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Preliminary Site Investigation

515 Crookwell Road, Kingsdale, NSW

Lot 103 & 104 DP 1007433

Planning Proposal – Large Lot Residential Development

LGA: Goulburn Mulwaree Council

Report No: 20027CC-001
Revision: 0
Site Inspection / Field Work Date: 6th October 2021
Report Date: 28th October 2021

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Type	Report No. & File	Status	Revision	Date	Prepare For
Electronic	20027CC-001	Approval	0	28th October 2021	Submission

Executive Summary

Objectives

The objectives of this Preliminary Site Investigation (PSI) are to assess the likelihood of contamination existing at the Site (where site contamination is defined within Section 5 of the Contaminated Land Management Act 1997 (CLM Act)) and if present, to assess the requirement for any particular contaminated land site management.

The Site

The site is located on Lot 103 & 104 DP 1007433 at 515 Crookwell Road, Kingsdale, NSW and is within the Goulburn Mulwaree Council and the WaterNSW catchment area. Access to the site is via an unpaved driveway from Crookwell Road leading to a dwelling and associated sheds and grain storage silos in the centre along the eastern boundary.

Lot 103 DP 1007433 has an approximate area of 90.97ha and lot 104 74.19ha. The developable land area of the site only (figure 2) is being assessed for this report, which is 54.68ha. This area is being considered due to the catchment bypassing nearby Sooley Dam to the west and flowing directly towards the Wollondilly River, downstream of the dam. The area is generally undulating and dips at approximately 6-7% falling from the northern extent at approximately RL 685 to RL 670 approximately 760m to the south.

The property has a driveway leading from Crookwell Road on the eastern boundary to the main dwelling and extended driveways leading to multiple large rural storage sheds and silos west and north of the dwelling. Further north, a gravel road leads to additional rural sheds and fenced stock yards. The remainder of the property is divided and fenced paddocks for different purposes, including for sheep grazing and cropping. A paddock to the south of the dwelling contains a bore (ID: GW050231).

Sooley Dam is located west of the site 1.05km from the western boundary.

Conclusions

This PSI concludes the following:

- The site is located on Lot 103 & 104 DP 1007433 at 515 Crookwell Road, Kingsdale, NSW and is located within the Goulburn Mulwaree Council. Access to the site is via an unpaved driveway from Crookwell Road leading to a dwelling, associated sheds and silos in the centre along the eastern boundary.
- Historical information for the property and onsite observations indicate that potentially contaminating activities may have occurred on site which may have impacted the Site. The potential contaminants of concern (PCOCs) associated with these activities, and the potential areas of environmental concern (AECs) are defined in the Conceptual Site Model (CSM) provided in figure 6 and Appendix E.
- They include the potential for onsite use of pesticides, primary effluent disposal area, vehicle/equipment storage and maintenance activities, pre 1998 dwelling, shed and structure

construction materials and importation of fill materials for the driveway which may have contained contaminants entrapped at the source of the fill.

- Four AECs have been identified and will require further investigation both pre and post demolition of the existing structures. The remainder of the site is of MODERATE likelihood for any contamination due to agricultural land use activities and will also require additional investigation.
- Test frequency, regime and mythology for further investigation in the form of a Detailed Site Investigation (DSI), needs to be determined in accordance with the following statutory guideline documents:
    - Guidelines for Consultants Reporting on Contaminated Sites (1997) EPA, NSW
    - National Environment Protection (Assessment of Site Contamination) Measure, (NEPM 2013)
- If any strong odours, soil staining or buried building/construction materials are observed during excavations, a qualified environmental consultant must be engaged to assess the likelihood of contamination in accordance with unexpected finds protocols.

Recommendations

The following recommendations are made:

Due to the historical use of the site resulting in a **moderate** likelihood of any contamination, it is recommended that a **Detailed Site Investigation (DSI)** is undertaken to determine if the site is fit for its intended purpose. Main areas of environmental concern (AEC) being the following:

- AEC 1
    - Shed, silo and storage area (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Shed, silo and storage area footprint validation (post demolition) (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos).
- AEC 2
    - Shed, silo and storage area (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Driveway fill material (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Dwelling and septic (HM, TRH, BTEXN, PAH, OCP/OPP, PCB, asbestos, microbial)
    - Dwelling, shed, silo and storage area footprint validation (post demolition) (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos).
- AEC 3
    - Shed, silo and storage area (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Shed, silo and storage area footprint validation (post demolition) (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos).
- AEC 4
    - Shed and storage area (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Shed and storage area footprint validation (post demolition) (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos).
- Paddocks and dams within the study area as described in this repot (figure 2)
    - Fenced off paddocks used for agricultural purposes (HM, OCP/OPP, herbicides).

- To address potential AEC and COPC, an intrusive soil sampling regime is recommended to be conducted. The sampling regime must be in accordance with the following statutory guideline documents:
    - Guidelines for Consultants Reporting on Contaminated Sites (1997) EPA, NSW
    - National Environment Protection (Assessment of Site Contamination) Measure, (NEPM 2013)

Samples are to be tested for the above-mentioned analytes. A map showing the AEC's can be seen in Appendix E.

1 Contents

Appendixes

- Appendix A – Aerial Photo Search
- Appendix B – NSW Title Searches
- Appendix C – Site Photos
- Appendix D – NSW SEEDs Maps
- Appendix E – Areas of Environmental Concern Map

1 Introduction

1.1 Purpose

This report has been prepared for Precise Planning Pty Ltd on behalf of Alimaco Pty Ltd to assess the likelihood of contamination existing at the Site (where site contamination is defined within Section 5 of the Contaminated Land Management Act 1997 (CLM Act)) and if present, to assess the requirement for any particular contaminated land site management.

Field work was carried out on Tuesday the 6th October 2021 by Tanya Erofeev, a suitably qualified environmental scientist. The site is located inside of the WaterNSW Catchment Area and this assessment has been prepared in accordance with the standards and guidelines listed in References.

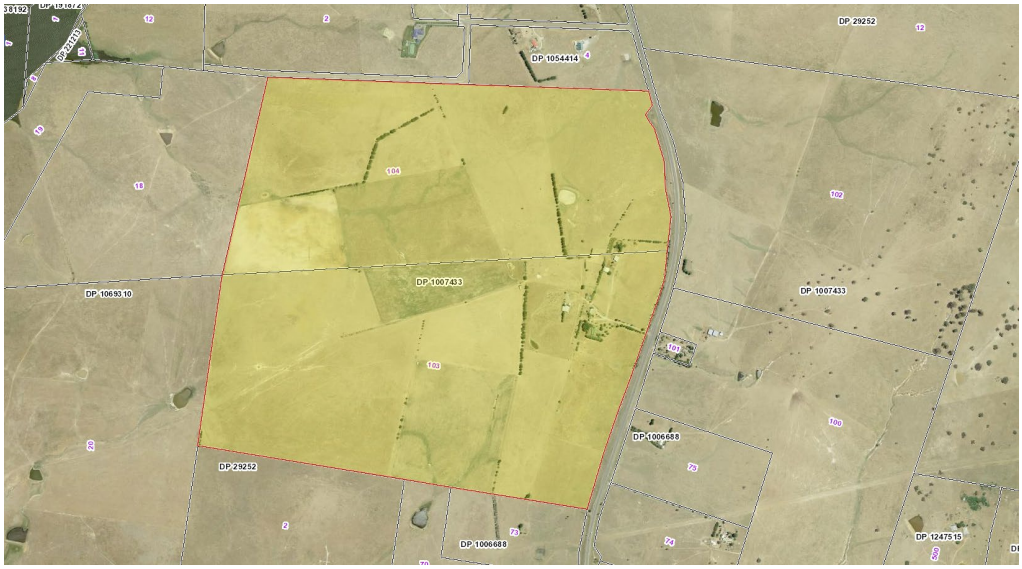


Figure 1: Site Location - NSW Imagery (SIX Maps)

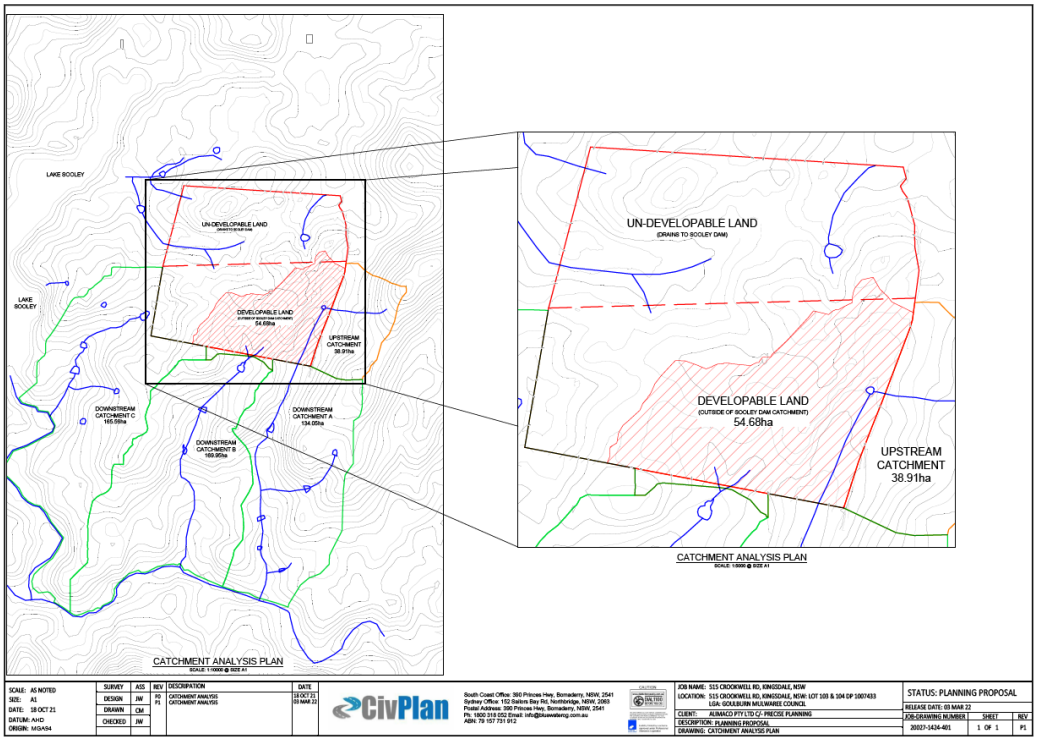


Figure 2: Developable Land

1.2 Site Description

The site is located on Lot 103 & 104 DP 1007433 at 515 Crookwell Road, Kingsdale, NSW and is within the Goulburn Mulwaree Council and the WaterNSW catchment area. Access to the site is via an unpaved driveway from Crookwell Road leading to a dwelling and associated sheds and grain storage silos in the centre along the eastern boundary.

Lot 103 DP 1007433 has an approximate area of 90.97ha and lot 104 74.19ha. The developable land area of the site only (figure 2) is being assessed for this report, which is 54.68ha. This area is being considered due to the catchment bypassing nearby Sooley Dam to the west and flowing directly towards the Wollondilly River, downstream of the dam. The area is generally undulating and dips at approximately 6-7% falling from the northern extent at approximately RL 685 to RL 670 approximately 760m to the south.

The property has a driveway leading from Crookwell Road on the eastern boundary to the main dwelling and extended driveways leading to multiple large rural storage sheds and silos west and north of the dwelling. Further north, a gravel road leads to additional rural sheds and fenced stock yards. The remainder of the property is divided and fenced paddocks for different purposes, including for sheep grazing and cropping. A paddock to the south of the dwelling contains a bore (ID: GW050231).

Sooley Dam is located west of the site 1.05km from the western boundary.

1.3 Proposed Development

The site at 515 Crookwell Road, Kingsdale is a planning proposal to change the zoning to enable the development of approximately 24 large rural residential allotments.

1.4 Methods

The environmental field work and subsequent reporting has been made via a desktop study using various information sources, regional mapping and open-source records. Observations have been made in the field of surface features of the property and the surrounding area during a site walkover.

1.5 Objectives

The objective of this assessment was to:

- Assess and advice on the Site's potential for contamination from historical and current land use (as defined in Section 5 of the Contaminated Land Management Act, 1997).
- Assess whether any such contamination will impact on the proposed use of the Site and to determine whether follow up investigations are required.

It is noted that 'Contamination', as defined in the *Contaminated Land Management Act, 1997,* is the presence (in, on or under the land) of a substance at a concentration above the concentration at which the substance is normally present (in, on or under the land respectively in the same locality), being a presence that presents a risk of harm to human health or any other aspects of the environment. However, land is not, for the purposes of this Act, contaminated land:

- Merely because in any surface water standing or running through the land, a substance is present in such concentration, or

- Merely because of the presence of a substance prescribed by the regulations, or
- In circumstances prescribed by regulations.

It is understood that the findings and conclusions of this report will be used by Council to assess any need for further site investigation to occur.

1.6 Scope of Work

The scope of work for PSI's generally comprises a desktop study, a site visit. This PSI included the following:

The desktop study involved reviewing the following documents:

- Historical aerial photography.
- Online information regarding the soil type, geology and topography of the area.
- Historical and current land titles to aid in the assessment of the sites historical and current uses.

The site visit involved the following activities:

- A site walkover by an environmental scientist to observe topography, vegetation, nearby sensitive environments, evidence for potential areas of concern such as stockpiles, stained ground, salt crusting, dumping etc.

And finally, to use the information gathered in the desktop study and the site visit to compile a report written in accordance with the consultants' guide / requirements 2011 (NSW) and ASC NEMP Schedule B2.

2 Desktop Study Findings

2.1 The Site

The site is located on Lot 103 & 104 DP 1007433 at 515 Crookwell Road, Kingsdale, NSW and is located within the Goulburn Mulwaree Council approximately 5 km to the north of the Goulburn Town Centre.

The site is currently covered with grasses, a residential dwelling, large rural storage and stock sheds surrounding the dwelling and to the north & west of the dwelling. There are stock holding yards to the north. The dwelling and associated large sheds are concentrated along the eastern boundary aligned parallel to Crookwell Road.

The remainder of the rural property is divided and fenced into paddocks used for multiple purposes including sheep grazing and cropping. The site is zoned as RU6 Transition C3 Environmental Management under the Goulburn Mulwaree Local Environmental Plan (2009).

Property Address	515 Crookwell Road, Kingsdale, NSW
Title Id	Lot 103 & 104 DP 1007433
Ownership	Alicamo Pty Ltd

Local Government Area	Goulburn Mulwaree
Current use	Rural
Land Zoning	C3 Environmental Management
Proposed use	Large Lot Rural Residential
Council	Goulburn Mulwaree Council

Surrounding land use is rural farmland (stock & cropping), with Goulburn residential township located to the southeast 5km.

2.2 General Geology

The 1:100,000 geology sheet for Goulburn indicates that the site is underlain by feldspar-lithic quartz sandstone with minor interbeded siltstone and mudstone of the Mount Fairy Group with Bishopthorpe suite dolerite formed in the Siluro-devonian.

2.3 Surface Topography

The area is generally undulating and dips at approximately 6-7% falling from the northern extent at approximately RL 685 to RL 670 approximately 760m to the south.

2.4 Surface Hydrology and Sub-Surface Hydrogeology

Rainfall on the site area considered to be developed will naturally follow the slope of the site and drain to the south, towards the Wollondilly River.

As the site is within the WaterNSW Catchment area, data has been drawn from the WaterNSW catchment weather stations, with the site being located within Zone 3 for evaporation & Goulburn TAFE for rainfall, as shown in Table 1 below (reference figure 2.1 table 2.1 and 2.2 in the document *Designing and Installing On-Site Wastewater Systems v.2 by WaterNSW dated Nov 2019*).

Month	**Mean Monthly Rainfall (mm)**	**Median Monthly Class A Pan Evaporation (mm)**	**Rainfall – Evaporation (mm)**
January	61.9	187	-125.1
February	60.7	145	-84.3
March	55.6	124	-68.4
April	44	79	-35.0
May	40.7	51	-10.3
June	53.1	34	19.1
July	40.8	39	1.8
August	52.5	61	-8.5
September	48	88	-40.0
October	52.5	123	-70.5

November	62.6	146	-83.4
December	62.8	185	-122.5
Annual	**624.6**	**1261**	**-636.4**

Table 2: Rainfall Data: WaterNSW Weather Station Data: Goulburn TAFE / Zone 3

Additionally, Bureau of Meteorology website and specifically the Goulburn Airport Monitoring Station (70330) at Latitude 34.81°S and Longitude149.73°E are shown in Table 2 below.

Month	**Mean Monthly Rainfall (mm)**
January	49.5
February	57.0
March	44.6
April	25.0
May	33.0
June	57.7
July	31.6
August	43.5
September	44.1
October	50.7
November	54.6
December	54.8
Annual	**763.0**

Table 2: Rainfall Data: BoM Goulburn Airport Monitoring Station (70330)

Hydrogeology Map of Australia: Commonwealth of Australia (Geoscience Australia) describes aquifers on and around the site as porous with extensive aquifers of low to moderate productivity. It is expected that a seasonal perched groundwater table will exist on the site at the interface between the soil and the underlying bedrock. If present, the groundwater would typically follow the topography of the Site and drain towards the south as per the surface water runoff.

2.5 Groundwater

There are two bores located on the site. GW035919 in the north-western section of site and was drilled to 23.50m for domestic stock purposes. GW050231 is located near the eastern boundary of the site. This water-bore is for domestic stock purposes also and was drilled to 38m depth on 1st February 1980. There are four bores off site that are within a 500m vicinity. GW110284 to the north, GW049127 and, GW043667 to the east and GW049788 to the south (Figure 3).

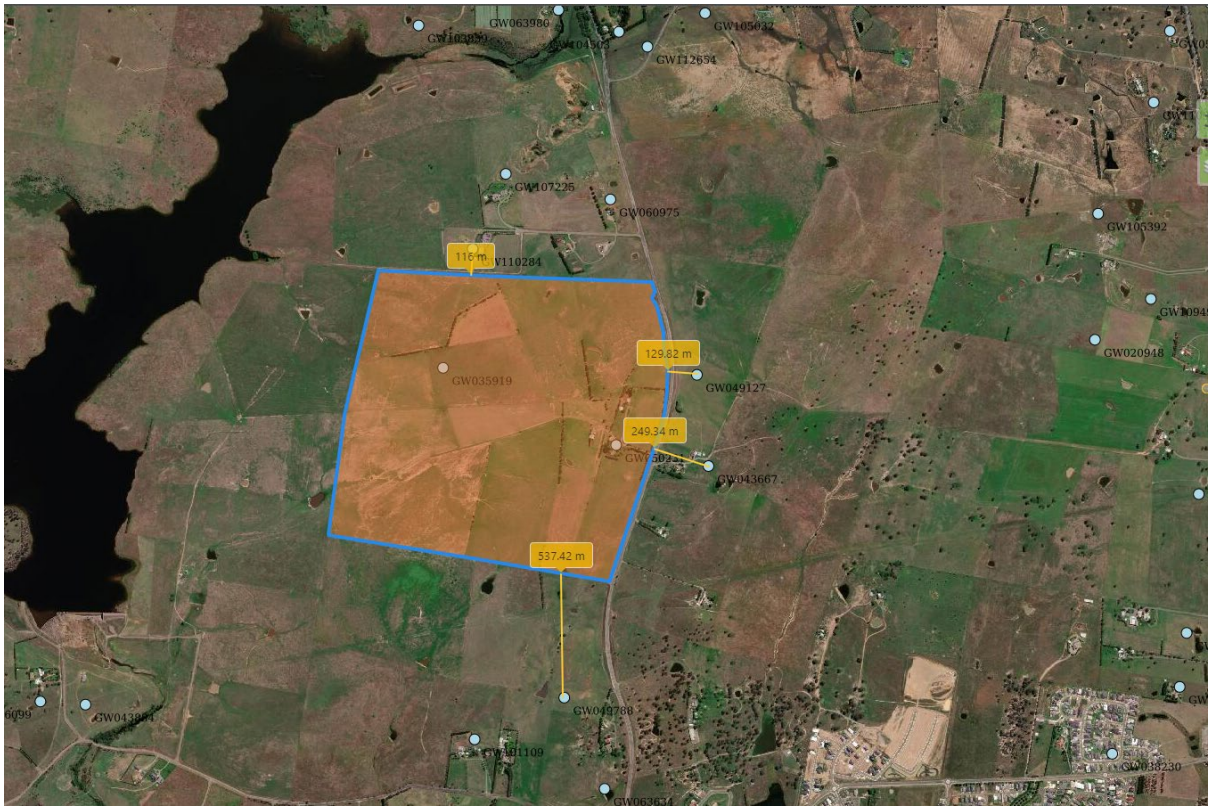


Figure 3: Groundwater Bore Locations (MinView).

2.6 Soil Investigation

NSW Government SEED Soil Classification Type Map (Appendix D) shows the site has both Vertosols and Kurosols. An eastern strip of land aligned along the eastern boundary is vertosols and classified as biophysical strategic agricultural land (BSAL). Vertosols are clay rich soils with uniform texture and shrink-swell capacity.

The remainder of the site is Kurosols. Kurosols are soils that display a strong texture contrast between surface (A) horizons and subsoil (B) horizons. The upper part of the subsoil is strongly acid (i.e. pH <5.5). Kurosols occur predominantly in the uplands where rainfall is higher and consequently so is the leaching.

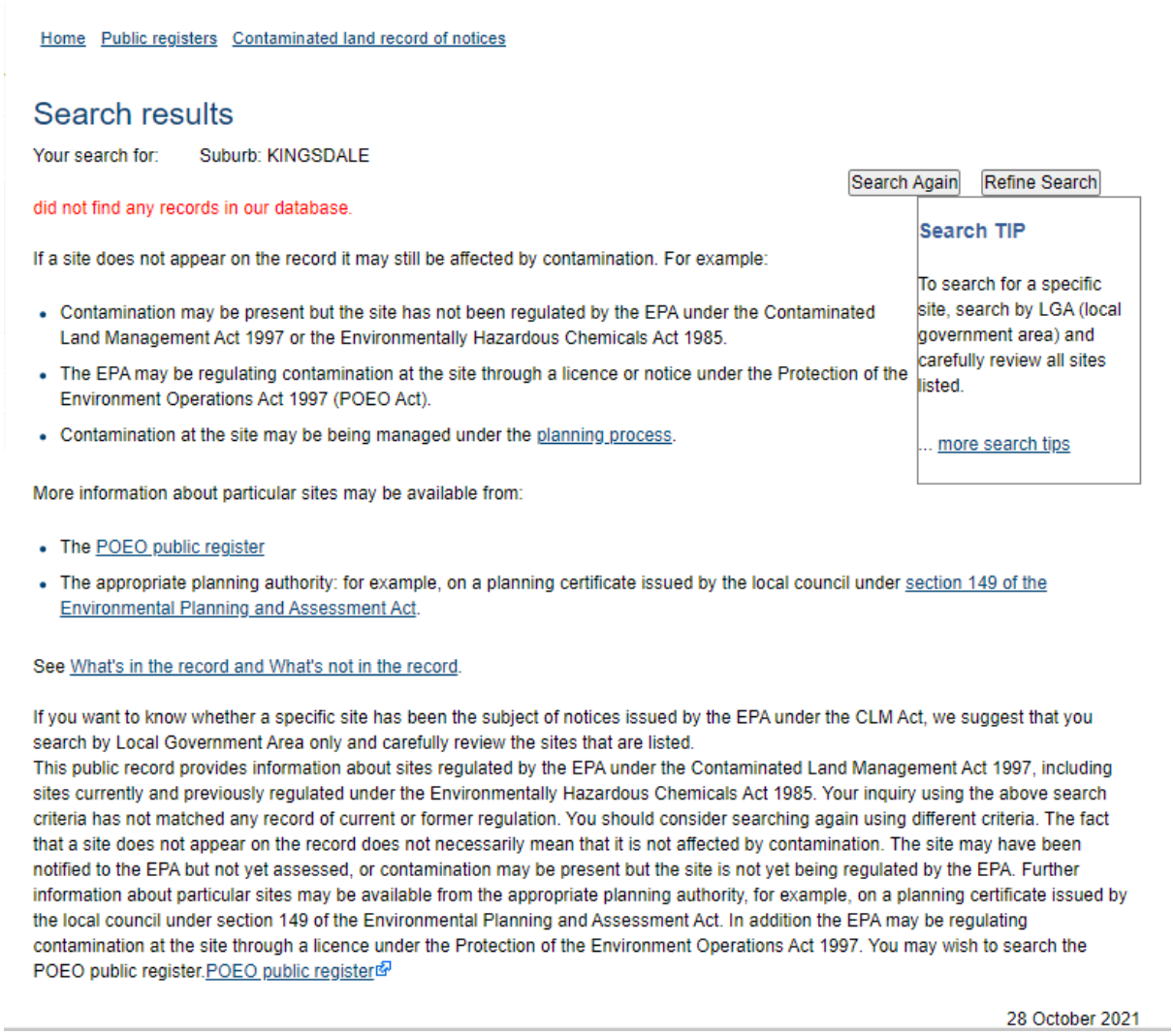
2.7 Site History Data Sources

Information on the Site history was obtained from:

- A search on NSW EPA register for listings of the Site and nearby sites.
- Review of NSW Government historical imagery - aerial images.
- NSW Water – groundwater borehole reports search.
- Title and historical title search with InfoTrack.
- NSW Government SEEDS Maps.

2.8 NSW EPA Contaminated Land and POEO Records

On the 28th October 2021 a search of NSW EPA Contaminated Land Records was conducted. Currently there are no notices for this Site or neighbouring sites. The National Waste Management Database and National Liquid Fuel Facilities register show no records for the area.



Home Public registers Contaminated land record of notices

Search results

Your search for: Suburb: KINGSDALE

Search Again Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register.POEO public register

28 October 2021

2.9 Historical Imagery

Aerial imagery from 1975 to the present day was reviewed. These were obtained from a search of the NSW Government Historical Imagery Database (Appendix A). Analysis of the imagery concluded the following:

- 1975: The site is cleared, open grass rural land, with a driveway leading to the dwelling, a large shed west of the dwelling and north of the dwelling. Further north are fenced stock holding yards and associated shed. Three dams are in existence, located north, southeast and south west of the dwelling. Surrounding land use is predominantly open cropping or stock grazing land. The neighbouring opposite property on Crookwell Road has an established dwelling and large sheds.
- 1987: Two additional sheds have been constructed. One large shed north of the dwelling adjacent to the stock holding yards. One small shed west of the dwelling. NO other changes evident.
- 1991: A small shed erected southwest of the dwelling between a cropping and grazing paddock. Four additional stock holding yards added to the cluster of holding yards and sheds north of the dwelling.

- 1997: Two front paddocks directly north and south of the driveway aligned with Crookwell Road appear to have been recently cultivated. No additional structures erected on the property.
- 2014: No new additional structures or changes evident.
- 2020: No new structures or changes evident.

2.10 Council and land registry records

InfoTrack provided current and historical land title information. These indicate that Lot 103 & 104 DP 1007433 site boundaries were formed in 1999. Current and historical titles can be found in Appendix B.

2.11 Summary of desktop Site history review

Between 1975 until 1987, the site was open grass rural farmland with an established dwelling, a large shed to the west of the dwelling, north of the dwelling and further north is located fenced stock yards and an associated shed. By 1987 two additional large sheds were constructed in the stock holding yard area and west of the dwelling. By 1991 four additional stock holding yards added in the north and a small shed between a cropping and grazing paddock. From 1991 until 2020, no additional structures have been added on site and no other changes are evident.

The NSW Government SEED site has not mapped the area as a risk for acid sulfate soils being present.

3 Site visit

A site visit was conducted by Tanya Erofeev (Environmental Scientist) for CivPlan Consulting Pty Ltd on Wednesday the 6th October 2021 where a site walkover was conducted and areas of environmental concern identified.

3.1 General Observations

During the site visit, no obvious signs of saline conditions were observed across the site. The onsite vegetation displayed no evidence of impeded growth. There were no observed surface water marks or crystalized salt. No suspected asbestos materials or odours were encountered during the site inspection.

Several AEC were identified during the site inspection, and the paddocks were observed to be used primary for agricultural activities. The dwellings, sheds and silos were used as vehicle, equipment and materials storage and maintenance locations.

Further observations in the form of site photos with descriptions can be found in Appendix C and the AEC locations found at Appendix E.

4 Preliminary Assessment Findings

4.1 Potential areas of Concern

Historical information for the Site and observations of the site indicates that there is moderate evidence of potentially contaminating activities occurring on the site. The potentially contaminating activities which may have occurred on this site include:

- Surface/subsurface primary effluent disposal system.
- Potential use of herbicides and/or pesticides on the site.
- Imported fill material used for driveway construction.
- Farm vehicles, equipment, and consumable storage / maintenance areas, around the sheds and silos.
- Pile of scrap materials including wooden furniture debris and green waste.
- Materials used during construction (dwelling and shed).

4.2 Potential Contaminants of Concern

The potential contaminants of concern associated with the Site activities include the following:

• **Metals (HM)** (Arsenic, Cadmium, Total Chromium, Copper, Lead, Nickel, Zinc and Mercury):
These metals are associated with the coating of metal (e.g. lead paint), copper wires, galvanising of metal, and electrical equipment etc. These materials may be present from the use of corrugated iron or lead paints on existing (or historical) structures on the Site or can be imported on to the site in fill material. Metals do not readily breakdown, hence some accumulation in plants may occur. Although in some cases essential for both plant and animal life, excessive amounts of metals can be toxic.

• **Pesticides (including insecticides, fungicides, herbicides, rodenticides and others) (OCP/OPP & Herbicides):**
Pesticides are likely to have been used to manage vegetation especially along creek lines. When sprayed it is likely to have been blown by the wind onto other areas. It is also likely that pesticides have been used on surrounding cropping land.

Typically, persistence is less than 5 years, with DDT and copper-based pesticides being a few of the exceptions. As no structures have been identified on the site, use of pesticides is expected to be limited to management of vegetation only.

• **Total recoverable hydrocarbons (TRH) and BTEXN:**
These contaminants may potentially exist if fuel or oil was spilled accidently onto the Site when vehicles are passing through the site. This type of activity has been limited since around 1994 when the unsealed road was rehabilitated. TRH and BTEX (benzene, toluene, ethylbenzene, and xylene) are not considered to be persistent in the environment due to their volatile nature.

• **PAHs (poly aromatic Hydrocarbons) and PCBs (Polychlorinated Biphenyl's):**
These contaminants are typically used in oils. Hot spots may occur because of spills. PCBs are generally not soluble in water, non-volatile and resistant to flame, thermal and chemical degradation. PCBs are therefore relatively persistent in the environment and can bio-accumulate. PAHs are relatively persistent in the environment, due to their chemical composition, however in aerobic environments, bacteria can degrade PAHs.

• **Asbestos:**
Asbestos was used in construction of buildings prior to the 1990's. Since there has been no structures on the Site it is unlikely that asbestos would be present as a result of building materials. However, if off-site fill was introduced at any stage, it is possible that Asbestos may be entrapped within any of the fill placed on the site. Although asbestos can occur naturally, the NSW Department of Industry,

Resources & Energy shows no results for naturally occurring Asbestos potential in the area. If present, Asbestos fibres generally do not breakdown to other compounds, and therefore remain persist in the environment.

Source	Pathway	Receptor
Introduced Asbestos impacted fill material	Inhalation of airborne fibres	Current Site owners and workers
		Future site occupiers
		Construction/Maintenance workers
		Native Fauna / Domestic animals
TPH, PAH, BTEX and pesticides	Inhalation of vapours	Current Site owners and workers
		Future site occupiers
		Construction/Maintenance workers
		Native Fauna / Domestic animals
	Ingestion and/or absorption by direct contact	Current Site owners and workers
		Future site occupiers
		Construction/Maintenance workers
		Native Fauna / Domestic animals
	Surface run-off	Drainage to the north of the site
	Flow migration (spill)	Drainage to the north of the site
	Plant uptake	Local flora - especially treed areas and dam
Metals within soils	Inhalation (dust)	Current site owners and workers
		Future site occupiers
		Construction/Maintenance workers
		Native Fauna / Domestic animals
	Ingestion and/or absorption by direct contact	Current site owners and workers
		Future site occupiers
		Construction/Maintenance workers
		Native Fauna / Domestic animals
	Surface run-off migration	Drainage into the dam and/or to the north of the site
		Groundwater
	Plant uptake	Local flora
		Human /animal ingestion of on-site grown produce

Figure 5: Potential receptors of concern

4.3 Conceptual Site Model

In this Conceptual Site model (CSM), a contaminant can be any substance, which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters. A pathway is defined as one or more routes or means by, or through, which a receptor is being or can be exposed to, or affected by, a contaminant. Figure 6 below summarises the conceptual Site model (CSM) for the Site. This CSM defines specifically:

- Potential activities which may have occurred on the site from current and historical site uses.
- Potential contaminants which may be associated with these activities.
- Potential areas of environmental concern (PAEC) which may be impacted by these activities and contaminants.
- Receptors that may be impacted by these contaminants if present and potential pathways through which these receptors may be impacted.
- Assessment of the risk of contamination. This assessment of risk is provided to allow identification and prioritisation of areas for further assessment.

Potential areas of Environmental concern	Potential sources of contamination	Potentially affected media / Receptors	Description	Likelyhood of Contamination impacting on proposed site use.	Contaminants of primary concern (COPC)
Dwelling, Shed and Silo Areas	Fuel/oil spills, leaks and exhaust fumes.	Surface water draining local roads and groundwater. Local fauna.	Typically, contamination is related to the leakage of oil from parked vehicles and equiment, incluidng local maintenance activities of and contaminates from exhausts onto unpaved areas that then potentially seep into the ground.	MODERATE likelihood due to the volatile nature of potential contaminants. The unsealed entrance, shed and silo areas.	TRH, BTEX, PAHs, Metals
	Rubbish/ waste pile.	Owners. Workers. Domestic animals, local fauna.	Any contamination at the source site for the fill material could have been transported to Site entrapped within the fill material.	LOW likelihood as rubbish looks like it was mainly sourced from inert materials. E.g. wooden, metal etc.	TRH, BTEX, PAHs, OCP/OPP, Metals, Asbestos
	Potential importation of fill material	Owners. Workers. Domestic animals, local fauna.	Any contamination at the source site for the fill material could have been transported to Site entrapped within the fill material.	MODERATE likelihood as driveway fill material looks like it was potentially sourced off site.	TRH, BTEX, PAHs, Metals, Asbestos
	Historical use of pesticides	Owners. Workers. Domestic animals, local fauna.	Pesticides are likely to have been used to manage vegetation.	MODERATE as this Site has been used for farm work, general agriculture and cropping activities.	BTEX, PAHs, Metals, OCP/OPP, PCB
	Construction materials used in dwelling	Owners. Workers. Local fauna.	Potential fibre sheeting used in construction.	MODERATE due to date of construction being pre 1998.	HM, TRH, BTEX, PAH, OCP/OPP, PCB, and asbestos.
	Potential use of lead based paints	Owners. Workers. Local fauna. Groundwater	Potential use of lead based paints	MODERATE due to date of construction being pre 1998.	Metals
	Septic system	Local flora & fauna. Surface water draining to the rear of the property. Groundwater.	What appears to be a primary septic treatment unit with an absorption trench disposal system has been unused for the dwelling	MODERATE due to date of construction being pre 1998.	BTEX, PAHs, Metals, OCP/OPP, PCB
Beneath dwelling, sheds and silos	Construction materials used	Owners. Workers. Local fauna.	Potential fibre sheeting used in construction.	MODERATE due to date of construction being pre 1998.	HM, TRH, BTEX, PAH, OCP/OPP, PCB, and asbestos.
	Potential use of lead based paints	Owners. Workers. Local fauna. Groundwater	Potential use of lead based paints	MODERATE due to date of construction being pre 1998.	Metals
Paddocks	Rubbish/ waste pile.	Owners. Workers. Domestic animals, local fauna.	Any contamination at the source site for the fill material could have been transported to Site entrapped within the fill material.	LOW likelihood as rubbish looks like it was mainly sourced from inert materials. E.g. wooden, metal etc.	TRH, BTEX, PAHs, OCP/OPP, Metals, Asbestos
	Potential importation of fill material	Owners. Workers. Domestic animals, local fauna.	Any contamination at the source site for the fill material could have been transported to Site entrapped within the fill material.	MODERATE likelihood as driveway fill material looks like it was potentially sourced off site.	TRH, BTEX, PAHs, Metals, Asbestos
	Historical use of pesticides	Owners. Workers. Domestic animals, local fauna.	Pesticides are likely to have been used to manage vegetation.	MODERATE as this Site has been used for farm work, general agriculture and cropping activities.	BTEX, PAHs, Metals, OCP/OPP, PCB

Figure 6: Conceptual Site Model

5 Conclusion

This PSI concludes the following:

- The site is located on Lot 103 & 104 DP 1007433 at 515 Crookwell Road, Kingsdale, NSW and is located within the Goulburn Mulwaree Council. Access to the site is via an unpaved driveway from Crookwell Road leading to a dwelling, associated sheds and silos in the centre along the eastern boundary.
- Historical information for the property and onsite observations indicate that potentially contaminating activities may have occurred on site which may have impacted the Site. The potential contaminants of concern (PCOCs) associated with these activities, and the potential areas of environmental concern (AECs) are defined in the Conceptual Site Model (CSM) provided in figure 6 and Appendix E.
- They include the potential for onsite use of pesticides, primary effluent disposal area, vehicle/equipment storage and maintenance activities, pre 1998 dwelling, shed and structure construction materials and importation of fill materials for the driveway which may have contained contaminants entrapped at the source of the fill.
- Four AECs have been identified and will require further investigation both pre and post demolition of the existing structures. The remainder of the site is of MODERATE likelihood for any contamination due to agricultural land use activities and will also require additional investigation.
- Test frequency, regime and mythology for further investigation in the form of a Detailed Site Investigation (DSI), needs to be determined in accordance with the following statutory guideline documents:
    - Guidelines for Consultants Reporting on Contaminated Sites (1997) EPA, NSW
    - National Environment Protection (Assessment of Site Contamination) Measure, (NEPM 2013)
- If any strong odours, soil staining or buried building/construction materials are observed during excavations, a qualified environmental consultant must be engaged to assess the likelihood of contamination in accordance with unexpected finds protocols.

6 Recommendations

The following recommendations are made:

Due to the historical use of the site resulting in a **moderate** likelihood of any contamination, it is recommended that a **Detailed Site Investigation (DSI)** is undertaken to determine if the site is fit for its intended purpose. Main areas of environmental concern (AEC) being the following:

- AEC 1
    - Shed, silo and storage area (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Shed, silo and storage area footprint validation (post demolition) (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos).

- AEC 2
    - Shed, silo and storage area (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Driveway fill material (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Dwelling and septic (HM, TRH, BTEXN, PAH, OCP/OPP, PCB, asbestos, microbial)
    - Dwelling, shed, silo and storage area footprint validation (post demolition) (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos).
- AEC 3
    - Shed, silo and storage area (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Shed, silo and storage area footprint validation (post demolition) (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos).
- AEC 4
    - Shed and storage area (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos)
    - Shed and storage area footprint validation (post demolition) (HM, TRH, BTEXN, PAH, OCP/OPP, PCB & asbestos).
- Paddocks and dams within the study area as described in this repot (figure 2)
    - Fenced off paddocks used for agricultural purposes (HM, OCP/OPP, herbicides).

- To address potential AEC and COPC, an intrusive soil sampling regime is recommended to be conducted. The sampling regime must be in accordance with the following statutory guideline documents:

    - Guidelines for Consultants Reporting on Contaminated Sites (1997) EPA, NSW
    - National Environment Protection (Assessment of Site Contamination) Measure, (NEPM 2013)

Samples are to be tested for the above-mentioned analytes. A map showing the AEC's can be seen in Appendix E.

7 Limitations

The use of this report is for the client only and is based on an assessment of the site at the point in time of assessment. The findings contained in this report are the result of methodologies used in accordance with normal practices and standards and in accordance with the agreed scope of works. Under no circumstances can it be considered that these findings represent the actual state of the Site at all points. The subsurface conditions may vary significantly across the Site, particularly where no nearby sampling and testing work has been carried out.

8 References

- AS4482.1 Guide to investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds (2005)
- Australian and New Zealand Guideline for the Assessment and Management of Contaminated Sites, published by Australian and New Zealand Environment and Conservation Council (ANZECC) and the National Health and Medical Research Council (NHMRC), January 1992
- Environmental Guidelines for Assessment, Classification and Management of Liquid and Non-Liquid Wastes, NSW EPA, 1999

- Guidelines for Consultants Reporting on Contaminated Sites (1997) EPA, NSW
- National Environment Protection (Assessment of Site Contamination) Measure, (NEPM 2013)
- NSW Environment Protection Authority. Contaminated Land Records Database
- NSW Environment Protection Authority (1995). Contaminated Sites: Sampling Design
- Guidelines. NSW Environment Protection Authority. 59-61 Goulburn Street, Sydney South, NSW 1232
- NSW Environment Protection Authority 2014. Waste Classification Guidelines Part 1: Classifying Waste. NSW EPA
- NSW Land and Property Information - http://www.lpi.nsw.gov.au/

Appendix A – Aerial Photo Search

Aerial Imagery 1975

515 Crookwell Road, Kingsdale, NSW

Historical Imagery – Search and Discovery, NSW Government.

Aerial Imagery 1987

515 Crookwell Road, Kingsdale, NSW

Historical Imagery – Search and Discovery, NSW Government.

Aerial Imagery 1991

515 Crookwell Road, Kingsdale, NSW

Historical Imagery – Search and Discovery, NSW Government.

Aerial Imagery 1997

515 Crookwell Road, Kingsdale, NSW

Historical Imagery – Search and Discovery, NSW Government.

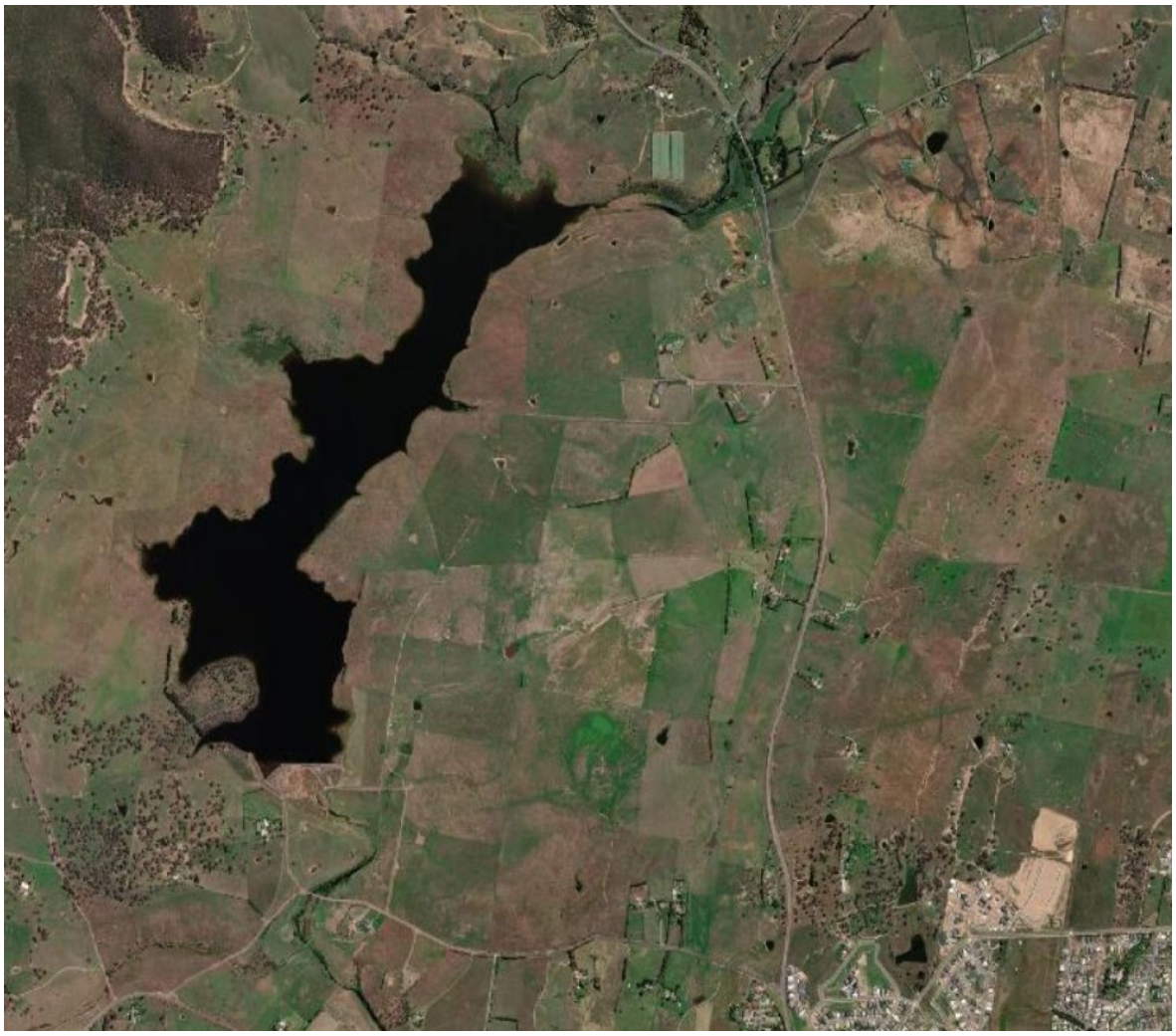
Aerial Imagery 2014

515 Crookwell Road, Kingsdale, NSW

Historical Imagery – SixMaps.

Aerial Imagery 2020

515 Crookwell Road, Kingsdale, NSW



Historical Imagery – Minview.

Appendix B – NSW Title Search

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
8/10/2021 1:45PM

FOLIO: 103/1007433

First Title(s): OLD SYSTEM
Prior Title(s): 8/29252

Recorded	Number	Type of Instrument	C.T. Issue
16/11/1999	DP1007433	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
24/7/2000	6967784	DEPARTMENTAL DEALING	FOLIO CREATED EDITION 1
4/11/2002	9096411	TRANSFER	EDITION 2
30/4/2004	AA603417	LEASE	EDITION 3
3/6/2004	AA687733	DEPARTMENTAL DEALING	
20/5/2009	AE690362	LEASE	EDITION 4
8/1/2014	AI276342	LEASE	EDITION 5
16/9/2019	AP533340	LEASE	EDITION 6
9/10/2019	AP594950	DEPARTMENTAL DEALING	EDITION 7

*** END OF SEARCH ***

Received: 08/10/2021 13:45:58

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 103/1007433

SEARCH DATE	TIME	EDITION NO	DATE
8/10/2021	1:45 PM	7	9/10/2019

LAND

LOT 103 IN DEPOSITED PLAN 1007433
AT DP1007433
LOCAL GOVERNMENT AREA GOULBURN MULWAREE
PARISH OF NARRANGARRIL COUNTY OF ARGYLE
TITLE DIAGRAM DP1007433

FIRST SCHEDULE

ALIMACO PTY LTD (T 9096411)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AP533340 LEASE TO MARTIN GERARD CROKER, MARGARET MAUREEN CROKER & BENJAMIN SCOTT CROKER OF "ONSLOW", 515 CROOKWELL RD, GOULBURN EXCLUDING THE PRINCIPAL DWELLING HOUSE. EXPIRES: 31/3/2024. OPTION OF RENEWAL: 2 YEARS.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Received: 08/10/2021 13:45:57

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
8/10/2021 1:45PM

FOLIO: 103/1007433

First Title(s): OLD SYSTEM
Prior Title(s): 8/29252

Recorded	Number	Type of Instrument	C.T. Issue
16/11/1999	DP1007433	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
24/7/2000	6967784	DEPARTMENTAL DEALING	FOLIO CREATED EDITION 1
4/11/2002	9096411	TRANSFER	EDITION 2
30/4/2004	AA603417	LEASE	EDITION 3
3/6/2004	AA687733	DEPARTMENTAL DEALING	
20/5/2009	AE690362	LEASE	EDITION 4
8/1/2014	AI276342	LEASE	EDITION 5
16/9/2019	AP533340	LEASE	EDITION 6
9/10/2019	AP594950	DEPARTMENTAL DEALING	EDITION 7

*** END OF SEARCH ***

Received: 08/10/2021 13:45:58

Appendix C – Site Photos

Photos from Site Visit

Date: 6th October 2021
Take by: Tanya Erofeev & John Weil
Address: 515 Crookwell Rd, Kingsdale, NSW


S
SW
W
NW
150
180
210
240
270
300
232°SW (T) 55 S 746944 6155486 ±5m 678m
AEC on ridge, old shed
CivPlan
515 Crookwell Rd
06 Oct 2021


SE
S
SW
W
150
180
210
240
270
300
218°SW (T) 55 S 747451 6155679 ±10m 680m
AEC1
CivPlan
515 Crookwell Rd
06 Oct 2021


SW W NW N
210 240 270 300 330 0
293°W (T) 55 S 747499 6155627 ±5m 682m
AEC2
CivPlan
515 Crookwell Rd
06 Oct 2021


W NW NE E
270 300 330 30 60 90
0°N (T) 55 S 747461 6155657 ±5m 686m
AEC2
CivPlan
515 Crookwell Rd
06 Oct 2021


S
SW
W
NW
180
210
240
270
300
330
246°SW (T) 55 S 747460 6155662 ±5m 683m
AEC3
CivPlan
515 Crookwell Rd
06 Oct 2021


W
NW
NE
270
300
330
30
60
359°N (T) 55 S 747469 6155656 ±5m 683m
AEC3
CivPlan
515 Crookwell Rd
06 Oct 2021


N
NE
E
SE
0
30
60
90
120
150
76°E (T) 55 S 747503 6155630 ±5m 680m
AEC3
CivPlan
515 Crookwell Rd
06 Oct 2021

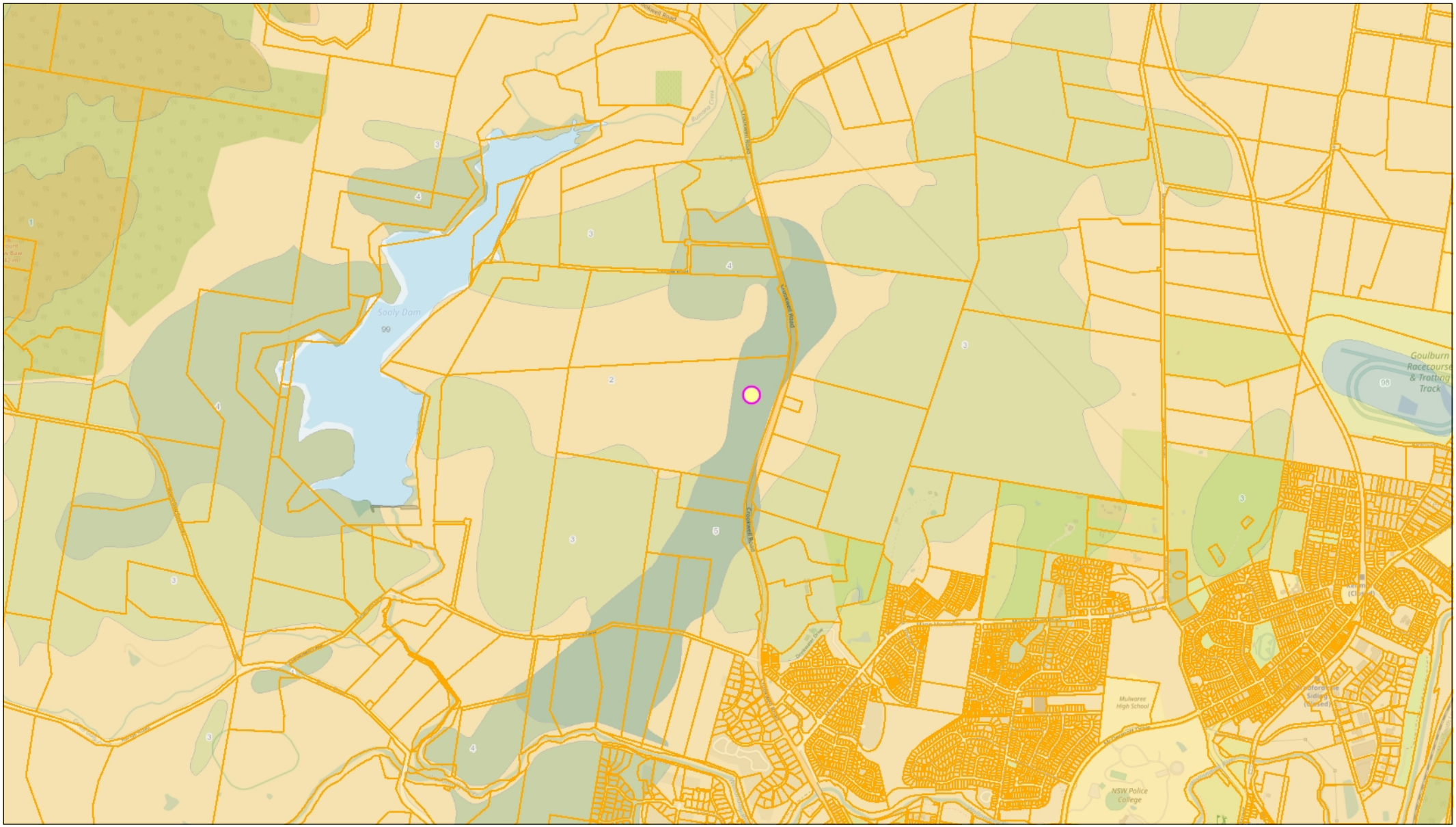

SE
S
SW
W
150
180
210
240
270
300
215°SW (T) 55 S 747508 6155577 ±5m 678m
Septic
CivPlan
515 Crookwell Rd
06 Oct 2021


NW
N
NE
E
330
0
30
60
90
120
39°NE (T)
55 S 747554 6155604 ±10m
697m
ARC on roadside
CivPlan
515 Crookwell Rd
06 Oct 2021

Appendix D – NSW SEEDs Maps

SEED | Sharing and Enabling Environmental Data

SEED Map - Estimated Inherent Soil Fertility



2.0 0 1.01 2.0 Kilometers

Scale 1: 40,386.17

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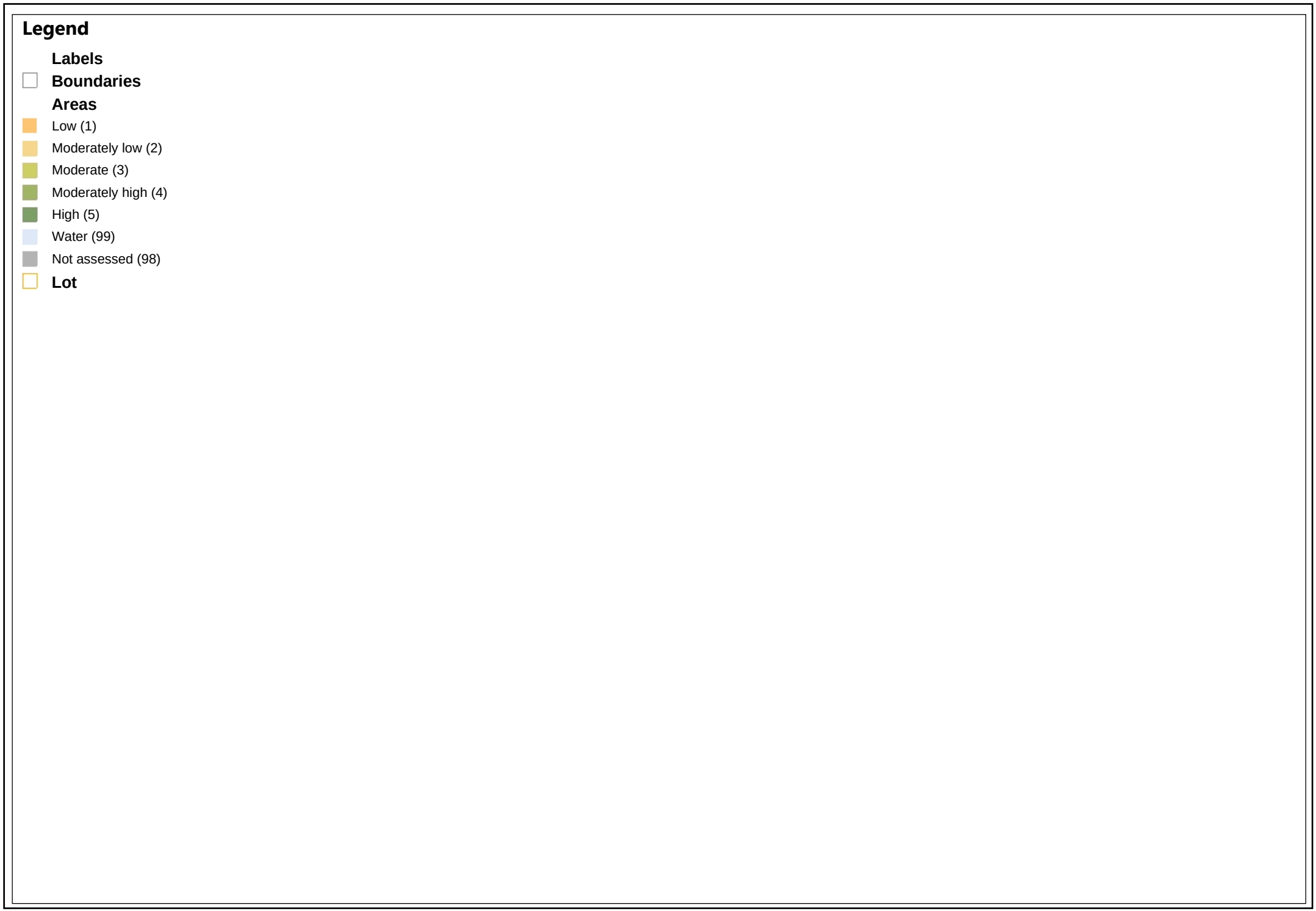
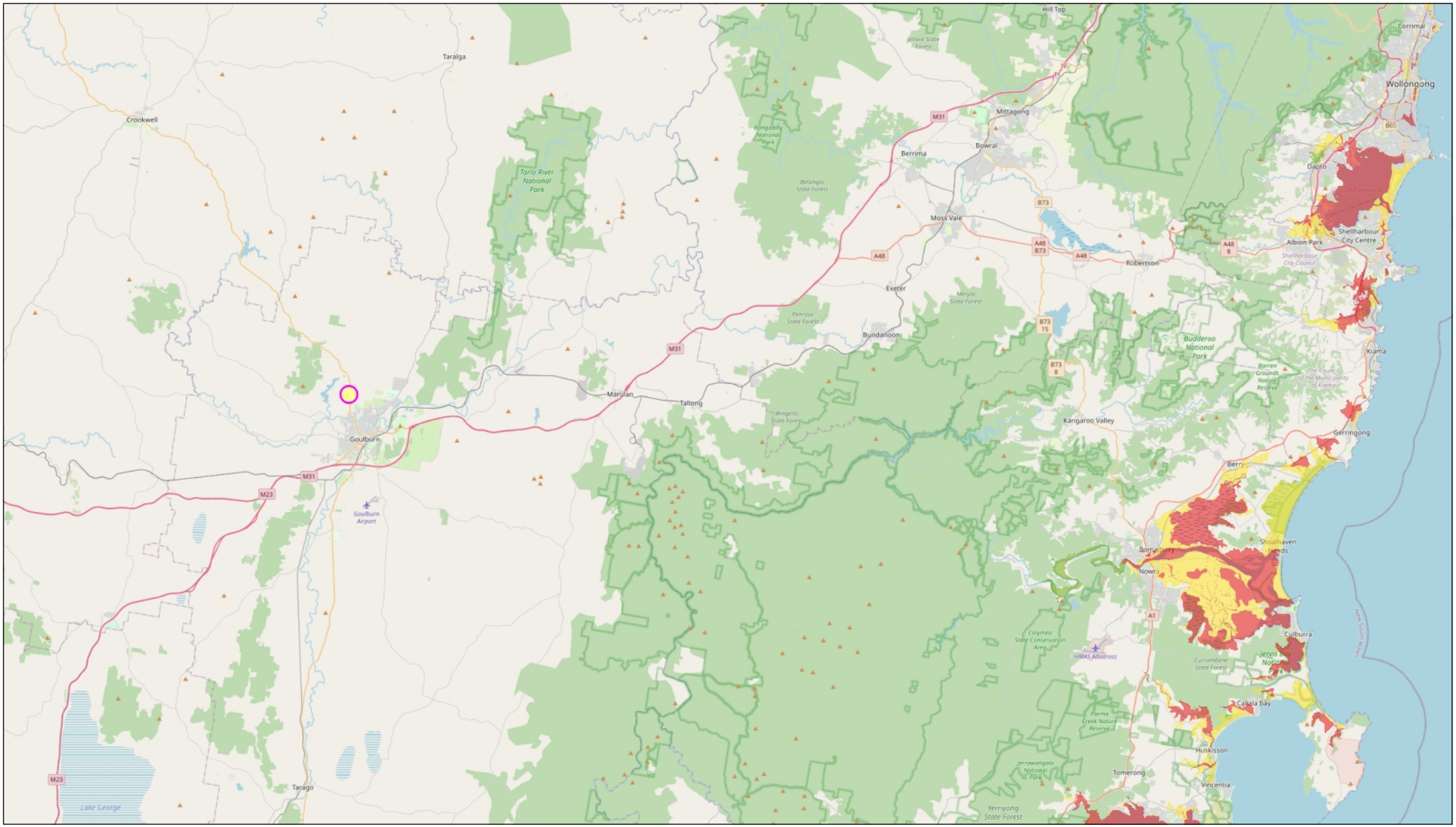
Generated from SEED web map. Created 9:35 AM 29/10/2021


Legend
Labels
Boundaries
Areas
Low (1)
Moderately low (2)
Moderate (3)
Moderately high (4)
High (5)
Water (99)
Not assessed (98)
Lot

SEED | Sharing and Enabling Environmental Data

SEED Map- Acid Sulfate Soil Risk



32.3 0 16.15 32.3 Kilometers

Scale 1: 646,178.71

WGS_1984_Web_Mercator_Auxiliary_Sphere

Generated from SEED web map. Created 5:50 PM 4/11/2021

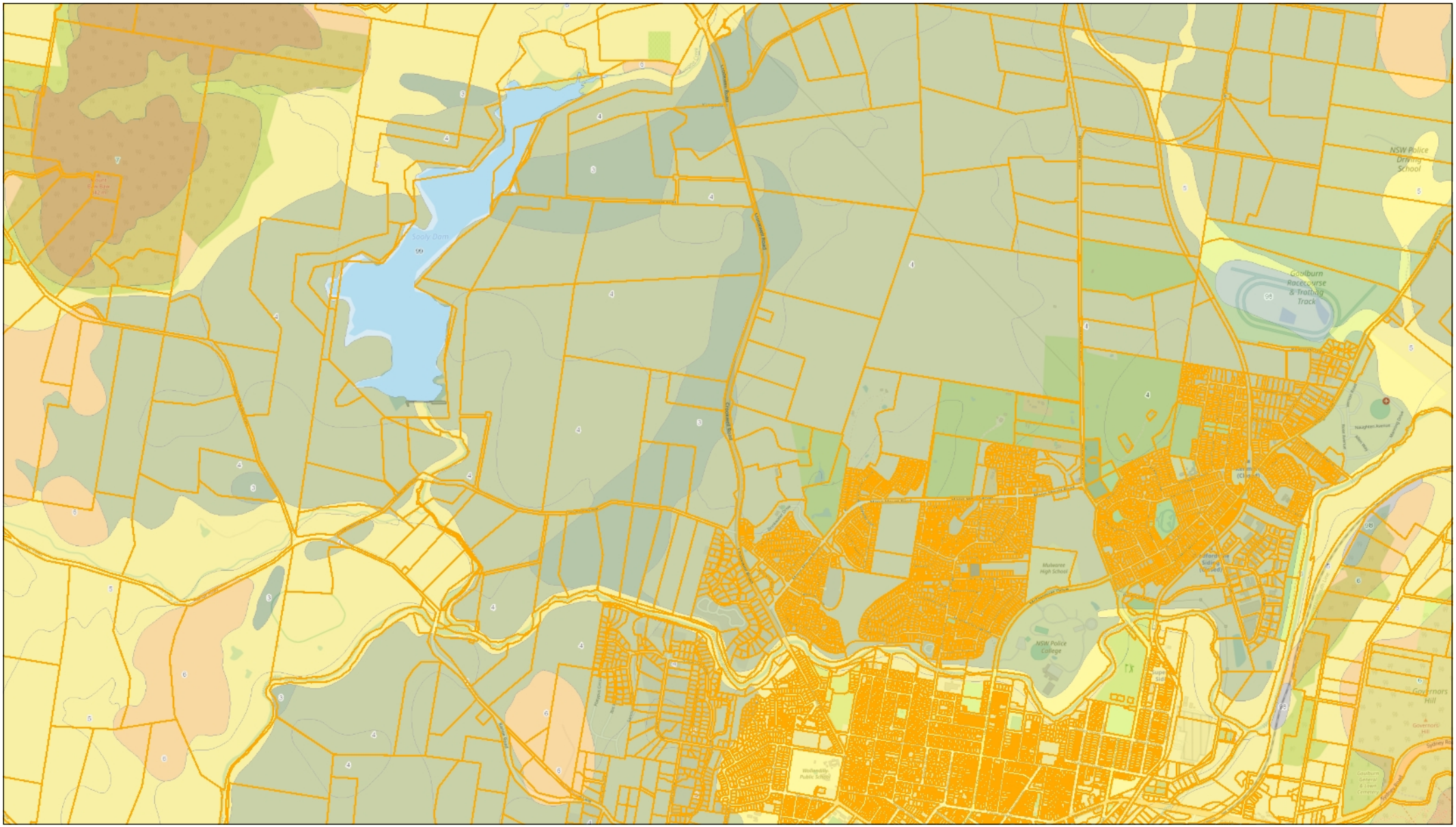
Legend

Areas

- High probability of occurrence
- Low probability of occurrence
- No known occurrence
- Not assessed

SEED | Sharing and Enabling Environmental Data

SEED Map

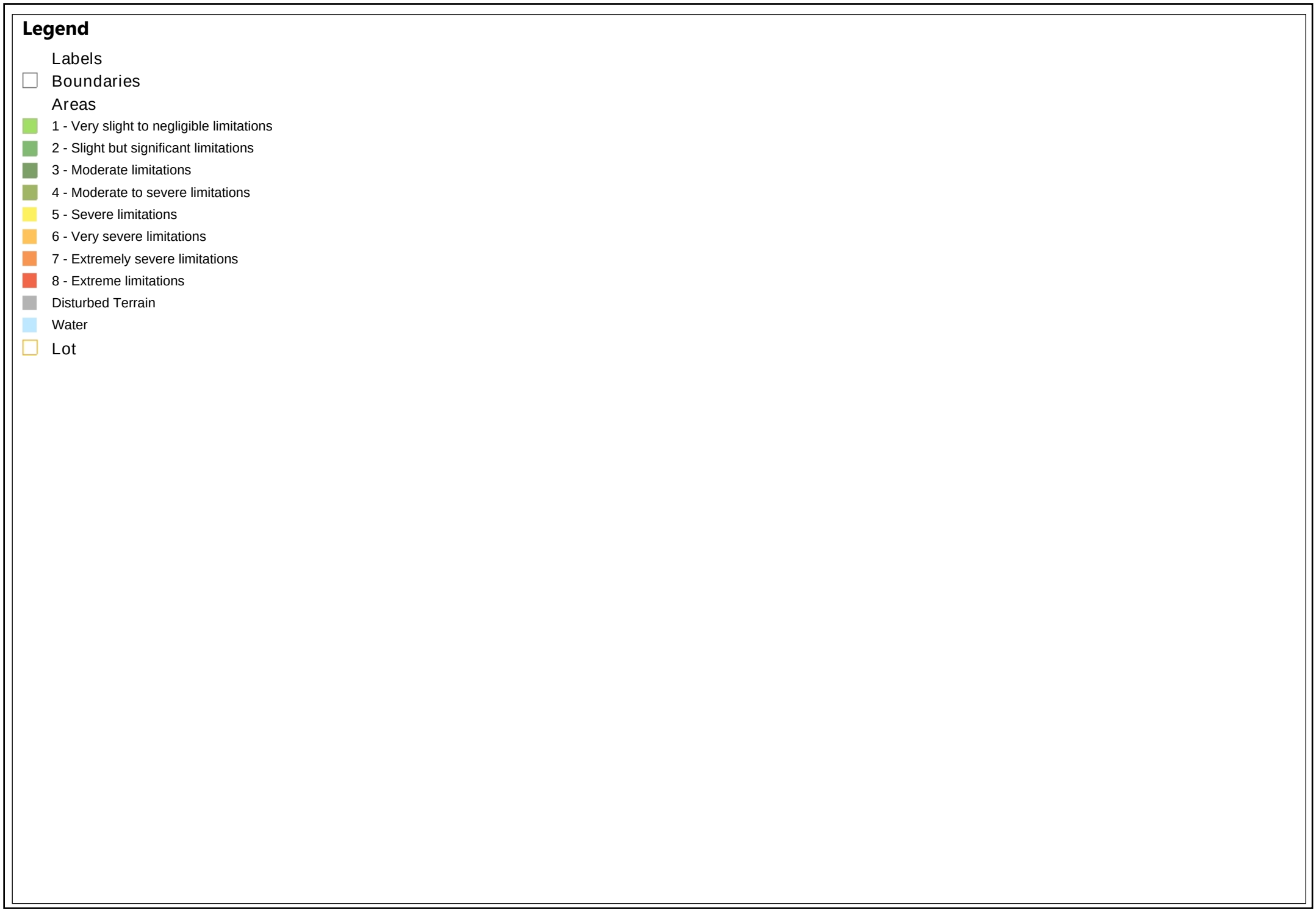


2.4 0 1.19 2.4 Kilometers

Scale 1: 47,503.12

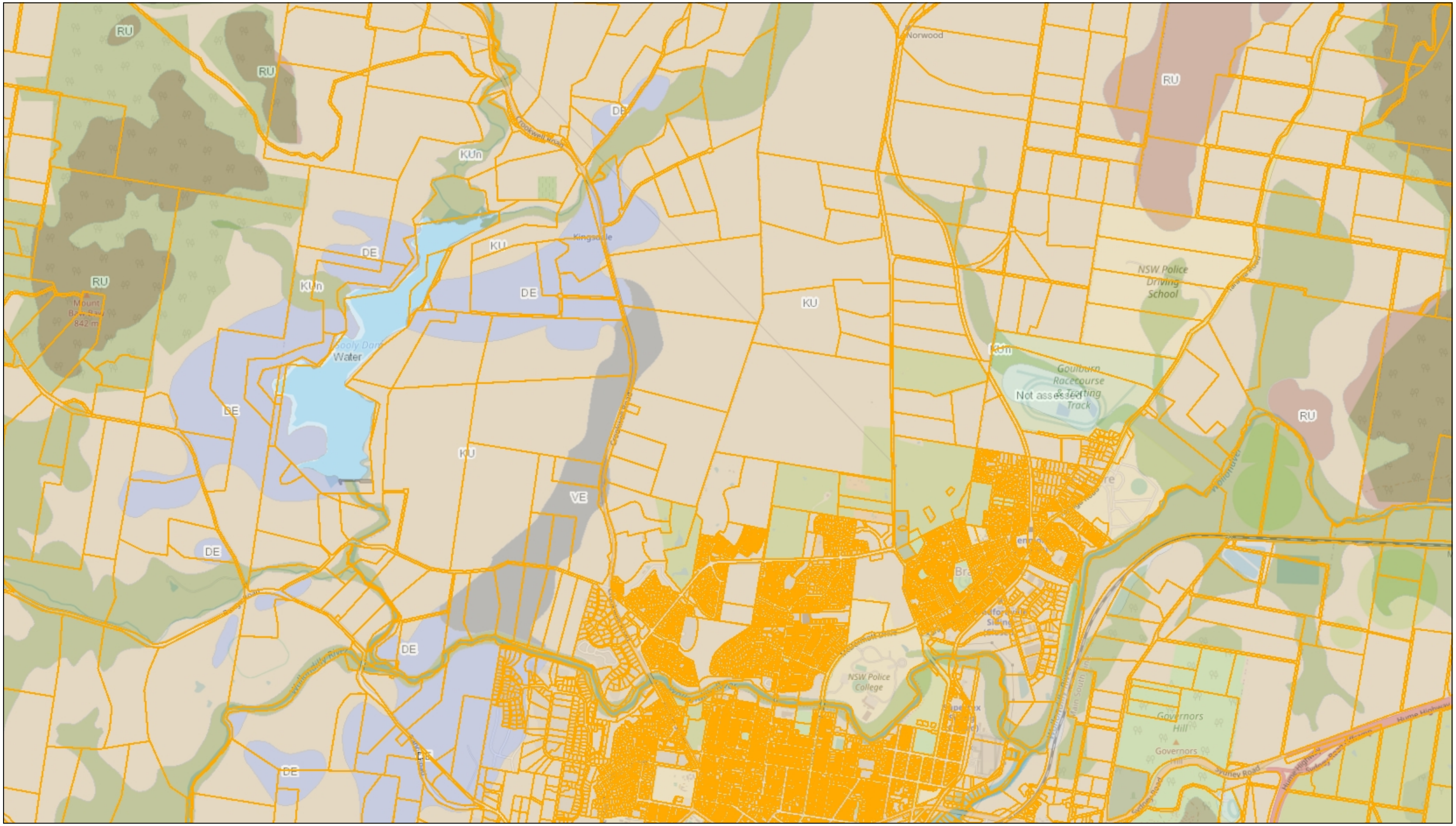
WGS_1984_Web_Mercator_Auxiliary_Sphere

Generated from SEED web map. Created 8:35 AM 23/7/2021


Legend
Labels
Boundaries
Areas
1 - Very slight to negligible limitations
2 - Slight but significant limitations
3 - Moderate limitations
4 - Moderate to severe limitations
5 - Severe limitations
6 - Very severe limitations
7 - Extremely severe limitations
8 - Extreme limitations
Disturbed Terrain
Water
Lot

SEED | Sharing and Enabling Environmental Data

SEED Map - Soil Classification

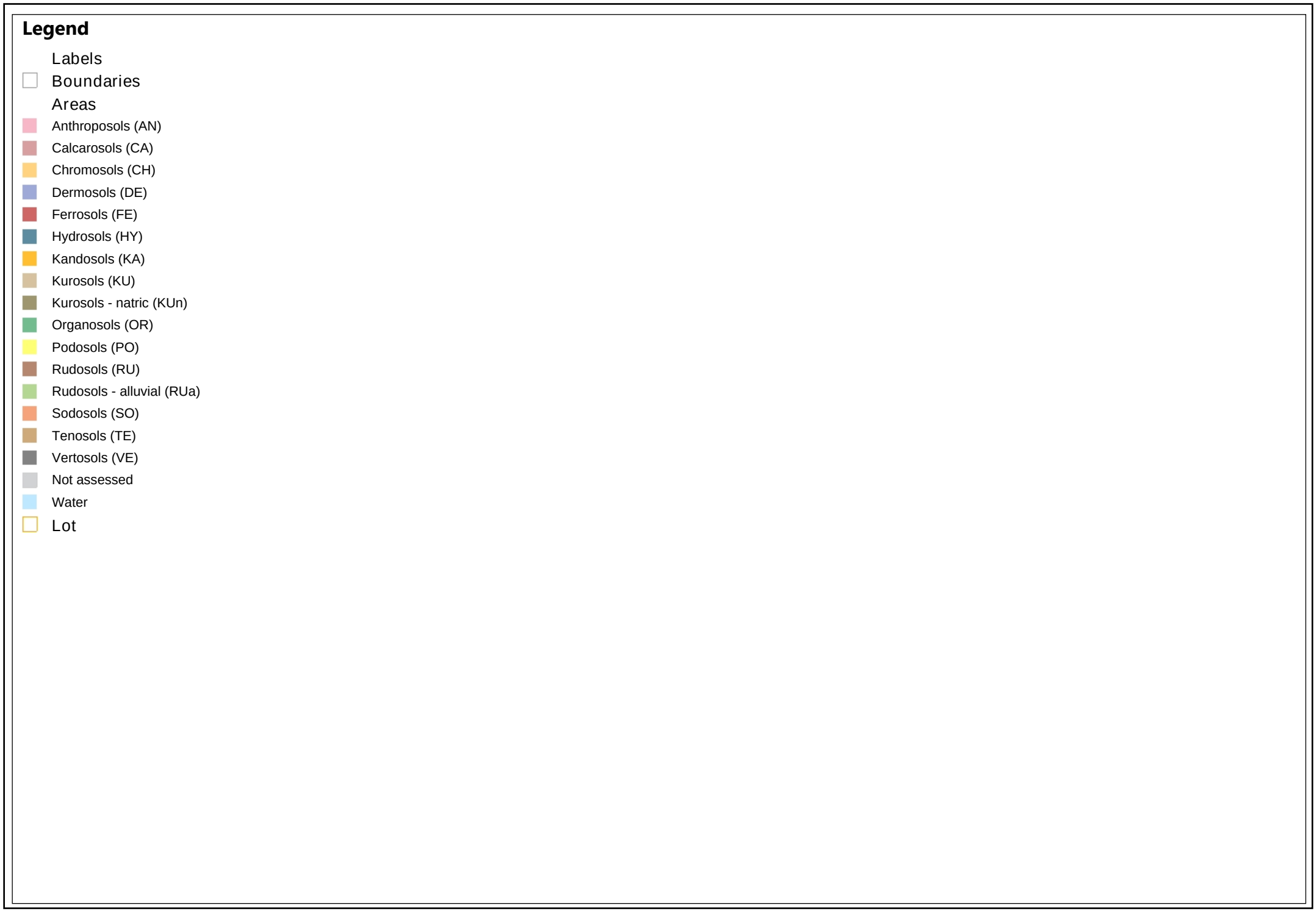


2.9 0 1.45 2.9 Kilometers

Scale 1: 57,821.01

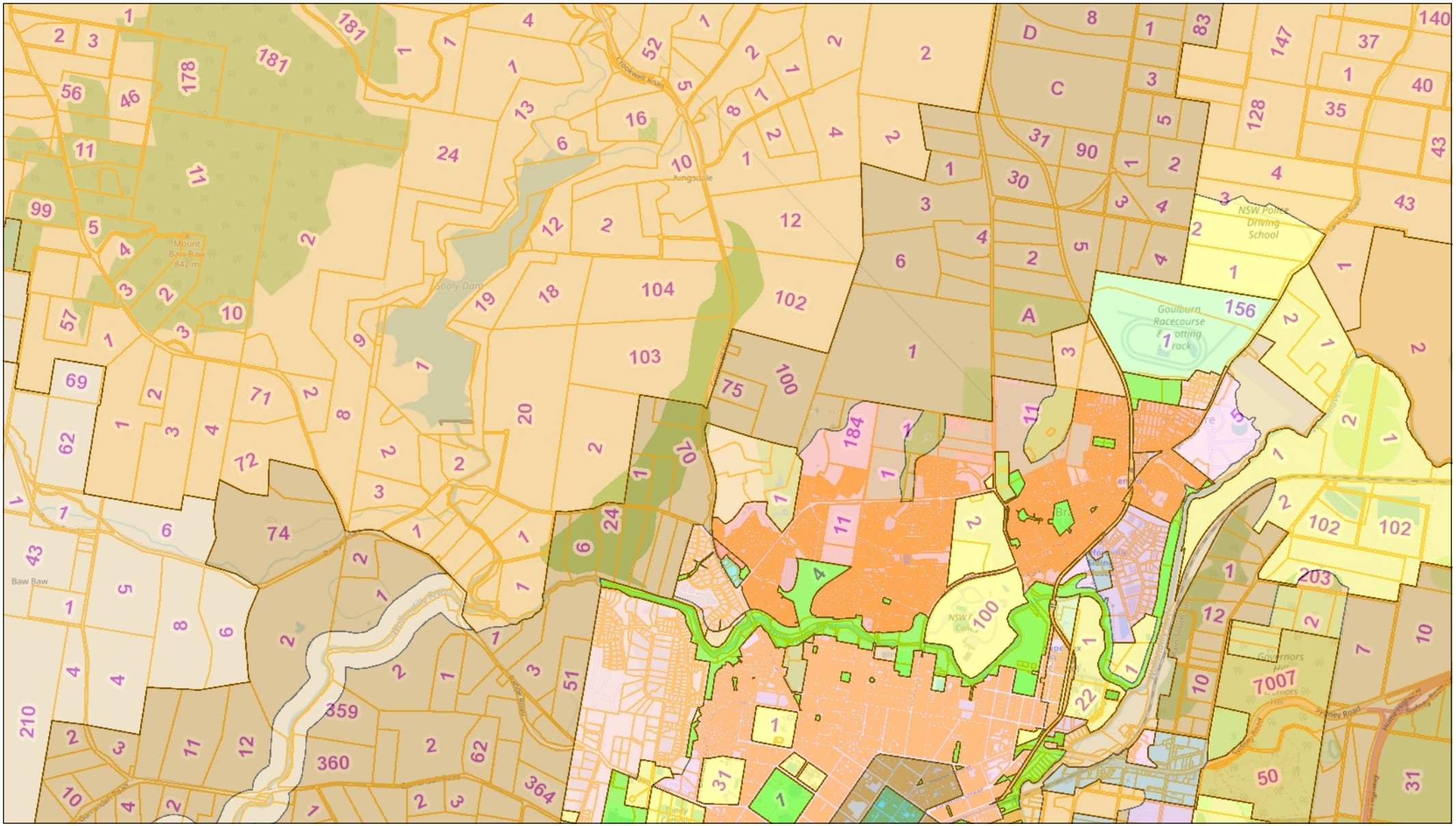
WGS_1984_Web_Mercator_Auxiliary_Sphere

Generated from SEED web map. Created 2:26 PM 1/11/2021


Legend
Labels
Boundaries
Areas
Anthroposols (AN)
Calcarosols (CA)
Chromosols (CH)
Dermosols (DE)
Ferrosols (FE)
Hydrosols (HY)
Kandosols (KA)
Kurosols (KU)
Kurosols - natric (KUn)
Organosols (OR)
Podosols (PO)
Rudosols (RU)
Rudosols - alluvial (RUa)
Sodosols (SO)
Tenosols (TE)
Vertosols (VE)
Not assessed
Water
Lot

SEED | Sharing and Enabling Environmental Data

SEED Map - SRLUP and Land Zones

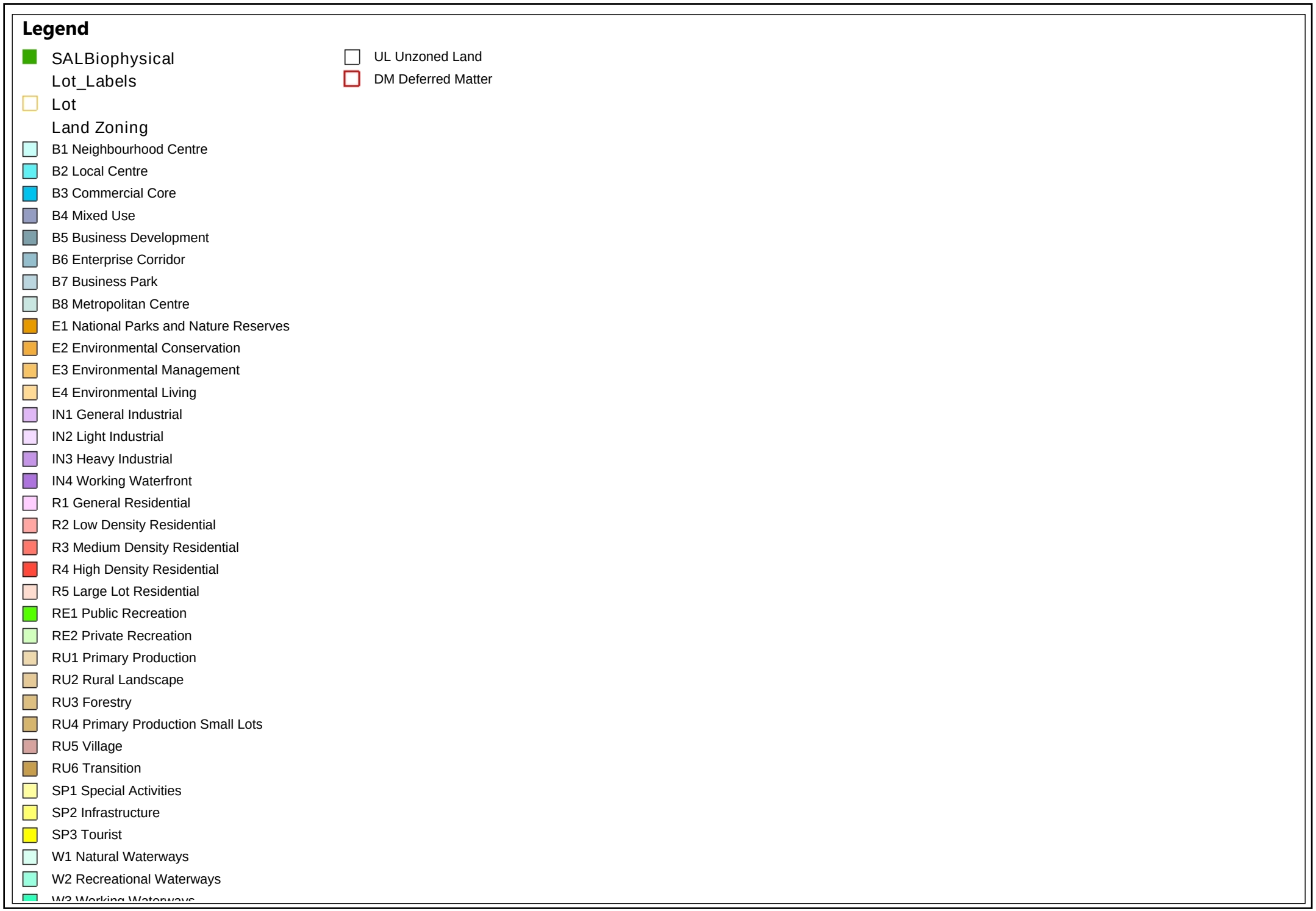


2.9 0 1.45 2.9 Kilometers

Scale 1: 57,821.01

WGS_1984_Web_Mercator_Auxiliary_Sphere

Generated from SEED web map. Created 1:12 PM 1/11/2021


Legend
SALBiophysical
Lot_Labels
Lot
Land Zoning
B1 Neighbourhood Centre
B2 Local Centre
B3 Commercial Core
B4 Mixed Use
B5 Business Development
B6 Enterprise Corridor
B7 Business Park
B8 Metropolitan Centre
E1 National Parks and Nature Reserves
E2 Environmental Conservation
E3 Environmental Management
E4 Environmental Living
IN1 General Industrial
IN2 Light Industrial
IN3 Heavy Industrial
IN4 Working Waterfront
R1 General Residential
R2 Low Density Residential
R3 Medium Density Residential
R4 High Density Residential
R5 Large Lot Residential
RE1 Public Recreation
RE2 Private Recreation
RU1 Primary Production
RU2 Rural Landscape
RU3 Forestry
RU4 Primary Production Small Lots
RU5 Village
RU6 Transition
SP1 Special Activities
SP2 Infrastructure
SP3 Tourist
W1 Natural Waterways
W2 Recreational Waterways
UL Unzoned Land
DM Deferred Matter

Appendix E – Areas of Environmental Concern (AEC) Plan


AEC 1
AEC 3
SEPTIC
AEC 2
AEC 4
DAM
DAM
BORE
INFRASTRUCTURE