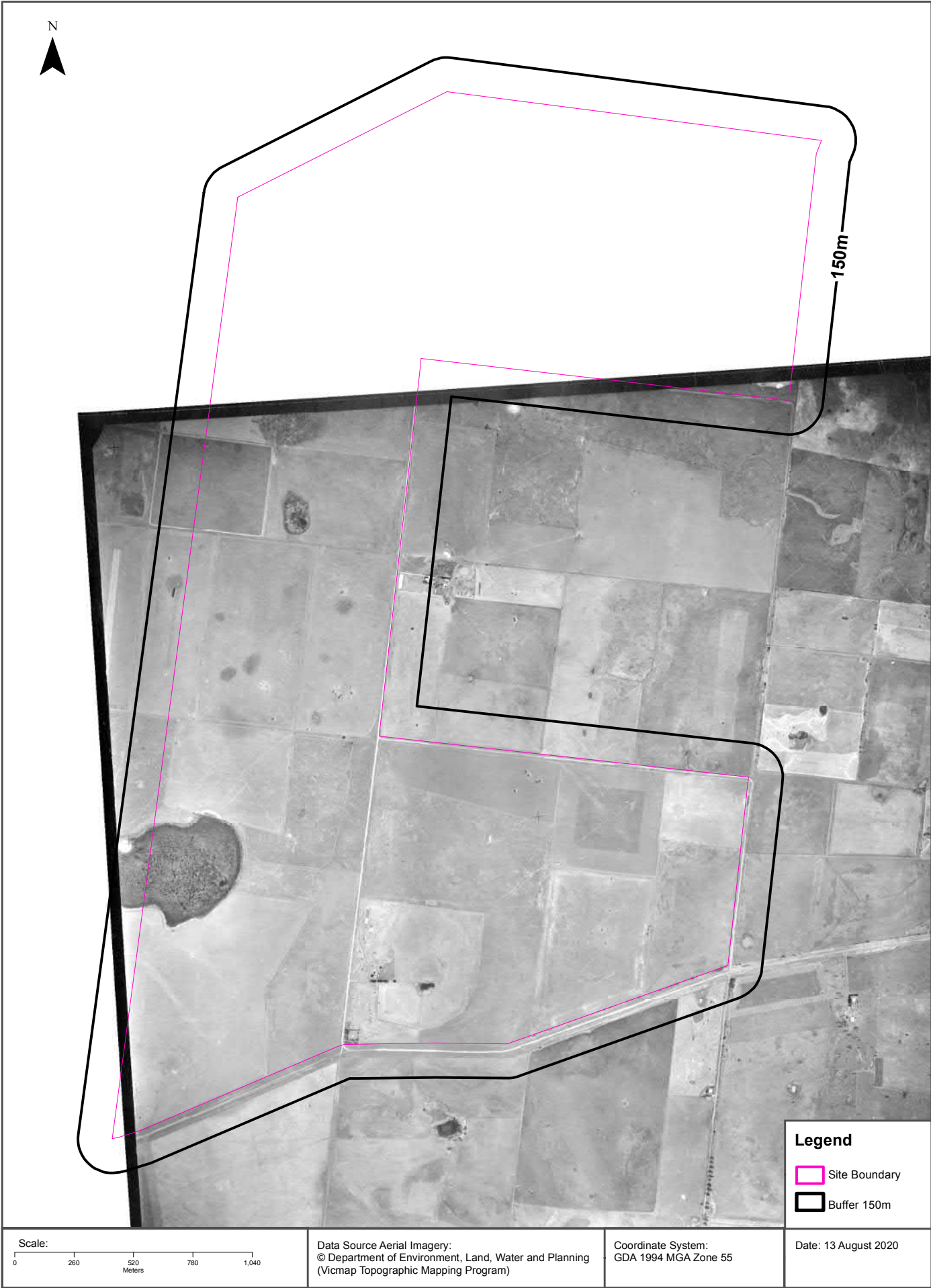
Aerial Imagery 1951

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Aerial Imagery 1951

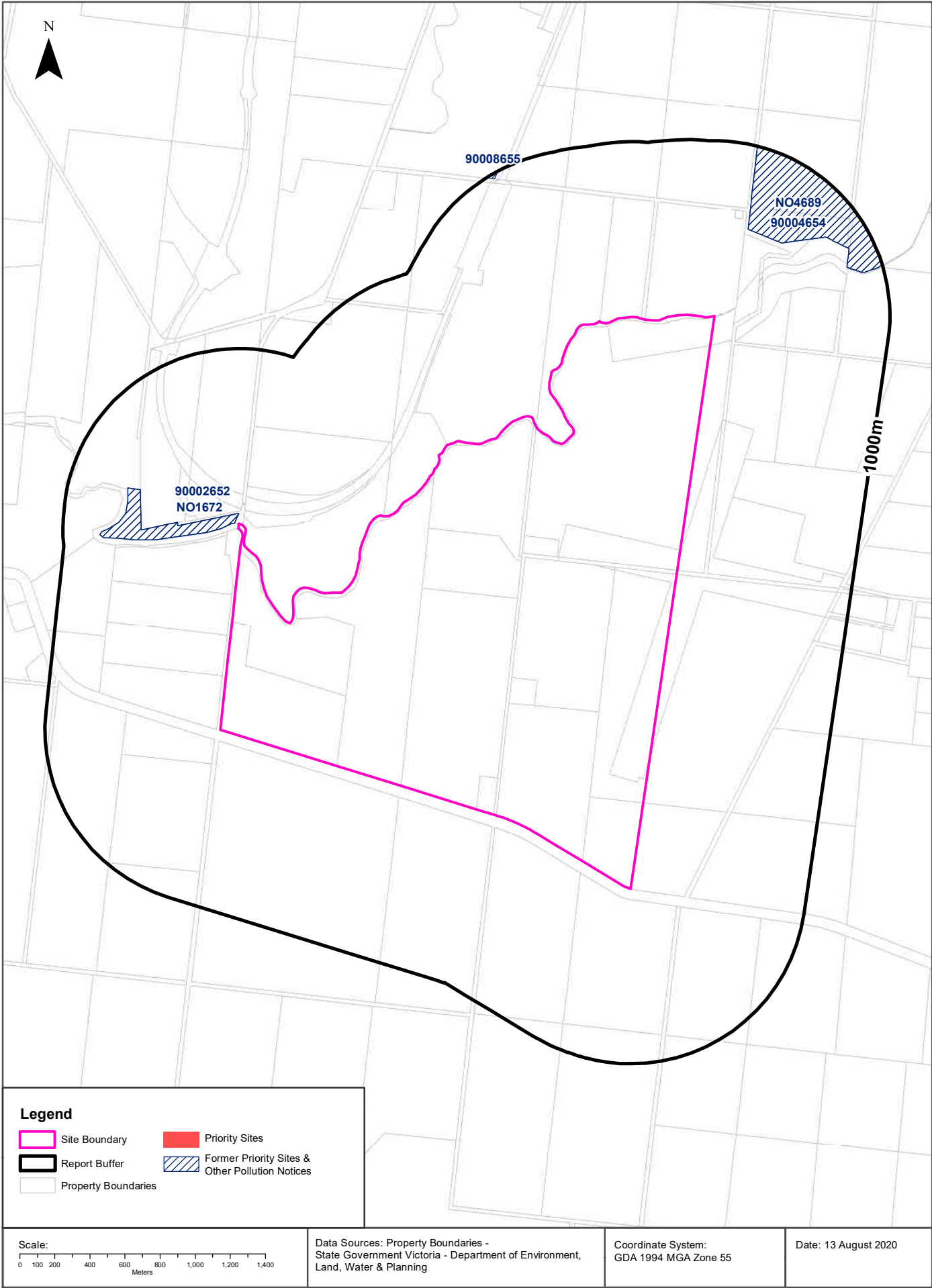
Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



Appendix H EPA Victoria Records

EPA Records - Priority Sites & Pollution Notices

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



EPA Priority Sites & Pollution Notices

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Current EPA Priority Sites Register

Sites on the current EPA priority sites register that exist within the dataset buffer:

Notice No	Address	Suburb	Issue	Loc Conf	Dist (m)	Direction
N/A	No records in buffer					

Priority Sites Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Priority Sites & Other Pollution Notices

Sites within the dataset buffer that have been issued a Pollution Notice:

Note. Due to pollution notices being revoked and removed from published lists this is not an exhaustive list of all past pollution notices.

Notice No	Notice Type	Company	Address	Suburb	Status	Issue	Date Issued	Loc Conf	Dist	Dir
NO1672	62A(1)	MOORABOOL SHIRE COUNCIL	C/A 5E SECTION 13 PARISH OFGORROCKB URKGAP COUNTYOF GRANT VOLUME 7283 FOLIO 402	ROWSLEY	Legacy EPA Database Pollution Notice	Gun, pistol or rifle range, Requires ongoing management.	05/05/2000	Premise Match	24m	West
90002652			C/a 5e Section 13 Parish Of Gorrockburkgap County Of Grant	ROWSLEY	Previous Pollution Notice	Gun, pistol or rifle range. Requires ongoing management		Premise Match	24m	West
NO4689	31B(1)	MADDINGLEY BROWN COAL P/L	EAST MADDINGLEY RD	BACCHUS MARSH	Legacy EPA Database Pollution Notice	Current Landfill, Requires ongoing management.	16/03/2005	Premise Match	530m	North East
90004654	Pollution Abatement Notice	MADDINGLEY BROWN COAL PTY LTD	Maddingley Road	BACCHUS MARSH	Previous Pollution Notice			Premise Match	530m	North East
90008655	Pollution Abatement Notice	INTERSTATE ENERGY GROUP PL [MADDINGLEY]	25 ROWSLEY STATION RD, MADDINGLEY VIC 3340	MADDINGLEY	Previous Pollution Notice		26/04/2018	Premise Match	972m	North

Pollution Notice Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

PFAS Investigation & Management Programs

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

EPA PFAS Site Investigations

Sites being investigated by the EPA for PFAS contamination within the dataset buffer:

Map ID	Site Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Site Investigations Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Defence PFAS Investigation & Management Program Investigation Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

Defence PFAS Investigation & Management Program Management Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

Defence PFAS Investigation & 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	Location Confidence	Distance	Direction
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Defence 3 Year Regional Contamination Investigation Program

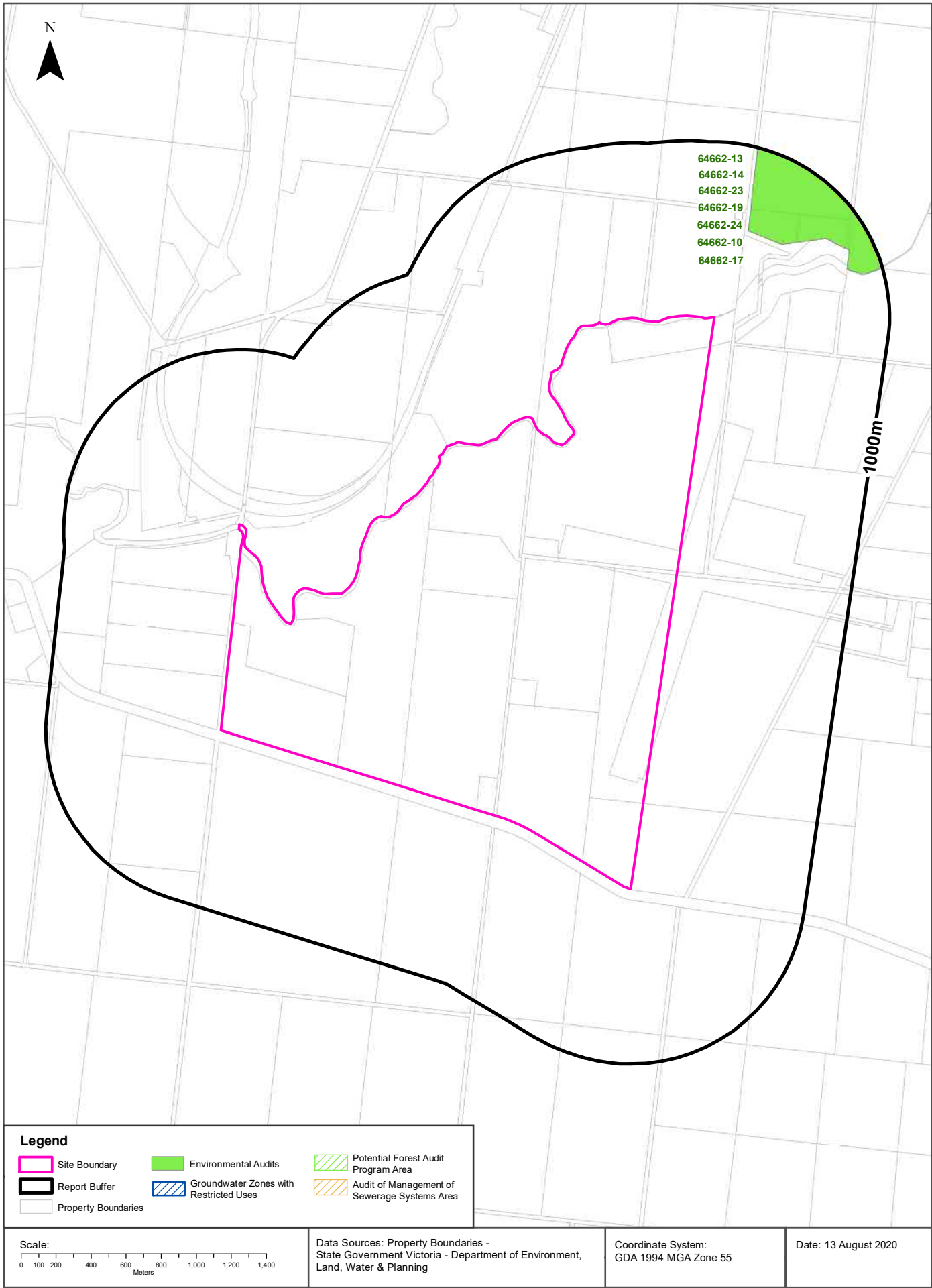
Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

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 Records - Audit Reports & GQRUZ

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



EPA Records

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

EPA Environmental Audits

EPA environmental audit records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation. If link does not work, documentation may still be accessible via the EPA Interaction Portal.

CARMS No	Transaction No	Site	Address	Suburb	Date Complete	Audit Category	Loc Conf	Distance	Direction
64662-10	8004134	EAST MADDINGLEY ROAD MADDINGLEY BROWN COAL (MBC) LANDFILL	EAST MADDINGLEY ROAD	Bacchus Marsh	16/01/2014	53V Audit recommendations	Premise Match	530m	North East
64662-13	8004437	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY	23/12/2014	53V Audit recommendations	Premise Match	530m	North East
64662-14	8004738	EAST MADDINGLEY RD, MADDINGLEY VIC 3340 EAST MADDINGLEY RD	EAST MADDINGLEY RD, MADDINGLEY VIC 3340 EAST MADDINGLEY RD	MADDINGLEY	10/12/2015	53V Audit recommendations	Premise Match	530m	North East
64662-17	8005136	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD, MADDINGLEY	MADDINGLEY	13/01/2017	53V Audit recommendations	Premise Match	530m	North East
64662-19	8005528	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY	30/01/2018	53V Audit recommendations	Premise Match	530m	North East
64662-23	8005942	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY	25/01/2019	53V Audit recommendations	Premise Match	530m	North East
64662-24	8006370	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY	27/03/2020	53V Audit recommendations	Premise Match	530m	North East

Environmental Audit Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

EPA Groundwater Zones with Restricted Uses

EPA GQRUZ records that exist within the dataset buffer:

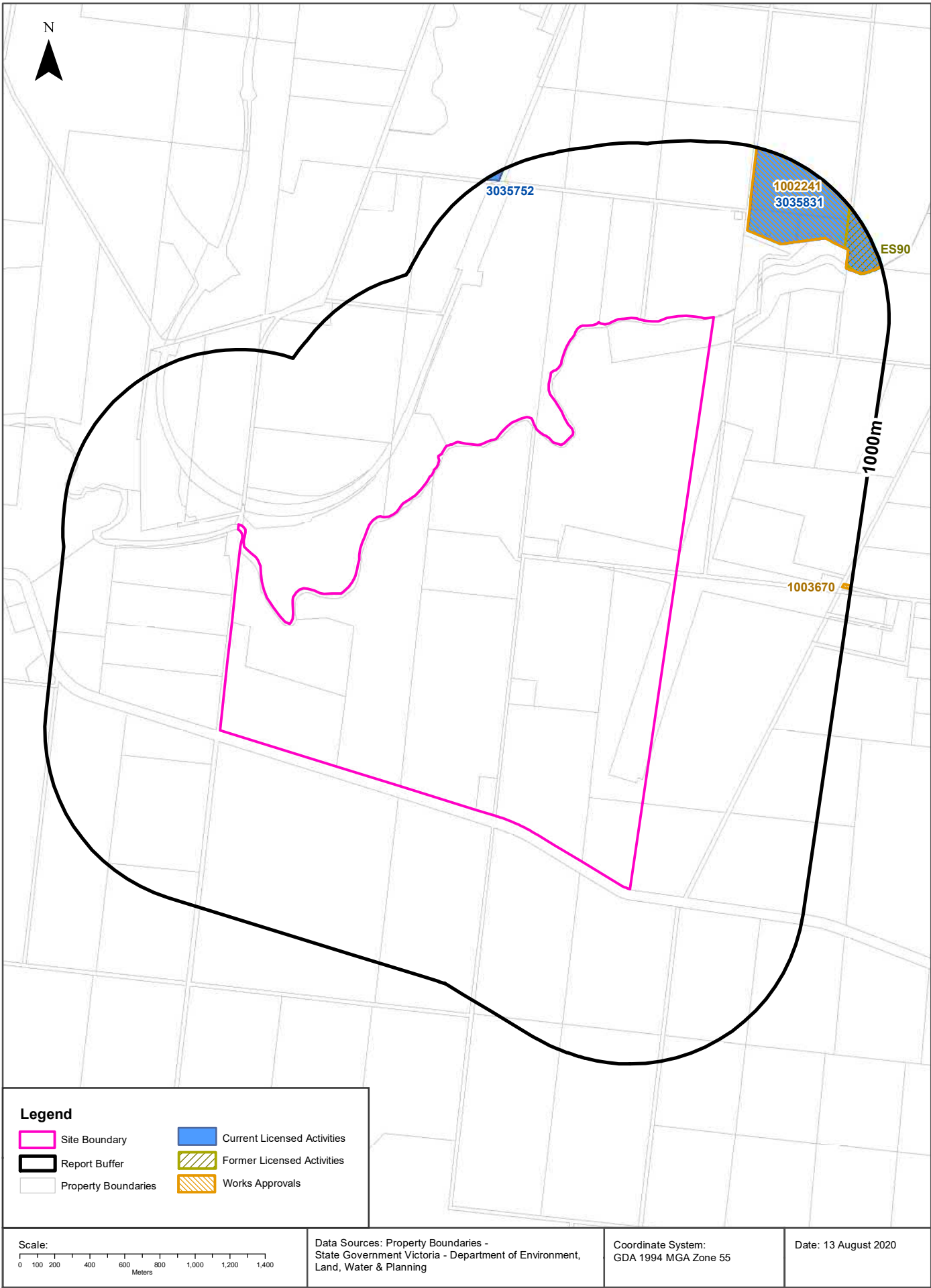
Note. Please click on CARMS No. to activate a hyperlink to online documentation.

CARMS No	EPA Id	Site History	Site Address	Restricted Uses	Status	Loc Conf	Distance	Direction
N/A	No records in buffer							

Environmental GQRUZ Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records - Licensed Activities & Works Approvals

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



EPA Activities

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

EPA Licensed Activities

EPA licensed activities that exist within the dataset buffer:

Trans No	Licence No	Licence Type	Organisation	Premise Ref	Premise Address 1	Premise Address 2	Activities	Loc Conf	Dist (m)	Direction
3035831	45288	Licence	MADDINGLEY BROWN COAL PTY LTD [MADDINGLEY]		11 TILLEYS RD	MADDINGLEY VIC 3340	A05 Landfills; A01 Prescribed Industrial Waste Management; A07 Composting	Premise Match	530m	North East
3035752	215043	Licence	AUSTRALIAN BIO FERT [MADDINGLEY]		LOT 2 PLAN OF SUB 626140T BACCHUS MARSH-BALLIANG ROAD, MADDINGLEY VIC 3340	MADDINGLEY	A02 Other Waste Treatment	Premise Match	957m	North

Licensed Activity Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Licensed Activities

Former EPA licensed activities that exist within the dataset buffer:

Licence No	Organisation	Premise Address	Suburb	Activities	Loc Conf	Dist (m)	Direction
ES90	MADDINGLEY BROWN COAL PTY LTD [MADDINGLEY]	EAST MADDINGLEY RD, BACCHUS MARSH VIC 3340	MADDINGLEY	Landfilling, Composting	Premise Match	814m	North East

Former Licensed Activity Data Custodian: State Government Victoria - Environmental Protection Authority (EPA)

EPA Works Approvals

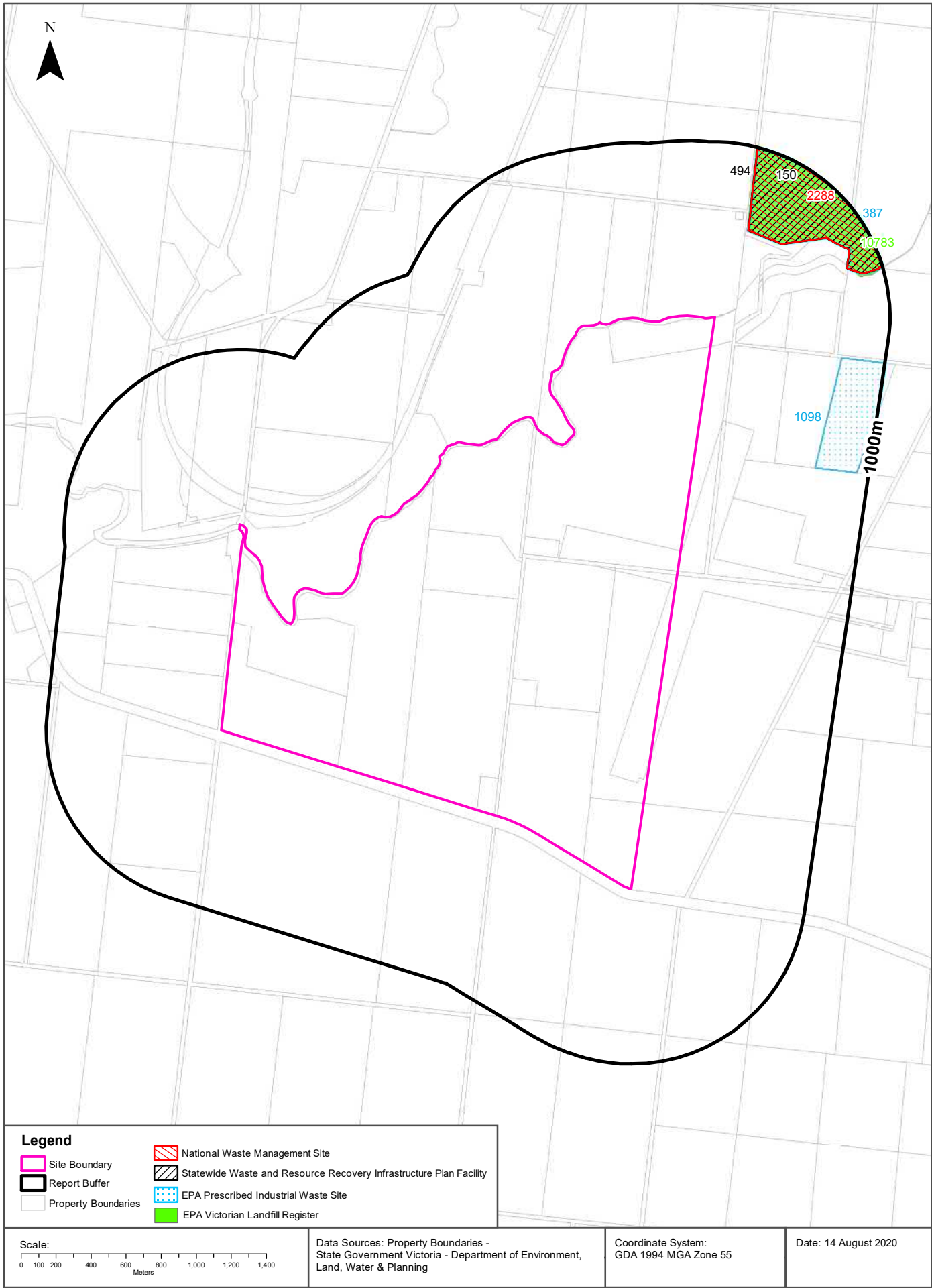
EPA works approvals that exist within the dataset buffer:

Transaction No	Status	Approval No	Organisation	Premise Address	Suburb	Scheduled Categories	Loc Conf	Dist (m)	Direction
1002241	Approved/Issued		MADDINGLEY BROWN COAL PTY LTD [MADDINGLEY]		MADDINGLEY	Design and construct landfill cells	Premise Match	530m	North East
1003670	Approved/Issued		DANDY AIRCRAFT PTY LTD [PARWAN]	Aerodrome Road	PARWAN	Exempt under 19A(4): Installation of a wastewater treatment plant	Road Match	950m	East

Works Approvals Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Waste Management Facilities & Landfills

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)



Waste Management Facilities & Landfills

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

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 (m)	Direction
2288	Maddingley Brown Coal Pty Ltd	Maddingley Brown Coal Pty Ltd	Tilleys Road	Maddingley	Landfill	Operational		Operational	Commercial waste only	Premise Match	530m	North East

Waste Management Facilities Data Source: Australian Government Geoscience Australia

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Statewide Waste and Resource Recovery Infrastructure Plan Facilities

Statewide Waste and Resource Recovery Infrastructure Plan Facilities within the dataset buffer:

Map Id	Owner	Site Name	Address	Suburb	Category	Sub Category	Loc Conf	Distance	Direction
150	Maddingley Brown Coal P/L	Maddingley Brown Coal - ES90	East Maddingley Rd	Bacchus Marsh	Landfill	Inert Landfill	Premise Match	530m	North East
494		Calleja Transport	East Maddingley Rd	Bacchus Marsh	Organics	Garden Waste	Premise Match	530m	North East

SWRRIPF Data Source: State Government Victoria - Department of Sustainability

EPA Prescribed Industrial Waste

EPA Prescribed Industrial Waste treaters, disposers and permitted transporters within the dataset buffer:

Map Id	Company Name	Address	Suburb	Treatment /Disposal	Transport	Accredited Agent	EPA List Status	Loc Conf	Dist' (m)	Direct
387	MADDINGLEY BROWN COAL PTY LTD [MADDINGLEY]	11 TILLEYS RD	MADDINGLEY VIC 3340	Yes	No	No	Current EPA List	Premise Match	530m	North East
1098	VENNIX, GERARD ANTHONY	163 SMITHS RD	PARWAN	No	Yes	No	Previous EPA List	Premise Match	689m	North East

Prescribed Industrial Waste Data Source: State Government Victoria - Environment Protection Authority (EPA)

EPA Victorian Landfill Register

EPA Victorian Landfill Register sites within the dataset buffer:

Landfill Register No.	Site	Address	Operating Status	Est. Year Of Closure	Waste type	Loc Conf	Dist' (m)	Direction
10783	Not available	11 Tilleys Road, Maddingley, VIC 3340	Operating	Not available	Contaminated soil (Cat C), Paper pulp, Shredder floc, Tyres (shredded), Waste acid sulphate soils, Solid inert waste, Foundry sands, Paper pulp, Commercial food waste, Biosolids, Green waste	As Supplied	525m	North East

EPA Victorian Landfill Register Data Source: State Government Victoria - Environment Protection Authority (EPA)

Former Gasworks and Liquid Fuel Facilities

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Former Gasworks

Former Gasworks identified from various historical sources within the dataset buffer:

Note - As this is a dataset collated from various historical sources, it is not an exhaustive list of all former Gasworks

Map Id	Site Name	Date Opened	Year Closed	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Collated from various historical sources

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 (m)	Direction
N/A	No records in buffer										

National Liquid Fuel Facilities Data Source: Geoscience Australia

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Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Business Directory Records 1905-1991 Premise or Road Intersection Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
	No records in buffer						

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Business Directory Records 1905-1991

Road or Area Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
	No records in buffer					

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Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 1)

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from Sands & McDougall's Directories and UBD Business Directories, 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
	No records in buffer						

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Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

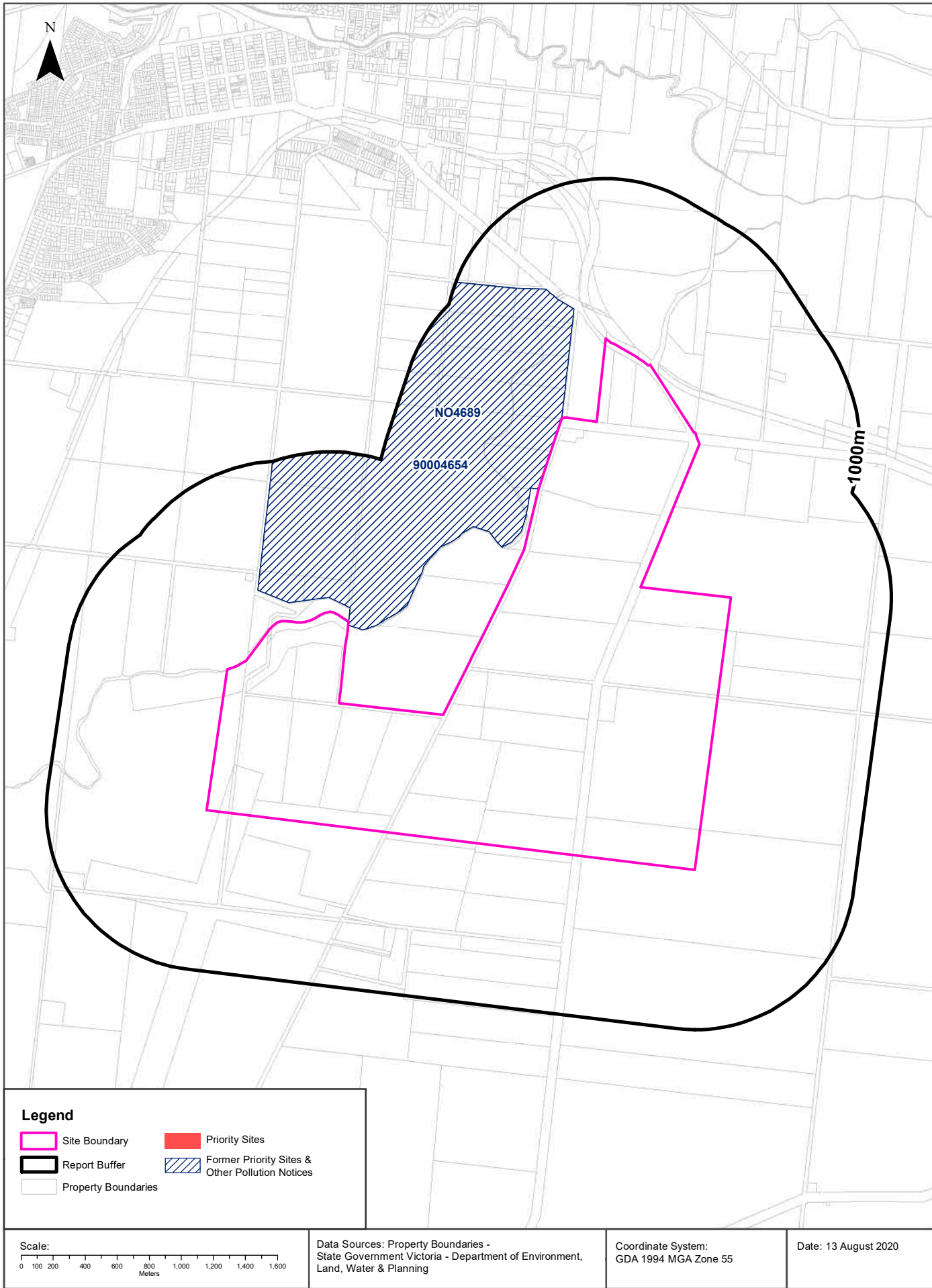
Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories and Sands & McDougall's Directories, mapped to a road or an area within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory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

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
	No records in buffer					

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EPA Records - Priority Sites & Pollution Notices

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



EPA Priority Sites & Pollution Notices

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Current EPA Priority Sites Register

Sites on the current EPA priority sites register that exist within the dataset buffer:

Notice No	Address	Suburb	Issue	Loc Conf	Dist (m)	Direction
N/A	No records in buffer					

Priority Sites Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Priority Sites & Other Pollution Notices

Sites within the dataset buffer that have been issued a Pollution Notice:

Note. Due to pollution notices being revoked and removed from published lists this is not an exhaustive list of all past pollution notices.

Notice No	Notice Type	Company	Address	Suburb	Status	Issue	Date Issued	Loc Conf	Dist	Dir
NO4689	31B(1)	MADDINGLEY BROWN COAL P/L	EAST MADDINGLEY RD	BACCHUS MARSH	Legacy EPA Database Pollution Notice	Current Landfill, Requires ongoing management.	16/03/2005	Premise Match	0m	North West
90004654	Pollution Abatement Notice	MADDINGLEY BROWN COAL PTY LTD	Maddingley Road	BACCHUS MARSH	Previous Pollution Notice			Premise Match	0m	North West

Pollution Notice Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

PFAS Investigation & Management Programs

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

EPA PFAS Site Investigations

Sites being investigated by the EPA for PFAS contamination within the dataset buffer:

Map ID	Site Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Site Investigations Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Defence PFAS Investigation & Management Program Investigation Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

Defence PFAS Investigation & Management Program Management Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

Defence PFAS Investigation & 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	Location Confidence	Distance	Direction
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Defence 3 Year Regional Contamination Investigation Program

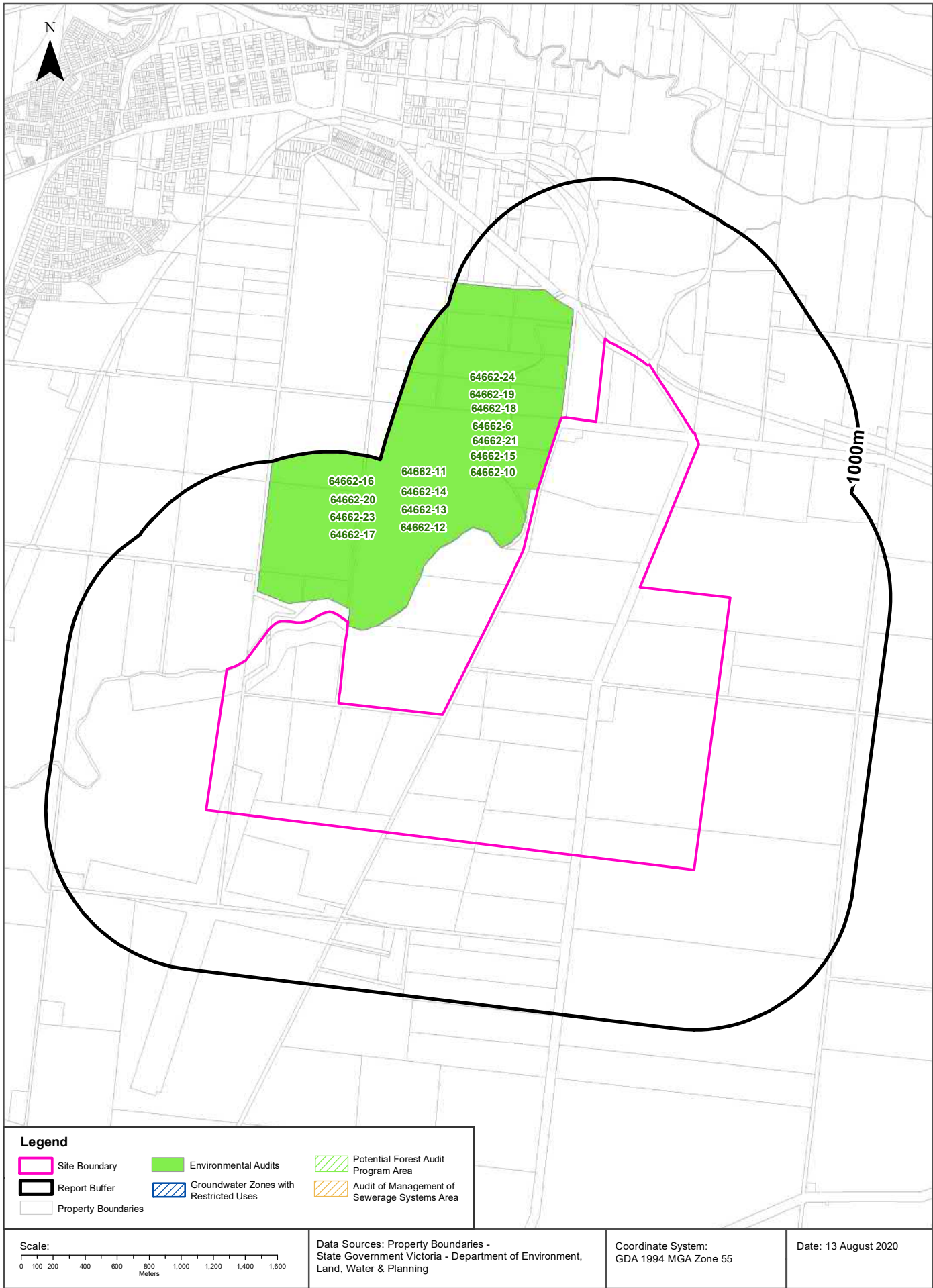
Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

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 Records - Audit Reports & GQRUZ

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



EPA Records

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

EPA Environmental Audits

EPA environmental audit records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation. If link does not work, documentation may still be accessible via the EPA Interaction Portal.

CARMS No	Transaction No	Site	Address	Suburb	Date Complete	Audit Category	Loc Conf	Distance	Direction
64662-10	8004134	EAST MADDINGLEY ROAD MADDINGLEY BROWN COAL (MBC) LANDFILL	EAST MADDINGLEY ROAD	Bacchus Marsh	16/01/2014	53V Audit recommendations	Premise Match	0m	North West
64662-13	8004437	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY	23/12/2014	53V Audit recommendations	Premise Match	0m	North West
64662-14	8004738	EAST MADDINGLEY RD, MADDINGLEY VIC 3340 EAST MADDINGLEY RD	EAST MADDINGLEY RD, MADDINGLEY VIC 3340 EAST MADDINGLEY RD	MADDINGLEY	10/12/2015	53V Audit recommendations	Premise Match	0m	North West
64662-17	8005136	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD, MADDINGLEY	MADDINGLEY	13/01/2017	53V Audit recommendations	Premise Match	0m	North West
64662-19	8005528	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY	30/01/2018	53V Audit recommendations	Premise Match	0m	North West
64662-23	8005942	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY	25/01/2019	53V Audit recommendations	Premise Match	0m	North West
64662-24	8006370	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY	27/03/2020	53V Audit recommendations	Premise Match	0m	North West
64662-15	8004805	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 11?, MADDINGLEY	MADDINGLEY	25/08/2016	53V Audit recommendations	Premise Match	78m	North
64662-6	8002697	MADDINGLEY BROWN COAL LANDFILL EAST MADDINGLEY RD	MADDINGLEY BROWN COAL LANDFILL EAST MADDINGLEY RD	MADDINGLEY	15/07/2015	53V No audit recommendations	Premise Match	112m	North
64662-21	8005893	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	CELL SWLE E5 11 TILLEYS RD	MADDINGLEY	21/09/2018	53V Audit recommendations	Premise Match	112m	North
64662-12	8004417	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY	11/12/2014	53V Audit recommendations	Premise Match	193m	North
64662-11	8004415	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY	18/08/2015	53V Audit recommendations	Premise Match	202m	North
64662-18	8005362	11 TILLEYS RD, MADDINGLEY VIC 3340 (CELL 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 (CELL 11 TILLEYS RD	MADDINGLEY	19/09/2019	53V Audit recommendations	Premise Match	214m	North

CARMS No	Transaction No	Site	Address	Suburb	Date Complete	Audit Category	Loc Conf	Distance	Direction
64662-20	8005598	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	11 TILLEYS RD, MADDINGLEY VIC 3340 11 TILLEYS RD	MADDINGLEY	07/08/2018	53V Audit recommendations	Premise Match	807m	North West
64662-16	8004884	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY BROWN COAL LANDFILL 11 TILLEYS RD	MADDINGLEY	21/10/2016	53V Audit recommendations	Premise Match	807m	North West

Environmental Audit Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

EPA Groundwater Zones with Restricted Uses

EPA GQRUZ records that exist within the dataset buffer:

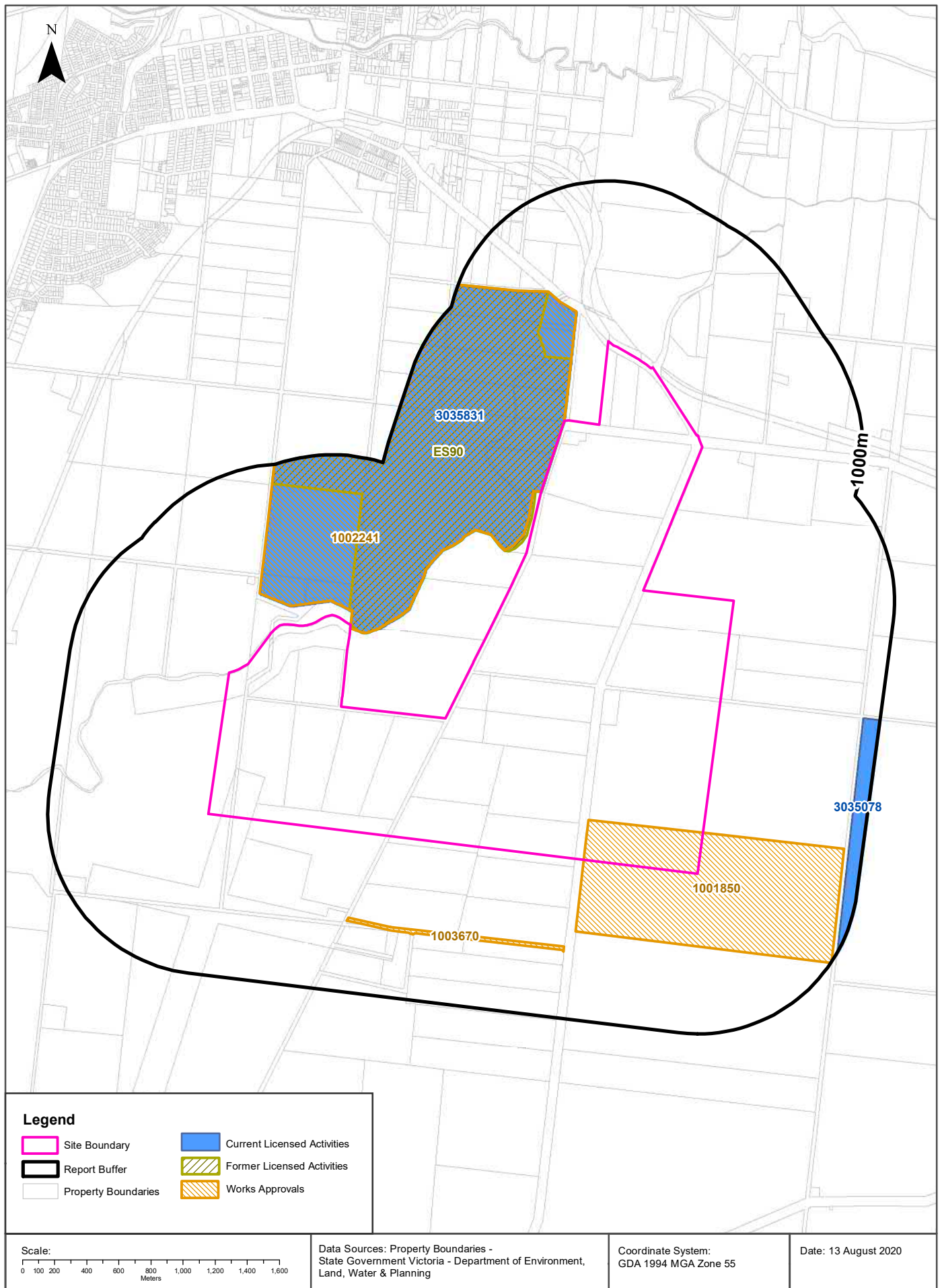
Note. Please click on CARMS No. to activate a hyperlink to online documentation.

CARMS No	EPA Id	Site History	Site Address	Restricted Uses	Status	Loc Conf	Distance	Direction
N/A	No records in buffer							

Environmental GQRUZ Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records - Licensed Activities & Works Approvals

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



EPA Activities

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

EPA Licensed Activities

EPA licensed activities that exist within the dataset buffer:

Trans No	Licence No	Licence Type	Organisation	Premise Ref	Premise Address 1	Premise Address 2	Activities	Loc Conf	Dist (m)	Direction
3035831	45288	Licence	MADDINGLEY BROWN COAL PTY LTD [MADDINGLEY]		11 TILLEYS RD	MADDINGLEY VIC 3340	A05 Landfills; A01 Prescribed Industrial Waste Management; A07 Composting	Premise Match	0m	North West
3035078	74268	Amalgamated licence	WESTERN REGION WATER CORPORATION	70755	CA 32, 33, 34, 34A&J SECTION 9, PARISH OF PARWAN	BACCHUS MARSH VIC 3340	A03 Sewage Treatment	Premise Match	891m	East

Licensed Activity Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Licensed Activities

Former EPA licensed activities that exist within the dataset buffer:

Licence No	Organisation	Premise Address	Suburb	Activities	Loc Conf	Dist (m)	Direction
ES90	MADDINGLEY BROWN COAL PTY LTD [MADDINGLEY]	EAST MADDINGLEY RD, BACCHUS MARSH VIC 3340	MADDINGLEY	Landfilling, Composting	Premise Match	0m	North

Former Licensed Activity Data Custodian: State Government Victoria - Environmental Protection Authority (EPA)

EPA Works Approvals

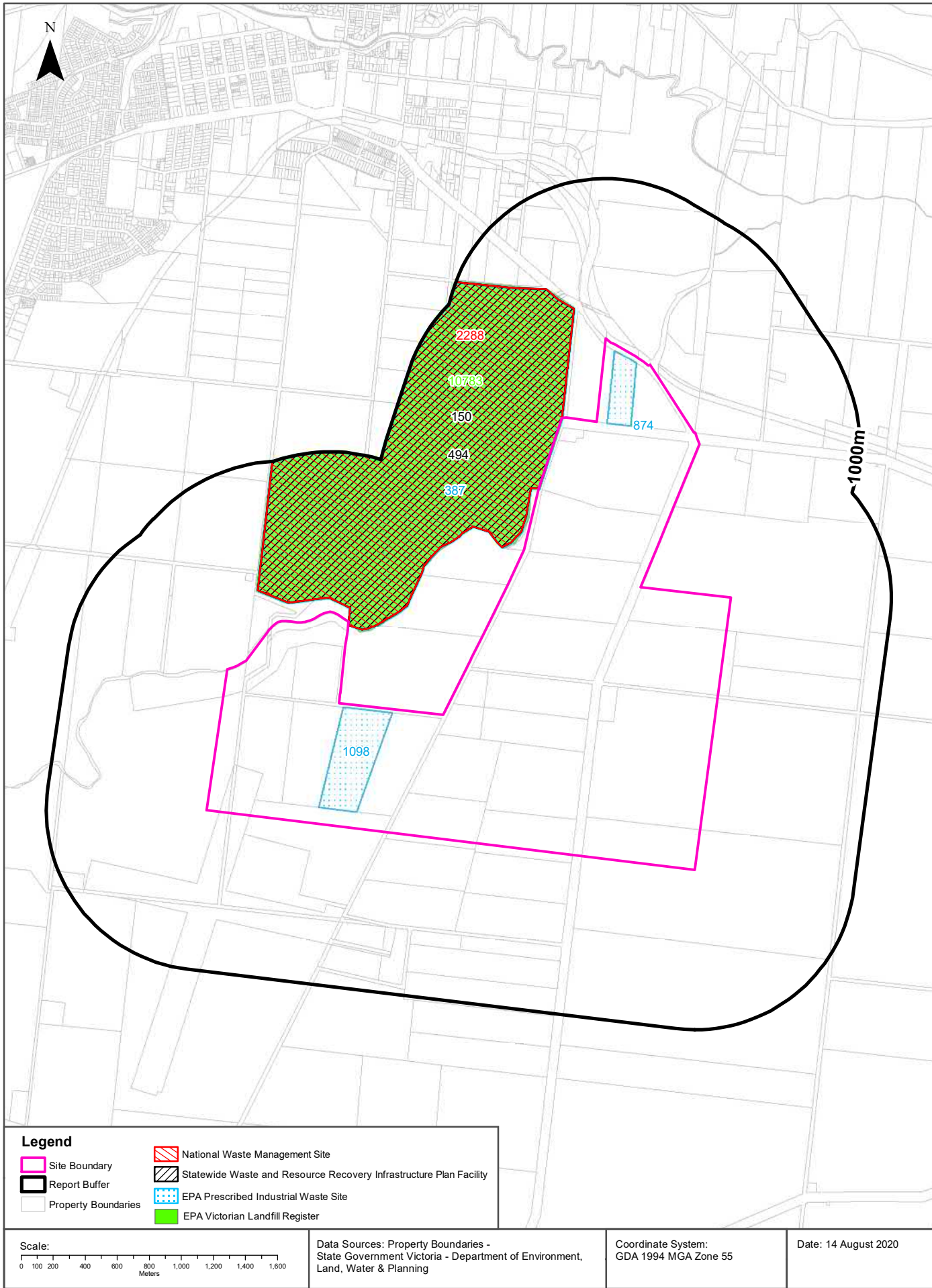
EPA works approvals that exist within the dataset buffer:

Transaction No	Status	Approval No	Organisation	Premise Address	Suburb	Scheduled Categories	Loc Conf	Dist (m)	Direction
1001850	Approved/ Issued		# PA2013096 4050 Geelong-Bacchus Marsh R # PA2013096 4050 Geelong-Bacchus Marsh	4050 Geelong Bacchus Marsh Road	PARWAN	Works Approval Exemption Decision	Premise Match	0m	Onsite
1002241	Approved/ Issued		MADDINGLEY BROWN COAL PTY LTD [MADDINGLEY]		MADDINGLEY	Design and construct landfill cells	Premise Match	0m	North West
1003670	Approved/ Issued		DANDY AIRCRAFT PTY LTD [PARWAN]	Aerodrome Road	PARWAN	Exempt under 19A(4): Installation of a wastewater treatment plant	Road Match	537m	South

Works Approvals Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Waste Management Facilities & Landfills

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Waste Management Facilities & Landfills

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

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 (m)	Direction
2288	Maddingley Brown Coal Pty Ltd	Maddingley Brown Coal Pty Ltd	Tilleys Road	Maddingley	Landfill	Operational		Operational	Commercial waste only	Premise Match	0m	North West

Waste Management Facilities Data Source: Australian Government Geoscience Australia

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Statewide Waste and Resource Recovery Infrastructure Plan Facilities

Statewide Waste and Resource Recovery Infrastructure Plan Facilities within the dataset buffer:

Map Id	Owner	Site Name	Address	Suburb	Category	Sub Category	Loc Conf	Distance	Direction
150	Maddingley Brown Coal P/L	Maddingley Brown Coal - ES90	East Maddingley Rd	Bacchus Marsh	Landfill	Inert Landfill	Premise Match	0m	North West
494		Calleja Transport	East Maddingley Rd	Bacchus Marsh	Organics	Garden Waste	Premise Match	0m	North West

SWRRIPF Data Source: State Government Victoria - Department of Sustainability

EPA Prescribed Industrial Waste

EPA Prescribed Industrial Waste treaters, disposers and permitted transporters within the dataset buffer:

Map Id	Company Name	Address	Suburb	Treatment /Disposal	Transport	Accredited Agent	EPA List Status	Loc Conf	Dist' (m)	Direct
1098	VENNIX, GERARD ANTHONY	163 SMITHS RD	PARWAN	No	Yes	No	Previous EPA List	Premise Match	0m	Onsite
874	EASTERN PETS PTY LTD	42 SCHOOL LANE	MADDINGLEY VIC 3340	No	Yes	No	Previous EPA List	Premise Match	0m	Onsite
387	MADDINGLEY BROWN COAL PTY LTD [MADDINGLEY]	11 TILLEYS RD	MADDINGLEY VIC 3340	Yes	No	No	Current EPA List	Premise Match	0m	North West

Prescribed Industrial Waste Data Source: State Government Victoria - Environment Protection Authority (EPA)

EPA Victorian Landfill Register

EPA Victorian Landfill Register sites within the dataset buffer:

Landfill Register No.	Site	Address	Operating Status	Est. Year Of Closure	Waste type	Loc Conf	Dist' (m)	Direction
10783	Not available	11 Tilley's Road, Maddingley, VIC 3340	Operating	Not available	Contaminated soil (Cat C), Paper pulp, Shredder floc, Tyres (shredded), Waste acid sulphate soils, Solid inert waste, Foundry sands, Paper pulp, Commercial food waste, Biosolids, Green waste	As Supplied	0m	North West

EPA Victorian Landfill Register Data Source: State Government Victoria - Environment Protection Authority (EPA)

Former Gasworks and Liquid Fuel Facilities

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Former Gasworks

Former Gasworks identified from various historical sources within the dataset buffer:

Note - As this is a dataset collated from various historical sources, it is not an exhaustive list of all former Gasworks

Map Id	Site Name	Date Opened	Year Closed	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Collated from various historical sources

National Liquid Fuel Facilities

National Liquid Fuel Facilities within the dataset buffer:

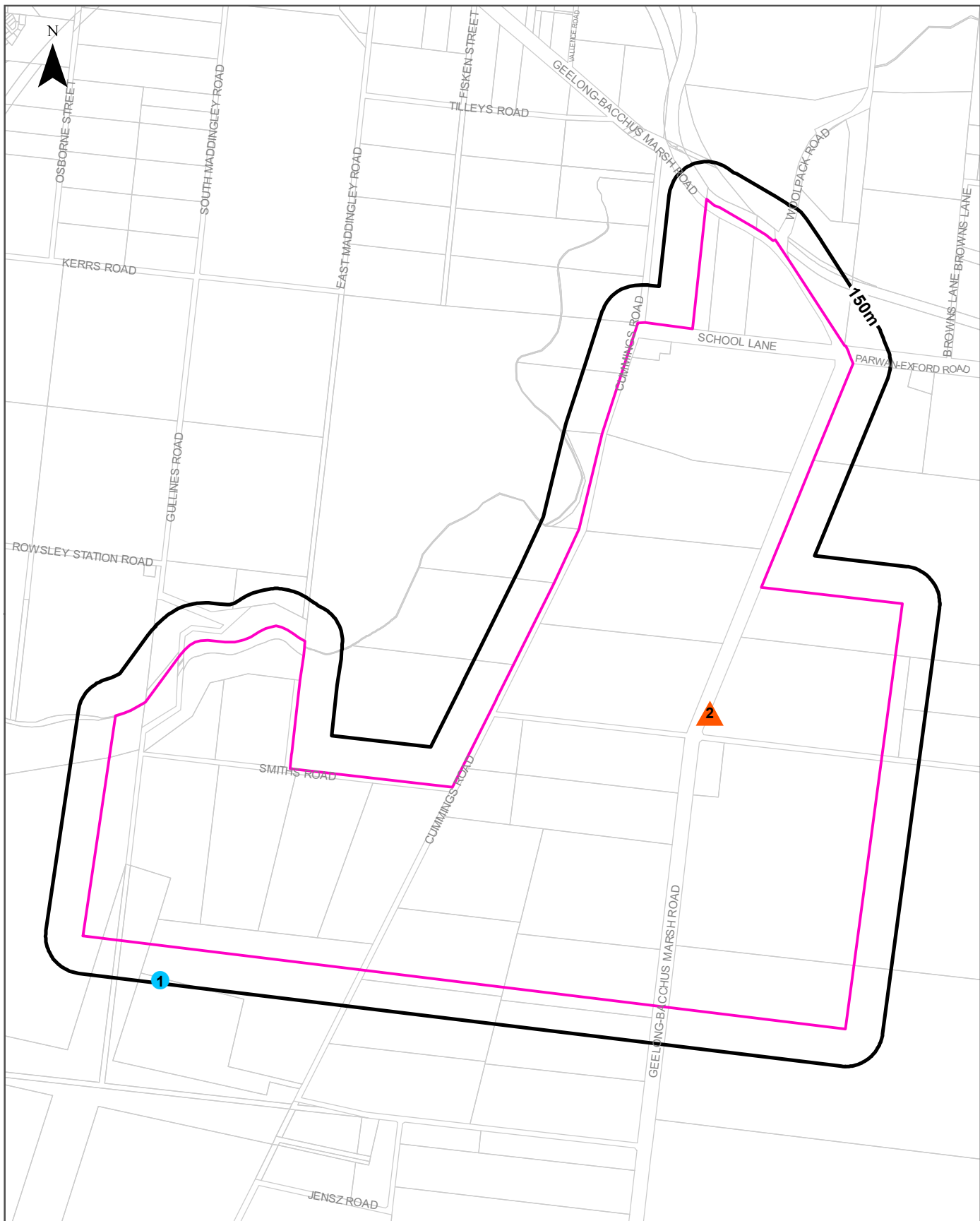
Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist (m)	Direction
N/A	No records in buffer										








National Liquid Fuel Facilities Data Source: Geoscience Australia

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Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)



Legend		Scale: 0 290 580 870 1,160 Meters	Coordinate System: GDA 1994 MGA Zone 55
 Site Boundary	 Business directory records mapped to a specific premise		Date: 13 August 2020
 Buffer 150m	 Business directory records mapped to a road intersection	Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018 Sands & McDougall's Directory - Digitised by State Library Victoria Property Boundaries © State Government Victoria - Dept. of Environment, Land, Water & Planning 2020	
 Property Boundary	 Business directory records mapped to a road corridor		
 Business directory records mapped to a general area			

Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Business Directory Records 1905-1991 Premise or Road Intersection Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
1	Flying Schools	Bacchus Marsh School Of Aviation. Airfield., Geelong Rd. Bacchus Marsh. 3340	73884	1991	Premise Match	119m	South West
	Clubs &/Or Sporting Bodies	Beaufort Gliding Club. (C/- Club House). Airfield., Aerodrome Rd. Bacchus Marsh. 3340	73820	1991	Premise Match	119m	South West
	Clubs &/Or Sporting Bodies	Geelong Gliding Club., Aerodrome Rd. Bacchus Marsh. 3340	73821	1991	Premise Match	119m	South West
	Clubs &/Or Sporting Bodies	Victorian Motorless Flight Group. (CI- Club House) Airfield., Aerodrome Rd. Bacchus Marsh. 3340	73822	1991	Premise Match	119m	South West

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Business Directory Records 1905-1991

Road or Area Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
2	Agricultural Spray Services	Hardi Spraying Systems., Geelong Rd. Bacchus Marsh. 3340	73725	1991	Road Match	0m

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Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 2)

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from Sands & McDougall's Directories and UBD Business Directories, 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
	No records in buffer						

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Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories and Sands & McDougall's 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.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
	No records in buffer					

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EPA Priority Sites & Pollution Notices

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Current EPA Priority Sites Register

Sites on the current EPA priority sites register that exist within the dataset buffer:

Notice No	Address	Suburb	Issue	Loc Conf	Dist (m)	Direction
N/A	No records in buffer					

Priority Sites Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Priority Sites & Other Pollution Notices

Sites within the dataset buffer that have been issued a Pollution Notice:

Note. Due to pollution notices being revoked and removed from published lists this is not an exhaustive list of all past pollution notices.

Notice No	Notice Type	Company	Address	Suburb	Status	Issue	Date Issued	Loc Conf	Dist	Dir
N/A	No records in buffer									

Pollution Notice Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

PFAS Investigation & Management Programs

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

EPA PFAS Site Investigations

Sites being investigated by the EPA for PFAS contamination within the dataset buffer:

Map ID	Site Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Site Investigations Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Defence PFAS Investigation & Management Program Investigation Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

Defence PFAS Investigation & Management Program Management Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

Defence PFAS Investigation & 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	Location Confidence	Distance	Direction
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

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 Records

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

EPA Environmental Audits

EPA environmental audit records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation. If link does not work, documentation may still be accessible via the EPA Interaction Portal.

CARMS No	Transaction No	Site	Address	Suburb	Date Complete	Audit Category	Loc Conf	Distance	Direction
N/A	No records in buffer								

Environmental Audit Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

EPA Groundwater Zones with Restricted Uses

EPA GQRUZ records that exist within the dataset buffer:

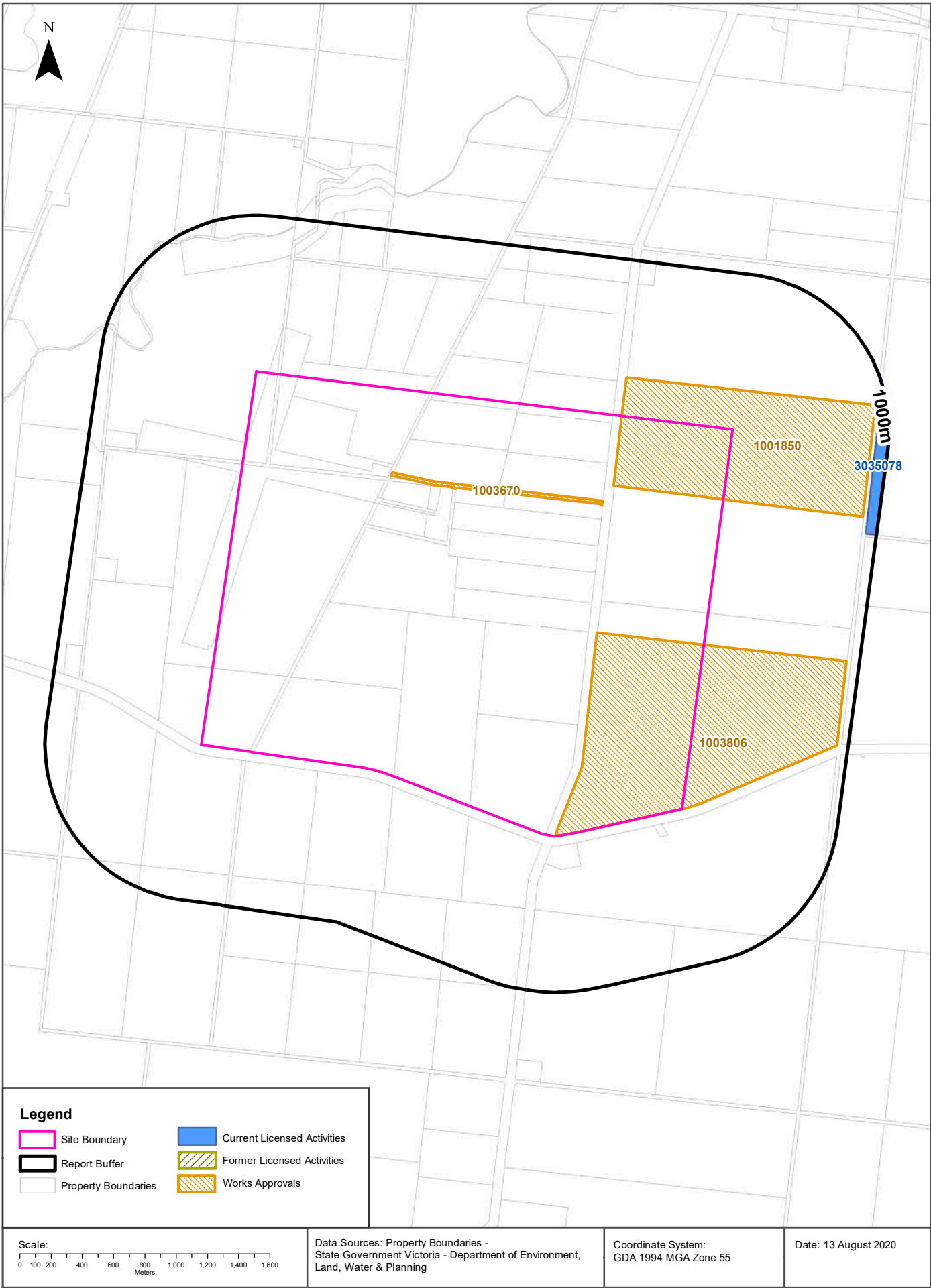
Note. Please click on CARMS No. to activate a hyperlink to online documentation.

CARMS No	EPA Id	Site History	Site Address	Restricted Uses	Status	Loc Conf	Distance	Direction
N/A	No records in buffer							

Environmental GQRUZ Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records - Licensed Activities & Works Approvals

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



EPA Activities

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

EPA Licensed Activities

EPA licensed activities that exist within the dataset buffer:

Trans No	Licence No	Licence Type	Organisation	Premise Ref	Premise Address 1	Premise Address 2	Activities	Loc Conf	Dist (m)	Direction
3035078	74268	Amalgamated licence	WESTERN REGION WATER CORPORATION	70755	CA 32, 33, 34, 34A&J SECTION 9, PARISH OF PARWAN	BACCHUS MARSH VIC 3340	A03 Sewage Treatment	Premise Match	914m	East

Licensed Activity Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Licensed Activities

Former EPA licensed activities that exist within the dataset buffer:

Licence No	Organisation	Premise Address	Suburb	Activities	Loc Conf	Dist (m)	Direction
N/A	No records in buffer						

Former Licensed Activity Data Custodian: State Government Victoria - Environmental Protection Authority (EPA)

EPA Works Approvals

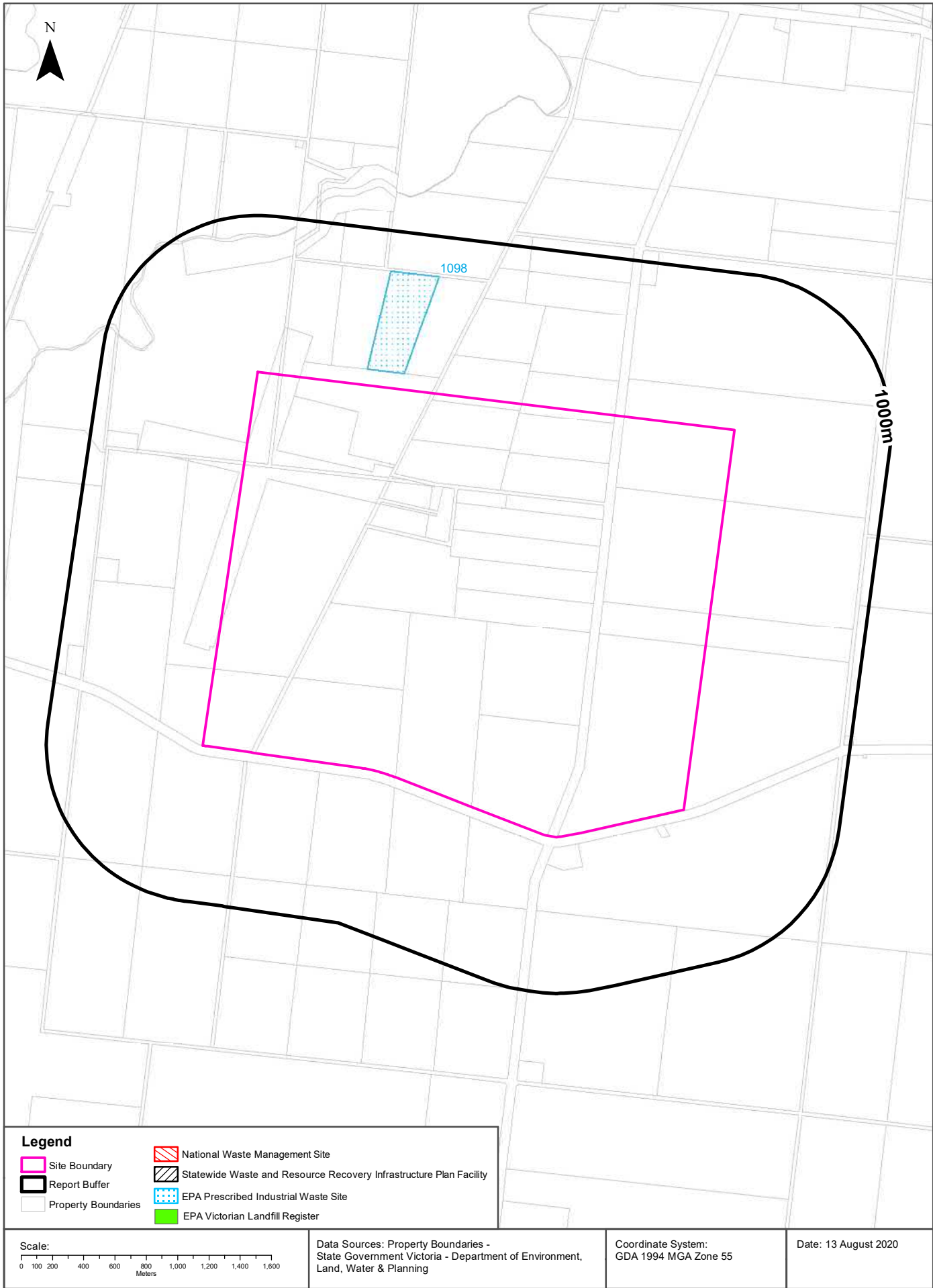
EPA works approvals that exist within the dataset buffer:

Transaction No	Status	Approval No	Organisation	Premise Address	Suburb	Scheduled Categories	Loc Conf	Dist (m)	Direction
1003806	Approved/ Issued	223070	L & G MEATS [PARWAN]	3922 GEELONG-BACCHUS MARSH RD	PARWAN	D02 Rendering	Premise Match	0m	Onsite
1001850	Approved/ Issued		# PA2013096 4050 Geelong-Bacchus Marsh R # PA2013096 4050 Geelong-Bacchus Marsh	4050 Geelong Bacchus Marsh Road	PARWAN	Works Approval Exemption Decision	Premise Match	0m	Onsite
1003670	Approved/ Issued		DANDY AIRCRAFT PTY LTD [PARWAN]	Aerodrome Road	PARWAN	Exempt under 19A(4): Installation of a wastewater treatment plant	Road Match	0m	Onsite

Works Approvals Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Waste Management Facilities & Landfills

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)



Waste Management Facilities & Landfills

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

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 (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Australian Government Geoscience Australia
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Statewide Waste and Resource Recovery Infrastructure Plan Facilities

Statewide Waste and Resource Recovery Infrastructure Plan Facilities within the dataset buffer:

Map Id	Owner	Site Name	Address	Suburb	Category	Sub Category	Loc Conf	Distance	Direction
N/A	No records in buffer								

SWRRIPF Data Source: State Government Victoria - Department of Sustainability

EPA Prescribed Industrial Waste

EPA Prescribed Industrial Waste treaters, disposers and permitted transporters within the dataset buffer:

Map Id	Company Name	Address	Suburb	Treatment /Disposal	Transport	Accredited Agent	EPA List Status	Loc Conf	Dist' (m)	Direct
1098	VENNIX, GERARD ANTHONY	163 SMITHS RD	PARWAN	No	Yes	No	Previous EPA List	Premise Match	105m	North

Prescribed Industrial Waste Data Source: State Government Victoria - Environment Protection Authority (EPA)

EPA Victorian Landfill Register

EPA Victorian Landfill Register sites within the dataset buffer:

Landfill Register No.	Site	Address	Operating Status	Est. Year Of Closure	Waste type	Loc Conf	Dist' (m)	Direction
No records in buffer								

EPA Victorian Landfill Register Data Source: State Government Victoria - Environment Protection Authority (EPA)

Former Gasworks and Liquid Fuel Facilities

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Former Gasworks

Former Gasworks identified from various historical sources within the dataset buffer:

Note - As this is a dataset collated from various historical sources, it is not an exhaustive list of all former Gasworks

Map Id	Site Name	Date Opened	Year Closed	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Collated from various historical sources

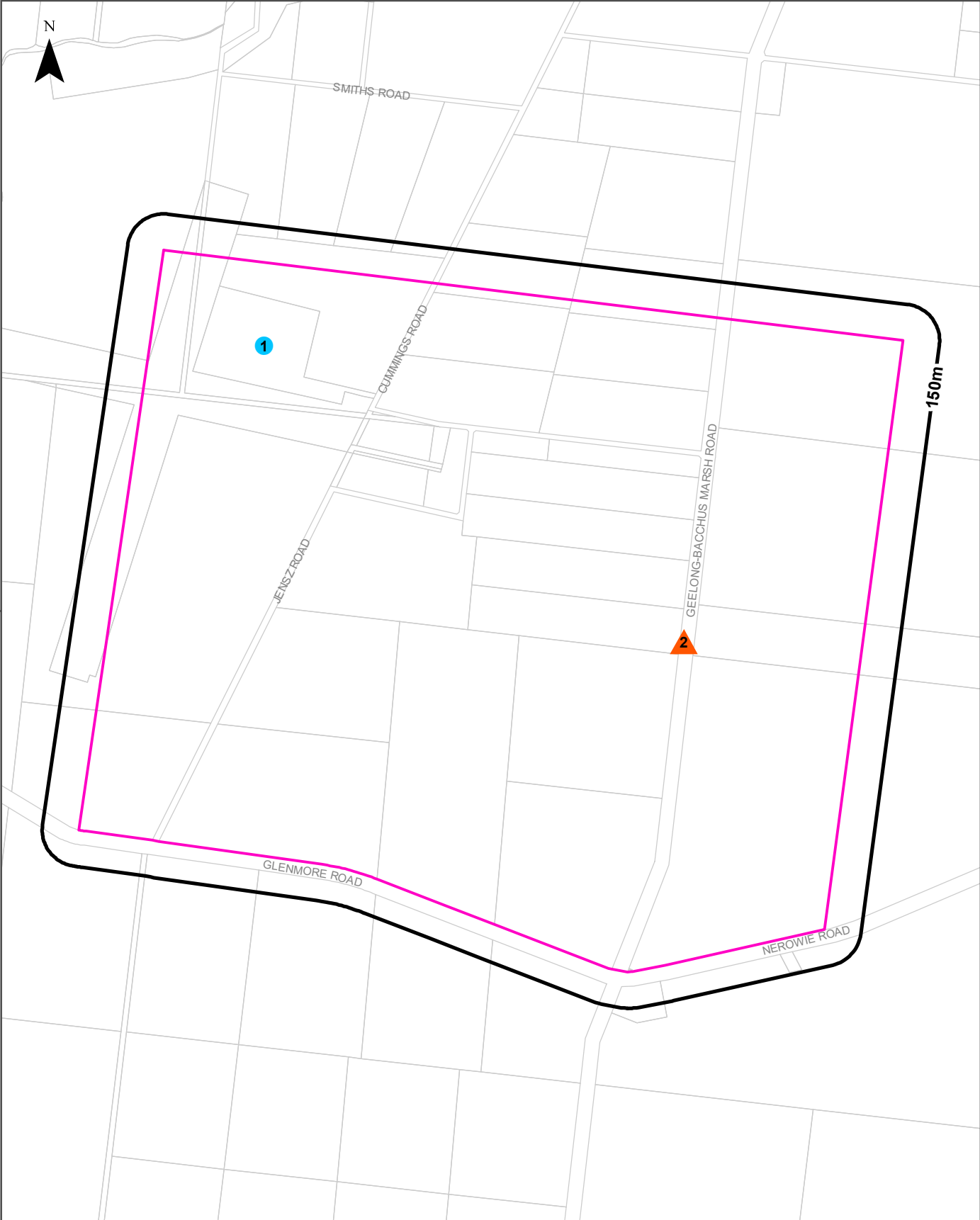
National Liquid Fuel Facilities

National Liquid Fuel Facilities within the dataset buffer:

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

National Liquid Fuel Facilities Data Source: Geoscience Australia

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Legend <div> <div>Site Boundary</div> <div>Buffer 150m</div> <div>Property Boundary</div> </div> <div> <div>Business directory records mapped to a specific premise</div> <div>Business directory records mapped to a road intersection</div> <div>Business directory records mapped to a road corridor</div> <div>Business directory records mapped to a general area</div> </div>		Scale: <div>03006009001,200</div> <div>Meters</div>	Coordinate System: GDA 1994 MGA Zone 55 Date: 13 August 2020
<small> Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018 Sands & McDougall's Directory - Digitised by State Library Victoria Property Boundaries © State Government Victoria - Dept. of Environment, Land, Water & Planning 2020 </small>			

Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Business Directory Records 1905-1991 Premise or Road Intersection Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
1	Flying Schools	Bacchus Marsh School Of Aviation. Airfield., Geelong Rd. Bacchus Marsh. 3340	73884	1991	Premise Match	0m	On-site
	Clubs &/Or Sporting Bodies	Beaufort Gliding Club. (C/- Club House). Airfield., Aerodrome Rd. Bacchus Marsh. 3340	73820	1991	Premise Match	0m	On-site
	Clubs &/Or Sporting Bodies	Geelong Gliding Club., Aerodrome Rd. Bacchus Marsh. 3340	73821	1991	Premise Match	0m	On-site
	Clubs &/Or Sporting Bodies	Victorian Motorless Flight Group. (CI- Club House) Airfield., Aerodrome Rd. Bacchus Marsh. 3340	73822	1991	Premise Match	0m	On-site

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Business Directory Records 1905-1991

Road or Area Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
2	Agricultural Spray Services	Hardi Spraying Systems., Geelong Rd. Bacchus Marsh. 3340	73725	1991	Road Match	0m

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Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 3)

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from Sands & McDougall's Directories and UBD Business Directories, 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
	No records in buffer						

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Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories and Sands & McDougall's 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.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
	No records in buffer					

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EPA Priority Sites & Pollution Notices

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Current EPA Priority Sites Register

Sites on the current EPA priority sites register that exist within the dataset buffer:

Notice No	Address	Suburb	Issue	Loc Conf	Dist (m)	Direction
N/A	No records in buffer					

Priority Sites Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Priority Sites & Other Pollution Notices

Sites within the dataset buffer that have been issued a Pollution Notice:

Note. Due to pollution notices being revoked and removed from published lists this is not an exhaustive list of all past pollution notices.

Notice No	Notice Type	Company	Address	Suburb	Status	Issue	Date Issued	Loc Conf	Dist	Dir
N/A	No records in buffer									

Pollution Notice Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

PFAS Investigation & Management Programs

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

EPA PFAS Site Investigations

Sites being investigated by the EPA for PFAS contamination within the dataset buffer:

Map ID	Site Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Site Investigations Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Defence PFAS Investigation & Management Program Investigation Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

Defence PFAS Investigation & Management Program Management Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

Defence PFAS Investigation & 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	Location Confidence	Distance	Direction
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

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 Records

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

EPA Environmental Audits

EPA environmental audit records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation. If link does not work, documentation may still be accessible via the EPA Interaction Portal.

CARMS No	Transaction No	Site	Address	Suburb	Date Complete	Audit Category	Loc Conf	Distance	Direction
N/A	No records in buffer								

Environmental Audit Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

EPA Groundwater Zones with Restricted Uses

EPA GQRUZ records that exist within the dataset buffer:

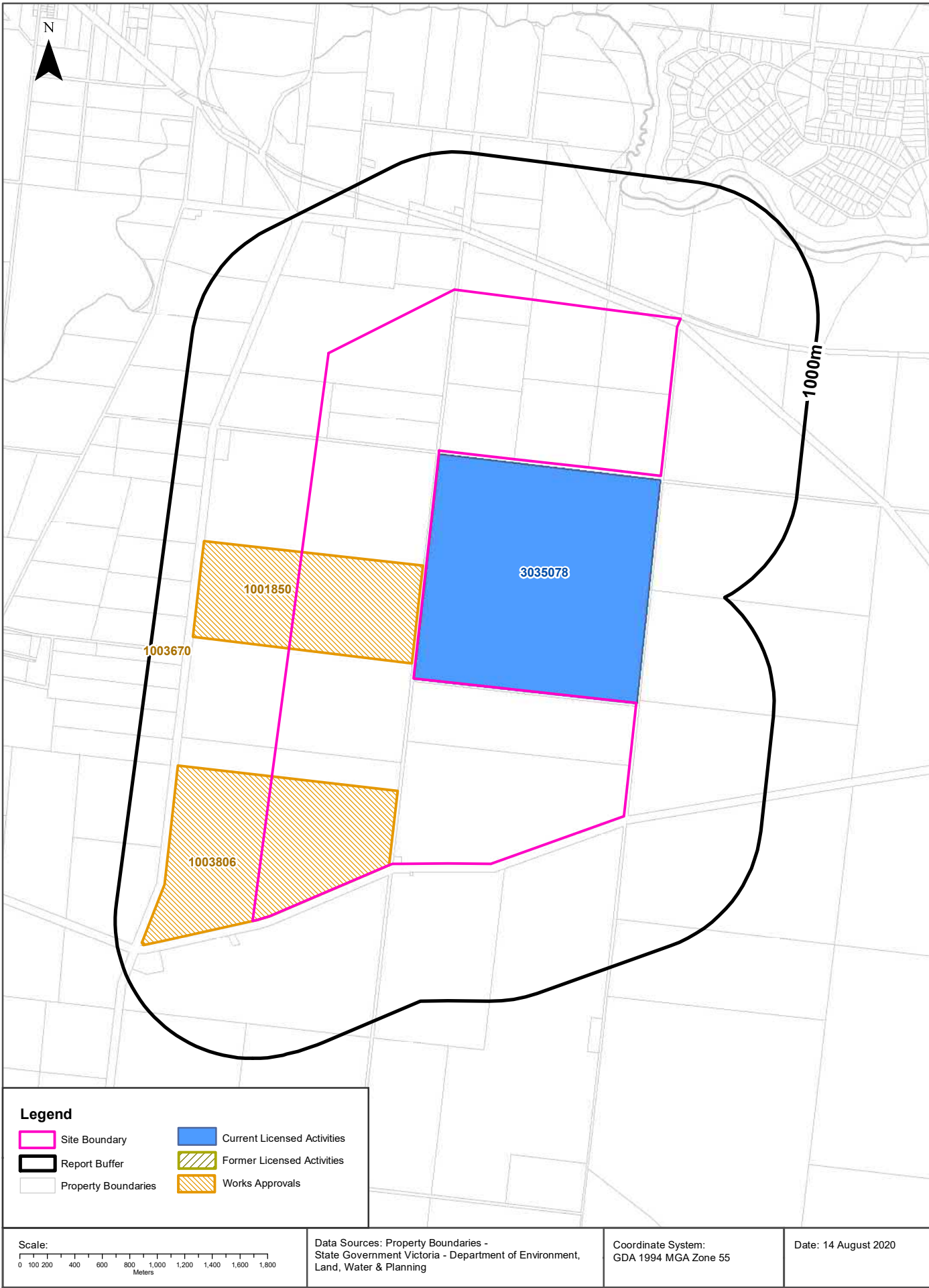
Note. Please click on CARMS No. to activate a hyperlink to online documentation.

CARMS No	EPA Id	Site History	Site Address	Restricted Uses	Status	Loc Conf	Distance	Direction
N/A	No records in buffer							

Environmental GQRUZ Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records - Licensed Activities & Works Approvals

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)



EPA Activities

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

EPA Licensed Activities

EPA licensed activities that exist within the dataset buffer:

Trans No	Licence No	Licence Type	Organisation	Premise Ref	Premise Address 1	Premise Address 2	Activities	Loc Conf	Dist (m)	Direction
3035078	74268	Amalgamated licence	WESTERN REGION WATER CORPORATION	70755	CA 32, 33, 34, 34A&J SECTION 9, PARISH OF PARWAN	BACCHUS MARSH VIC 3340	A03 Sewage Treatment	Premise Match	0m	East

Licensed Activity Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Licensed Activities

Former EPA licensed activities that exist within the dataset buffer:

Licence No	Organisation	Premise Address	Suburb	Activities	Loc Conf	Dist (m)	Direction
N/A	No records in buffer						

Former Licensed Activity Data Custodian: State Government Victoria - Environmental Protection Authority (EPA)

EPA Works Approvals

EPA works approvals that exist within the dataset buffer:

Transaction No	Status	Approval No	Organisation	Premise Address	Suburb	Scheduled Categories	Loc Conf	Dist (m)	Direction
1003806	Approved/ Issued	223070	L & G MEATS [PARWAN]	3922 GEELONG-BACCHUS MARSH RD	PARWAN	D02 Rendering	Premise Match	0m	Onsite
1001850	Approved/ Issued		# PA2013096 4050 Geelong-Bacchus Marsh R # PA2013096 4050 Geelong-Bacchus Marsh	4050 Geelong Bacchus Marsh Road	PARWAN	Works Approval Exemption Decision	Premise Match	0m	Onsite
1003670	Approved/ Issued		DANDY AIRCRAFT PTY LTD [PARWAN]	Aerodrome Road	PARWAN	Exempt under 19A(4): Installation of a wastewater treatment plant	Road Match	762m	West

Works Approvals Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Waste Management Facilities & Landfills

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

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 (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Australian Government Geoscience Australia
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Statewide Waste and Resource Recovery Infrastructure Plan Facilities

Statewide Waste and Resource Recovery Infrastructure Plan Facilities within the dataset buffer:

Map Id	Owner	Site Name	Address	Suburb	Category	Sub Category	Loc Conf	Distance	Direction
N/A	No records in buffer								

SWRRIPF Data Source: State Government Victoria - Department of Sustainability

EPA Prescribed Industrial Waste

EPA Prescribed Industrial Waste treaters, disposers and permitted transporters within the dataset buffer:

Map Id	Company Name	Address	Suburb	Treatment /Disposal	Transport	Accredited Agent	EPA List Status	Loc Conf	Dist' (m)	Direct
N/A	No records in buffer									

Prescribed Industrial Waste Data Source: State Government Victoria - Environment Protection Authority (EPA)

EPA Victorian Landfill Register

EPA Victorian Landfill Register sites within the dataset buffer:

Landfill Register No.	Site	Address	Operating Status	Est. Year Of Closure	Waste type	Loc Conf	Dist' (m)	Direction
No records in buffer								

EPA Victorian Landfill Register Data Source: State Government Victoria - Environment Protection Authority (EPA)

Former Gasworks and Liquid Fuel Facilities

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Former Gasworks

Former Gasworks identified from various historical sources within the dataset buffer:

Note - As this is a dataset collated from various historical sources, it is not an exhaustive list of all former Gasworks

Map Id	Site Name	Date Opened	Year Closed	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Collated from various historical sources

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 (m)	Direction
N/A	No records in buffer										

National Liquid Fuel Facilities Data Source: Geoscience Australia

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Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Business Directory Records 1905-1991 Premise or Road Intersection Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
	No records in buffer						

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Business Directory Records 1905-1991

Road or Area Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
	No records in buffer					

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Historical Business Directories

Parwan Employment Precinct, Parwan, VIC 3340 (Part 4)

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from Sands & McDougall's Directories and UBD Business Directories, 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
	No records in buffer						

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Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories and Sands & McDougall's 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.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
	No records in buffer					

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Appendix I Geological Borehole Records

Parwan PSP Historical Borehole Records

The logs of historical boreholes located within the PSP are provided below.

Descriptions of strata encountered by Borehole Reference 326082 (GeoVic 2020)

From (m)	To (m)	Material	Comments
0	3	clay	clay - red brown clay. little moisture, fair consistency
3	6	soil	soil - red brown earth
6	29	basaltic rock	basalt - the basalt is scoria, weathered, with large vesicles throughout becomes more massive until 26m where a fine red brown clay layer is present. at 27m basalt is vesicular, partly weathered grey colour
29	43	clay	clay - ochre coloured then a lighter orange at 33m, little moisture, slightly silty. at 34.5m clay turns a reddy colour. at 35m clay becomes whiter and more silty. 37.5m clay is very silty and a distinctly ochre colour. at 39m clay is very silty and orange. at 40m becomes redder again. 41.5m clay is whitey yellow. at 42m silty clay is red then at 43m fawny white and at 44m ochre to light tan/oran
43	57	silt [material]	silt/sand - silt as described above with sand ~ 1mm average angular to sub-angular well sorted
57	62.5	clay	clay - good consistency, ochre to orange colour - white and fawn
62.5	63	clay	carbonaceous clay - dark black to brown - good consistency, high moisture content
63	67.2	humic coal series	brown coal - start coring - 63.5m 63.5 - 64.9 no recovery 64.9 - 66.4 2.1m recovery 66.4 - 69.4 3.09m recovery
67.2	73.06	clay	clay - grey clay, good consistency, good moisture - contains bands of pyrite 69.4 - 72.4 2.04m recovery clay also contains fine shell material 72.4 - 75.4 3.1m recovery last 0.6m of clay has abundant pyrite and some rounded quartz grains ~ 3mm to <1mm in size
73.06	121.1	humic coal series	brown coal - black to dark brown slightly clayey for 73.06 - 73.56m abundant lignite material 75.4 - 78.4 3.0m recovery 78.4 - 81.4 3.0m recovery 81.4 - 84.4 3.0m recovery 84.4 - 87.4 3.0m recovery coal is much drier and less clayier 87.4 - 90.4 3.0m recovery 90.4 - 93.4 3.0m recovery 93.4 - 96.4 3.0m recovery 96.4 - 99.2 2.8m recovery 99.2 - 102.2 3.0m recovery 102.2 - 105.2 3.0m recovery 105.2 - 108.2 3.0m recovery 108.4 - 111.4 3.0m recovery 111.4 - 113.4 0.6m recovery 113.4 - 115.9 1.03m recovery 115.9 - 118.0 2.1m recovery 118.0 - 121.1 coal from 110.2 - 114.7 is drier and woodier than previously large pieces of lignite present. 117.2 - 117.7 - coal has quartz sand associated - sub-angular grains - well sorted n/mm size fairly abundant
121.1	129.699	clay	silty clay - fawn coloured clay with silty particles within - good consistency silt becomes more abundant at 120.2m. some parts of the bed are clayier and others siltier 117.7 - 120.7 2.7m recovery 0.8m coal 1.8m non coal 120.7 - 123.7 1.7m recovery 123.7 - 126.7 1.9m recovery 126.7 - 129.7 1.45m recovery

Descriptions of strata encountered by Borehole Reference 942649 (GeoVic 2020)

From (m)	To (m)	Material	Comments
0	2	clay	clay - light red/brown to orange/brown stiff, silty clay with occasional ochre/brown, very weathered rounded basalt fragments
2	4	clay	clay - light grey to buff slightly silty stiff clay
4	6	clay	clay - light grey to buff, slightly silty stiff clay with some dark grey/brown to dark brown well weathered basalt fragments
6	14	basaltic rock	basalt - brown/grey weathered basalt with occasional off white crystalline small grains (chalcedone?)

From (m)	To (m)	Material	Comments
14	22	basaltic rock	basalt - dark brown to dark red/brown well weathered basalt, with some red/brown to red claystone rock fragments. occasional stiff light brown clay. some brown silty friable clay below 20 metres
22	24	clay	clay - light brown, moderately soft, smooth to silty, with occasional rare weathered basalt (?) rock fragments, some approaching friable. possibly paleosal.
24	28	clay	clay - all as above, with some brown and grey friable, very silty clay
28	30	silt [material]	silt - extremely fine, orange/brown with some light grey to light brown moderately soft silty clay
30	32	sand	sand - very fine, ochre stained quartz sand with some fine to coarse sub-rounded to rounded ochre stained quartz grains. occasional light brown silty clay
32	34	basaltic rock	basalt - dark brown to dark grey brown, very weathered basalt fragments with some fine to pebble sized, ochre stained, sub-rounded quartz grains. occasional dark brown sandy friable to firm clay
34	36	gravel [material]	gravel - coarse, orange/brown to ochre stained, sub-angular to rounded quartz pebbles, mainly 2x2x1 cm size, with some dark brown weathered basalt rock fragments. some light grey firm, slightly silty clay. occasional fine to coarse ochre stained sand
36	46	basaltic rock	basalt - dark grey/brown, becoming dark grey with depth, well weathered basalt, with some ochre fragile slightly silty rounded rock fragments. occasional light brown and ochre soft clay. occasional white to ochre stained quartz grains (vein quartz?) - rounded to angular
46	48	clay	clay - very soft, silty, red clay. some dark brown grey to dark red/brown weathered basalt rock fragments. occasional ochre fine grey slightly silty rock fragments. occasional medium grained quartz sand - sub-angular to sub-rounded ochre stained
48	52	clay	clay - ochre and red silty soft clay with some ochre, moderately soft, sandy clay, and some dark grey to dark brown weathered basalt fragments. rare, sub-rounded, medium grained, ochre stained quartz sand
52	54	clay	clay - ochre, moderately soft, sandy clay. abundant dark brown soft carbonaceous clay (some possibly ligneous), and some dark grey to dark brown weathered basalt fragments. occasional ochre stained, angular clean quartz grains
54	56	clay	carbonaceous clay - dark brown, moderately soft, with some ochre sandy clay. some dark grey brown weathered basalt fragments. occasional medium grained, sub-rounded, ochre stained quartz grains
56	58	humic coal series	brown coal - slightly ligneous with some dark brown carbonaceous clay - soft. some ochre stained sandy clay. occasional medium grained ochre stained quartz sand
58	60	clay	carbonaceous clay - dark brown, moderately soft with some ochre sandy clay. some dark grey brown weathered basalt fragments. occasional medium grained, sub-rounded, ochre stained quartz grains
60	68	clay	clay - medium grained soft, smooth clay, with some medium grained, sub-rounded, ochre stained quartz sand. occasional dark grey basalt fragments and occasional dark brown carbonaceous clay increasing down
68	76	humic coal series	brown coal (?) - very soft, with some dark brown soft carbonaceous clay and occasional fine to medium grained, sub-rounded quartz sand. occasional medium grey, moderately soft, smooth clay and occasional ligneous fragments
76	84	humic coal series	brown coal (?) - some ligneous fragments and some dark brown, soft carbonaceous clay. rare fine to medium quartz sand
84	90	clay	clay - dark brown carbonaceous clay, very soft, with some soft smooth brown-grey clay and rare ochre and red friable clay. occasional ligneous fragments
90	102	humic coal series	brown coal - some ligneous dark brown fragments increasing downwards. some dark brown soft carbonaceous clay

From (m)	To (m)	Material	Comments
102	108	humic coal series	brown coal (?) - some ligneous fragments and occasional light grey soft, smooth clay
108	114	clay	carbonaceous clay - soft, dark brown carbonaceous clay with some moderately firm brown coal and some ligneous fragments. from 112m downwards some fine to medium clean quartz sand, moderately sorted and sub-angular to sub-rounded
114	120	clay	carbonaceous clay - dark brown, very soft carbonaceous clay. occasional beige soft smooth. occasional fine to medium clean quartz sand. occasional ligneous fragments
120	124	sand	sand - very fine to medium grained poorly sorted clean quartz sand - sub-angular to sub-rounded. some very soft carbonaceous clay and some very soft light grey and beige smooth clay. occasional ligneous fragments
124	128	sand	sand - fine to med but becoming coarser downwards. sub-angular to sub-rounded moderately sorted quartz sand with some grey/brown and light grey very soft smooth clay. occasional brown coal and ligneous fragments
128	133.999	sand	sand - fine to medium grained, becoming coarser downwards, sub-angular to sub-rounded sand. some light grey, very stiff clay

Parwan Employment Precinct Historical Borehole Records

The logs of historical boreholes located within the PEP are provided below.

Descriptions of strata encountered by Borehole Reference 326003 (GeoVic 2020)

From (m)	To (m)	Material	Comments
0	0.305	soil	loam
0.305	0.61	clay	red clay
0.61	1.524	basaltic rock	basalt
1.524	6.401	clay	clay, gravel, and basalt
6.401	11.887	clay	Yellow clay
11.887	12.192	clay	ligneous clay
12.192	21.336	humic coal series	brown coal
21.336	21.946	clay	ligneous clay
21.946	22.859	clay	sandy clay

Descriptions of strata encountered by Borehole Reference 326001 (GeoVic 2020)

From (m)	To (m)	Material	Comments
0	0.61	soil	red sandy loam
0.61	1.219	sand	red sand
1.219	1.829	clay	red sandy clay
1.829	8.534	clay	red clay
8.534	9.754	clay	clay and gravel
9.754	13.106	clay	grey and yellow clay
13.106	14.021	sand	Yellow sand
14.021	17.069	clay	grey clay
17.069	20.117	clay	dark green pug

From (m)	To (m)	Material	Comments
20.117	23.165	sand	Yellow sand
23.165	52.73	humic coal series	brown coal
52.73	53.035	clay	ligneous clay
53.035	53.949	clay	Yellow clay water struck at 20.12 metres

Descriptions of strata encountered by Borehole Reference 326000 (GeoVic 2020)

From (m)	To (m)	Material	Comments
0	0.305	soil	red loam
0.305	1.829	sand	red sand
1.829	4.267	clay	clay, sand, and gravel
4.267	4.877	sand	sand
4.877	8.23	clay	grey and yellow clay
8.23	9.754	sand	sand and gravel
9.754	10.058	clay	Yellow clay
10.058	39.929	humic coal series	brown coal
39.929	40.234	clay	ligneous clay
40.234	40.537	clay	brown clay water struck at 4.57 metres standing at 4.57 metres

Descriptions of strata encountered by Borehole Reference 326004 (GeoVic 2020)

From (m)	To (m)	Material	Comments
0	0.305	soil	loam
0.305	1.829	clay	grey clay
1.829	4.877	clay	grey and yellow clay
4.877	5.182	sand	sand and gravel
5.182	7.925	sand	drift sand and gravel
7.925	12.802	humic coal series	brown coal
12.802	13.106	clay	ligneous clay
13.106	14.325	clay	Yellow clay

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