Preliminary Site Investigation

Environmental Site History

Lots A DP 150057, B 150057, 1 DP 516621, 33 DP 1138201

148 Rouse Street, Tenterfield, NSW, 2372

Tenterfield Shire Council

20095_COWAN_DSI

Prepared for Jack Thomas, Nutrien Harcourts

August 2021

Document control

Project Title:	**Rouse Street Tenterfield PSI ESH**
Job Number	21299
Document Title	Rouse Street, Tenterfield Site Investigation Report
Document number	21299_ROUSE_STREET_TENTERFIELD_PSI_ESH
Prepared for	Jack Thomas, Nutrien Harcourts
Prepared by	Ecoteam
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Executive Summary

Revision	Date	Description	Report Author/s	Internal Review	Approved for Issue
00	27/08/2021	Issued as Final	Lise Bolton	Nick Crowley	Lise Bolton
Draft	27/08/2021	Issued for Review	Lise Bolton	Keith Bolton	Lise Bolton
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Ecoteam has been engaged by Jack Thomas, Nutrien Harcourts to undertake a Phase 1 Preliminary Site Investigation (PSI) and Environmental Site History (ESH) assessment for 148 Rouse Street, Tenterfield. The site is approximately 5.65 ha and currently comprises of a car dealership, mechanic, and panel beaters. The subject site is proposed to be redeveloped to include a childcare centre, medical centre, and commercial shops.

This investigation has established potential sources of contamination associated with current or past practices at the site which may pose a risk to future receptors during and following the redevelopment of the site. Contamination is possible from leakage of oil and fuel from the mechanic workshop and associated infrastructure. Leakages of fuel and oil from cars housed on the site or chemical from other site uses (panel beating) may also be present. Importation of contaminated fill may also have occurred at the site.

The CSM has identified potential health risks to future visitors and workers at the site (children and adults). Based on the level of soil contact within the site, the child-care centre site requires assessment as land use scenario 'A' low-density residential for contaminant exposure risk assessment. This includes outdoor exposure. The remainder of the site has been assessed as land use scenario 'D', Commercial. This land use provides contaminant levels which assume mostly sealed surfaces. An ecological receptor exists to the west of the site which receives stormwater from the site.

Further investigation is required including soil and surface water sampling to determine if the site presents a potential risk to the future receptors at the site. Further soil sampling shall include surface and under slab/bitumen sampling, depth sampling around underground contamination sources (mechanical pit and wash down collection tank). Surface water sampling at the site of the exposed drain will also provide information on potential water contamination at the site. The further investigation should be carried out in accordance with AS4482.1-2005 and the ASC NEPM.

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1. Introduction

1.1. Project Outline

Ecoteam has been engaged by Jack Thomas, Nutrien Harcourts to undertake a Phase 1 Preliminary Site Investigation (PSI)- Environmental Site History (ESH) assessment for the Sexton and Green car dealership and mechanics and Panel Beaters on Rouse Street, Tenterfield. The site is part of a development application with Tenterfield Shire Council to be redeveloped to include a medical centre, childcare centre and commercial shops. This assessment will identify potential contamination at the site which may affect its future land use. This assessment will use historical and environmental searches and known site conditions to develop a Conceptual Site Model (CSM), identify contaminants of Potential Concern (CoPC) and assess if further information and/ or soil sampling is required.

1.2. Site Identification

Table 1 presents site details. Refer to **Appendix A** for site overview and detailed site plan of the Investigation Area. Site location is marked in **Figure 1**.

Table 1. Site details of Cowan former service station

Feature	Description
Address	148 Rouse Street, Tenterfield, NSW, 2372
Plan Number	Lots A DP 150057, B 150057, 1 DP 516621, 33 DP 1138201.
Local Government Area	Tenterfield Shire Council
Geographic Coordinates	S -29.057071°, E 152.017890°
Investigation Area	Approx. 5.65 ha
Current Zoning	R5 Village
Proposed Development	Day-care centre, medical centre commercial shops (**Appendix B**)

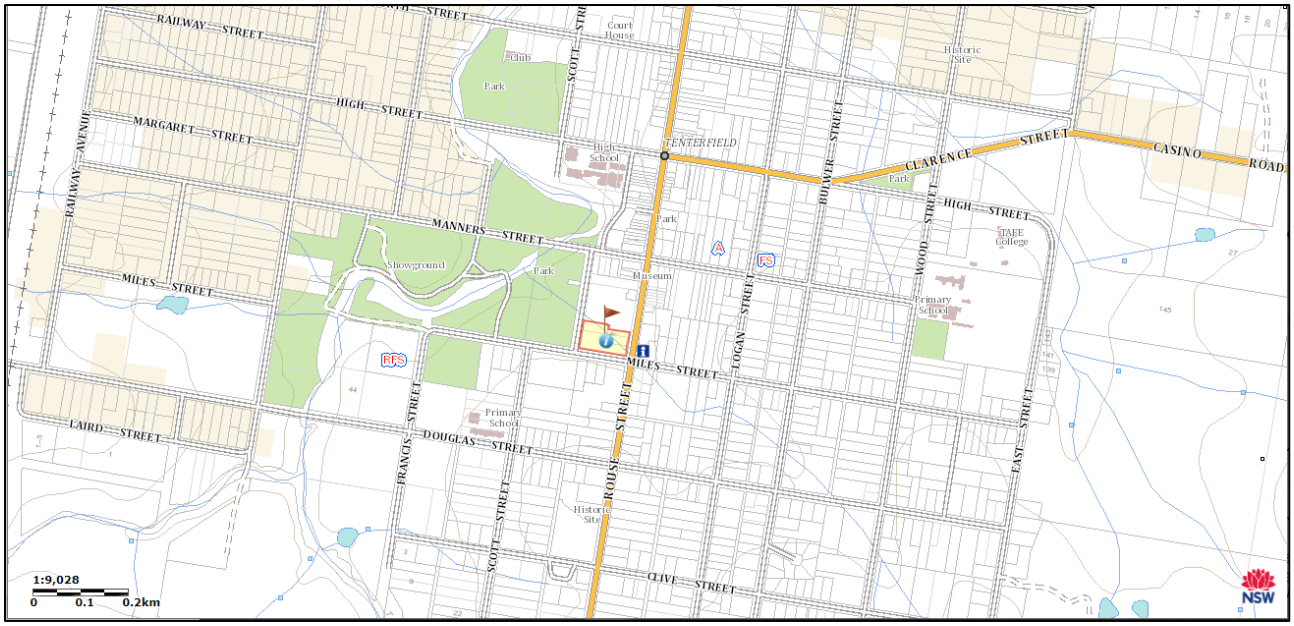

Figure 1. Site location. Site boundaries marked with red flag. Source: Six Maps Online (NSW Spatial Services, NSW Department of finance and Service)

1.3. Scope of Works

The scope of works for this assessment was guided by CLM Act (1997), SEPP 55, OEH (2011), NEPC (2013), AS 4482.1 (2005) and AS 4482.2 (1999). This scope of works included:

1. Assess the regional topography, geology hydrology and hydrogeology. Assess the potential for contamination migration.
2. Review Current and Historical site information including historical and current arial photographs;
3. Review site historical practices including chemical handling and storage and Undertake a desktop study to identify areas of concern from past practices;
4. Prepare a Conceptual Site Model (CSM) and assess Data Quality Objectives (DQO);
5. Prepare recommendation and final conclusions from interpretation of the Preliminary Site Investigation.

1.4. Objectives

The objectives of this assessment are to:

1. Assess established databases including historical information to provide background information for the site;
2. Identify potential contamination from site infrastructure;
3. Investigate all potential contamination sources and Contaminants of Potential Concern (CoPC) based on site information and historical and current land use;
4. Develop a Conceptual Site Model to determine potential risks, receptors, contaminant migration and exposure pathways;
5. Assess the adequacy of information available and determine the need for further investigations.

1.5. Legislative Framework

The following legislative acts and guidelines have been referred to during the investigation and interpretation processes:

- Managing Land Contamination: Planning Guidelines - SEPP55 - Remediation of Land (DPUA & NSW EPA, 1998).
- Section 105 of the *Contaminated Land Management Act 1997* (CLM Act) (NSW Government, 1997a).
- *Protection of the Environment Operations Act 1997* (POEO Act), (NSW Government, 1997b).
- Australian Standard (AS 4482.1- 2005) Guide to the investigation and sampling of sites with potentially contaminated soil (Part 1).
- Australian Standard (AS 4482.2- 1999) Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile substances.
- Contaminated Sites – Sampling Design Guidelines (NSW EPA, 1995).
- Consultants Reporting on Contaminated Land- Contaminated Land Guidelines. (NSW EPA, 2020).
- National Environmental Protection (Assessment of Site Contamination) Measures 1999 - Amended 2013 (NEPC, 2013);
- Regional Policy for the Management of Contaminated Land (NRRC, 2007)
- Waste Classification Guidelines – Part 1: Classifying Waste (EPA, NSW, 2014)
- Contaminated Sites: Guidelines for NSW Site Auditor Scheme (DECC NSW, 2006).
- Guidelines on the Duty to Report Contamination under the *Contaminated Land Management Act 1997* (DECC NSW, 2015).
- Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC/NHMRC, 1992).
- Guidelines for the Assessment of On-site Containment of Contaminated Soil (ANZECC, 1999).

2. Site Conditions

2.1. Topography, Geology and Hydrology

Table 2 contains a description of the regional topography, geology, hydrology and hydrogeology.

Table 2. Topography, geology, soil landscape and hydrology

Feature	Description
Topography (DPIE 2021)	Site elevation: ~851-849 m AHD. Site slope to the south-west. The site contains a flat area within the eastern portion of the site which slope down to the western potion.
Geology (NSW Geo Survey, 1969, DPIE 2021)	Tenterfield mass of Dundee Ademellite Porphyrite (Blue-grey medium to course grained).
Soil Landscape (DPIE 2021)	Lucas Heights-Moderately deep (50–150 cm), hard setting Yellow Podzolic Soils and Yellow Soloths Yellow Earths on outer edges.
Hydrology (NSW LPI, 2001 and commonwealth of Australia, 1987	An open drain is present on the western portion of the site. This drain collets stormwater for the site and surrounding areas. This drains forms as a tributary to Tenterfield Creek and runs through the subject site from the south-eastern corner to the north-western corner. The south-eastern corner runs underground. Tenterfield creek is present approximately 160 m to the north-west. Tenterfield dam is located 1.6 km to the south.
Groundwater (NSW Office of Water 2014, Jacobson & Lau 1987)	Granite fracture rock of low to moderate productivity of the New England Tablelands. Groundwater estimated at approximately 3 m depth.
Acid sulfate soil (DPIE 2021)	Not present

2.2. Register Groundwater Bores and Water Use

Search of the Water NSW register database (**Appendix B**) shows 5 water bores are located within 100 m of the subject site. Two of these bores are registered for stock/domestic use, while three are registered as monitoring wells at the Mobil service station (70 m east of the subject site). A further 7 bores are located within 500 m of the site. **Table 3** presents the detail of bores situated within 100 m of the site. The Tenterfield Village is connected to town water supply, therefore limited domestic groundwater water use is expected in the surrounding area. The site is not close to any local water supply areas.

Table 3. Groundwater wells within 100 m of the subject site

Well ID	Position from Subject Site	Construction date	Use	SWL	Total depth	Estimated ADH
GW900213	70 m SW	1991	Domestic	1 m	21 m	853 m
GW970501	70 m NE	2010	Monitoring Bore	2.1 m	5.0	851 m
GW970502	70 m NE	2010	Monitoring Bore	3.1 m	4.5 m	851 m
GW970500	85 m NE	2010	Monitoring Bore	3.0 m	5.5	854 m
GW308356	170 m NE	2019	Domestic/stock	6 m	27m	856 m

2.3. Environmentally Sensitive Sites

The immediate surrounding area is not consider enviromentally sensitive. The park directly west of the subject site is marked as public open space for planning purposes and is mainly grasses withs some mature trees. A creek is situated 160 m south-west which contins mature trees and riparian vegetation. The creek is situated in a urban environemnt and is not likley to be considered a highly sensitve environment. This area shall be considered a .potential ecological receptor for assessement purposes

3. Site History

3.1. Land Use

The subject site is situated on the corner of Rouse Street and Miles Street. Rouse Street borders the southern side of the site. The Tenterfield Shopping Centre is neighbouring the northern boundary of the site. Rouse Street is a considered a central commercial / shopping area. The surrounding area consists of commercial land use including a shopping centre, service station, information centre and various commercial shops. Residential dwellings and a church are present directly south of the site across from Miles Street. A designated Public Open Space is present along the western boundary which is grassed with some trees The wider area surrounding the property includes residential, commercial, and public recreation land uses. Surrounding land use is presented in **Table 4**.

Table 4. Surrounding land use

Orientation	Land Use
North	Village- Commercial
South	Village- Commercial
East	Village- Residential
West	Village- Public recreational area (Open space)

3.2. Current Site Conditions

The site is currently a car dealership yard and mechanical workshop. The workshop includes a welder, hoists, and drill presses. The Sexton and Green portion of the site contains a large office building. A panel beaters workshop is present to the north-west of the subject site. The site consists of a brick building with cement floor and tin roof. The site has two car parking areas (north-east and south-west).

An open external drain runs underneath the site which is exposed within the south-western corner of the site. The drain is a tributary to Tenterfield Creek to the east. The drain holds water at times.

An internal drain is present within the workshop area which collected wash down water. This water is then collected in a wastewater pit which is treated though an oil water separator prior to being discharged into the council wastewater system. A mechanical pit is also present at the site. There is potential for leakage of oil and fuel from these sites (**Appendix A**). No asbestos was visually identified to be present on-site. The property contains concrete, bitumen, grassed and exposed soil surfaces. The south-western car park area is

the only fenced potion of the site. The site contains a flat surface within the eastern potion which drops down to the west. The site has some cars remaining in parking areas.

Contaminating Infrastructure has been identified on the site map in **Appendix A**.

Infrastructure identified (past and present) within the site:

- Mechanic Pit (4.3m x 1.2 m x 1.8 m deep)
- Wash down treatment pit (location unknown)
- Internal wash down drains
- Car parking area

3.3. Services and Underground Utilities

Main sewage in present running from the north to south though the northern carpark to the Sexton and Green workshop area (**Appendix C**). A Dial Before You Dig (DBYD) assessment of the site (**Appendix C**) has identified Telstra cables (including NBN infrastructure) are present along the eastern and south boundary of the site within the footpath area. Power poles are also located along the eastern, southern, and western boundaries of the site. Further intrusive investigation at the site will require a competent underground service locator to clear the underground infrastructure before undertaking soil sampling and assessment.

3.4. Site Walkover

An Ecoteam representative was unable to attend the site at the time of this report due to a Covid lockdown. A site assessment was undertaken by Jack Thomas of Nutrien Harcourts. The site was investigated on the 24th August 2021 (**Appendix D**).

According to the site photographs (**Appendix D**) and discussions the sites external concrete sand bitumen surfaces were in very good condition. Both buildings are also in good condition. The Sexton and Green workshop area is currently in good condition and has been kept tidy and clean with very limited oil stains present on the concrete surface. The wash down drain is of new condition and has been replaced recently.

An external open drain is present running under the site from the south-eastern corner to the north-western corner. A drain runs underground under the Sexton and Green building site. The open portion of the drain had some vegetation and contained standing water. There is grass present surrounding the drain. A bitumen driveway leads into the panel beaters site.

3.5. Site History

The Rouse Street area in Tenterfield was expanded from 1900-1950. The subject site was established as the Sexton and Green garage and car showroom in 1919. The Sexton and Green dealership is one of oldest car dealership in Tenterfield.

The current Sexton and Green building was built in the early 1960s and was constructed of brick, with a cement floor and tin roof. This building was then upgraded in the 1990s. The front veneer was upgraded and repainted at this time.

The western workshop/shed was built in the late 1970s to early 1980s. This building was also renovated in the 1990s. The site has historically been used as a car storge parking and as a mechanics. Recently, the western workshop has been used as a panel beaters. Aerial photographs reviewed from 1967 to present (**Appendix F**) have shown the main Sexton and Green Building is present prior to 1967. The site and its surroundings are designated as a heritage conservation area.

3.6. Review of Aerial Photographs

Aerial photographs from 1967 to 2021 were reviewed and summarised to investigate previous land use within the subject site and the surrounding vicinity. **Table 5** contains a summary review of historic aerial photographs for the subject property and surrounding land. (See **Appendix F** for historical images).

Table 5. Summary of historic aerial photographs.

Date Source	Site
28/05/1967 NSW Historical Imagery	The photograph is black and white and of good quality **The site** The Sexton and Green building is present along the corner of Rouse Street and Miles Street. Some car parking is visible to the west. The area directly to the west of the Sexton and Green building is undeveloped. The north-western portion of the site is partially vegetated. The drain is present flowing to the north-west. **Surrounding Land** The site directly to the west is cleared and grassed. Some trees are present. Residential premises are present directly north, east and south of the site. Industrial/commercial premises are present further to the north.
3/04/1975 NSW Historical Imagery	The photograph is black and white and of poor quality **The site** The Sexton and Green building is present along the corner of Rouse Street and Miles Street. Some car parking is visible to the west. The area directly to the west of the Sexton and Green building is undeveloped. The north-western portion of the site is partially vegetated. The drain is present flowing to the north-west. **Surrounding Land** The site directly to the west is cleared and grassed. Some trees are present. Residential premises are present directly north, east and south of the site. Industrial/commercial premises are present further to the north. The site is largely unchanged from the previous Historical Image

1/08/1985 NSW Historical Imagery	The photograph is black and white and of poor quality **The site** The Sexton and Green Building is present along the corner of Rouse Street and Miles Street. Directly north of the building is clear and contains a concrete surface. Car parking is still visible to the west. A shed/building has been erected within the western portion of the site. The north-western portion of the still contains some vegetation. **Surrounding Land** The site directly to the west is cleared and grassed. Some trees are present. Residential premises are present directly north, east and south of the site. Industrial/commercial premises are present further to the north.
1993 Google Earth Image	The photograph is colour and of good quality **The site** The Sexton and Green building is present along the corner of Rouse Street and Miles Street. Directly north of the building is clear and contains a concrete surface. Cars are visible parked in this area. Car parking is visible to the west, taking up a small portion of this area. The western carpark is fenced. A shed/building is present within the western portion of the site The north-western portion of the site contains some vegetation and grass surfaces. **Surrounding Land** The site directly to the west is cleared and grassed. Some trees are present. Residential premises are present directly to the north, east and south of the site. Industrial/commercial premises are present further to the north. Some commercial land uses are visible across Rouse Street to the south.
2010 Google Earth Image	The photograph is colour and of good quality **The site** The Sexton and Green building is present along the corner of Rouse Street and Miles Street. Directly north of the building is clear and contains a concrete surface. Many cars are visible parked in this area. Car parking is visible to the west, this carpark has expanded further west. The western carpark is fenced. A shed/building is present within the western portion of the site. The north-western portion of the site has been cleared. **Surrounding Land** The site directly to the west is cleared and grassed. Some vegetation has been removed. A shopping centre is present directly north of the site. Residential premises are present directly to the south. Industrial/commercial premises are present further to the north and north-east. The areas north and northeast have expanded to include more commercial land uses. More commercial land use is viable further south.
2013 Google Earth	The photograph is colour and of good quality **The site** The Sexton and Green building is present along the corner of Rouse Street and Miles Street. Directly north of the building is clear and contains a concrete surface. Many cars are visible parked in this area. Car parking is visible to the west. The western carpark is fenced. A shed/building is present within the western portion of the site. The north-western portion of the site is cleared. **Surrounding Land** The site directly to the west is cleared and grassed. Some vegetation has been removed. A shopping centre is present directly north of the site. Residential premises are present directly to the south. Industrial/commercial premises are present further to the north and north-east and further south.
2021 Google Earth	The photograph is colour and of good quality **The site** The Sexton and Green building is present along the corner of Rouse Street and Miles Street. Directly north of the building is clear and contains a concrete surface. Some cars are visible parked in this area. Car parking is visible to the west. The western carpark is fenced. A shed/building is present within the western portion of the site. The north-western portion of the site is cleared. **Surrounding Land** The site directly to the west is cleared and grassed. A shopping centre is present directly north of the site. Residential premises are present directly to the south. Industrial/commercial premises are present further to the north and north-east and further south. The site is largely unchanged from the previous Historical Image

3.7. Contamination History

No known previous continuation assessments have been conducted at the site. A Search of NSW Contaminated Lands Records show only one site is present within the Tenterfield Shire (Former Arsenic Factory Duke and Manor Street, Tenterfield). The site is no listed on the NSW EPA List of notified Sites. The United Tenterfield Service Station (94 Rouse Street) is a listed site which is currently under investigation.

3.8. Previous Titles

A prior Title search was conducted via the NSW Land & Property information website for the subject property (**Table 6**). The Subdivision Certificate which was issued in 2008 is presented in **Appendix F**. Historical land parish maps are located in **Appendix G** which shows the site as 1 lot in the early 1900s owned by J Witten. The subject property was shown to be subdivided within the 1958 historical maps.

Table 6. Title search details.

	Current title (2021)	Previous titles
Date	1/516621	12915-227
Lot and DP	1/1113227	1/350046, 4/22/758959
	32/1138201	2/851417, 3/587603
	A/150057	12350-237
	B/150057	4599-26

4. Assessment Criteria

The key assessment criteria adopted in the assessment of contamination is the National Environmental Protection (Assessment of Site Contamination) Measure 2013 (NEPC, 2013). Schedule B1 provides contaminant exposure levels which can be used to assess risk of contamination to human and ecological receptors. Health Investigation Levels (HILs), Health Screening levels (HSLs), Ecological Screening Levels (ESLs) and Ecological Investigation Levels (EILs) may be adopted from the measure to determine the likely human and ecological health impacts of soil contamination and any further investigation required. Management limits are also adopted for petroleum hydrocarbons. Water quality within groundwater is compared with Groundwater Investigation Level (GIL) threshold contamination limits.

HILs provide assessment criteria for indicators of risk for direct contact and therefore are important for determining immediate risk. HSLs are applicable to assessing human health risk through inhalation, ingestion or direct contact pathways and are site dependent. EILs and ESLs assess the direct risk to terrestrial ecosystems and are only applicable to the top 2 m of soil. This assessment criteria will be used as a reference to indicate the potential for soil contamination. Management limits identify the need for further investigation but do not imply contamination risk.

GILs are based on marine and freshwater groundwater quality assessment criteria which are adapted from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality ANZECC/ARMCANZ 2000 (ANZECC 2000). This guideline outlines water quality objectives for the protection of aquatic ecosystems. These values do not imply an environmental problem but are intended as trigger values in which further assessment may be required. GILs for drinking water assessment criteria are adapted from the Australian Drinking Water Guidelines (ADWG, NHMRC 2011). Drinking water criteria are provided as a reference only.

4.1. Contaminants of Potential Concern (CoPC)

Current land-use indicates there may be potential for land contamination within the subject site. Contamination is possible from leakage of oil and fuel from the mechanic workshop associated infrastructure. Leakages of fuel and oil from cars housed on the site or chemical from other site uses (panel beating) may also be present. Importation of contaminated fill may also have occurred at the site. Soil will be tested for contaminants of potential concern (CoPC) from car storage and mechanics which include:

- Total recoverable hydrocarbons (TRH) (C6 to C40)
- Benzene, toluene, ethylbenzene and xylenes (BTEX)
- Naphthalene
- Metals
- VOCs
- PAH

Secondary contaminants that may be associated with other activities carried out on workshop areas sites include:

- Polycyclic aromatic hydrocarbons (PAH) from oil and fuel and workshop activities.
- Heavy metals (As, Cd, Cr, Cu, Ni, Pb, Zn), phenols from workshop activities.
- BTEX compound from paints and workshop chemicals.
- VOCs from oil and fuels.
- PFAS within drainage lines.
- Organochlorine pesticides (OCP) and heavy metals used under slabs.
- Heavy metals and TRH associated with imported fill material.

The service station across the road may also be an off-site source of contamination.

5. Preliminary Conceptual Site Model

A preliminary Conceptual Site Model (CSM) identified pathways and receptors of CoPC within the Areas of Environmental Concern (AEC). AEC are defined as any area in which past potentially contaminating activities may have been conducted.

Table 7 shows information on AEC and CoPCs which were tested at the site. **Table 8** presents contamination sources, AEC, activity of concern and CoPC characterisation.

Table 7. AEC, activities of concern and CoPC

I.D	AEC	Activity of concern	CoPC	Comments
Mechanic Workshop	Oil and fuel collection and disposal	Oil, diesel and leaded fuel storage and dispensing	TRH, BTEXN, metals, PAH, VOCs phenols	Contaminant of oil, diesel and leaded fuel and oils. Volatile substances may also be present.
Workshops/ panel beaters	Workshop (past and present) and area of washdown	Wash down of fuel oil and chemicals in workshop, oil collection and treatment	TRH, BTEXN, metals, PAH, phenols	Contaminant of diesel leaded and unleaded fuel and oils, metals form chemical use and phenolic compounds may be present within the soil.
Concrete areas	All concreted or bitumen surfaces	Chemical treatment and metals for pesticide treatment	TRH, BTEXN, metals,	Contaminant of metals and pesticides may be present in the top surface of the soil directly under the slab.
Drain	Drainage from commercial areas	Stormwater and shallow groundwater runoff from the site and surrounding commercial areas	TRH, BTEXN, metals, PFAS	PFAS may be present within drainage lines. Stormwater and shallow groundwater may have commination from leaking pits or site activities.

Table 8. Potential contamination sources and transport mechanisms

AEC	Primary Sources	Secondary Sources	Transport mechanisms
Mechanic Workshop	-Leaking pits and oil collection tank (>2m) -Leaking drain (0-0.3m) -Fill material -Surface spills	Impacted surface soil (0-0.3m) Impacted sub-surface soil (0.3m+) NAPL plume migration in groundwater Impacted stormwater	Volatilisation and atmospheric dispersion of dusts and vapours Soil and contaminant particle movement Mobile free phase hydrocarbon or chemical migration Flood/storm migration Groundwater migration
Workshop/ panel beaters	-Wash down water (0-0.15m) --Fill material -Surface spills	Impacted surface soil (0-0.3m) Impacted sub-surface soil (0.1m+) Chemical migration in groundwater	Volatilisation and atmospheric dispersion of dusts and vapours Soil and contaminant particle movement Mobile free phase hydrocarbon or chemical migration Groundwater migration
Car parking Area	-Chemical application during laying of the concrete. Oil, fuel, and chemical spills. (0-0.3m)	Impacted surface soil (0-0.3m)	Soil dispersion during removal of the slab.
Drain	-Contaminants from stormwater (0-0.3m), Water contamination	Impacted surface soil (0-0.3m). Impacted surface water	Flood/storm migration Groundwater migration

5.1. Receptors and Pathways

The area of investigation is a car dealership, mechanic and panel beaters which will be demolished and developed into a day-care centre, medical centre and commercial shops. Based on the level of soil contact within the AEC, the childcare centre site will be assessed as land use scenario 'A' low-density residential' for contaminant exposure risk assessment. This includes outdoor exposure. The remainder of the site will be assessed as land use scenario D "Commercial". This land use provides contaminant levels which assume mostly sealed surfaces.

5.1.1. Sensitive Receptors

Sensitive receptors have been identified within the vicinity of the site.

- Future construction personnel during excavation work.
- Children within the day-care centre.
- Visitors to the medical centre and shopping area.
- Future workers at the site.
- Residential dwellings surrounding the site.
- Ecological receptors towards the west of the site.
- Visitors to the recreational area west of the site.

5.1.2. Potential Exposure Pathways

Contamination has been identified as being potentially present in soil within the AEC due to past activities. The main CoPC have been identified as TRH, BTEXN, PAH, PCB and metals. Exposure pathways of these contaminants in soil include direct contact, inhalation of vapours and ingestion of soil particles through dust or eating of soil. **Table 9** provides a risk assessment of potential exposure pathways for receptors at the site.

Table 9. Receptor and pathway risk assessment

Source	Pathway		Risk
Contamination from mechanics and workshop	**Human health**	Ingestion of soil and inhalation of dust particles.	**High risk**. Soil particles may be ingested as dust particles. Soil particles may be directly ingested, particularly by young children. Risk is high for the childcare centre with direct access to soil. Inhalation exposure associated with particulates are considered of less significance than direct ingestion of soil.
		Ingestion of contaminated water	**Minor risk.** Tenterfield has a reticulated water mains supply. Based on this it is considered unlikely that a groundwater will present a risk.
		Inhalation/Vapour intrusion	**Minor risk**. Naphthalene and volatile hydrocarbons (C6-C16) may be present. Groundwater may be contaminated if mechanical washdown collection tanks have leaked. Vapour intrusion presents a risk for future staff and visitors. Minor risk due to limited storage of volatile chemicals stored onsite.
		Dermal absorption	**Minor risk**. At most risk to future construction personnel during excavation work. Dermal adsorption of most chemicals potentially present are low.
	Ecological	Surface runoff to waterways. Infiltration to groundwater.	**Moderate risk**. A drainage area and creek exist towards the west of the site. A groundwater plume or migration though the drain on-site may be possible due to the water table and close proximity to drainage lines.
		Direct uptake from ecological receptors	**Minor risk.** An open ecological area exists towards the west of the site. The is limited ecological receptors to the west of the site. Contamination is unlikely to spread to this site.

6. Interpretation and Data Gaps

The results of the desktop ESH has been evaluated for data gaps as per Schedule B2 of the NEPM guidelines.

The following data gaps have been identified during the assessment.

- A site assessment conducted by a specialist is required to ensure that all potential contaminant sources are identified.
- The exact construction date of the building and the prior conditions of the site in the past has not been fully established.
- Exact concentrations of contaminants within the soil at the site are unknown and therefore soil sampling is a data gap which needs to be addressed.
- All past land uses for the for the workshop structure (current panel beaters) is unknown.
- Contamination status within water (surface or groundwater) at the site is unknown.

Based on these data gaps it is considered that uncertainty as to the contamination status of the site. Therefore, further site assessment and soil sampling is required to further assess the risk posed to the future receptors at the site.

7. Conclusion & Recommendations

A Preliminary Site Investigation which includes an Environmental Site History has been conducted for 148 Rouse Street, Tenterfield. The site is approximately 5.65 ha and currently comprises of a car dealership, mechanic, and panel beaters. The subject site is proposed to be redeveloped to include a childcare centre, medical centre, and commercial shops.

This investigation has established potential sources of contamination associated with current or past practices at the site which may pose a risk to future receptors during and following the redevelopment of the site. Contamination is possible from leakage of oil and fuel from the mechanic workshop and associated infrastructure. Leakages of fuel and oil from cars housed on the site or chemical from other site uses (panel beating) may also be present. Importation of contaminated fill may also have occurred at the site.

The CSM has identified potential health risks to future visitors and workers at the site (children and adults). Based on the level of soil contact within the site, the child-care centre site requires assessment as land use scenario 'A' low-density residential for contaminant exposure risk assessment. This includes outdoor exposure. The remainder of the site requires assessed as land use scenario 'D', Commercial. This land use allows for contaminant levels assuming mostly sealed soil surfaces. An ecological receptor exists to the west of the site which receives stormwater from the site.

Further investigation is required including soil and surface water sampling to determine if the site presents a potential risk to the future receptors at the site. Further soil sampling shall include surface and under slab/bitumen sampling, depth sampling around underground contamination sources (mechanical pit and wash down collection tank). Surface water sampling at the site of the exposed drain will also provide information on potential water contamination at the site. The further investigation should be carried out in accordance with AS4482.1-2005 and the ASC NEPM.

8. References & Guidelines

Australian Standard AS4482.1, (2005). Guide to the investigation and sampling of sites with potentially contaminated soil (Part 1: Non-volatile and semi-volatile compounds).

Australian Standard AS4482.2, (1999). Guide to the investigation and sampling of sites with potentially contaminated soil (Part 2: Volatile substances).

Australian Standard AS5667.11, (1998). Water quality—sampling. Part 11: Guidance on sampling of groundwater's.

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CRC Care (2017). Risk-based management and remediation guidance for benzo(a)pyrene. Technical report no. 39.

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Friebel, E. and Nadebaum, P. (2011a). Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 1: Technical development document. CRC CARE Technical report no. 10.

Friebel, E. and Nadebaum, P. (2011b) Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 2: Application document. CRC CARE Technical report no. 10.

Friebel, E. and Nadebaum, P. (2011c). Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 3: Sensitivity assessment. CRC CARE Technical report no. 10.

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National Environmental Protection Council (NPEC) Measure, (2013a). Schedule B (1) – Guidelines on the Investigation Levels for Soil and Groundwater

National Environmental Protection Council (NPEC) Measure, (2013b). Schedule B (2) – Guidelines on Data Collection, Sample Design and Reporting.

National Environmental Protection Council (NPEC) Measure, (2013a). Schedule B (7a) – Guidelines on Health-Based Investigation Levels.

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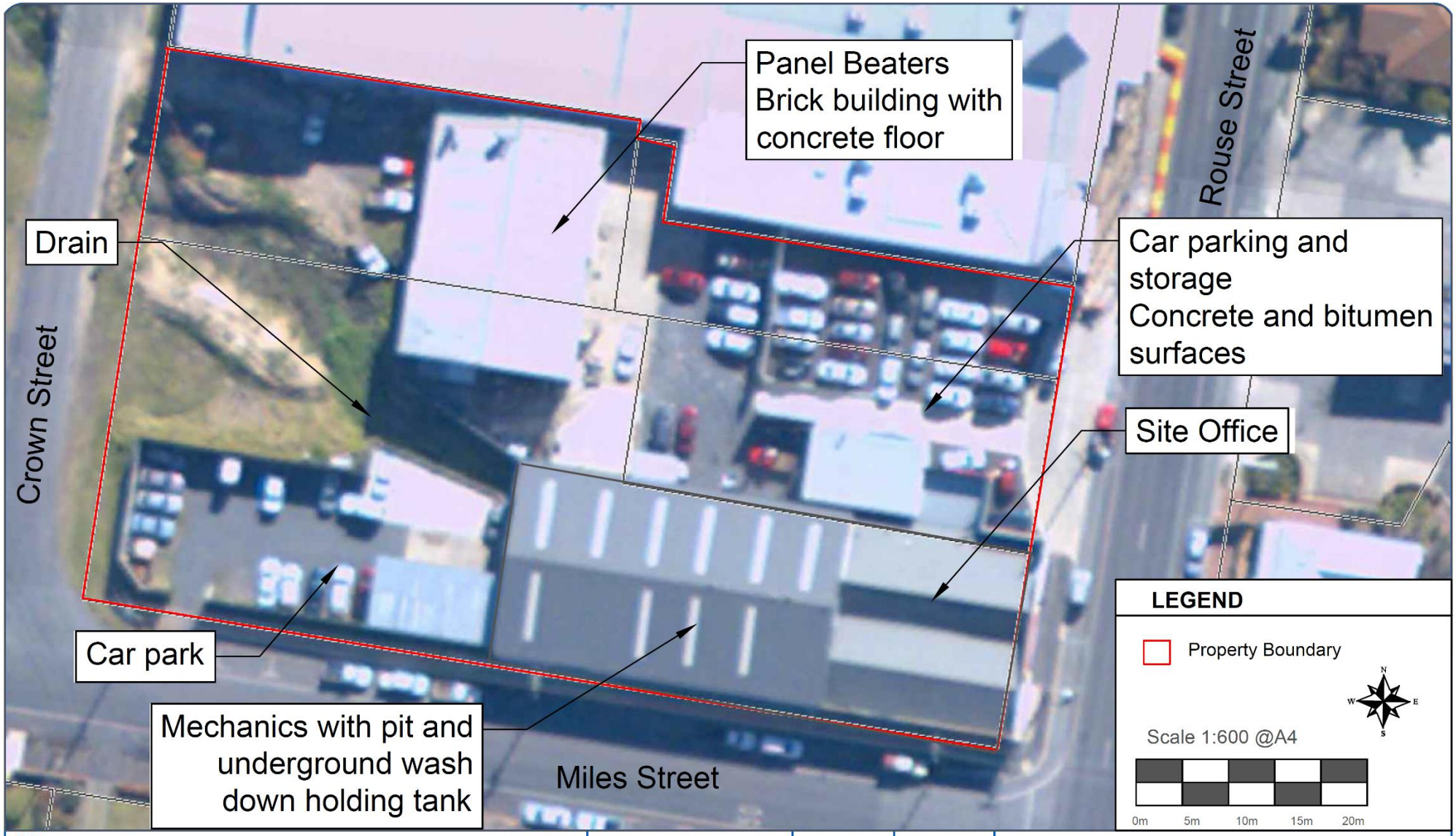
Tenterfield Shire Local Heritage Register 1 of 2. Final assessment list, November 17, 2004

Appendix A

Site map

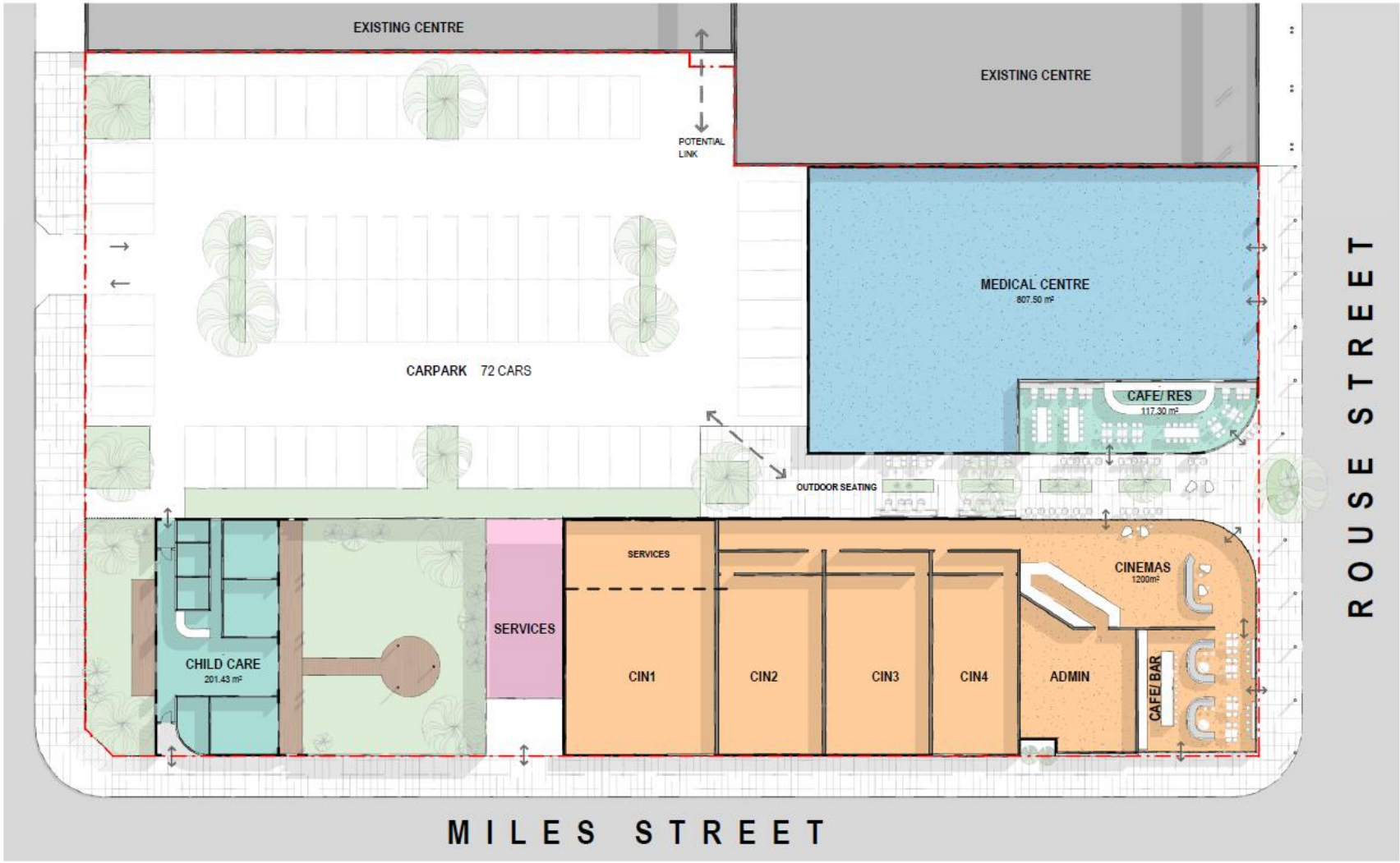


SITE: 148 Rouse Street Tenterfield NSW 2372	Jack Thomas (Client)		21299 (PROJECT NO.)	26/08/21 (DATE.)
TITLE: Site Map- Current Land Use	1:600 (SCALE AT A4.)	LB (DRAWN.)	KB (CHECKED.)	A (REVISION.)

ecoteam natural solutions for environmental challenges
13 Ewing Street, Lismore, NSW
(02) 66215 123
www.ecoteam.com.au

Appendix B

Development Plans



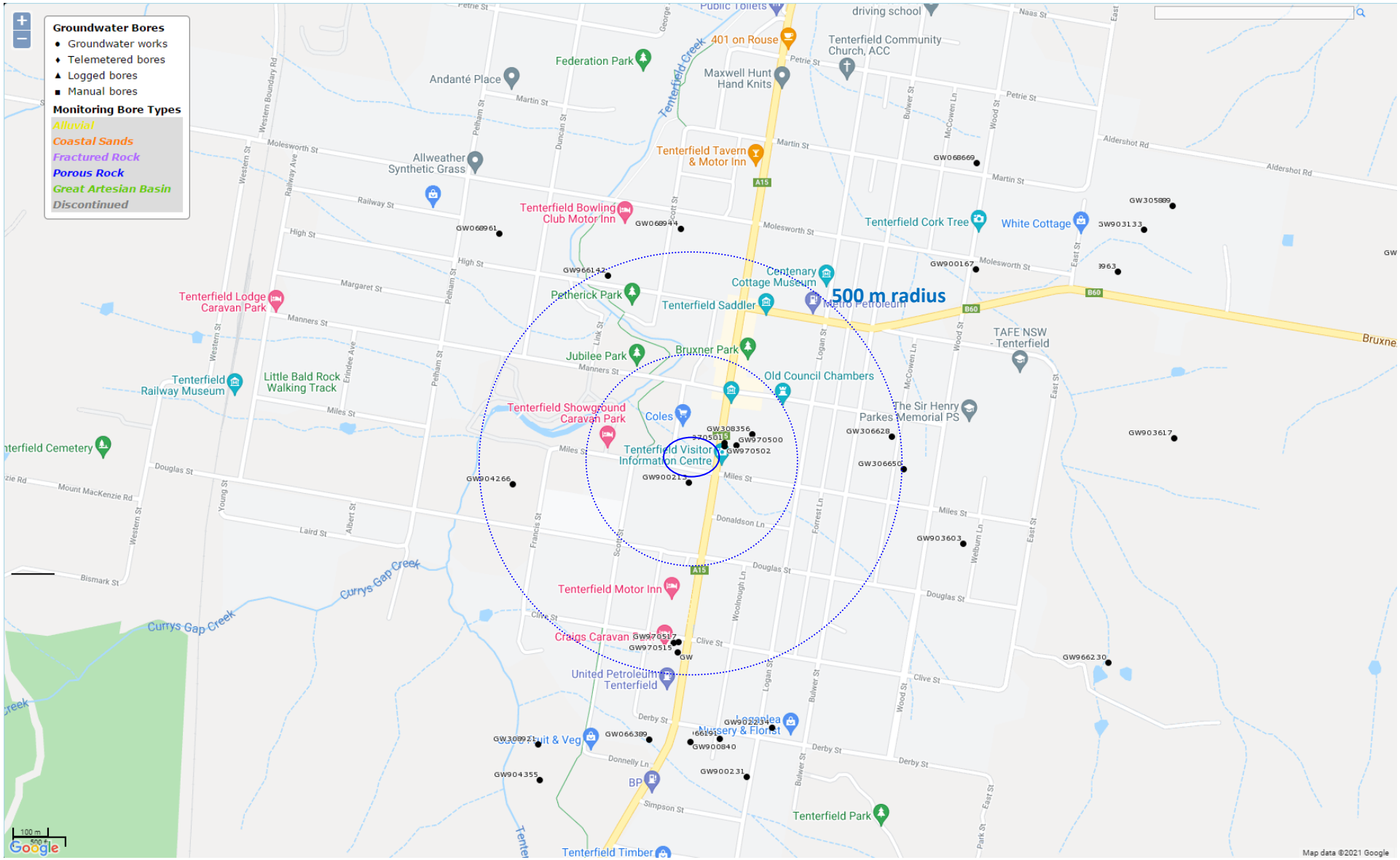
FLOOR PLAN
SCALE 1 : 300

PROJECT	PROJECT ADDRESS	CLIENT	TITLE	SCALE	DRAWN	DATE	DRAWING No.	REV.
CINEMAS/ CHILDCARE/ MEDICAL CENTRE CONCEPT	148 ROUSE ST, TENTERFIELD	CHRIS HSU	FLOOR PLAN	1 : 300 @A3	TP	21/05/21	SK 01	

MGA
Mills Gorman Architects
Level 1 95 Johnston Street
Fitzroy Victoria 3065
61 3 9650 1607
millsgorman.com.au

Appendix C

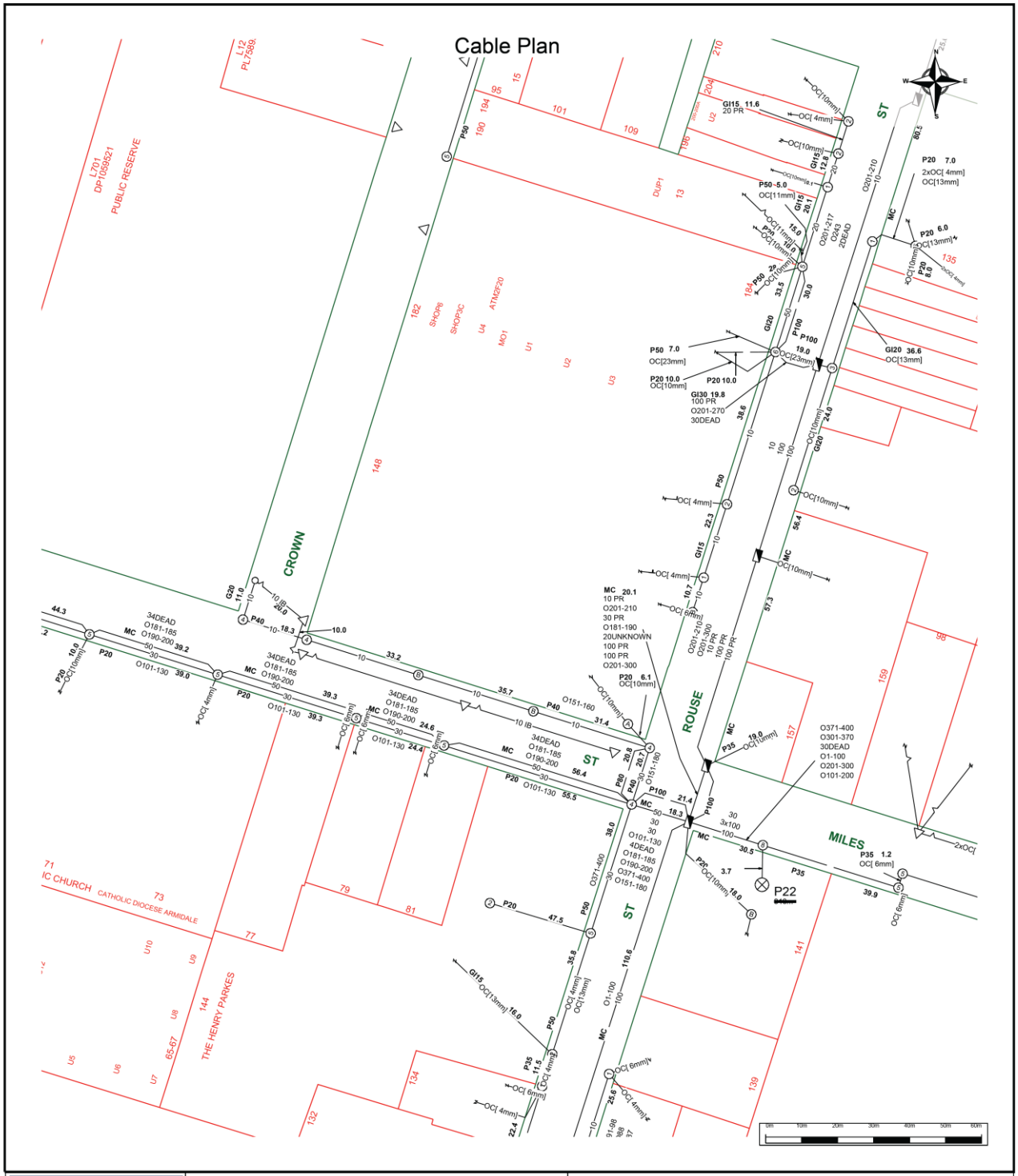
Groundwater Wells


Groundwater Bores
Groundwater works
Telemetered bores
Logged bores
Manual bores
Monitoring Bore Types
Alluvial
Coastal Sands
Fractured Rock
Porous Rock
Great Artesian Basin
Discontinued
500 m radius
Tenterfield Visitor Information Centre
Tenterfield Showground Caravan Park
Tenterfield Motor Inn
Craigs Caravan
Tenterfield Saddler
Tenterfield Tavern & Motor Inn
Tenterfield Bowling Club Motor Inn
Tenterfield Lodge Caravan Park
Tenterfield Railway Museum
Little Bald Rock Walking Track
Federation Park
Andanté Place
Allweather Synthetic Grass
Petherick Park
Jubilee Park
Bruxner Park
Old Council Chambers
Centenary Cottage Museum
Tenterfield Community Church, ACC
401 on Rouse
Maxwell Hunt Hand Knits
Tenterfield Cork Tree
White Cottage
TAFE NSW - Tenterfield
The Sir Henry Parkes Memorial PS
Coles
BP
United Petroleum Tenterfield
Tenterfield Park
Tenterfield Timber
Tenterfield Cemetery
Tenterfield Creek
Currys Gap Creek
Map data ©2021 Google

Appendix D

Sewage and DBYD


32
1138201
1
516621
33
1138201
A
150057
B
150057
CROWN STREET
ROUSE STREET
MILES STREET



Telstra

For all Telstra DBYD plan enquiries -
email - Telstra.Plans@team.telstra.com
For urgent onsite contact only - ph 1800 653 935 (bus hrs)

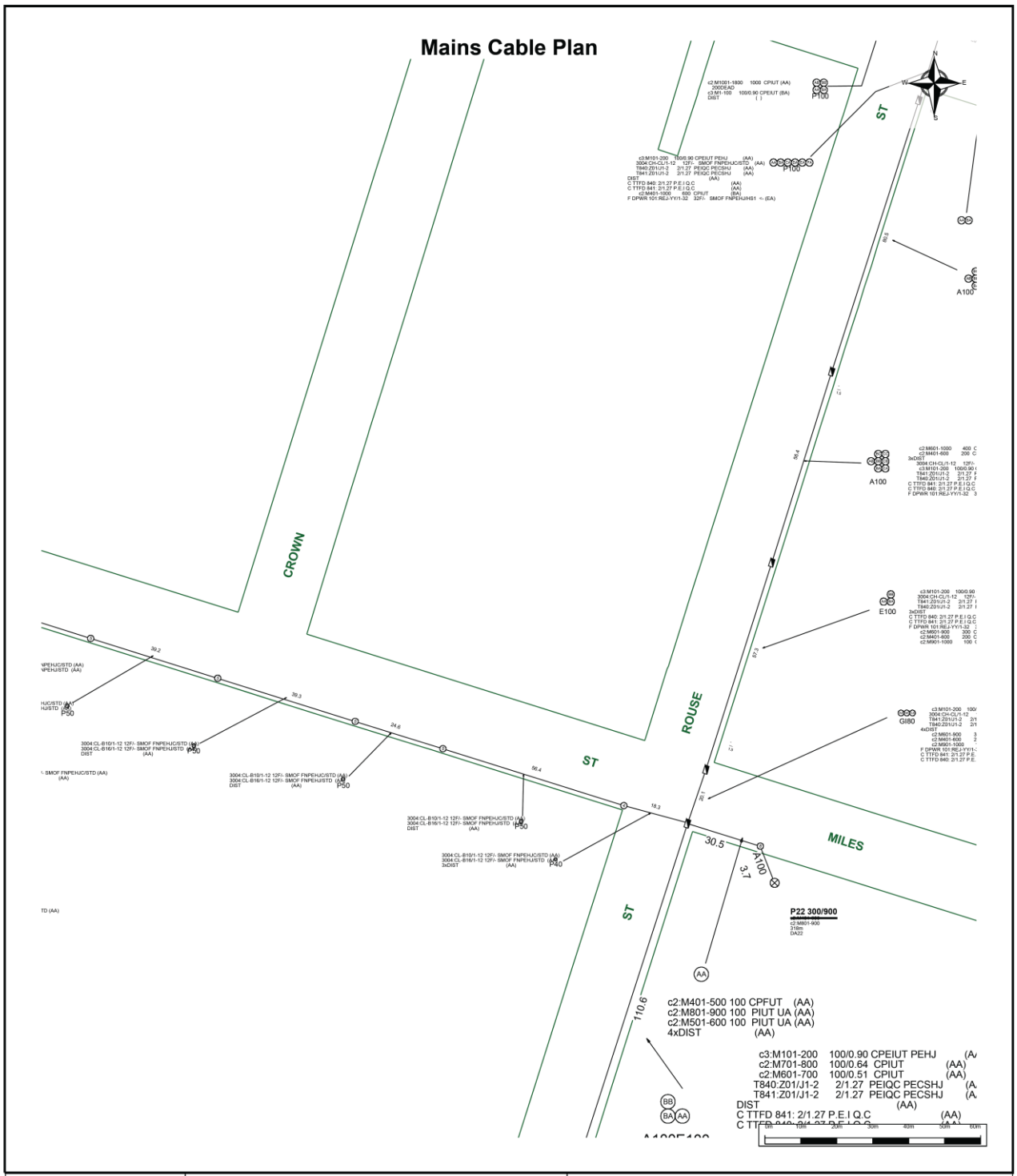
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 18/08/2021 10:07:10

Sequence Number: 201915064

CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page



Telstra

For all Telstra DBYD plan enquiries -
email - Telstra.Plans@team.telstra.com
For urgent onsite contact only - ph 1800 653 935 (bus hrs)

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 18/08/2021 10:07:12

Sequence Number: 201915064

CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

Page 2 of 2

LEGEND

IT'S HOW WE CONNECT

For more info contact a Certified Location Organisation or Telstra Plan Services 1800 653 935

Exchange
(Major Cable Present)

Footway Access Chamber
(can vary from 1-lid to 12-lid)

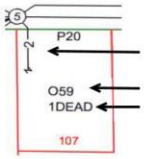
or
Pillar / Cabinet
(above ground / free standing)

Above ground complex equipment housing (eg RIM)
Please Note: This equipment is powered by 240V Electricity

OC — Other Carrier

Dist — Distribution cables in Main Cable ducts
MC — Main Cable ducts on a Distribution plan

Blocked or damaged duct.



2 pair lead-in to property from pit in street
1 pair working (pair ID 059)
1 pair dead (i.e. spare, not connected)

Single to multiple round conduit
Configurations 1,2,4,9 respectively
(attached text denotes conduit typr and size)

Multiple square conduit
Configurations 2, 4, 6 respectively
(attached text denotes conduit typr and size)

Some examples of conduit type and size:

A - Asbestos cement, P - PVC / Plastic, C - Concrete,
GI - Galanised iron, E - Earthenware
Conduit sizes *nominally* range from 20mm to 100mm
P50 50mm PVC conduit
P100 100mm PVC conduit
A100 100mm asbestos cement conduit

6 — Cable Jointing Pit
(number indicating Pit Type)

EJ — Elevated Joint
(above ground joint on buried cable)

Telstra Plant in shared Utility trench

Aerial Cable

Aerial Cable
(attached to joint Use Pole eg. Power)

Direct Buried Cable

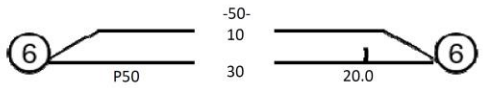
M — Marker Post Installed

T or TR — Buried Transponder

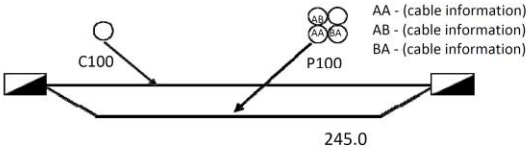
MT — Marker Post, Transponder

SMOF — Optical Fibre cable direct buried

Some Examples of how to read Telstra Plans



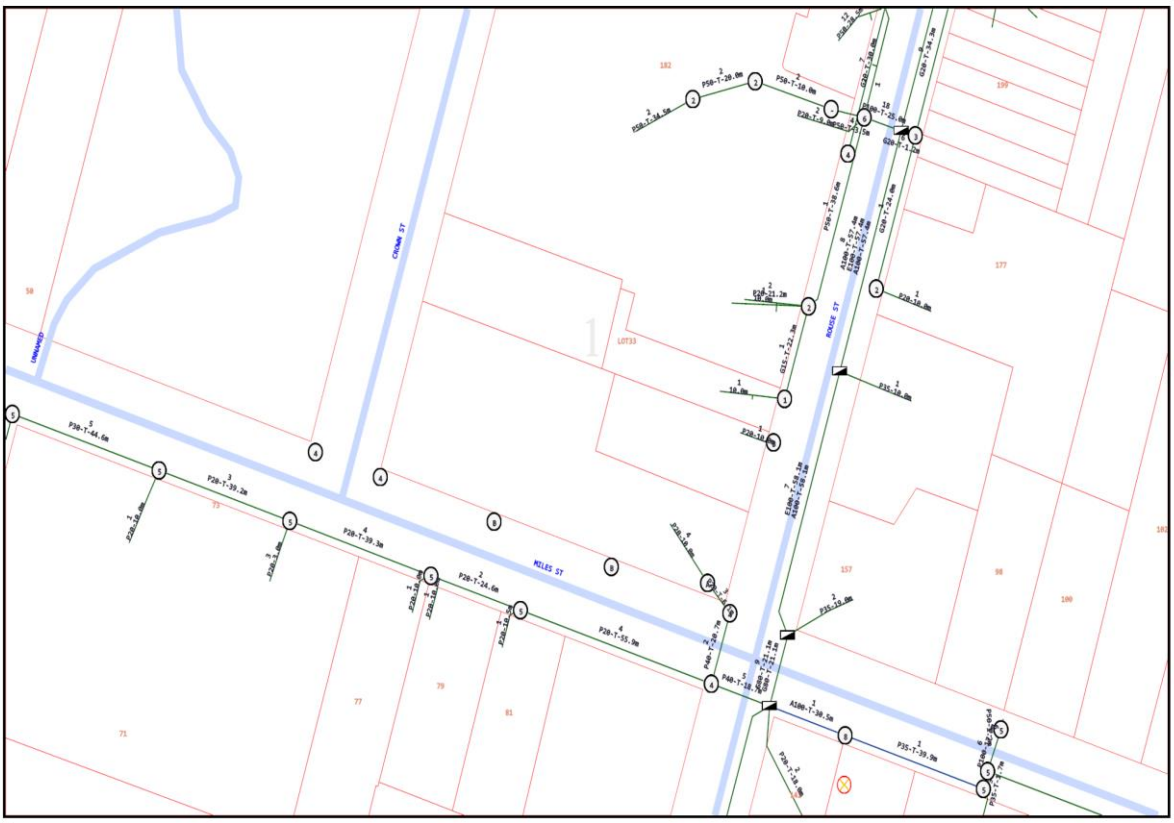
One 50mm PVC conduit (P50) containing a 50-pair and a 10-pair cable between two 6-pits. 20.0m apart, with a direct buried 30-pair cable along the same route



Two separate conduit runs between two footway access chambers (manholes) 245m apart A nest of four 100mm PVC conduits (P100) containing assorted cables in three ducts (one being empty) and one empty 100mm concrete duct (C100) along

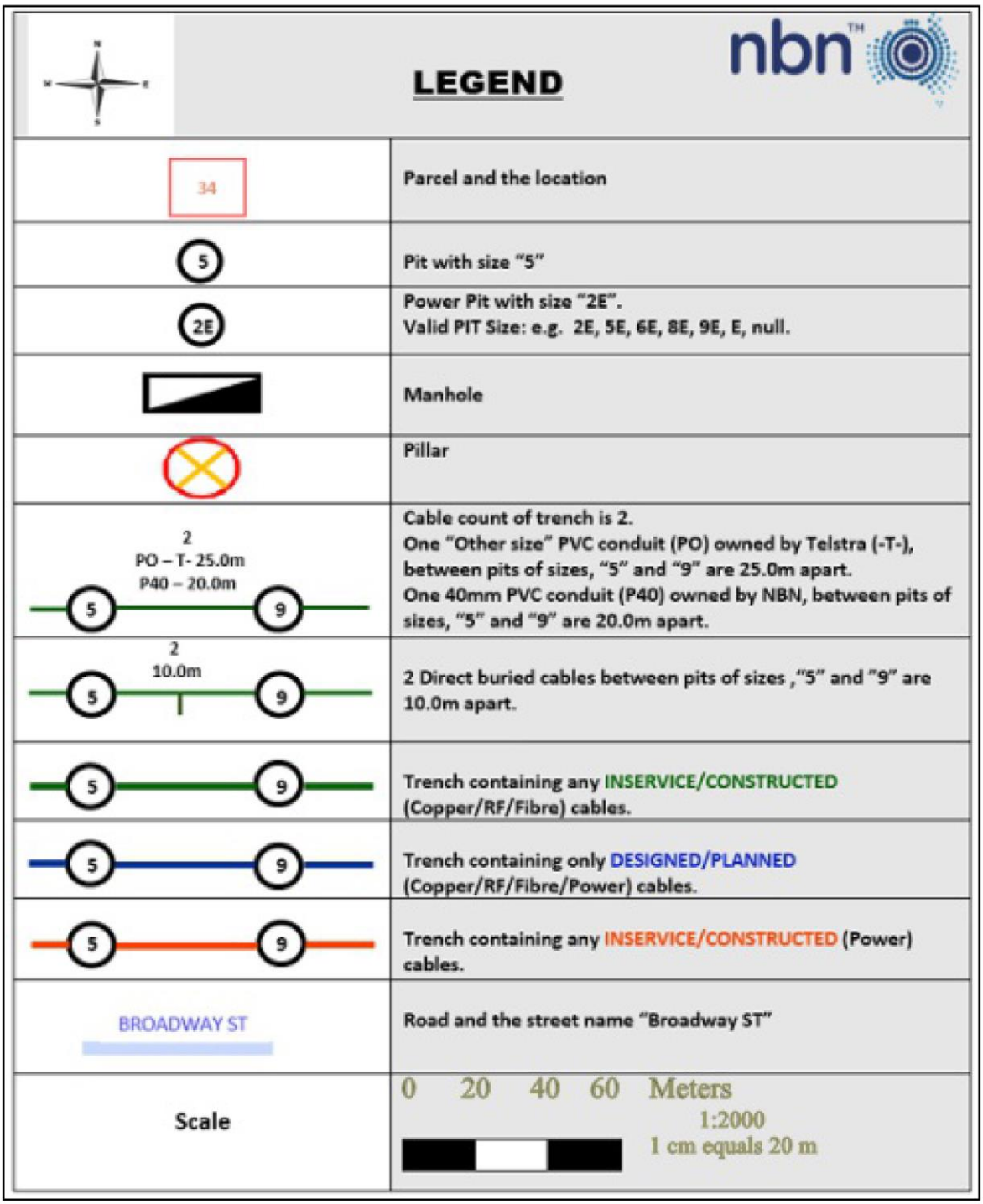
WARNING: Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. FURTHER ON SITE INVESTIGATION IS REQUIRED TO VALIDATE THE EXACT LOCATION OF TELSTRA PLANT PRIOR TO COMMENCING CONSTRUCTION WORK. A plant location service is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works. The exact position of Telstra assets can only be validated by physically exposing it. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

TELSTRA CORPORATION ACN 051 775 556



Emergency Contacts

You must immediately report any damage to the **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 329.


LEGEND
nbn
34
Parcel and the location
5
Pit with size "5"
2E
Power Pit with size "2E".
Valid PIT Size: e.g. 2E, 5E, 6E, 8E, 9E, E, null.
Manhole
Pillar
2
PO – T- 25.0m
P40 – 20.0m
5
9
Cable count of trench is 2.
One "Other size" PVC conduit (PO) owned by Telstra (-T-), between pits of sizes, "5" and "9" are 25.0m apart.
One 40mm PVC conduit (P40) owned by NBN, between pits of sizes, "5" and "9" are 20.0m apart.
2
10.0m
5
9
2 Direct buried cables between pits of sizes ,"5" and "9" are 10.0m apart.
5
9
Trench containing any INSERVICE/CONSTRUCTED (Copper/RF/Fibre) cables.
5
9
Trench containing only DESIGNED/PLANNED (Copper/RF/Fibre/Power) cables.
5
9
Trench containing any INSERVICE/CONSTRUCTED (Power) cables.
BROADWAY ST
Road and the street name "Broadway ST"
Scale
0 20 40 60 Meters
1:2000
1 cm equals 20 m


CROWN ST
12
190
198
196
201203
137
139
199
182
177
163
159
102
104
98
100
157
71
77
79
81
147
141
67
134
139
101
107
Overhead wires not shown
LOOK UP & LIVE!
LEGEND
LV Underground Cable
HV Underground Cable
Underground Pipe
Underground Earth or Wires
Ground Substation
Pole
Cubicle
Pit
Area of Interest
Critical Assets
Contact Essential Energy on 13 23 91
Zone Substation
Underground Cable
Underground Fibre
Proposed Works
Area of proposed works
Proposed assets are shown as orange symbols
THE INFORMATION ON THIS MAP MAY NOT BE ACCURATE. If details are incorrect, please notify Essential Energy on 13 23 91 (or fax 1800 354 636)
ISSUE DATE: 18/08/2021
You must resubmit your request if you have not started work within 4 weeks of the 'Issue Date' above
A4
SCALE: 1:1531
essential energy
Job Number: 30328252
Sequence number: 201915066
Job location: 182 Rouse Street, Tenterfield
Map Centre: 152° 1' 4.3", -29° 3' 25.1"

Appendix E

Site Photographs

	**Plate A- 24/08/2021** Wester Workshop (Panel beaters). View Northern western corner of the site looking east.
	**Plate B- 24/08/2021** Sexton and Green building. South-eastern corner. Looking north.
	**Plate C- 24/08/2021** Sexton and Green building and north-eastern car park. Looking west

	**Plate D- 24/08/2021** Sexton and Green building and north-eastern car park. Looking south.
	**Plate E- 24/08/2021** Sexton and Green building- offices/show room.
	**Plate F- 24/08/2021** Sexton and Green building- offices/show room.

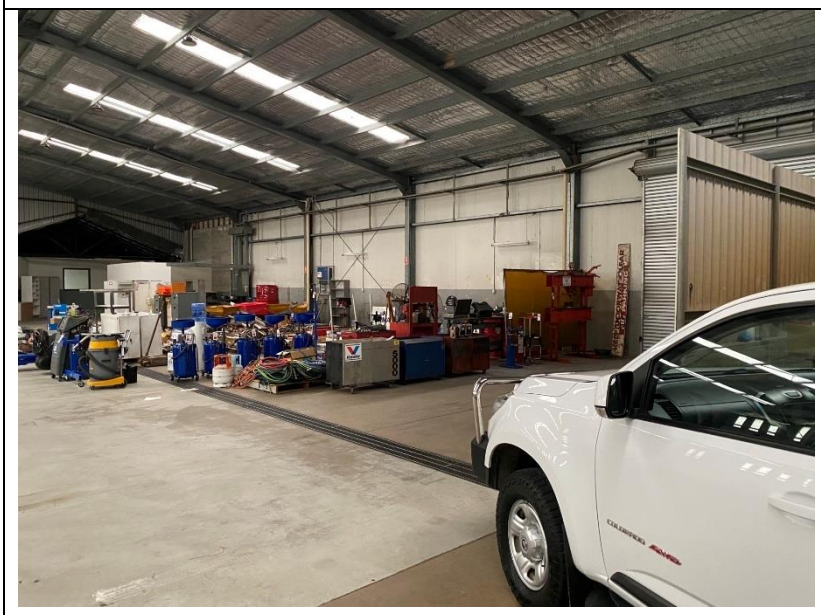
	**Plate G- 24/08/2021** Sexton and Green building. Mechanic. Hoists.
	**Plate H- 24/08/2021** Sexton and Green building. Mechanics. Storage.
	**Plate I- 24/08/2021** Sexton and Green building. Mechanics. Storage.

	**Plate J- 24/08/2021** Sexton and Green building. Mechanics. Office space.

Appendix F

Historical Photographs

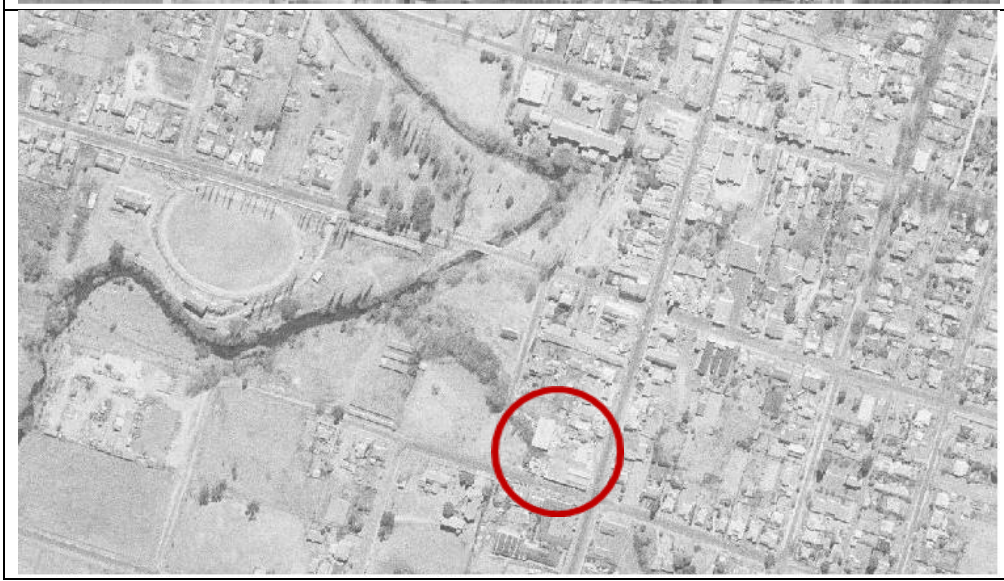
	**Plate K** (1967) Aerial View: Spatial viewer, 148 Rouse Street, Tenterfield. AEC red circle
	**Plate L** (1975) Aerial View: Spatial viewer, 148 Rouse Street, Tenterfield. AEC red circle.
	**Plate M** (1985) Aerial View: Spatial viewer, 148 Rouse Street, Tenterfield. AEC red circle.

	**Plate N** (1993) Aerial View: Spatial viewer, 148 Rouse Street, Tenterfield. AEC red circle.
	**Plate O** (2010) Aerial View: Google Earth, 148 Rouse Street, Tenterfield. AEC red circle.
	**Plate P** (2013) Aerial View: Google Earth, 148 Rouse Street, Tenterfield. AEC red circle.

Plate Q (2021) Aerial View: Google Earth, 148 Rouse Street, Tenterfield. AEC red circle.

Appendix G

Subdivision Certificate

PLAN FORM 2 — Plan Drawing only to appear in this space

SIGNATURE AND SEALS ONLY

Executed on behalf of Sexton + Green (Sales + Service) Pty Ltd by

Graham George ROSSINGTON (Director)

Leeayne Carol ROSSINGTON (Secretary)

Mortgagee under Mortgage No. 0806718 2
Signed at Sydney this 29th day of December 2008 for National Australia Bank Limited ABN 12 004 044 937 by AMY CHU its duly appointed Attorney under Power of Attorney No. 39 Book 4512

Level 2 Attorney

Witness/Bank Officer
335 George Street, Sydney NSW

Executed and certified correct in accordance with Section 127 Corporations Act 2001 by the corporation named below by the authorised person(s) whose signature(s) appear below.
Corporation: Tenterfield Pizza Pty Ltd
Gerard Hanna (Director)
Marcus Joseph Stephen (Director)

The Department of Lands Approval

.....(Authorised Officer).....in approving this plan certify that all necessary approvals in regard to the allocation of the land shown hereon have been given

Signature .....
Date .....
File Number .....
Office .....

Subdivision Certificate

I certify that the provisions of s109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed SUBDIVISION set out herein

* (insert 'subdivision' or 'new road')

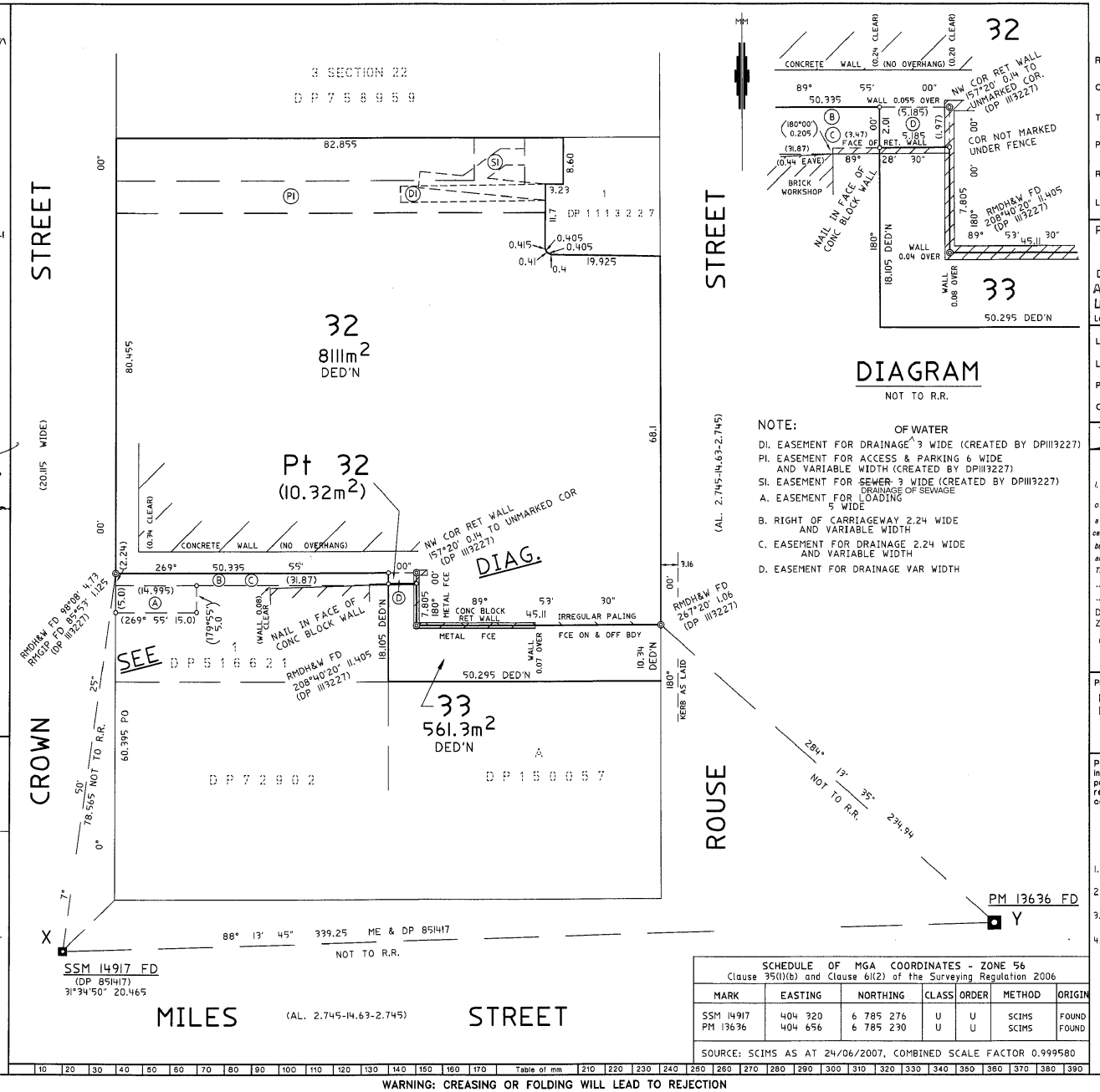
.....
* Authorised person/General Manager/Accredited Certifier

Consent Authority TENTERFIELD SHIRE COUNCIL
Date of Endorsement 17 December 2008
Accreditation No. .....
Subdivision Certificate No. 115/3
File No. DA 2006/075

Note:
When the plan is electronically lodged in the Land Titles Office, it should include a signature in an electronic or digital format approved by the Registrar General.

* Delete whichever is inapplicable

SURVEYOR'S REFERENCE: 0731 Checklist



DIAGRAM

NOT TO R.R.

NOTE:

OF WATER

DI. EASEMENT FOR DRAINAGE 3 WIDE (CREATED BY DP1113227)
PI. EASEMENT FOR ACCESS & PARKING 6 WIDE AND VARIABLE WIDTH (CREATED BY DP1113227)
SI. EASEMENT FOR ~~SEWER~~ DRAINAGE OF SEWAGE 3 WIDE (CREATED BY DP1113227)
A. EASEMENT FOR LOADING 5 WIDE
B. RIGHT OF CARRIAGEWAY 2.24 WIDE AND VARIABLE WIDTH
C. EASEMENT FOR DRAINAGE 2.24 WIDE AND VARIABLE WIDTH
D. EASEMENT FOR DRAINAGE VAR WIDTH

SCHEDULE OF MGA COORDINATES - ZONE 56
Clause 35(1)(b) and Clause 61(2) of the Surveying Regulation 2006

MARK	EASTING	NORTHING	CLASS	ORDER	METHOD	ORIGIN
SSM 14917	404 320	6 785 276	U	U	SCIMS	FOUND
PM 13636	404 656	6 785 230	U	U	SCIMS	FOUND

SOURCE: SCIMS AS AT 24/06/2007, COMBINED SCALE FACTOR 0.999580

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 Table of mm 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

DP1138201 P

Registered: 12.5.2009
C.A. SEE CERTIFICATE
Title System: TORRENS
Purpose: SUBDIVISION
Ref. Map: TENTERFIELD SH2#
Last Plan DP1113227, DP587603, DP851417

PLAN
OF SUBDIVISION OF LOT 2 IN DP 1113227, LOT 3 IN DP 587603 & LOT 2 IN DP 851417
AND EASEMENTS WITHIN LOT 1 IN DP 516621

Lengths are in metres. Reduction Ratio 1:500

LGA: TENTERFIELD
Locality: TENTERFIELD
Parish: TENTERFIELD
County: CLIVE

This is sheet 1 of my plan in ~~sheets~~ (Delete if inapplicable)

Survey Certificate
Surveying Regulation, 2001

I, ANTHONY T HARVEY
ENVIROLINK CONSULTING
of 95 BARKER ST, CASINO 2470

a surveyor registered under the Surveying Act 2002, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying Regulation 2001 and was completed on 3rd Mar.2007
The survey relates to BOUNDARY ADJUSTMENT AND EASEMENTS ONLY

Datum: 'X' - 'Y'
Zone: Urban

(Signature) A. T. Harvey
~~Surveyor~~ registered under the Surveying Act, 2002

Plans used in preparation of survey/~~compilation~~
DP 587603 DP 1113227 DP 851417
DP 516621

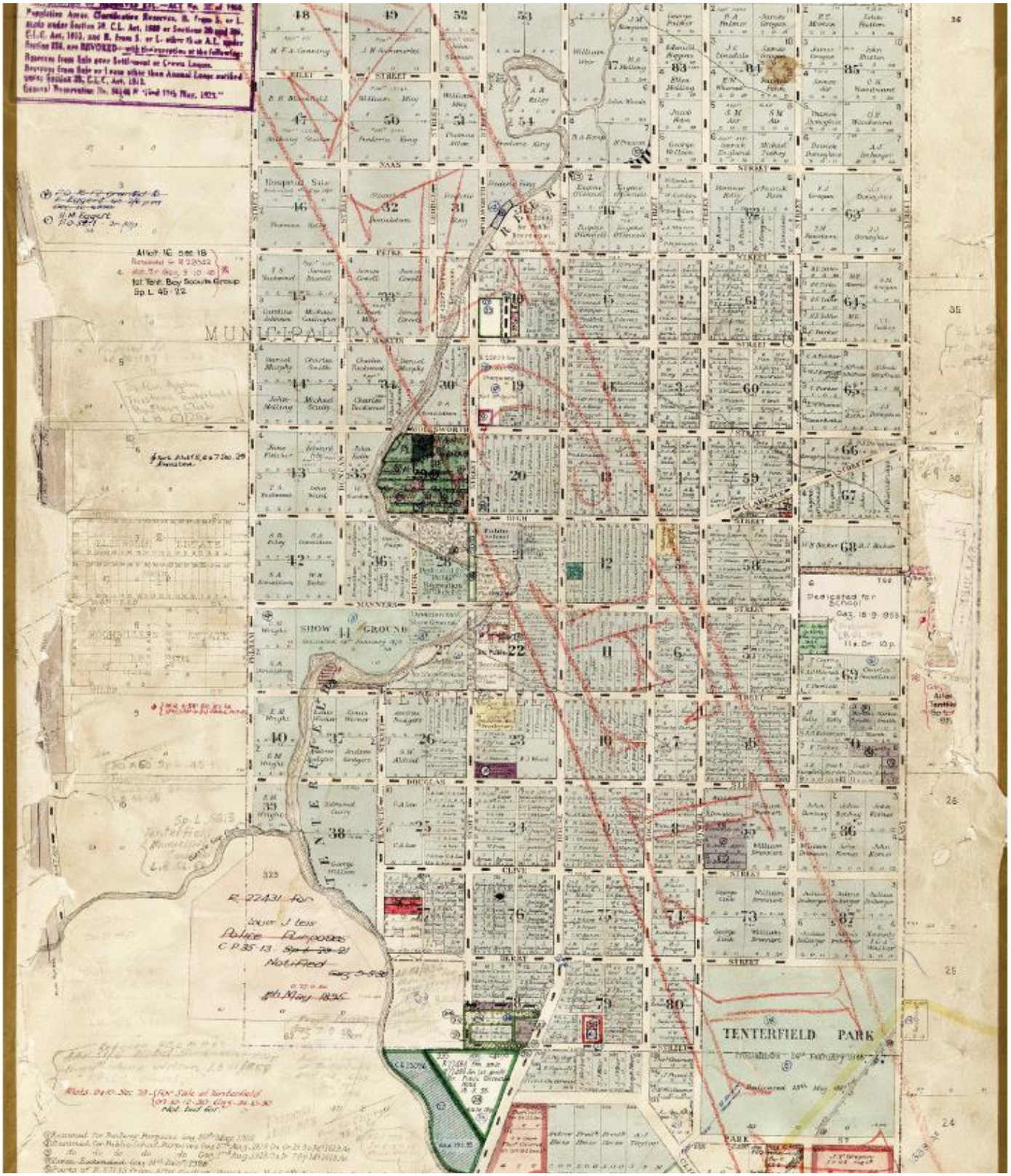
PANEL FOR USE ONLY for statements of intention to dedicate public roads or to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

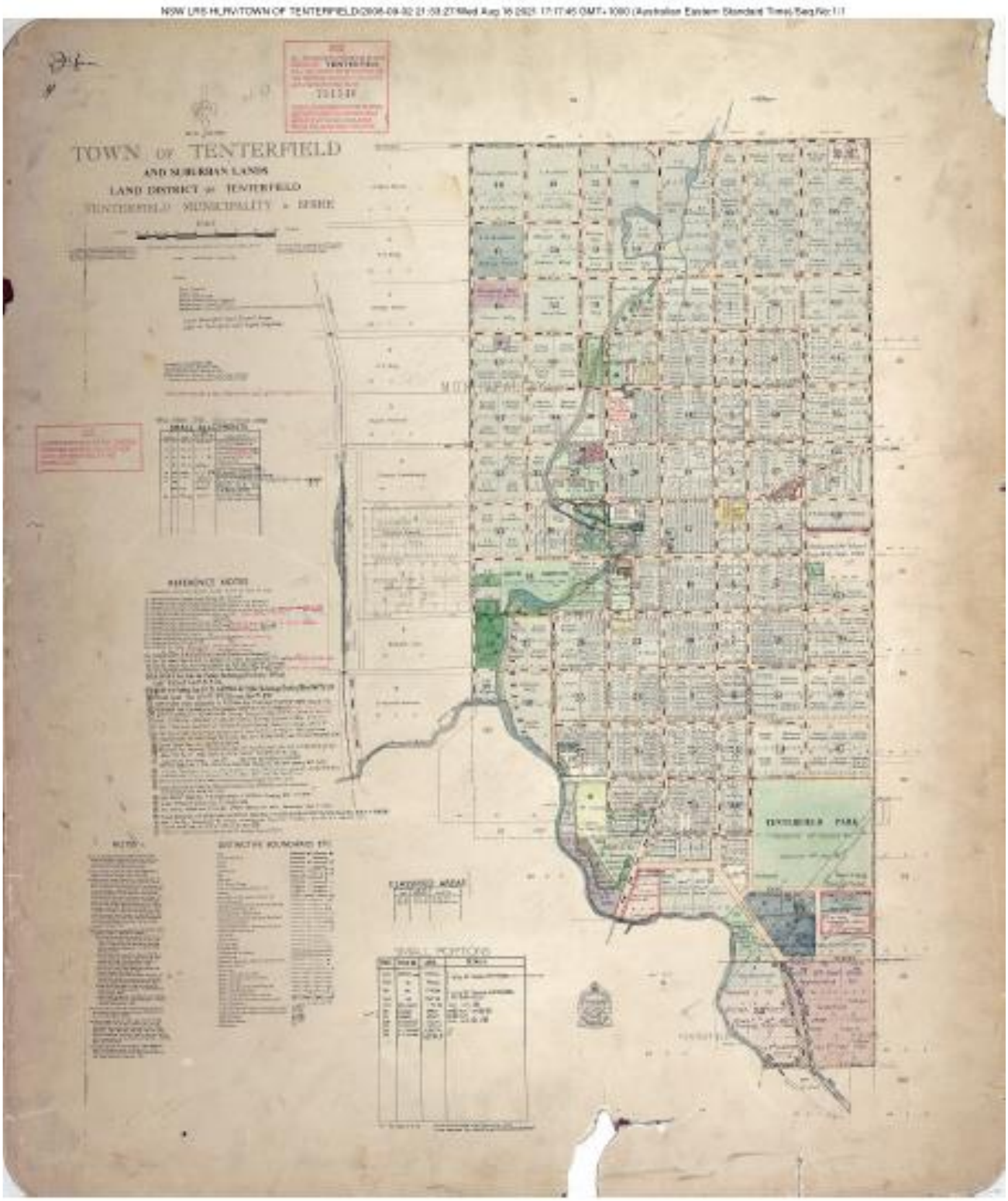
IT IS INTENDED, PURSUANT TO SEC 88B OF THE CONVEYANCING ACT 1919, AS AMENDED, TO CREATE:-

1. EASEMENT FOR LOADING 5 WIDE
2. RIGHT OF CARRIAGEWAY 2.24 WIDE AND VARIABLE WIDTH
3. EASEMENT FOR DRAINAGE 2.24 WIDE AND VARIABLE WIDTH
4. EASEMENT FOR DRAINAGE VAR WIDTH

Appendix H

Historical Land Maps


STREET
SHOW GROUND
TENTERFIELD PARK
Dedicated for School
Police Purposes
Notified
4th May 1926


TOWN OF TENTERFIELD
AND SUBURBAN LANDS
LAND DISTRICT OF TENTERFIELD