

Parkes Bypass

Preliminary site investigation

Roads and Maritime Services | October 2018



Roads and Maritime Services

Parques Bypass

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October 2018

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Abbreviations

ACM	Asbestos containing material
ASS	Acid sulfate soil
BTEX	Benzene, toluene, ethylbenzene and xylene
CSM	Conceptual site model
DP	Deposited Plan
LEP	Local environmental plan
LGA	Local Government Area
mBGL	metres below ground level
NEPC	National Environment Protection Council
NSW EPA	New South Wales Environment Protection Authority
OCPs	Organochlorine pesticides
OPPs	Organophosphate pesticides
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
TRH	Total recoverable hydrocarbons

Executive summary

This preliminary site investigation (PSI) was undertaken for Roads and Maritime Services (Roads and Maritime) for the proposed new 10.5 kilometre bypass in Parkes (the Parkes Bypass). The Parkes Bypass would provide a new alternate route about two kilometres west of Parkes town centre, diverting heavy vehicle traffic away from Parkes town centre.

The footprint of the Parkes Bypass (the proposal footprint) generally comprises:

- A portion of private land from the Newell Highway to London Road
- Crown land from London Road to Bogan Road, including the Travelling Stock Route from Back Trundle Road north to Bogan Road
- Private land from Bogan Road to the Newell Highway north of Parkes town centre.

It is understood that some soil excavation will take place in order to allow for the construction of the road.

The PSI identified a number of potential contamination sources including:

- Unknown fill used across the proposal footprint prior to concrete hardstand and/or roads being established
- Vehicle use on existing roads
- Parkes golf course adjacent to the route (south of London Road)
- Agricultural use of land adjacent to the route
- A disused gold mine
- Use of railway lines
- An electrical substation (corner of Westlime Road and Brolgan Road)
- A storage facility adjacent to the route (Hartigan Avenue).

Potential contaminants of concern relating to these activities include petroleum hydrocarbons, volatile organic compounds, volatile halogenated compounds, polycyclic aromatic hydrocarbons, pesticides, polychlorinated biphenyls, phenols, asbestos and sulfur.

Based on the above findings, it is recommended that a targeted Phase 2 investigation providing a general coverage of the proposed alignment and areas of potential contamination sources listed above be undertaken. The Phase 2 investigation would address the potential risk which the fill material may pose to construction workers and future commercial/industrial users of the site. Phase 2 investigations would need to cover areas where fill material will be encountered during construction. The work would also be carried out under a contaminated land management plan and with provisions for managing the discovery of unexpected contaminants and accidental spills.

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1 Introduction

This preliminary site investigation (PSI) was undertaken for Roads and Maritime Services (Roads and Maritime) for the proposed new 10.5 kilometre bypass in Parkes (the Parkes Bypass). The Parkes Bypass would provide a new alternate route about two kilometres west of Parkes town centre, diverting heavy vehicle traffic away from Parkes town centre.

The footprint of the Parkes Bypass (the proposal footprint) generally comprises:

- A portion of private land from the Newell Highway to London Road
- Crown land from London Road to Bogan Road, including the Travelling Stock Route (TSR) from Back Trundle Road north to Bogan Road
- Private land from Bogan Road to the Newell Highway north of Parkes town centre.

The proposal footprint is shown on Figure 1 in Appendix A.

It is understood that some soil excavation will take place in order to allow for the construction of the road.

1.1 Objectives

Objectives of the PSI were to:

- Assess the potential for past and present on-site activities to cause contamination
- Where potential contaminating activities are identified, document the likely associated contaminants (i.e. potential contaminants of concern)
- Develop a conceptual site model (CSM)
- Provide a preliminary assessment for potential site contamination and provide recommendations for a more detailed investigation and additional works (if required).

1.2 Scope

To achieve the project objectives, the scope of works for the PSI included:

- A desktop review of available historical and current information pertaining to the proposed alignment, including:
 - Historical aerial photographs of the route and surrounding area (for the years 1973, 1977, 1989 and 2014)
 - Groundwater database search of registered boreholes in the area within a 500 m radius (to assess groundwater use in the vicinity of the route)
 - New South Wales Environment Protection Authority (NSW EPA) database for notices and licenses relating to known contamination or potentially contaminating activities on properties in the vicinity of the route
 - Available information that may document historical crashes, spills, waste disposal or other polluting activities across the route
 - Physical site setting information including topography, geology and hydrogeology and potential sensitive receptors on or in the vicinity of the route
 - Parkes Shire Council records to identify current zoning on- and off-site and current planning overlays that are of relevance to contaminated sites.
- Preparation of this PSI report detailing all of the information obtained as well as the information sources accessed.

The works were undertaken in general accordance with the following NSW guidelines:

- NSW Department of Environment and Conservation 2006, *Guidelines for the NSW Site Auditor Scheme* (2nd edition)
- NSW EPA 1997, *Guidelines for Consultants Reporting on Contaminated Sites*
- *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM; as amended 2013)
- NSW Government Office of Environment and Heritage 2011, *Guidelines for Consultants Reporting on Contaminated Sites*.

2 Location and setting

2.1 Route location and identification

Details of the location, zoning and current use of the route are provided in Table 2-1 below (refer to Figure 1, Appendix A for a site location and layout plan).

Table 2-1 Site identification

Legal description	Portions of the Newell Highway at the northern and southern parts of the route, and parts of the following lots: <ul style="list-style-type: none">• Lot 388 DP 750179• Lot 1 DP 1098082• Lot 1, 2 DP 1129859• Lot 1 DP 838430• Lot 1 DP 870752• Lot 155, 1037, 1085 DP 750152• Lot 2 606056• Lot 2 DP 1012623• Lot 387, 517, 543, 554, 683 DP 750179• Lot 7008 DP 1030636• Lot 7019 DP 1077038• Lot 7044, 7045 DP 1059946• Lot 7071 DP 1058313• Lot 7073 DP 1077021• Lot 7303 DP 1143523• Lot 7328, 7329, 7330 DP 1147447• Lot 7332 and 7333 DP 1147355• Lots 781, 784, 837 and 907 DP 750152.
Route length	10.5 km
Current site use	Roadways, Crown land and rural land
Zoning	The <i>Parkes Local Environment Plan 2012</i> (LEP) indicated the site is subject to three land zones, RU1 – primary production, SP2 – infrastructure and SP1 – special activities.
Proposed end use	Road

2.2 Site description

The Parkes Bypass would be approximately 10.5 km long. The northern portion of the proposed route passes through private rural land, along roads and the TSR. A footpath/cycle bridge is proposed over the bypass from Victoria Street to Back Trundle Road. The proposal footprint borders a storage facility at the portion of the route crossing Hartigan Avenue and the Broken Hill railway line to the west, and an electrical substation on the north-east corner of Westlime Road and Brologan Road. A bridge is proposed to be constructed over Hartigan Avenue and the railway lines directly south of Hartigan Avenue. The route then borders rural land and Parkes Golf Course south-east of London Road and further rural land at the southern portion of the route. The proposal also includes an extension of Hartigan Avenue to connect to Condobolin Road.

A physical site inspection of the proposal footprint and examination of the surrounding areas was not within the agreed scope of works, however the following potential signs of contamination along the route were provided by RMS:

- A disused gold mine was identified north of Goldrush Road at the northern portion of the route
- A portion of the route north of Endicott Street was observed to have dumped cars and garbage with imported fill
- Railway tracks cross the route south of Hartigan Avenue
- A disused sheep dip is adjacent to the route between the Parkes Golf Club and the route.

Areas of identified concern are presented on Figure 2, Appendix A.

2.3 Surrounding land uses

Based on observations of the most recent aerial photograph (2017), adjacent land uses include:

- **North:** Newell Highway then rural land beyond
- **East:** Parkes Golf Course and Parkes town centre beyond
- **South:** Newell Highway then rural land
- **West:** Parkes National Logistics Hub, Parkes Christian School, Shallow Rush township and rural land.

2.4 Topography and hydrology

The route is situated at approximately 300 metres in Australian Height Datum (mAHD) at the southern end and 380 mAHD at the northern end of the route. The site generally rises towards the northern end of the route.

The closest surface water body to the route is Goobang Creek. Goobang Creek is located approximately 2 km east of the site at its closest point. A number of artificial agricultural dams and waterways are present along the proposal footprint, the most significant of which is a large dam north of Parkes Gold Course and south of Hartigan Avenue.

2.5 Soils and geology

Based on the 1:100,000 Parkes Geological Series Sheet 8531 (2000), the route is underlain by material from the Quaternary Period, described as alluvial slopes and sand ridges, at the southern portion of the route to Thomas Street. North of Thomas Street the route is underlain by Parkes Volcanics, described as volcanic sandstone and conglomerate.

2.6 Acid sulfate soils

A review of the ASRIS – Acid Sulfate Risk map (<http://www.asris.csiro.au>) identified that the route is located within an area described as having a low probability of acid sulfate soil (Class B4 – low probability, confidence unknown).

Parkes LEP (2012) does not include acid sulfate soil maps or provisions. Areas within a Class 4 area generally require planning approval for works below 2 metres below ground level (mBGL) and areas where works by which the water table is likely to be lowered more than 2 metres below the natural ground surface.

2.7 Hydrogeology

A review of the registered groundwater bore database (<http://allwaterdata.water.nsw.gov.au/water.stm>, accessed on 9 June 2017) indicated that there were 12 registered bores within a 500-m radius of the route identified mainly for stock/domestic purposes. Based on the well depths, yields and quality reported on the registered bore summaries these wells are expected to be used for stock purposes and are not suitable for potable use. No registered potable groundwater wells were identified within a 500-m radius of the site. Details of groundwater wells are summarised in Table 2-2. Groundwater bore information is provided in Appendix B.

Table 2-2 Groundwater bores

Bore ID	Approximate distance and direction from the route	Purpose	Total depth (m)	Standing water level (m)
GW002429	350 m west of the route (east of Bogan Road), 530 m north-west of Maguire Road	Unknown	34.80	30.80
GW704568	25 m east of the route (south of Bogan Road – Newell Highway), 70 m east of Currajong rest area	Stock/domestic	57.00	27.00
GW703444	50 m west of the route (south of Bogan Road – Newell Highway), 90 m north of Currajong rest area	Stock/domestic	56.00	Unknown
GW10688	150 m east of the route (south of Bogan Road – Newell Highway), 180 m south-east of Currajong rest area	Stock	52.70	30.50
GW704282	100 m east of the route (east of Reedsdale Road), 80 m south of Endicott Street	Stock/domestic	45.00	25.00
GW702042	110 m east of the route (east of Reedsdale Road), 180 m north of Endicott Street	Stock/domestic	50.00	25.00
GW702158	110 m east from the route (east of Reedsdale Road), 110 m north from Thomas Street	Stock/domestic	42.00	27.00
GW704356	250 m east of the route (south of Thomas Street), 110 m south of Thomas Street	Stock/domestic	53.00	Unknown
GW704588	450 m north of route (west of Moulden Street), 350 m west of Moulden Street	Stock/domestic	35.00	24.00
GW704643	100 m from the route (west of Moulden Street), 430 m west of Moulden Street	Stock/domestic	66.00	27.00
GW703838	300 m south of route (west of Moulden Street), 200 m west of Moulden Street	Stock/domestic	Unknown, assumed at 40.00 m	Unknown
GW020719	Within Parkes Golf Club, 430 m east of Ballerdee Lane	Stock	85.30	Unknown

Based on the bores summarised above it is anticipated that groundwater is present between 30 and 50 mBGL in the vicinity of the proposal. Additional groundwater bores, located in Parkes, are indicative of a shallower water bearing zone approximately 10 mBGL.

3 Site history review

3.1 Historical aerial photographs

Historical aerial photographs taken in 1973, 1977, 1989 and 2014 which capture the route were reviewed, and a summary of the observed land use changes is presented in Table 3-1. The historical aerial photographs are presented in Appendix C.

Table 3-1 Historical aerial photograph review

Year	Route land uses	Surrounding area
1973	The southern portion of the route, south of the railway line, is predominantly occupied by rural land. The Parkes Golf Club appears to be partially developed. Land north of the railway line appears to be used as rural land. Main roads, including Hartigan Avenue and Condobolin Road, have been paved.	The southern portion of the route south of the railway line is surrounded by rural land. The electrical substation at the corner of Hartigan Avenue and Broilgan Road is present. Parkes town centre to the east of the site is well developed, the railway line is present and a natural creek runs approximately 400 m east of the route parallel to the railway line.
1977	There are no visible changes to the route with the exception that the Parkes Golf Club has been completed.	A portion of the storage facility south-west of Hartigan Avenue has been built.
1989	The route remains largely unchanged.	The storage facility appears to be developing to the west. Remaining surrounding land is largely unchanged.
2014	The route remains largely unchanged and in its current configuration.	The storage facility is completely developed

3.2 NSW EPA online records

A search of the NSW EPA contaminated land record database (<http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx>) undertaken on 9 June 2017, indicated that there are no contaminated sites listed with a 1 km radius of the route.

A review of the NSW EPA *Protection of the Environment Operations Act 1997* (POEO Act) public register (<http://www.epa.nsw.gov.au/prpoeoapp/>) undertaken on 9 June 2017, indicated that there are five properties within a 1 km radius of the route which hold environment protection licences (summarised in Table 3-2).

Table 3-2 Sites listed on the NSW EPA POEO Act public register

Licence holder	Address	Activity	Status	Distance and direction from route	Potential to impact the route
Australian Topmaking Services Limited	King Merino Road	Greasy wool or fleece processing	License surrendered in 2005	800 m west of Westlime Road, 140 m south from Brolgan Road.	Low – Unlikely to cause widespread impacts, distance from site significant
B.M.D. Constructions Pty Ltd	Inland Rail – Parkes	Railway systems activities	Pending	N/A – Parkes-Narrromine rail line	Low – Unlikely to cause widespread impacts
Neil Robert Unger	Mid-west piggery, "Kildare", 83 Hideaway Lane	Pig accommodation	License in force until 5 April 2020	600 m east from route, 1.5 km south of London Road	Moderate – Potential to result in impacts, however, distance to site significant
Parkes Shire Council	Brolgan Road, Parkes	Waste disposal by application to land	License in force until 26 September 2018	700 metres west of the proposal footprint	Moderate – Potential to result in impacts, however, distance to site significant
Westlime Pty Limited	London Road	Land-based extractive activity, crushing, grinding or separating	License in force until 28 October 2019	500 m west of the route, 280 m west of Ballerdee Lane	Low – Unlikely to cause widespread impacts, distance from site significant

3.3 Heritage

A search of the state heritage register (<http://www.environment.nsw.gov.au/heritage/index.htm>) on 9 June 2017 indicated that there are no state heritage items within a 500-m radius of the route. The closest item is the Parkes Railway Station Group located on May Street, Parkes, approximately 2 km east of the route. The Parkes Railway Station Group has been identified as a heritage significant item since 19 July 2013.

Local heritage items are provided by Parkes Shire Council LEP (2012) and *State Environment Planning Policy (Major Development) 2005*. A portion of the Parkes Railway station group, located at the corner of Hartigan Avenue and Best Street and approximately 500 m east of the southern portion of the route was listed as an item I6, 'General heritage'. No local heritage items were identified in the northern section of the route.

3.4 Summary

Aerial imagery indicates the route was predominantly used for rural and agricultural purposes which has a low likelihood of associated contamination. Other potential contamination sources in the vicinity of the proposal footprint were identified:

- An electrical substation
- Parkes Golf Course
- Former gold mine
- Railway line
- Adjacent roads
- Uncontrolled fill
- Dumped rubbish.

3.5 Previous environmental investigations

No previous environmental investigations were supplied pertaining to the route.

4 Preliminary conceptual site model

Based on the desktop review of the route setting and historical land use information, a preliminary conceptual site model (CSM) has been prepared. This is summarised in the following sections.

4.1 Potential sources of contamination identified

Based on a review of historical and background information, the following features in Table 4-1 were considered to be likely sources of contamination with potential to impact soil and groundwater along the route. It should be noted that no site walkover was undertaken as part of this PSI and therefore some sources of contamination may have been omitted.

Table 4-1 Summary of potential contamination sources/contaminants of concern

Activity along route	Contaminant source	Potential contaminants of concern
Unknown fill used across the route prior to concrete hardstand and/or roads being established	Imported fill material	Heavy metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs) and asbestos containing material (ACM)
	Dumped garbage and cars north of the route	
Sections of the route are roads	Emissions from vehicles using nearby roads	BTEX, TRH, PAHs, heavy metals, phenols
	Bitumen from the road	BTEX, TRH, PAHs, heavy metals
Parkes Golf Course adjacent to the route (south of London Road)	Use of pesticides or herbicides to maintain the grounds	Heavy metals, organochlorine pesticides (OCPs) and organophosphate pesticides (OPPs), herbicides
Agricultural land adjacent to the route	Use of pesticides to maintain land	Heavy metals, OCPs and OPPs
	Sheep dip between Parkes Golf Course and the route	Synthetic pyrethroids, OPPs and OCPs
Disused gold mine	Offset contamination from production of ores, emissions	Heavy metals, particularly arsenic and mercury, sulfur and cyanide
Railway line	Ballast material and train emissions	Heavy metals, TRH, BTEX, PAHs, asbestos
An electrical substation (corner of Westlime Road and Brogan Road)	Transformer oils	TRH, BTEX, heavy metals, PAHs, phenols and PCBs

4.2 Potential affected media

Based on the potential sources identified, soil is the media most likely to be affected, as the majority of identified sources are surficial and extensive subsurface contamination is unlikely. This is applicable to all identified potential sources and contaminants.

Some impacts have the potential to have migrated to the groundwater, including hydrocarbons and metals, particularly in unsealed areas. The nearest surface water body is 2 km east from the route at its closest point; therefore surface water condition is not considered relevant.

Where volatile hydrocarbons may be present there is also a potential for vapour impacts, although there is limited potential for vapour accumulation along the route due to the lack of structures present.

4.3 Potential receptors

Human receptors identified along the route comprise:

- Future construction workers or maintenance workers
- Future users of the road
- Current and future rural and residential users of adjacent land.

Hydrological receptors identified along the route comprise:

- Underlying soil and groundwater
- Goobang Creek, approximately 2 km from the route.

4.4 Potential exposure pathways

Based on the potential contaminants and receptors identified, the following potential exposure pathways exist:

- Direct contact with or ingestion of impacted surface or near surface soils by construction workers during the road construction or maintenance workers following construction
- Inhalation of dust, vapour or fibres by construction workers during the road construction or maintenance workers following construction
- Inhalation of dust, vapour or fibres by users of the road or of adjacent land
- Ingestion of or dermal contact with impacted groundwater if extracted for beneficial use by nearby site users
- Migration of impact into the groundwater or into Goobang Creek.

The potential for direct contact exposure by construction workers or future maintenance workers is considered to be a low risk, as these workers would be expected to adopt the appropriate safety controls to reduce risk. The potential for adjacent site users or road users to be exposed to dust, fibre or direct contact with soil is minimal once the road is constructed, as the roadway will act as a barrier. However, during the construction exposure is possible.

The potential for significant groundwater impact is considered to be low, however if groundwater is impacted it may be extracted for stock, irrigation or domestic uses based on the presence of nearby registered bores. The potential for impacted groundwater to migrate to Goobang Creek is low, based on the distance from the route.

5 Discussion and recommendations

The Phase 1 PSI identified several potential contamination sources including:

- Unknown fill used across the route prior to concrete hardstand and/or roads being established
- Sections of the route that are roads
- Parkes Golf Course adjacent to the route (south of London Road)
- Agricultural land adjacent to the route
- A disused gold mine
- Railway line
- An electrical substation (corner of Westlime Road and Brolog Road)
- A storage facility adjacent to the route (Hartigan Avenue).

Potential contaminants of concern relating to these activities include TRH, BTEX, PAHs, OCPs/OPP, PCBs, phenols, VOCs, ACM, cyanide and sulfur. Accordingly, the following safeguards and management measures are recommended.

Table 5-1 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing
Identification of contaminated land	A targeted Phase 2 investigation providing general coverage of the proposed alignment and areas of potential contamination sources (including areas where fill will be encountered during construction) will be undertaken. This investigation will address the potential risk that fill material may pose to construction workers and future users of the site. Assessments will be carried out in accordance with guidance made or endorsed by the NSW EPA. The contaminated land investigations will be carried out and the report verified by a suitably qualified and experienced environmental consultant.	Roads and Maritime	Detailed Design, Pre-construction
Contaminated land	A Contaminated Land Management Plan will be prepared in accordance with the Guideline for the Management of Contamination (Roads and Maritime, 2013) and implemented as part of the CEMP. The plan will include, but not be limited to: <ul style="list-style-type: none"> • Capture and management of any surface runoff contaminated by exposure to the contaminated land • Further investigations required to determine the extent, concentration and type of contamination, as identified in the detailed site investigation (Phase 2) • Management of the remediation and subsequent validation of the contaminated land, including any certification required • Measures to ensure the safety of site personnel and local communities during construction. 	Contractor	Detailed design/Pre-construction
Contaminated land	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other work that may impact on the contaminated area will stop until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Roads and Maritime Environment Manager and/or EPA.	Contractor	Detailed design/Pre-construction

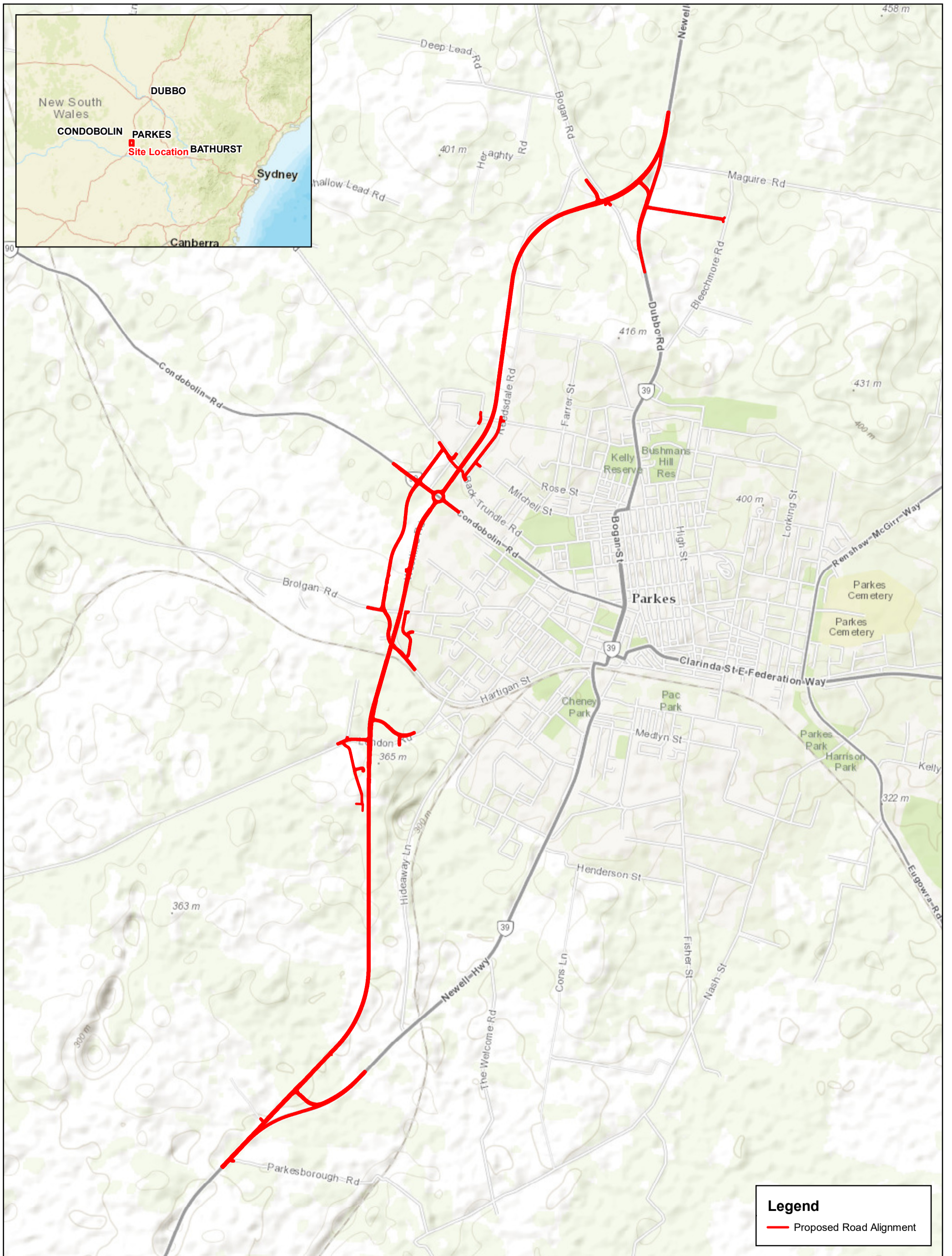
Impact	Environmental safeguards	Responsibility	Timing
Accidental spill	A site-specific emergency spill plan will be developed, and include spill management measures in accordance with the Roads and Maritime Code of Practice for Water Management (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Roads and Maritime and EPA officers).	Contractor	Detailed design/Pre-construction

6 References

- CSIRO Acid Sulfate Soil Risk Map, <http://www.asris.csiro.au> (accessed May 2017)
- Geological Survey of NSW Parkes Map 2000, Parkes – 1:100,000 Geological Sheet
- National Environment Protection Council (NEPC) 1999, as amended 2013. National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM)
- NSW Department of Environment and Conservation 2006, Guidelines for the NSW Site Auditor Scheme (2nd edition)
- NSW EPA 1997, Guidelines for Consultants Reporting on Contaminated Sites
- NSW Government Office of Environment and Heritage 2011, Guidelines for Consultants Reporting on Contaminated Sites.


Appendix A

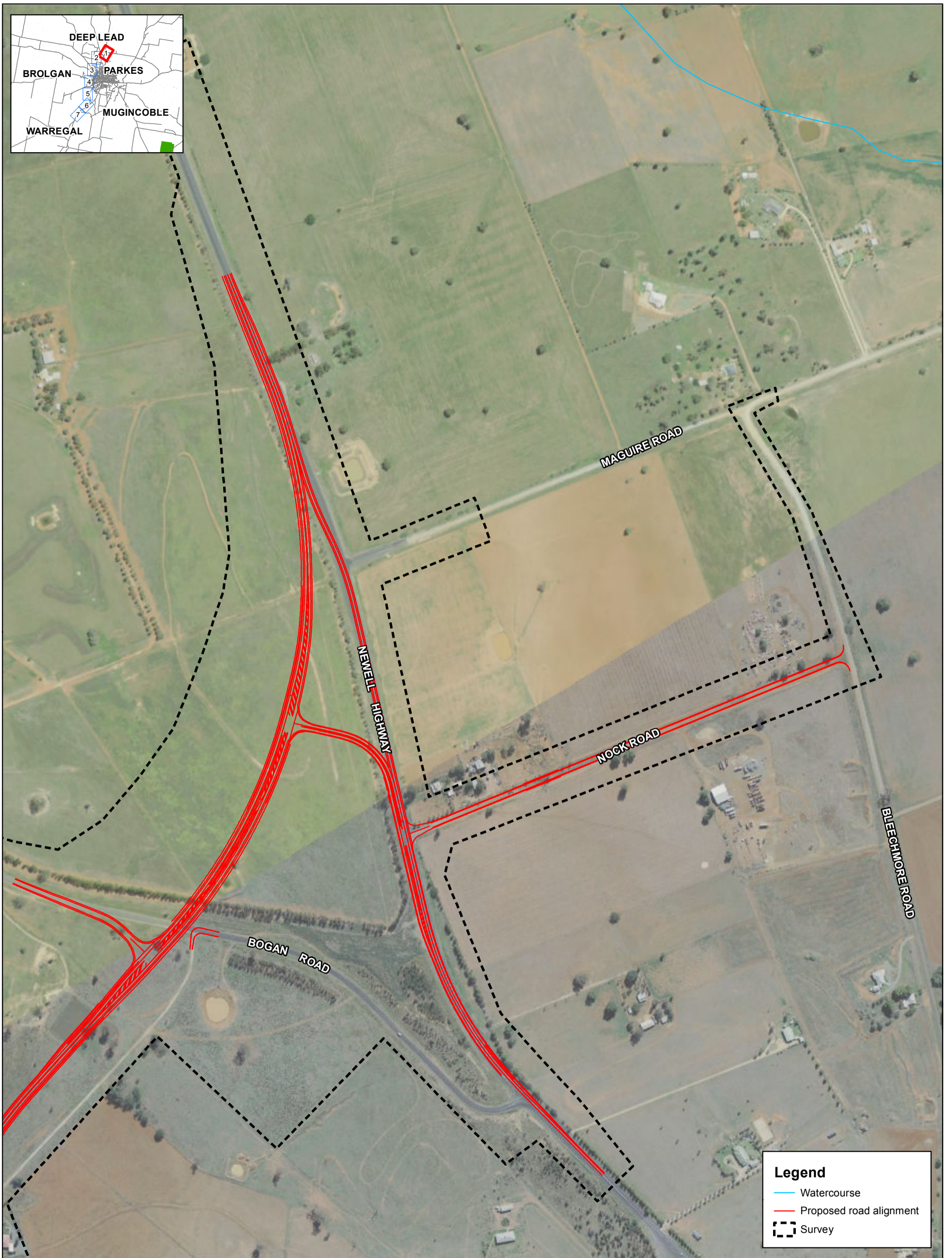
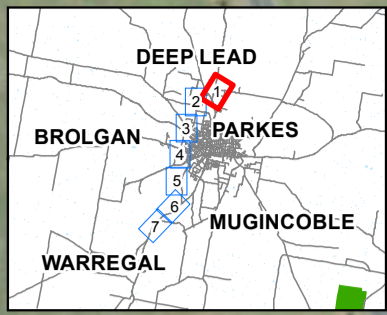
Figures



Legend

— Proposed Road Alignment

Map: 2270437A_GIS_004_A2	Author: David.Naikien		 1:30,000		Parkes Bypass Figure 1 Proposal Overview
Date: 30/08/2018	Approved by: Isabella.See				
Data source: ESRI Topographic Map, ESRI World Street Map		Coordinate system: GDA 1994 MGA Zone 55 Scale ratio correct when printed at A3			
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Legend

- Watercourse
- Proposed road alignment
- Survey

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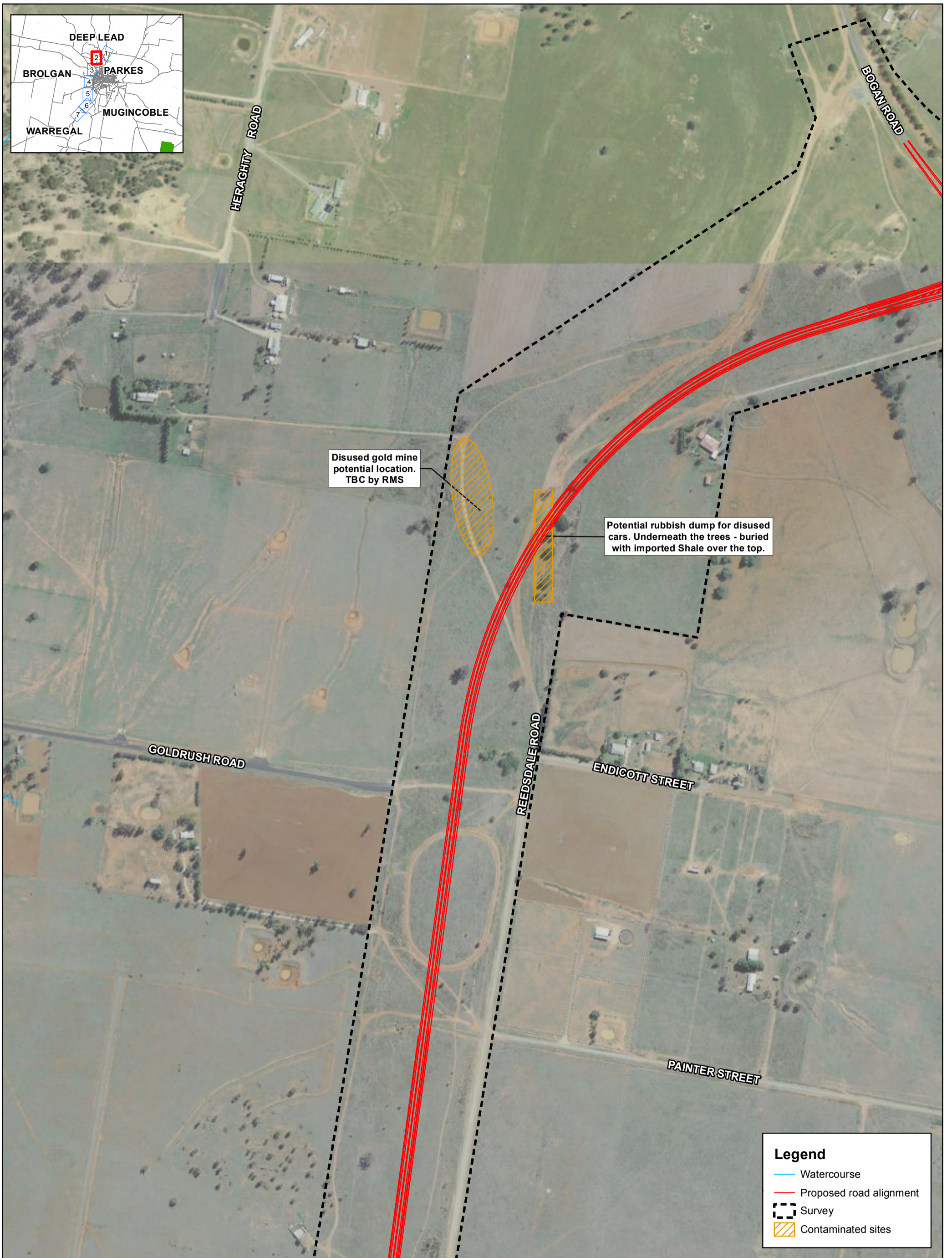
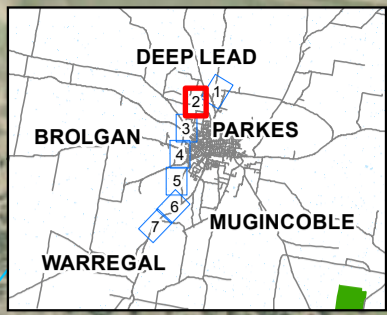
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Parkes Bypass

Figure 2
Contaminated Sites
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Legend

- Watercourse
- Proposed road alignment
- Survey
- Contaminated sites

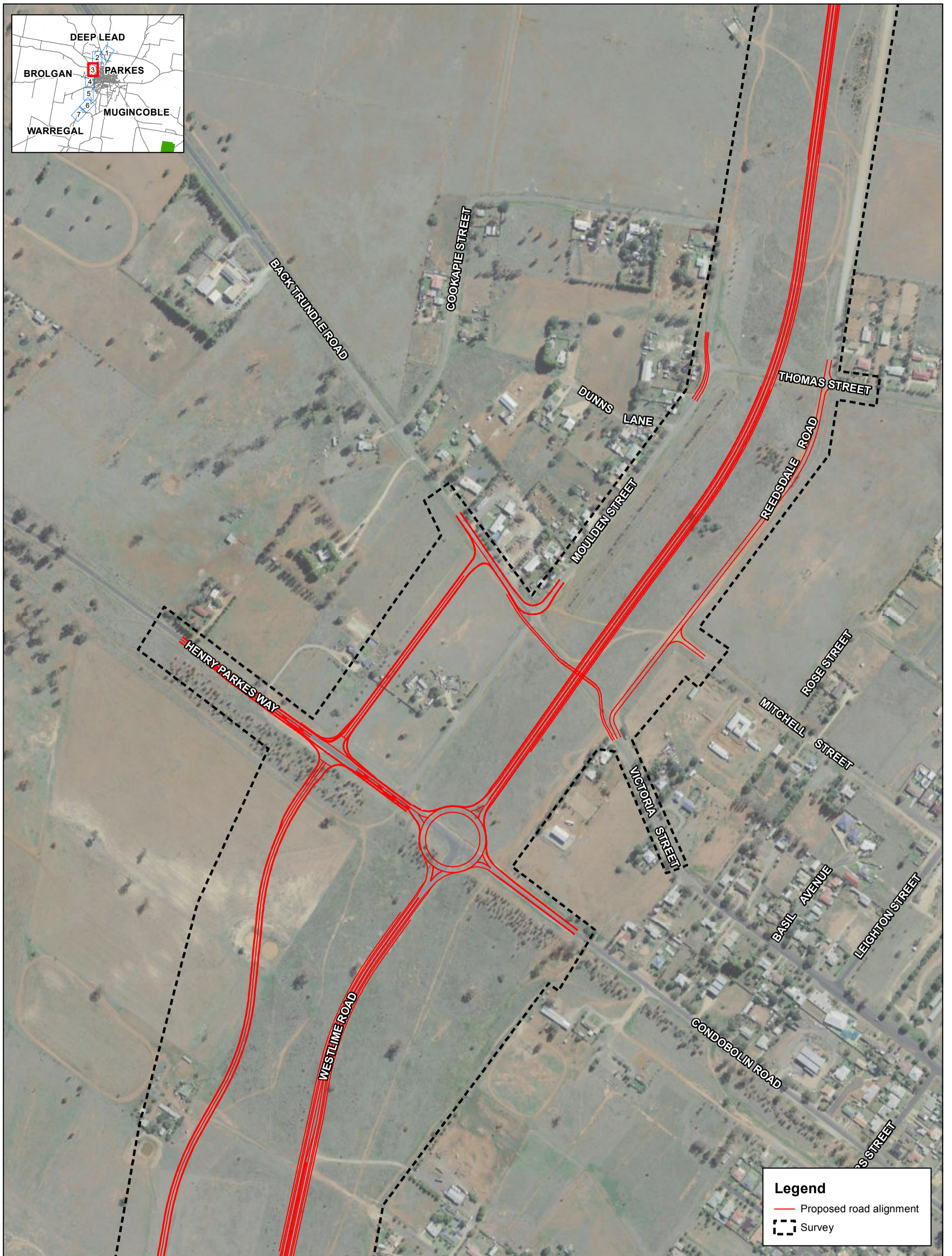
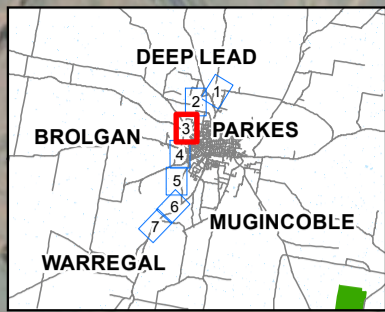
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Parkes Bypass
Figure 2
 Contaminated Sites
 Page 2 of 7



Legend

- Proposed road alignment
- Survey

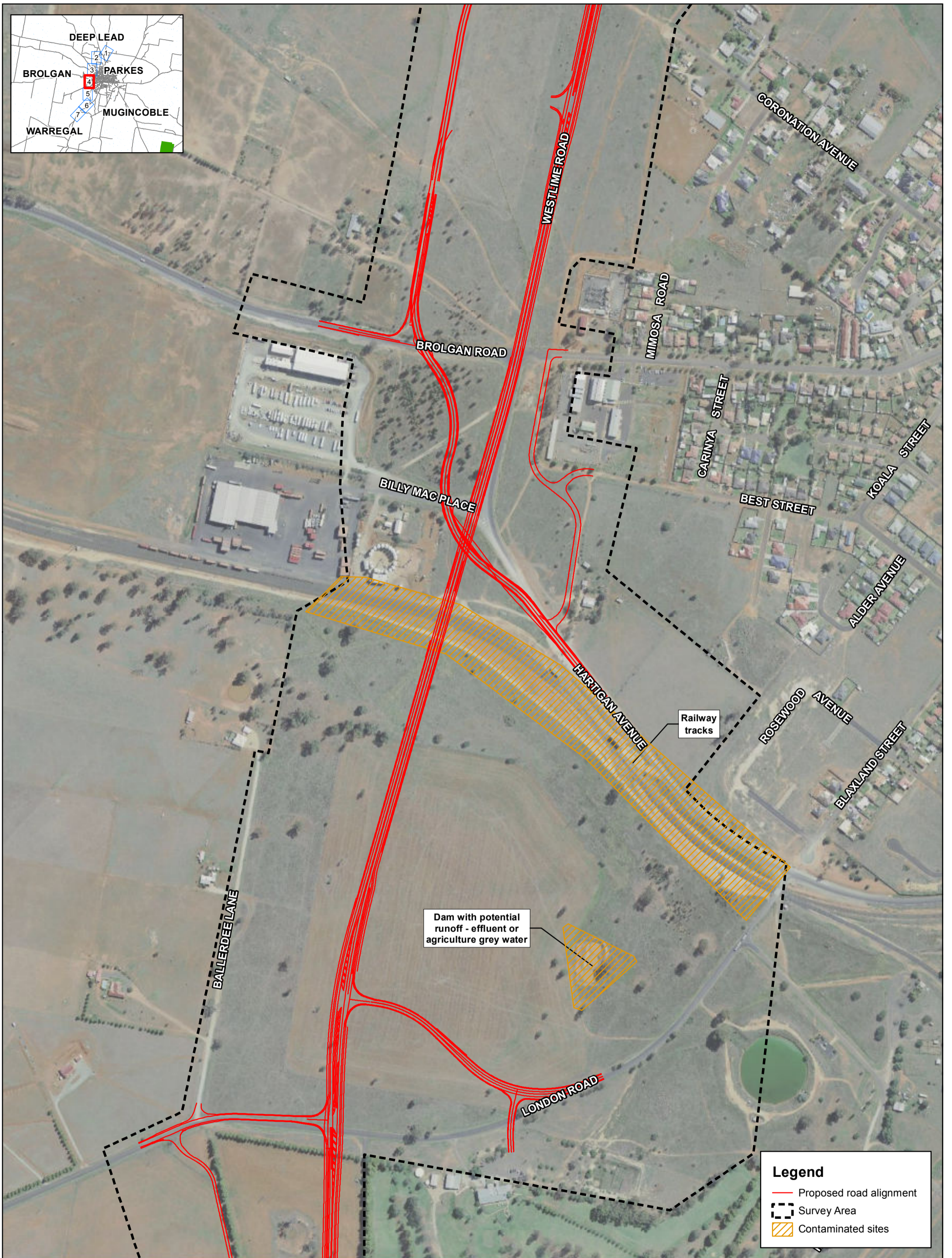
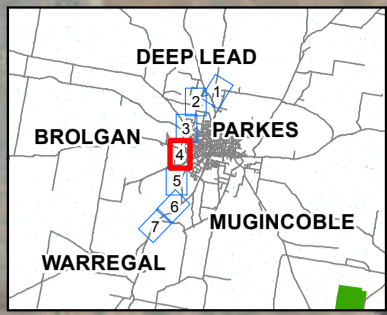
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Date: 31/08/2018	Approved by: Isabella.See		
Data Source: Imagery © Land and Property Information 2017		Coordinate system: GDA 1994 MGA Zone 55 Scale ratio correct when printed at A3	



Parkes Bypass

Figure 2
Contaminated Sites
Page 3 of 7

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Legend

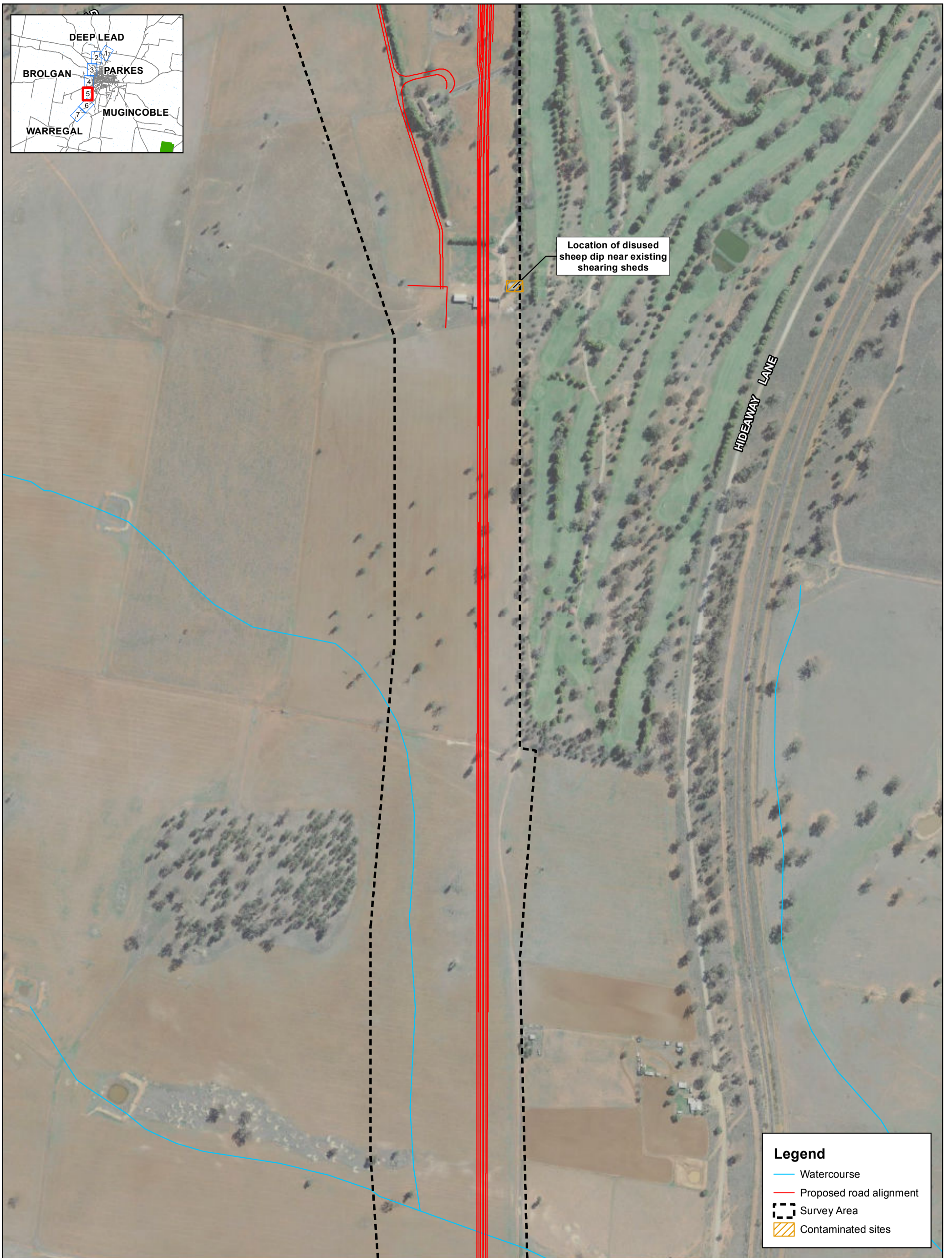
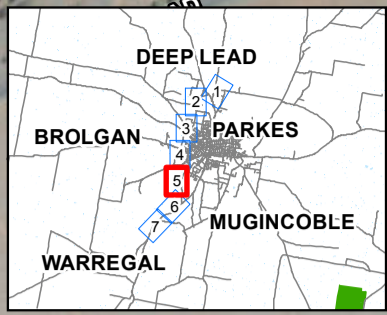
- Proposed road alignment
- Survey Area
- Contaminated sites

Map: 2270437A_GIS_002_A5 Author: orfanosm
 Date: 31/08/2018 Approved by: Isabella.See
 Data Source: Imagery © Land and Property Information 2017

0 75 150
 m
 1:5,000
 Coordinate system: GDA 1994 MGA Zone 55
 Scale ratio correct when printed at A3



Parkes Bypass
Figure 2
 Contaminated Sites
 Page 4 of 7



Legend

- Watercourse
- Proposed road alignment
- Survey Area
- Contaminated sites

Map: 2270437A_GIS_002_A5 Author: orfanosm
 Date: 31/08/2018 Approved by: Isabella.See
 Data Source: Imagery © Land and Property Information 2017

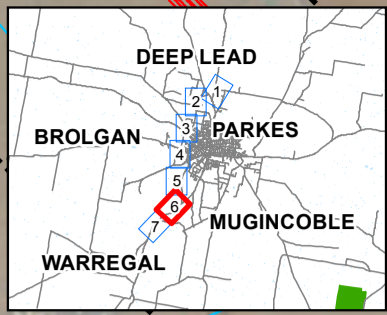


0 75 150
m
 1:5,000
 Coordinate system: GDA 1994 MGA Zone 55
 Scale ratio correct when printed at A3



Parkes Bypass
Figure 2
 Contaminated Sites
 Page 5 of 7

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Legend

- Watercourse
- Proposed road alignment
- Survey Area

Map: 2270437A_GIS_002_A5	Author: orfanosm
Date: 31/08/2018	Approved by: Isabella.See
Data Source: Imagery © Land and Property Information 2017	

0 75 150
m

1:5,000

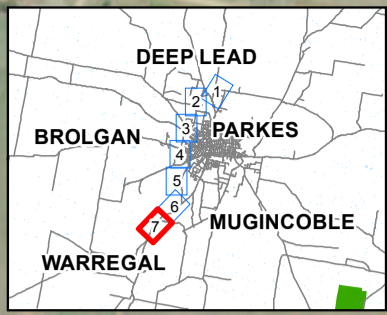
Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3



Parkes Bypass

Figure 2
Contaminated Sites
Page 6 of 7

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BARKERS ROAD

PARKESBOROUGH ROAD

NEWELL HIGHWAY

Legend

- Proposed road alignment
- Survey Area

Map: 2270437A_GIS_002_A5	Author: orfanosm
Date: 31/08/2018	Approved by: Isabella.See
Data Source: Imagery © Land and Property Information 2017	



0 75 150
m

1:5,000

Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3



Parkes Bypass

Figure 2
Contaminated Sites
Page 7 of 7

Appendix B

Groundwater bore search

NSW Office of Water

Work Summary

GW002429

Licence:

Licence Status:

Authorised Purpose(s):
Intended Purpose(s): NOT KNOWN

Work Type: Bore open thru rock

Work Status:

Construct.Method: Cable Tool

Owner Type: Private

Commenced Date:

Completion Date: 01/07/1928

Final Depth: 34.70 m

Drilled Depth: 34.80 m

Contractor Name:

Driller:

Assistant Driller:

Property:

Standing Water Level
(m):

GWMA:

Salinity Description: Fresh

GW Zone:

Yield (L/s):

Site Details

Site Chosen By:

County Parish Cadastre
Form A: ASHBU ASHBU.023 837
Licensed:

Region: 70 - Lachlan
River Basin: 412 - LACHLAN RIVER
Area/District:

CMA Map: 8531-N

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)

Elevation (Unknown)

Source:

Northing: 6337188.0

Easting: 609445.0

Latitude: 33°05'54.4"S

Longitude: 148°10'22.3"E

GS Map: -

MGA Zone: 0

Coordinate GD.,ACC.MAP
Source:

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Threaded Steel	0.00	30.50	152			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

33.80	33.80	0.00	Fractured	30.80	0.38		
-------	-------	------	-----------	-------	------	--	--

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	28.65	28.65	Clay	Clay	
28.65	34.75	6.10	Rock Water Bearing Water Supply	Rock	

Remarks

*** End of GW002429 ***

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NSW Office of Water

Work Summary

GW010688

Licence: 70BL003650

Licence Status: CONVERTED

Authorised Purpose STOCK
(s):
Intended Purpose(s): STOCK

Work Type: Bore

Work Status:

Construct.Method: Cable Tool

Owner Type: Private

Commenced Date:

Completion Date: 01/09/1953

Final Depth: 52.70 m

Drilled Depth: 52.70 m

Contractor Name:

Driller:

Assistant Driller:

Property: WESTLANDS

GWMA: 811 - CENTRAL WEST
FRACTURED ROCKS

GW Zone: -

Standing Water Level
(m):

Salinity Description: Stock

Yield (L/s):

Site Details

Site Chosen By:

County Parish Cadastre
Form A: ASHBU ASHBU.023 5
Licensed: ASHBURNHAM CURRAJONG Whole Lot //

Region: 70 - Lachlan

CMA Map: 8531-N

River Basin: 412 - LACHLAN RIVER
Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)

Elevation (Unknown)

Source:

Northing: 6335459.0

Easting: 609840.0

Latitude: 33°06'50.4"S

Longitude: 148°10'38.3"E

GS Map: -

MGA Zone: 0

Coordinate GD.,ACC.MAP
Source:

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Threaded Steel	-0.90	52.70	152			Seated on Bottom
1	1	Opening	Slots	46.60	52.70	152		1	Mechanically Slotted

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
46.00	49.00	3.00	(Unknown)	30.50		0.03			

Geologists Log**Drillers Log**

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.91	0.91	Loam	Loam	
0.91	37.49	36.58	Clay	Clay	
37.49	52.73	15.24	Slate Decomposed Water Supply	Slate	

Remarks

09/12/1978: MIDDLE TRUNDLE ROAD PARKES

***** End of GW010688 *****

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NSW Office of Water

Work Summary

GW020719

Licence: 70BL013739

Licence Status: CONVERTED

Authorised Purpose STOCK
(s):
Intended Purpose(s): STOCK

Work Type: Bore
Work Status:
Construct.Method: Cable Tool
Owner Type: Private

Commenced Date:
Completion Date: 01/10/1957

Final Depth: 85.30 m
Drilled Depth:

Contractor Name:
Driller:
Assistant Driller:

Property: N/A
GWMA: 811 - CENTRAL WEST
FRACTURED ROCKS
GW Zone: -

Standing Water Level
(m):
Salinity Description: 3001-7000 ppm
Yield (L/s):

Site Details

Site Chosen By:

County Parish Cadastre
Form A: ASHBU ASHBU.050 546
Licensed: ASHBURNHAM PARKES Whole Lot //

Region: 70 - Lachlan
River Basin: 412 - LACHLAN RIVER
Area/District:

CMA Map: 8531-N

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation (Unknown)
Source:

Northing: 6331571.0
Easting: 607698.0

Latitude: 33°08'57.4"S
Longitude: 148°09'17.3"E

GS Map: -

MGA Zone: 0

Coordinate GD.,ACC.MAP
Source:

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Threaded Steel	0.00	0.00	152			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
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Remarks

*** End of GW020719 ***

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NSW Office of Water

Work Summary

GW702042

Licence: 70BL229659

Licence Status: CONVERTED

Authorised Purpose DOMESTIC,STOCK
(s):
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method: Rotary Air

Owner Type: Private

Commenced Date:

Completion Date: 21/07/2004

Final Depth: 50.00 m

Drilled Depth: 50.00 m

Contractor Name: MT MCKECHNIE DRILLING &
PUMPING

Driller: Malcolm Dexter Mckechnie

Assistant Driller:

Property: N/A

GWMA: -

GW Zone: -

Standing Water Level: 25.000

Salinity:

Yield: 0.500

Site Details

Site Chosen By:

County Parish Cadastre
Form A: ASHBU ASHBU.23 LT 2 DP 838430
Licensed: ASHBURNHAM CURRAJONG Whole Lot 2//838430

Region: 70 - Lachlan

CMA Map: 8531-N

River Basin: 412 - LACHLAN RIVER
Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)

Elevation Unknown

Source:

Northing: 6335920.0

Easting: 608662.0

Latitude: 33°06'35.8"S

Longitude: 148°09'52.6"E

GS Map: -

MGA Zone: 0

Coordinate Source: Map Interpretation

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	50.00	125			Rotary Air
1	1	Casing	Pvc Class 9	0.00	15.00	125	119		Driven into Hole, Riveted

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

30.00	30.50	0.50	Unknown	25.00	0.50	02:00:00
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Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	Topsoil	Topsoil	
1.00	2.00	1.00	Clay	Clay	
2.00	7.00	5.00	Shale	Shale	
7.00	8.00	1.00	Clay	Clay	
8.00	12.00	4.00	Shale	Shale	
12.00	50.00	38.00	Basalt	Basalt	

Remarks

21/07/2004: Form A Remarks, Natalie Carling, 28-Apr-2005:

Coordinates taken from Arcview, based on location map provided by owner. Sump was installed from 30m to 50m. Open Hole. Assistant driller was L Anderson, total of 2 drillers.

*** End of GW702042 ***

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NSW Office of Water

Work Summary

GW702158

Licence: 70BL228086

Licence Status: CONVERTED

Authorised Purpose STOCK,DOMESTIC
(s):
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method: Rotary Air

Owner Type: Private

Commenced Date:
Completion Date: 30/09/2001

Final Depth: 42.00 m
Drilled Depth: 42.00 m

Contractor Name: MT MCKECHNIE DRILLING & PUMPING

Driller: Malcolm Dexter Mckechnie

Assistant Driller:

Property: MELVAVALE THOMAS STREET Standing Water Level: 27.000
PARKES 2870

GWMA: -
GW Zone: -

Salinity:
Yield: 0.500

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	ASHBU	ASHBU.23	1 855083
Licensed:	ASHBURNHAM	CURRAJONG	Whole Lot 1//855083

Region: 70 - Lachlan

CMA Map: 8531-N

River Basin: 412 - LACHLAN RIVER
Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Unknown
Source:

Northing: 6334569.0
Easting: 608383.0

Latitude: 33°07'19.8"S
Longitude: 148°09'42.5"E

GS Map: -

MGA Zone: 0

Coordinate Source: Map Interpretation

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	42.00	200			Rotary Air
1	1	Casing	Pvc Class 9	0.00	25.00	125	119		Driven into Hole, Glued

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Duration (hr)	Salinity (mg/L)
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							Hole Depth (m)		
38.00	39.00	1.00	Unknown		27.00		0.50		01:00:00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	Topsoil	Topsoil	
1.00	3.00	2.00	Clay	Clay	
3.00	12.00	9.00	Basalt, soft	Basalt	
12.00	42.00	30.00	Basalt	Basalt	

Remarks

30/09/2001: Form A Remarks, Natalie Carling, 26-Jul-2005:

Coordinates taken from arcview, based on location map provided with licence application. Open ended. Open hole. Sump was installed from 39m to 42m. Assistant driller was Leo Anderson, total of 2 drillers.

05/08/2005: Natalie Carling, 5-Aug-2005:

Adjusted coordinates, taken from arcview, based on location map provided by client.

*** End of GW702158 ***

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NSW Office of Water

Work Summary

GW703444

Licence: 70BL229212

Licence Status: CONVERTED

Authorised Purpose STOCK,DOMESTIC
(s):
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method:

Owner Type: Private

Commenced Date:

Completion Date: 18/05/2003

Final Depth:

Drilled Depth:

Contractor Name: MT MCKECHNIE DRILLING &
PUMPING

Driller: Malcolm Dexter Mckechnie

Assistant Driller:

Property: LOT 1 FROGSWAMP PARKES
2870

Standing Water Level:

GWMA:
GW Zone:

Salinity:
Yield:

Site Details

Site Chosen By:

County **Parish** **Cadastre**
Form A: ASHBU ASHBU.23 1//810439
Licensed:

Region: 70 - Lachlan
River Basin: - Unknown
Area/District:

CMA Map:
Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Unknown
Source:

Northing: 6335768.0
Easting: 609414.0

Latitude: 33°06'40.5"S
Longitude: 148°10'21.7"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	topsoil	Topsoil	
1.00	2.00	1.00	clay	Clay	
2.00	18.00	16.00	hard shale	Shale	
18.00	56.00	38.00	basalt	Basalt	

Remarks

18/05/2003: Form A Remarks:
Form AG. No other details were provided. Entered by H. Lester.

*** End of GW703444 ***

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NSW Office of Water

Work Summary

GW703838

Licence: 70BL229633

Licence Status: CONVERTED

Authorised Purpose DOMESTIC,STOCK
(s):
Intended Purpose(s):

Work Type: Bore

Work Status:

Construct.Method:

Owner Type: Private

Commenced Date:

Completion Date: 01/03/2010

Final Depth:

Drilled Depth:

Contractor Name:

Driller:

Assistant Driller:

Property: N/A LOT 156 CONDOBOLIN
ROAD PARKES 2870 NSW

Standing Water Level:

GWMA:
GW Zone:

Salinity:
Yield:

Site Details

Site Chosen By:

County
Form A: ASHBU
Licensed:

Parish
ASHBU.23

Cadastre
156/750152

Region: 70 - Lachlan
River Basin: - Unknown
Area/District:

CMA Map:
Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Unknown
Source:

Northing: 6334191.0
Easting: 607668.0

Latitude: 33°07'32.3"S
Longitude: 148°09'15.0"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

**Geologists Log
Drillers Log**

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
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Remarks

01/03/2010: Form A Remarks:

Entered by H. Lester

System date entered as only approx. given as 2004.

Final depth unknown. Guestimation of 40m entered.

We purchased the property after the bore was drilled and weren't left with any details. (as per our phone conversation in Oct 2009 with Lucy)

No other details were provided.

***** End of GW703838 *****

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NSW Office of Water

Work Summary

GW704282

Licence: 70BL232264

Licence Status: CONVERTED

Authorised Purpose STOCK,DOMESTIC
(s):
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status:

Construct.Method:

Owner Type: Private

Commenced Date:

Completion Date: 07/12/2010

Final Depth: 45.00 m

Drilled Depth:

Contractor Name:

Driller: Miles Dixon Cooke

Assistant Driller:

Property: LOT 935 PEAK HILL ROAD
PARKES 2870

Standing Water Level: 25.000

GWMA:
GW Zone:

Salinity:
Yield: 0.500

Site Details

Site Chosen By:

County
Form A: ASHBU
Licensed:

Parish
ASHBU.23

Cadastre
935//750152

Region: 70 - Lachlan
River Basin: 412 - LACHLAN RIVER
Area/District:

CMA Map: 8531-N

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Unknown
Source:

Northing: 6335585.0
Easting: 608694.0

Latitude: 33°06'46.7"S
Longitude: 148°09'54.0"E

GS Map: -

MGA Zone: 0

Coordinate Map Interpretation
Source:

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	45.00	0			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Duration (hr)	Salinity (mg/L)
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								Hole Depth (m)		
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Geologists Log**Drillers Log**

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
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Remarks

07/12/2010: Form A Remarks:
Helen Lester: Coordinates based on location map provided with the Form AG.
PVC casing into open hole - 12m.
No other details were provided.

*** End of GW704282 ***

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water

Work Summary

GW704356

Licence: 70BL228080

Licence Status: CONVERTED

Authorised Purpose (s): STOCK,DOMESTIC
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method:

Owner Type: Private

Commenced Date:

Completion Date: 01/01/2001

Final Depth: 53.00 m

Drilled Depth: 53.00 m

Contractor Name: MCKECHNIE DRILLING PTY LTD

Driller:

Assistant Driller:

Property: LOT 1 PARKES 2870
GWMA:
GW Zone:

Standing Water Level:
Salinity:
Yield:

Site Details

Site Chosen By:

County
Form A: ASHBU
Licensed:

Parish
 ASHBU.23

Cadastre
 1/854857

Region: 70 - Lachlan
River Basin: 412 - LACHLAN RIVER
Area/District:

CMA Map: 8531-N
Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Unknown
Source:

Northing: 6334374.0
Easting: 608543.0

Latitude: 33°07'26.1"S
Longitude: 148°09'48.7"E

GS Map: -

MGA Zone: 0

Coordinate Map Interpretation Source:

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	53.00	0			(Unknown)
1	1	Casing	P.V.C.	0.00	0.00	127			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Duration (hr)	Salinity (mg/L)
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								Hole Depth (m)		
--	--	--	--	--	--	--	--	----------------------	--	--

Geologists Log**Drillers Log**

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
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Remarks

01/01/2001: Form A Remarks:
Helen Lester: Coordinates based on location map provided with the Form AG.
Casing - PVC, 5"
High calcium content.
No other details were provided.

*** End of GW704356 ***

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NSW Office of Water

Work Summary

GW704568

Licence: 70WA609690

Licence Status: CURRENT

Authorised Purpose STOCK,DOMESTIC
(s):
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method:

Owner Type: Private

Commenced Date:

Completion Date: 03/09/2012

Final Depth: 57.00 m

Drilled Depth: 57.00 m

Contractor Name: Drillit P/L

Driller: Marko Ivan Zagrovic

Assistant Driller:

Property: LOT 145 GOOBANS STREET
LOT 145 GOOBANS STREET
ALECTOWN 2870 NSW

Standing Water 27.000
Level:

GWMA:
GW Zone:

Salinity: Salty
Yield: 0.500

Site Details

Site Chosen By:

County
Form A: ASHBU
Licensed:

Parish
ASHBU.23

Cadastre
2//830071

Region: 70 - Lachlan

CMA Map: 8531-N

River Basin: 412 - LACHLAN RIVER
Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Unknown
Source:

Northing: 6335655.0
Easting: 609674.0

Latitude: 33°06'44.1"S
Longitude: 148°10'31.8"E

GS Map: -

MGA Zone: 0

Coordinate Unknown
Source:

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	57.00	200			(Unknown)
1	1	Casing	Pvc Class 9	0.00	44.00	125			
1	1	Opening	Screen	44.00	50.00	125		1	PVC Class 9

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
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Geologists Log Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
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Remarks

03/09/2012: Form A Remarks:

Helen Lester: Coordinates are taken from charted licence location.

Bore/Excavation form

Drilled 200mm hole to 57m aquifer at 47m, small salty supply. Hole cased with 125mm PVC with 6m screen and 3m sup, gravel packed to 30m, cemented and backfilled.

*** End of GW704568 ***

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NSW Office of Water

Work Summary

GW704588

Licence: 70WA614660

Licence Status: CURRENT

Authorised Purpose (s): STOCK, DOMESTIC
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method: Rotary Air

Owner Type: Private

Commenced Date:

Completion Date: 05/02/2013

Final Depth: 35.00 m

Drilled Depth: 35.00 m

Contractor Name: Miles Cooke Water Bores & Drilling

Driller: Miles Dixon Cooke

Assistant Driller:

Property: 3 COOKOPIE STREET PARKES 2870 **Standing Water Level:** 24.000

GWMA:
GW Zone:

Salinity:
Yield:

Site Details

Site Chosen By:

County: ASHBU **Parish:** ASHBU.23 **Cadastre:** 1095//750152
Form A: ASHBU **Licensed:**

Region: 70 - Lachlan
River Basin: - Unknown
Area/District:

CMA Map:
Grid Zone: **Scale:**

Elevation: 0.00 m (A.H.D.)
Elevation: Unknown
Source:

Northing: 6334704.0 **Latitude:** 33°07'15.5"S
Easting: 608060.0 **Longitude:** 148°09'29.9"E

GS Map: -

MGA Zone: 0 **Coordinate Source:** Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	3.00	180			Rotary Air
1		Hole	Hole	3.00	15.00	150			Rotary Air
1		Hole	Hole	15.00	35.00	150			Rotary - Percussion (Down Hole Hammer)
1		Annulus	Waterworn/Rounded	22.00	35.00				Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 9	0.00	35.00	114	104		Riveted and Glued

1	1	Casing	Pvc Class 9	0.00	3.00	130	116		Seated on Bottom, Riveted
1	1	Opening	Slots - Diagonal	29.00	35.00	114		1	Casing - Hand Sawn Slot, PVC Class 9, Riveted and Glued, SL: 200.0mm, A: 4.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
31.00	31.00	0.00	Unknown	24.00				00:20:00	

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	topsoil	Topsoil	
1.00	15.00	14.00	clay, hard, red	Clay	
15.00	35.00	20.00	shale, hard, blue	Shale	

Remarks

05/02/2013: Form A Remarks:

Helen Lester: Coordinates are taken from charted licence location.

*** End of GW704588 ***

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NSW Office of Water

Work Summary

GW704643

Licence: 70WA614675

Licence Status: CURRENT

Authorised Purpose STOCK,DOMESTIC
(s):
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore

Work Status: Supply Obtained

Construct.Method: Rotary - Percussion (Down Hole Hammer)

Owner Type: Private

Commenced Date:

Completion Date: 22/03/2013

Final Depth: 66.00 m

Drilled Depth: 66.00 m

Contractor Name: Miles Cooke Water Bores & Drilling

Driller: Miles Dixon Cooke

Assistant Driller:

Property: 215 BACK TRUNDLE ROAD
PARKES 2870

Standing Water Level: 27.000

GWMA:
GW Zone:

Salinity:
Yield: 0.500

Site Details

Site Chosen By:

County
Form A: ASHBU
Licensed:

Parish
ASHBU.23

Cadastre
1//592881

Region: 70 - Lachlan

CMA Map: 8531-N

River Basin: 412 - LACHLAN RIVER
Area/District:

Grid Zone:

Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Unknown
Source:

Northing: 6334453.0
Easting: 607646.0

Latitude: 33°07'23.8"S
Longitude: 148°09'14.1"E

GS Map: -

MGA Zone: 0

Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	66.00	150			Rotary - Percussion (Down Hole Hammer)
1	1	Casing	Pvc Class 9	0.00	66.00	114	104		Seated on Bottom, Riveted and Glued
1	1	Opening	Slots - Diagonal	48.00	66.00	114		1	Casing - Hand Sawn Slot, PVC Class 9, Riveted and Glued, SL: 200.0mm, A: 3.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
36.00	36.00	0.00	Unknown	27.00					
48.00	48.00	0.00	Unknown	27.00					
58.00	58.00	0.00	Unknown	27.00		0.50		01:00:00	

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	topsoil	Topsoil	
1.00	4.00	3.00	clay, red	Clay	
4.00	6.00	2.00	clay, yellow	Clay	
6.00	40.00	34.00	shale, hard, yellow	Shale	
40.00	66.00	26.00	shale, hard, blue	Shale	

Remarks

22/03/2013: Form A Remarks:

Helen Lester: Coordinates are taken from charted licence location.

Gravel pack inserted - 100 litres rounded, graded, grain size (7-10mm) - No depth given.

*** End of GW704643 ***

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Appendix C

Aerial photographs



0 m 500 m




 Site boundary

Figure 1
Historical Aerial Photograph
8 November 1973




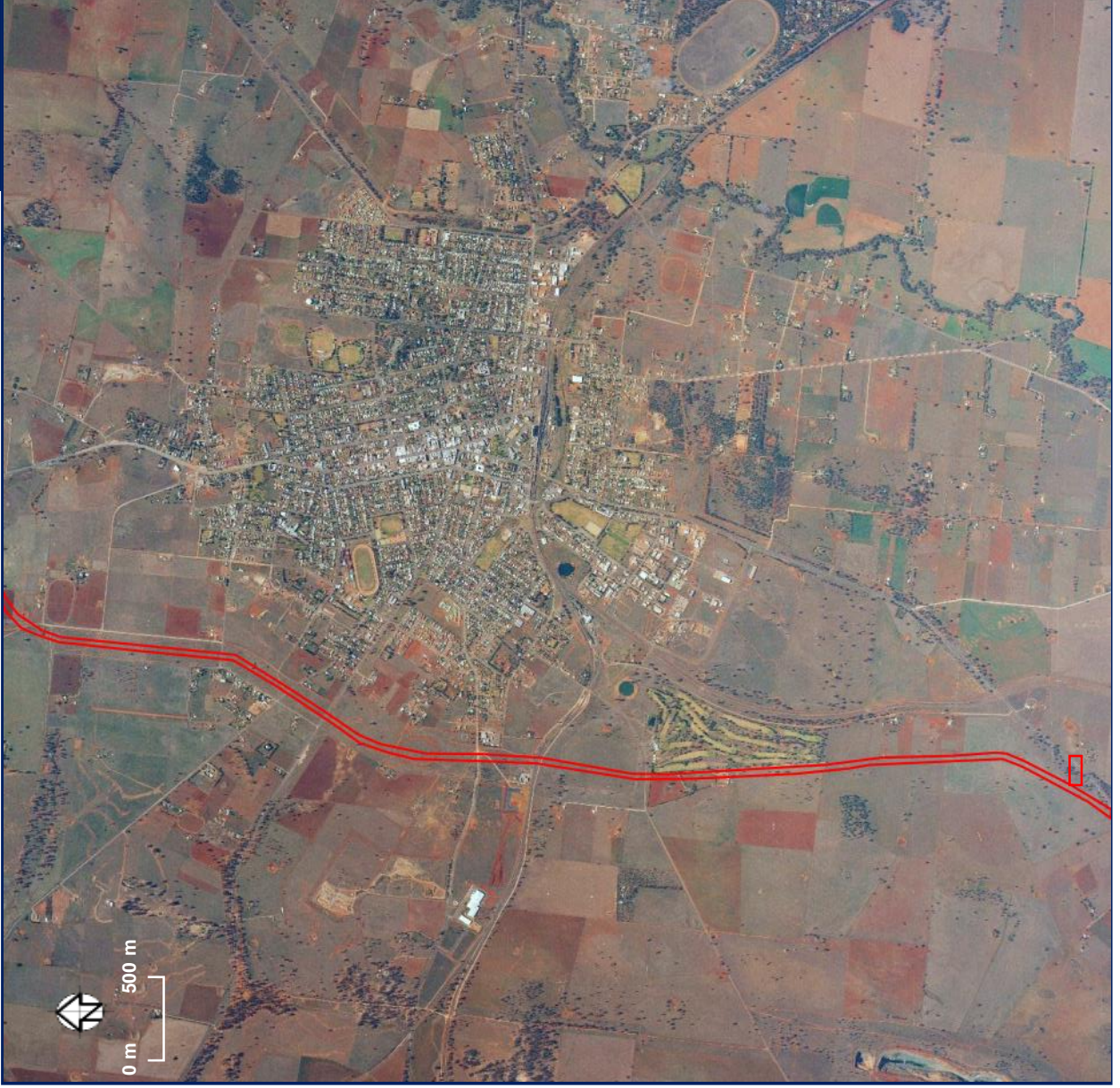
 Site boundary

Figure 2
Historical Aerial Photograph
20 July 1977




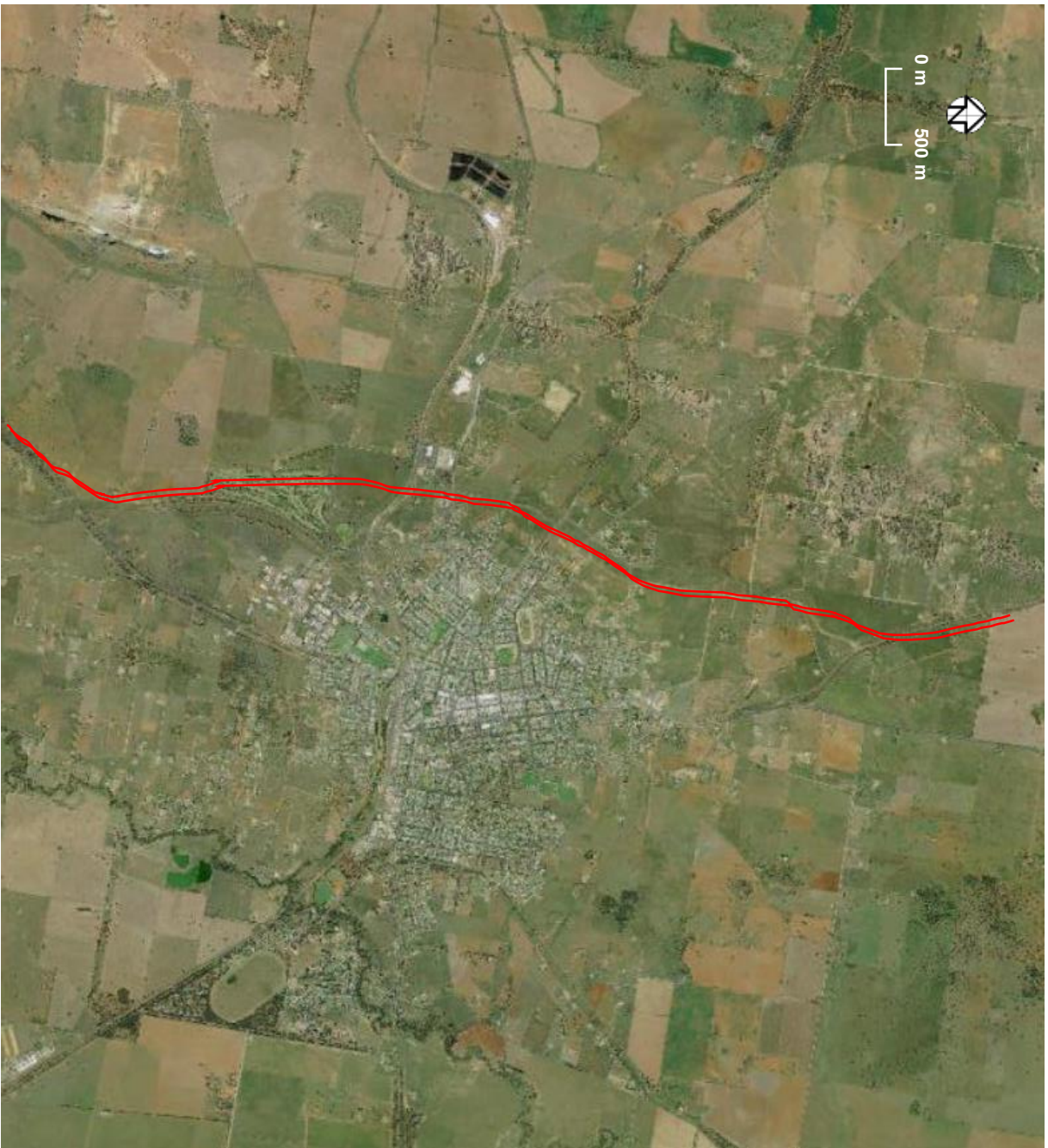
 Site boundary

Figure 3
Historical Aerial Photograph
29 September 1989




 Site boundary

Figure 4
Historical Aerial Photograph
2014



rms.nsw.gov.au/autorenew



13 22 13



Customer feedback
Roads and Maritime
Locked Bag 928,
North Sydney NSW 2059

October 2018