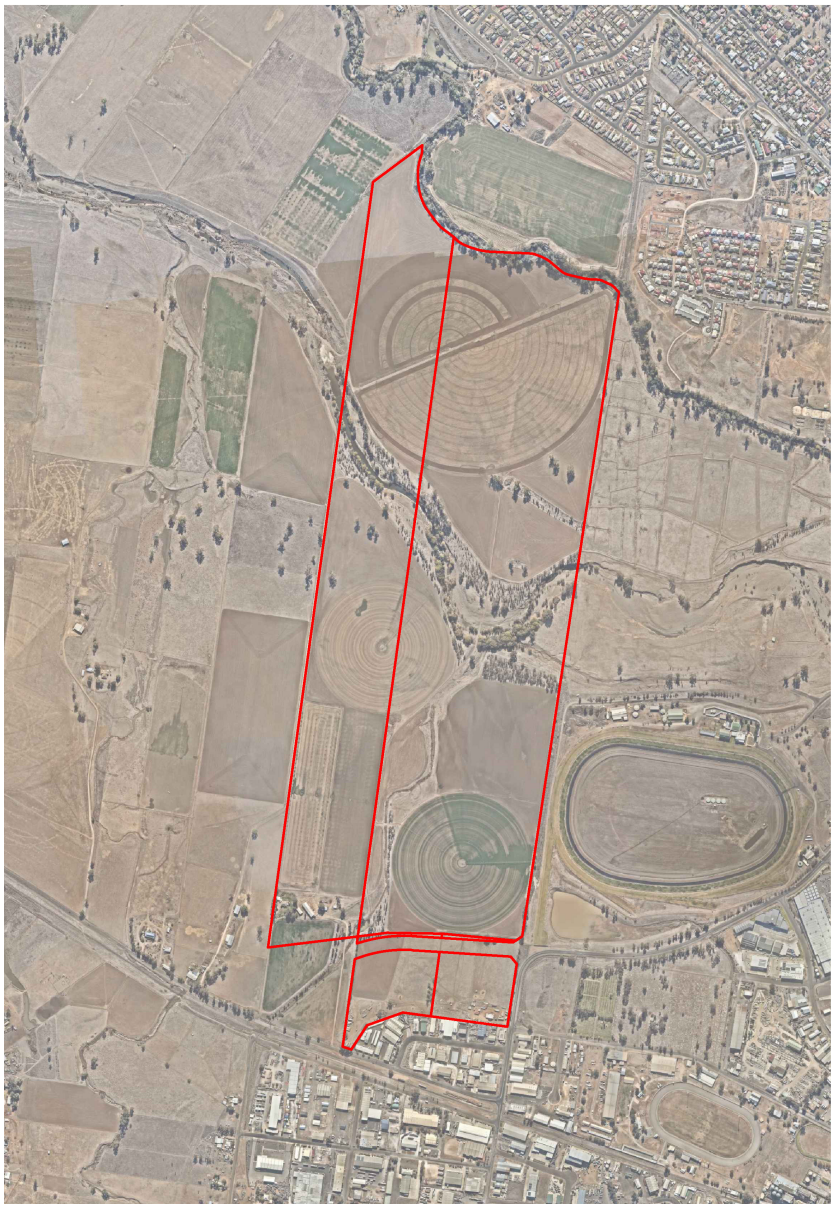
9 Appendices

9.1 Agricultural land study



Agricultural Report
For Proposed Solar Farm and Industrial Precinct
Lots 1 -3 DP 1234850 and Lot 60 DP1227482
55 Dampier Street and 72 Wallamore Road,
Taminda NSW 2340

Melaleuca Group Pty Ltd

Date: 7th March 2019

Prepared for:
Elton Consulting on behalf of Tamworth Industrial Pty Ltd

Further Information:
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Melaleuca Group Pty Limited

1. Introduction

Melaleuca Group has been engaged by Elton Consulting on behalf of Chan Abbey Holdings Pty Ltd to undertake an Agricultural Assessment for 55 Dampier Street and 72 Wallamore Road, Taminda NSW 2340 (the site) to allow for the proposed rezoning of part of the Study Area. The proposal will subsequently include development of a Solar Farm and industrial lands. Please refer to Figures 1 and 2 for the site locality plan and a plan showing the rezoning proposal.

The objective of this assessment is to assess the agricultural impact of the proposed development.

2. The Study Area

2.1 Site Identification

The Study Area is located approximately 2.5km west of the Tamworth CBD. The Area consists of four parcels namely (note areas approximate only):

- Lot 1 DP 1234850 - 90 ha;
- Lot 2 DP 1234850 - 5 ha;
- Lot 3 DP 1234850 - 4.5 ha;
- Lot 60 1227482 - 52 ha; and
- a 1.9ha road reserve.

The Study Area is bound by the Peel River in the north and industrial lands/Wallamore Road in the south. To the east is Tamworth Cemetery and Racecourse and to the west is agricultural lands. The Wallamore Anabranch dissects the Study Area in approximately the middle of the Study Area.

2.2 Zoning and Proposal

The Study Area is zoned RU4 Primary Production Small Lots in accordance with the Tamworth Regional Council (TRC) Local Environmental Plan (2010). Surrounding lands are predominantly also zoned RU4 with exception of lands to the south and south-east whereby a mixture of zones occur including IN1 (General Industrial), SP1 (Special Activities), SP3 (Tourist), RE1 (Public Recreation) and B5 (Business Development).

The proposal would see the rezoning of approximately 11ha within Lots 2-3 to IN1 (6.7ha), B5 (2.4ha) and Road Reserve (1.9ha). The remainder of the Area would remain as RU4. The Solar Farm would be located in Lot 1 which would also not be rezoned. Further, while also not being rezoned, approximately 13ha within Lot 60 would be utilised for flood mitigation measures. This area would not be exclusive to flood mitigation activity as flooding is irregular, thereby allowing for other uses to occur.

2.3 Site Usages

Information pertaining to the historical landuses are limited to information available from Kayandel Archaeological Services (2018), available aerial photography and knowledge of agricultural activities

in the locality. Given the characteristics of the land it is surmised the Study Area has been used for a range of agricultural pursuits for many years (estimated for nearly 200 years).

Kayandel Archaeological Services (2018) indicate the first Europeans to venture into Tamworth area was from 1818 (John Oxley) with other explorers and settlement of the area soon after. In 1833, 313,298 acres of the Liverpool Plains were granted to the Australian Agricultural Company. The following extract is provided from Kayandel Archaeological Services (2018):

> *Sheep and cattle were grazed on the alluvial plains of the Peel River, and farming consisted primarily of crops such as wheat and, later, tobacco. The Tamworth region, specifically the Goonoo Goonoo estate owned by the Australian Agricultural Company, became known for wool (EJE Town Planning, 2001). The estate was fenced from the mid-1950s, which prevented the shepherding of sheep and was subsequently less cost effective (EJE Town Planning, 2001).*

Given the generic history of the area, it is likely the Study Area was settled and cleared around 100 - 180 years ago with the establishment of large pastoral properties in the area. Initially principal uses were likely to be grazing animals but also some subsistence farming could have occurred. Establishment into broad acre cropping would have soon followed and is the typical agricultural pursuit of the area of today.

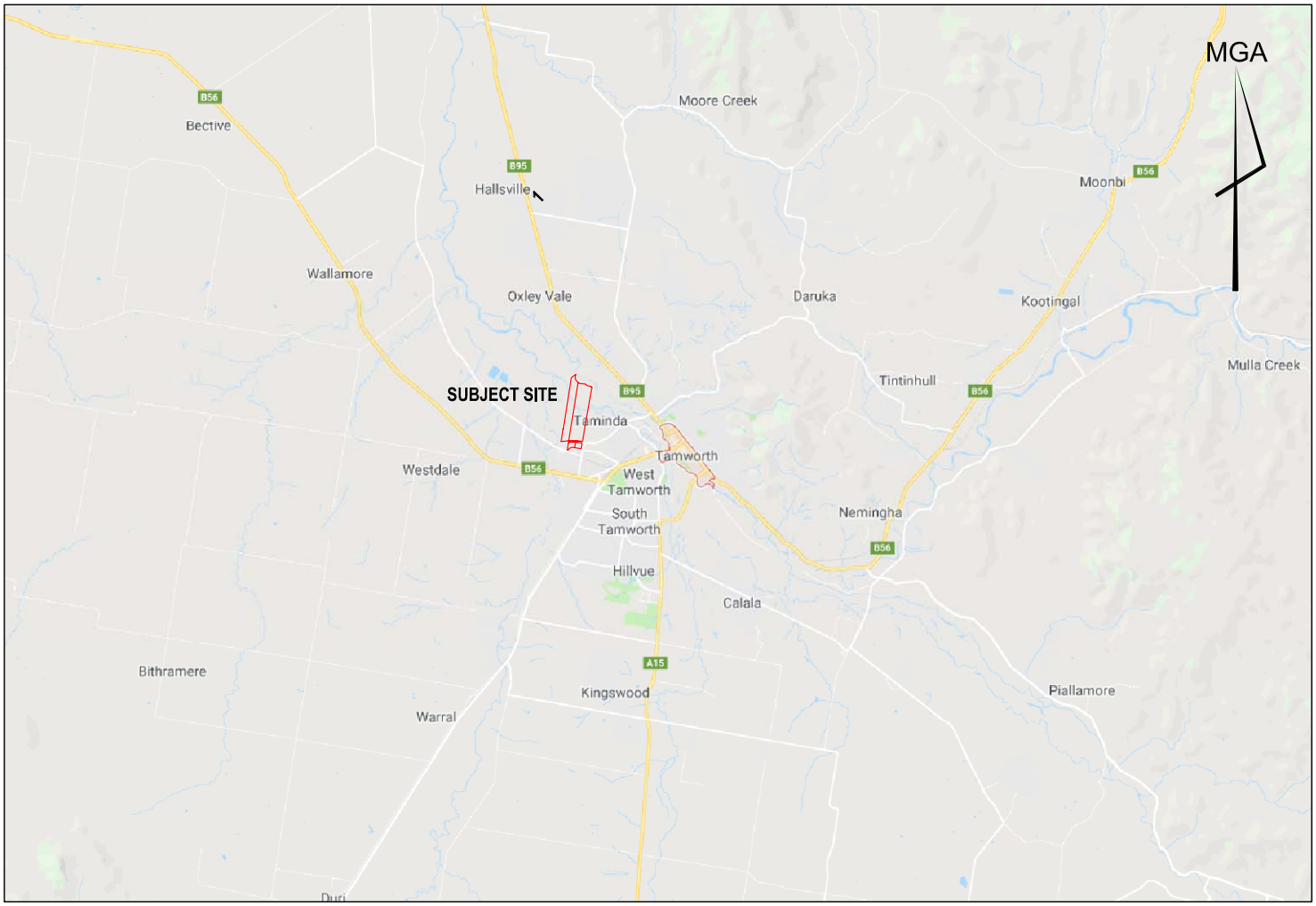
Thereby it is surmised predominantly the land was used low intensity grazing (cattle and sheep) and for broad scale cropping such as Wheat, Tobacco with possibilities of Cotton, Canola, Soybean, Corn, Lucerne and a range of other crops throughout its history. Given the Study Area lies within the floodplain of the Peel River, agricultural uses would need to have been adaptive for the ephemeral nature of flooding.

Plates 1 to 2 show general views some of the cropping land within the site in July 2018.

2.4 Local Geology and Soil Description

Banks (2001) maps (Figure 3) and describes the soil landscapes and geology of the Study Area as follows:

- Majority of Study Area, northern section: Alluvial *Peel* Soil Landscape. Geology - Quaternary (Qa) and recent alluvium of the Peel and lower Cockburn Rivers. Sources of parent materials are extremely diverse;
- Majority of southern section of Study Area (south-west of Racecourse): Alluvial *Goonoo Goonoo* Soil Landscape. Geology - Quaternary alluvium derived predominantly from Tertiary basalts of the Liverpool Ranges; and
- Small section near southern boundary of Study Area: Residual *Duri* Soil Landscape. Geology - Complex folded Carboniferous and Devonian sedimentary rocks of the Tamworth Fold Belt. The Devonian geology units include the Baldwin Formation, Keepit Conglomerate, and Mandowa Mudstones.





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Date	11.12.2018
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Dwg. No.	MG18026-PL04A

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Project: Lots 1 - 3 DP1234850 & Lot 60 DP1227482, 21 & 72 Wallamore Rd & 55 Dampier St, Taminda

Title: LOCALITY PLAN

Figure 1

The existing planning controls identifies the land use as an Primary Production Small Lots. It is proposed to amend the planning controls on site as follows.

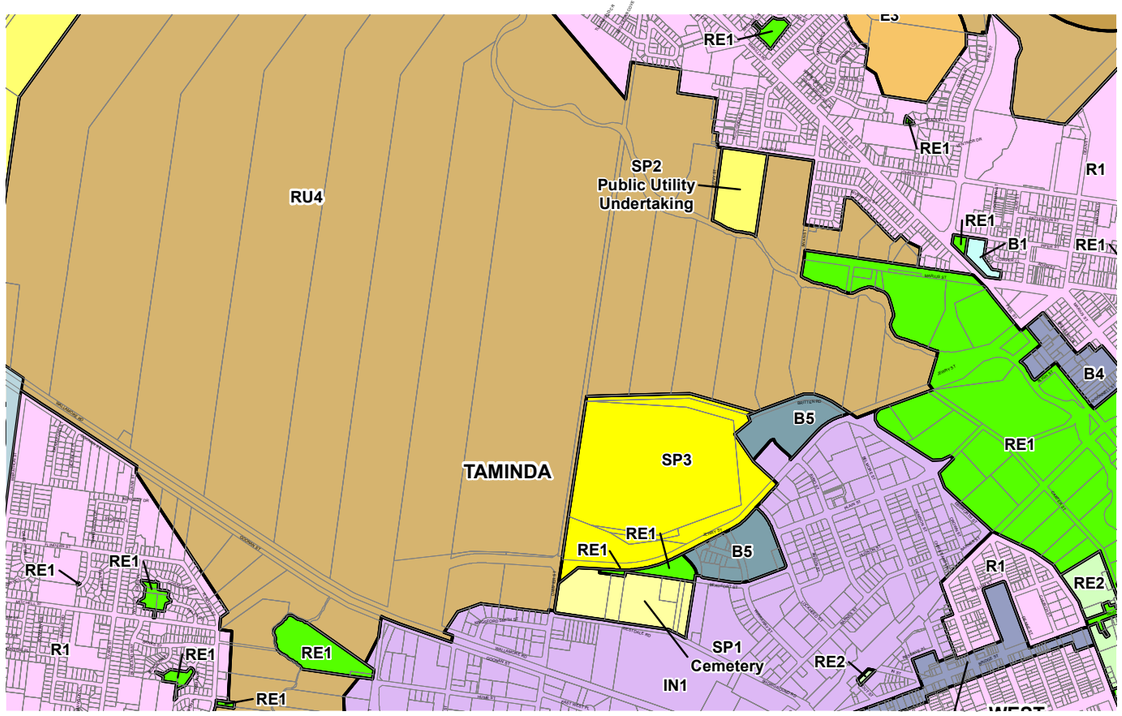
The proposal:

- Amendments to LEP to allow for B5 Business Development and IN1 General Industrial

Total site area = 9Ha

- B5 2.4Ha
- IN1 = 4.6Ha

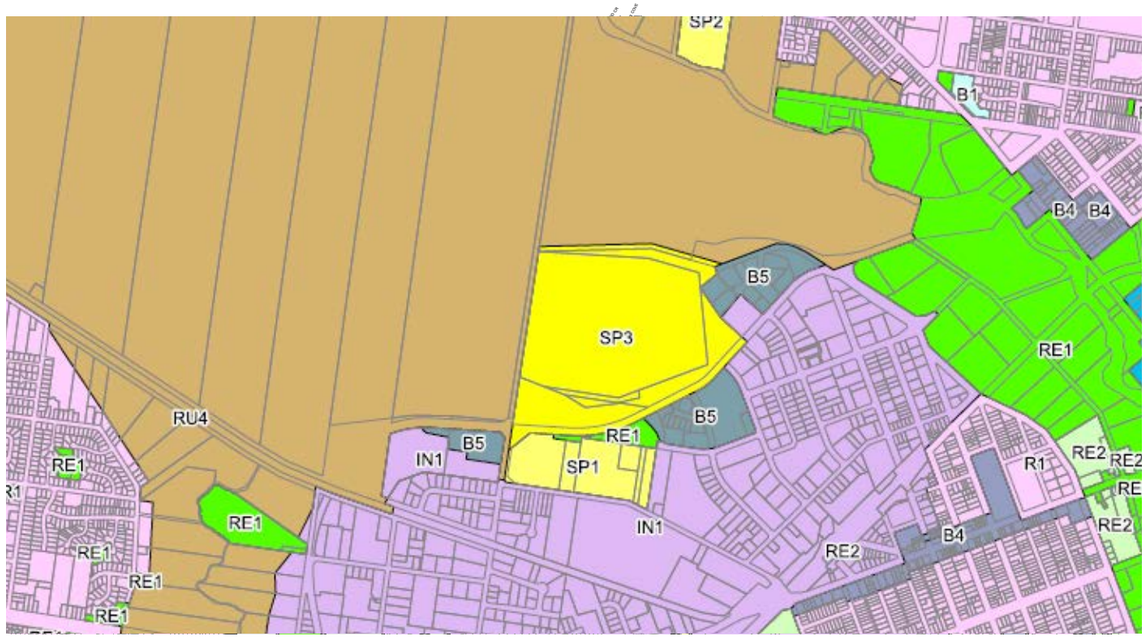
Existing Land Zoning



Zone

B1	Neighbourhood Centre	R2	Low Density Residential
B2	Local Centre	R5	Large Lot Residential
B3	Commercial Core	RE1	Public Recreation
B4	Mixed Use	RE2	Private Recreation
B5	Business Development	RU1	Primary Production
B7	Business Park	RU3	Forestry
E1	National Parks and Nature Reserves	RU4	Primary Production Small Lots
E2	Environmental Conservation	RU5	Village
E3	Environmental Management	RU6	Transition
IN1	General Industrial	SP1	Special Activities
IN3	Heavy Industrial	SP2	Infrastructure
R1	General Residential	SP3	Tourist

Proposed Land Zoning



Zone

B1	Neighbourhood Centre	R2	Low Density Residential
B2	Local Centre	R5	Large Lot Residential
B3	Commercial Core	RE1	Public Recreation
B4	Mixed Use	RE2	Private Recreation
B5	Business Development	RU1	Primary Production
B7	Business Park	RU3	Forestry
E1	National Parks and Nature Reserves	RU4	Primary Production Small Lots
E2	Environmental Conservation	RU5	Village
E3	Environmental Management	RU6	Transition
IN1	General Industrial	SP1	Special Activities
IN3	Heavy Industrial	SP2	Infrastructure
R1	General Residential	SP3	Tourist



Plate 1: General view of cropping area on Lot 1 (Source: J Foong).



Plate 2: General view of cropping area on Lot 1 (Source: J Foong).



Figure 3. Soil Landscapes (Banks 2001; source: eSPADE NSW OEH website).

These soil landscapes are described by Banks (2001) as:

Peel (**pe**):

> **Soils –** soil types are individually extensive, but random in distribution. In decreasing order of dominance, soil types encountered include giant, moderately well-drained Black Dermosols (Chernozems); very deep, imperfectly drained Calcareous Black Vertosols (calcareous Black Earths), very deep, imperfectly drained Haplic Black Vertosols (Black Earths); and moderately deep, moderately well-drained Brown Chromosols (Red-brown Earths).

Goonoo Goonoo (**gn**):

> **Soils** – soil types are diverse but individually locally extensive. In decreasing order of importance, soil types encountered include very deep to giant, imperfectly drained Brown Sodosols (Solodic Soils); deep to giant, imperfectly drained Black Vertosols (Black Earths); very deep to giant, poorly drained Grey Vertosols (Grey Clays); shallow, moderately well-drained Calcareous Rudosols (calcareous Alluvial Soils); and deep to giant, imperfectly drained Brown Vertosols (Brown Clays).

Duri (du):

> **Soils** – extremely complex due to rapid changes in underlying lithology. Generally dominated by duplex soils such as moderately deep, moderately well-drained Red and Brown Chromosols (Noncalcic Brown Soils; Red-brown Earths) with minor occurrences of shallow, very well-drained Rudosols (Lithosols) around rock outcrops. Deep, imperfectly drained Red Vertosols (Red Clays) and deep to very deep, imperfectly drained Red and Brown Chromosols (Non-calcic Brown Soils) and possibly some Sodosols (Solodic Soils) occur along drainage lines and on sodic bedrock.

2.5 Topography

The Study Area is considered relatively flat across its entirety. Some undulations occur (e.g. in vicinity of the Wallamore Anabranch). Elevation is around 380m across the Study Area.

2.6 Surface Water

The Study Area is bounded in the north by the Peel river and the Wallamore Anabranch dissects the Study Area. Timbumburi Creek is located to the west.

2.7 Agricultural Land Classification

Three (3) available mapping data sets were available for review, namely:

- Land Capability Mapping (Emery 1985 Soil Conservation Service of NSW);
- Land and Soil Capability Mapping (NSW OEH 2013); and
- Biophysical Strategic Agricultural Land (BSAL) Mapping (Department of Planning and Environment 2013).

Land Capability Mapping (1985) map the majority of the Study Area as:

- Class 2 - Suitable for Regular Cultivation: Soil conservation practices such as strip cropping, conservation tillage and adequate crop rotation (Figure 4).

This area applies to the northern 138 ha of the Study Area. The remaining section of the Area is mapped as Urban.

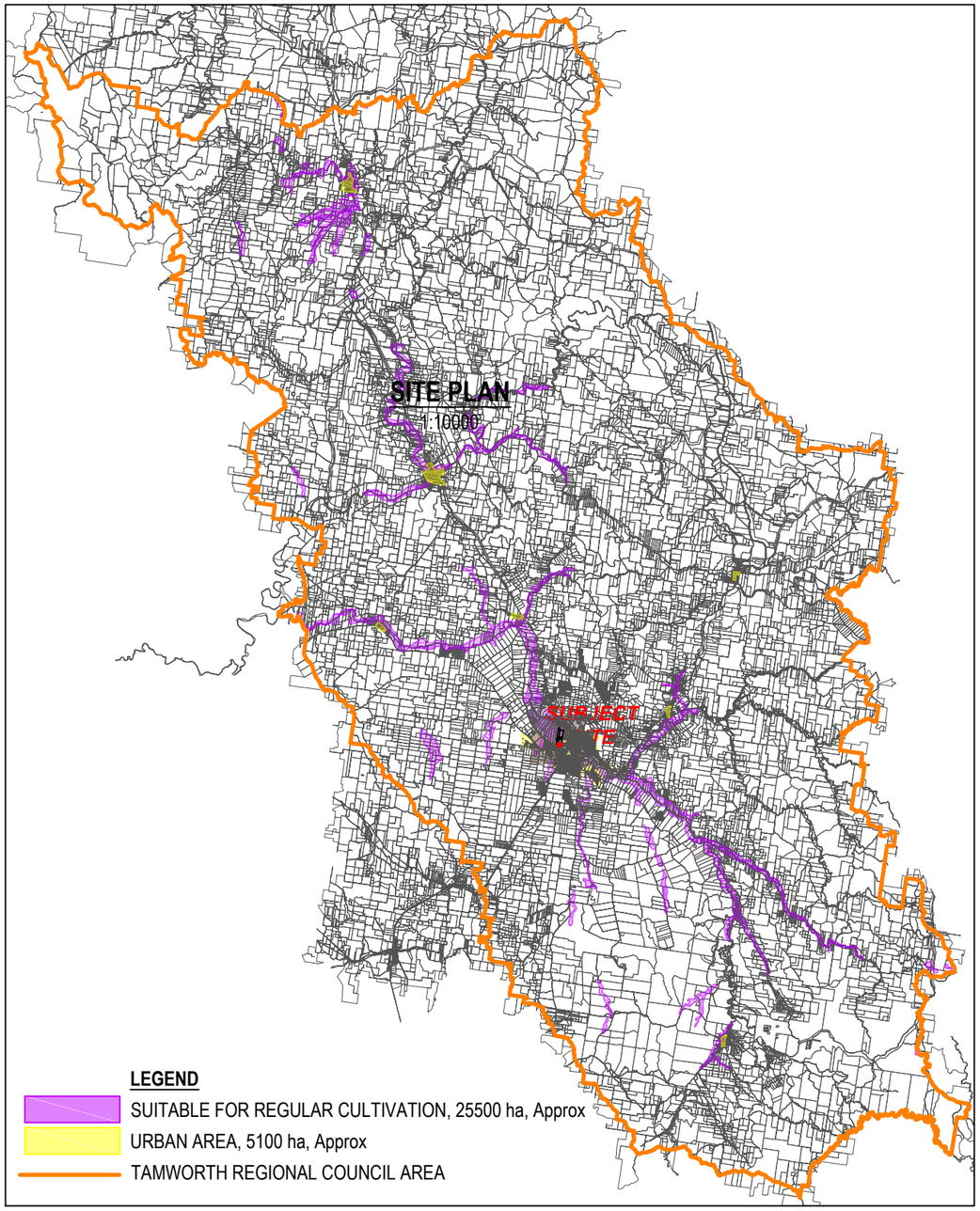
Land and Soil Capability Mapping (NSW OEH 2013) map (Figure 5) the Study Area into three classes, namely:

- Class 2 - Slight but significant limitations. Land capable of sustaining high impact land uses which can be managed by readily available, and easily implemented management practices;
- Class 3 - Moderate limitations. Land capable of sustaining high impact land uses using more intensive, readily available and accepted management practices;
- Class 4 - Moderate to severe limitations. Land generally not capable of sustaining high impact land uses unless using specialised management practices with high level of knowledge, expertise, inputs, investment and technology. Limitations are more easily managed for lower impact land uses (e.g. grazing).

That is, this mapping takes into a number of attributes including:

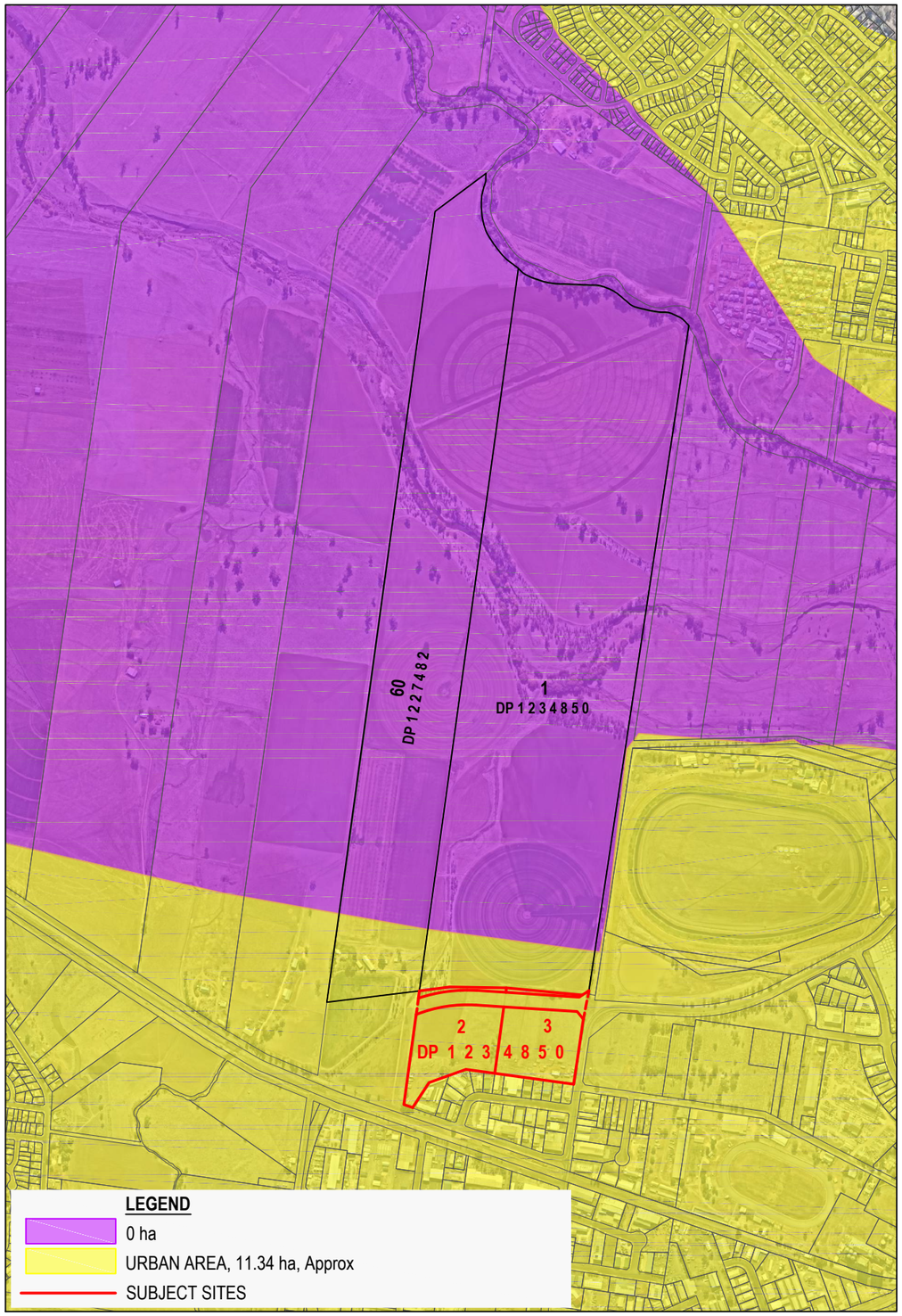
- Soil acidity;
- Water;
- Soil structure;
- Wind erosion;
- Shallow rock;
- Salinity;
- Mass Movement; and
- Water logging/flooding.

The BSAL (2013) map the majority of the Study Area (152 ha) as strategic agricultural land (143 ha). This area generally aligns to that mapped within the Land Capability mapping of 1985. That is, it excludes the southern portion of the Study Area (Figure 6). It is important to note, the Proposal is not considered neither a mining or coal seam gas development. However, this mapping was utilised to obtain an understanding of the potential of the land for agricultural pursuits. Thereby, it has been determined that this proposal will not require a submission to the Commonwealth Independent Expert Scientific Committee.



MGA

PLAN OF LAND CAPABILITY ACROSS TAMWORTH REGIONAL COUNCIL
(SUITABLE FOR REGULAR CULTIVATION & URBAN AREA)
SCALE; 1:800000



PLAN OF SUBJECT SITE LAND CAPABILITY
(SUITABLE FOR REGULAR CULTIVATION & URBAN AREA)
SCALE; 1:15000

SOURCE:
AERIAL: NearMaps
LAND CAPABILITY: Emery 1985 Soil Conservation Service of NSW)

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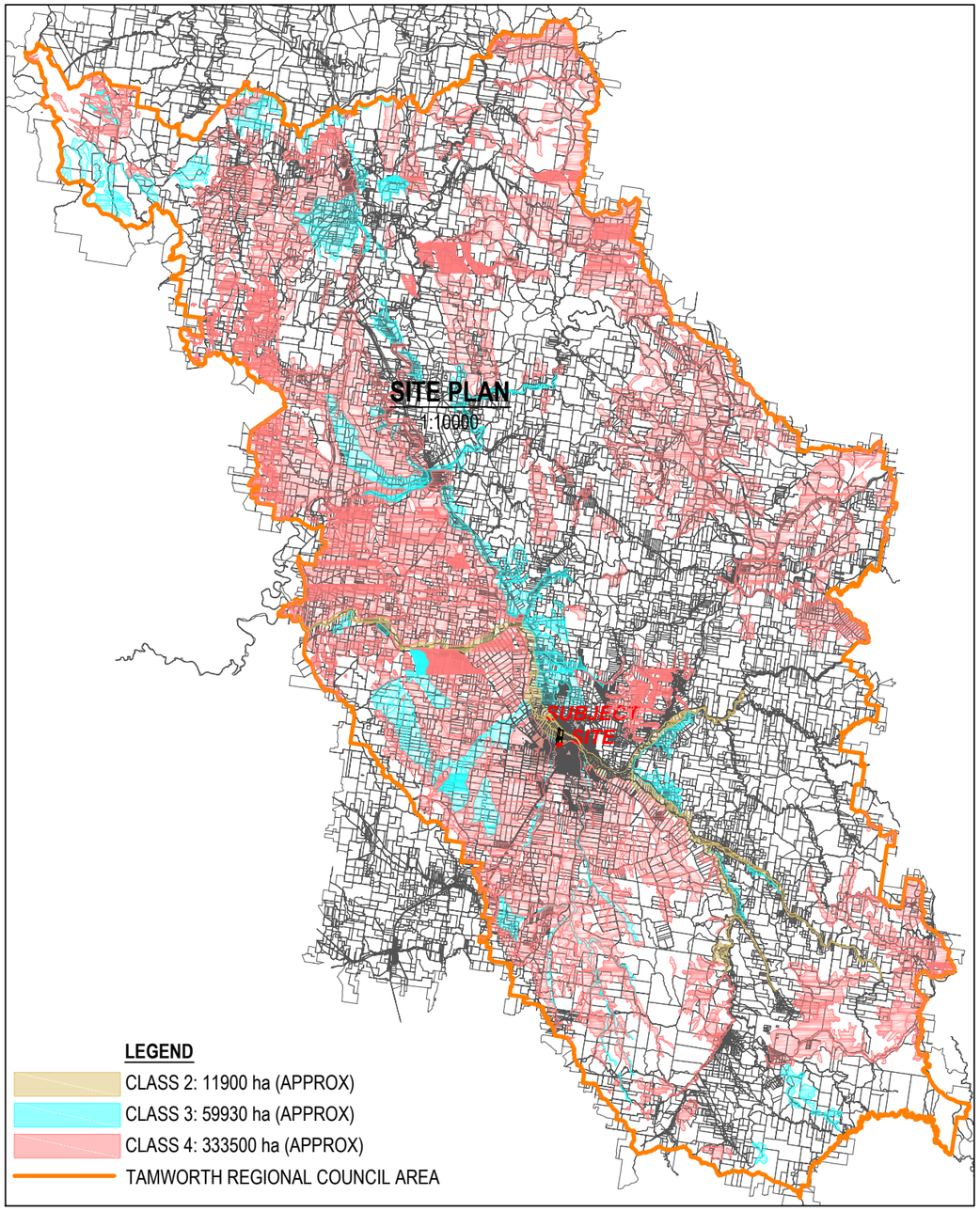
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SCALE 1:15000 AT A1

Project: Lots 1 - 3 DP1234850 & Lot 60 DP1227482, 21 & 72 Wallamore Rd & 55 Dampier St, Taminda

Title: PLAN OF LAND CAPABILITY

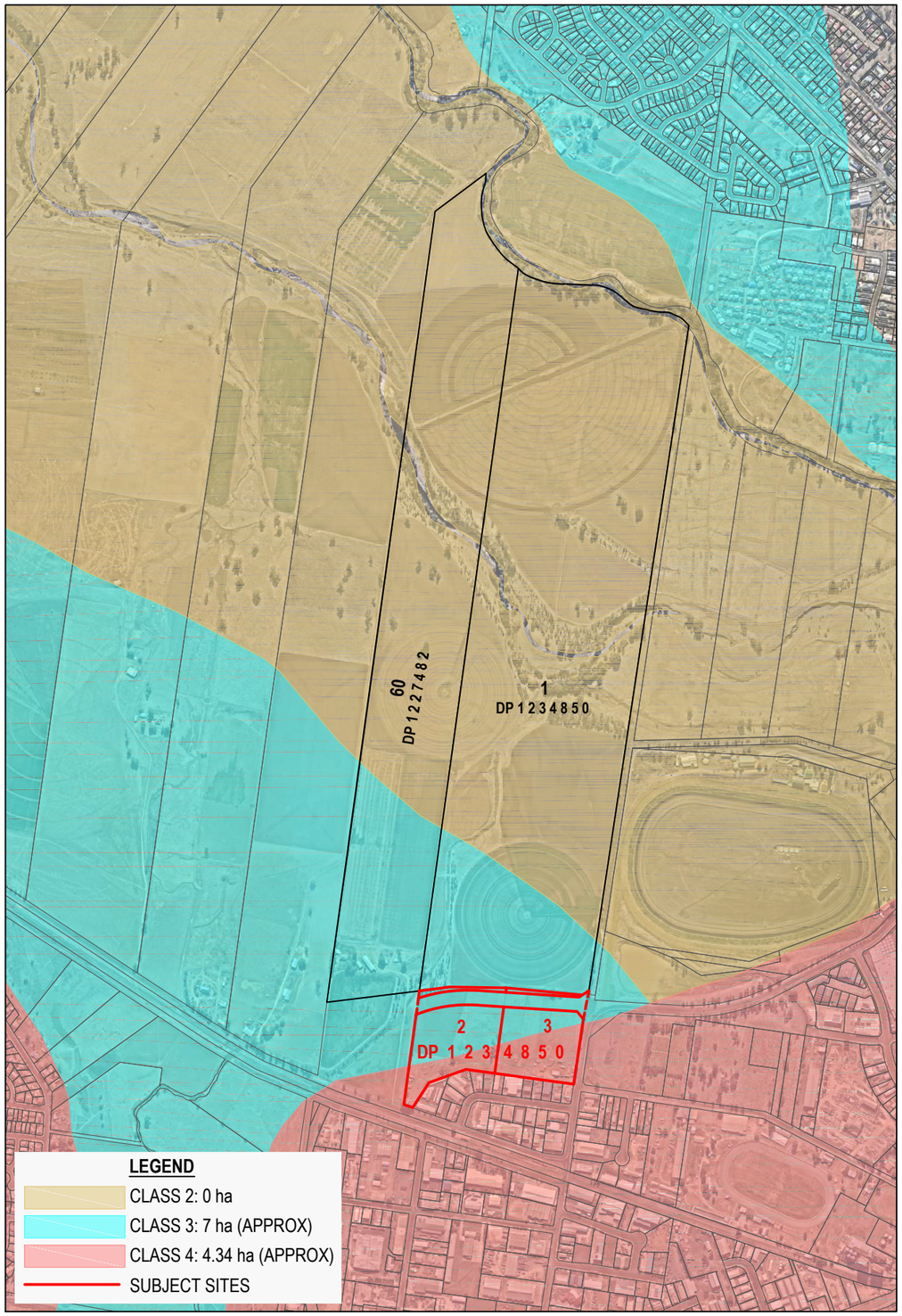
Figure 4



PLAN OF LAND & SOIL CAPABILITY CLASS ACROSS TAMWORTH REGIONAL COUNCIL (CLASSES 2, 3 & 4)

SCALE; 1:800000

MGA



PLAN OF SUBJECT SITE WITH LAND & SOIL CAPABILITY CLASS (CLASSES 2, 3 & 4)

SCALE; 1:15000

SOURCE:
AERIAL: NearMaps
LAND & SOIL CAPABILITY: NSW OEH 2013

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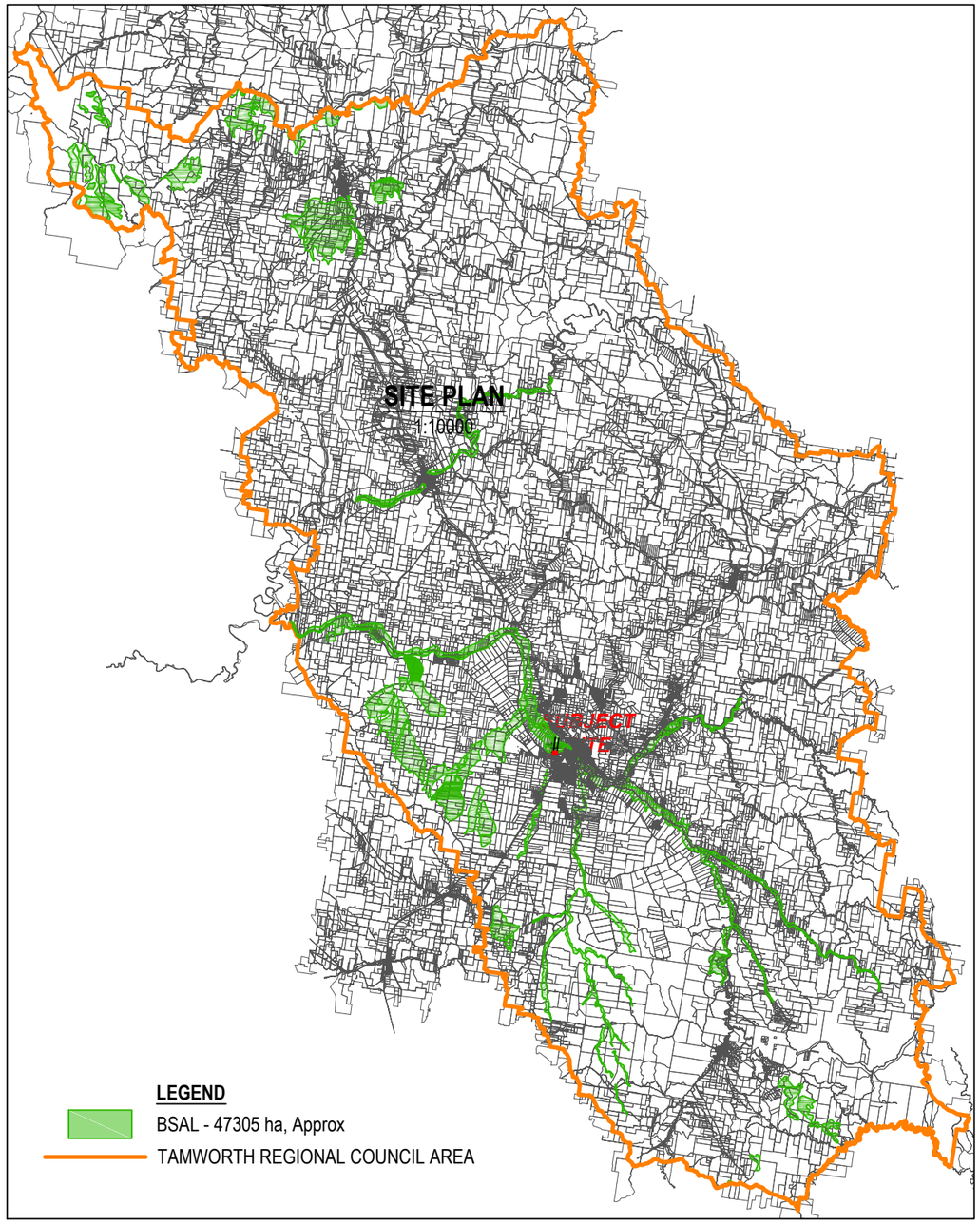
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SCALE 1:15000 AT A1

Project: **Lots 1 - 3 DP1234850 & Lot 60 DP1227482, 21 & 72 Wallamore Rd & 55 Dampier St, Taminda**

Title: **PLAN OF LAND & SOIL CAPABILITY**

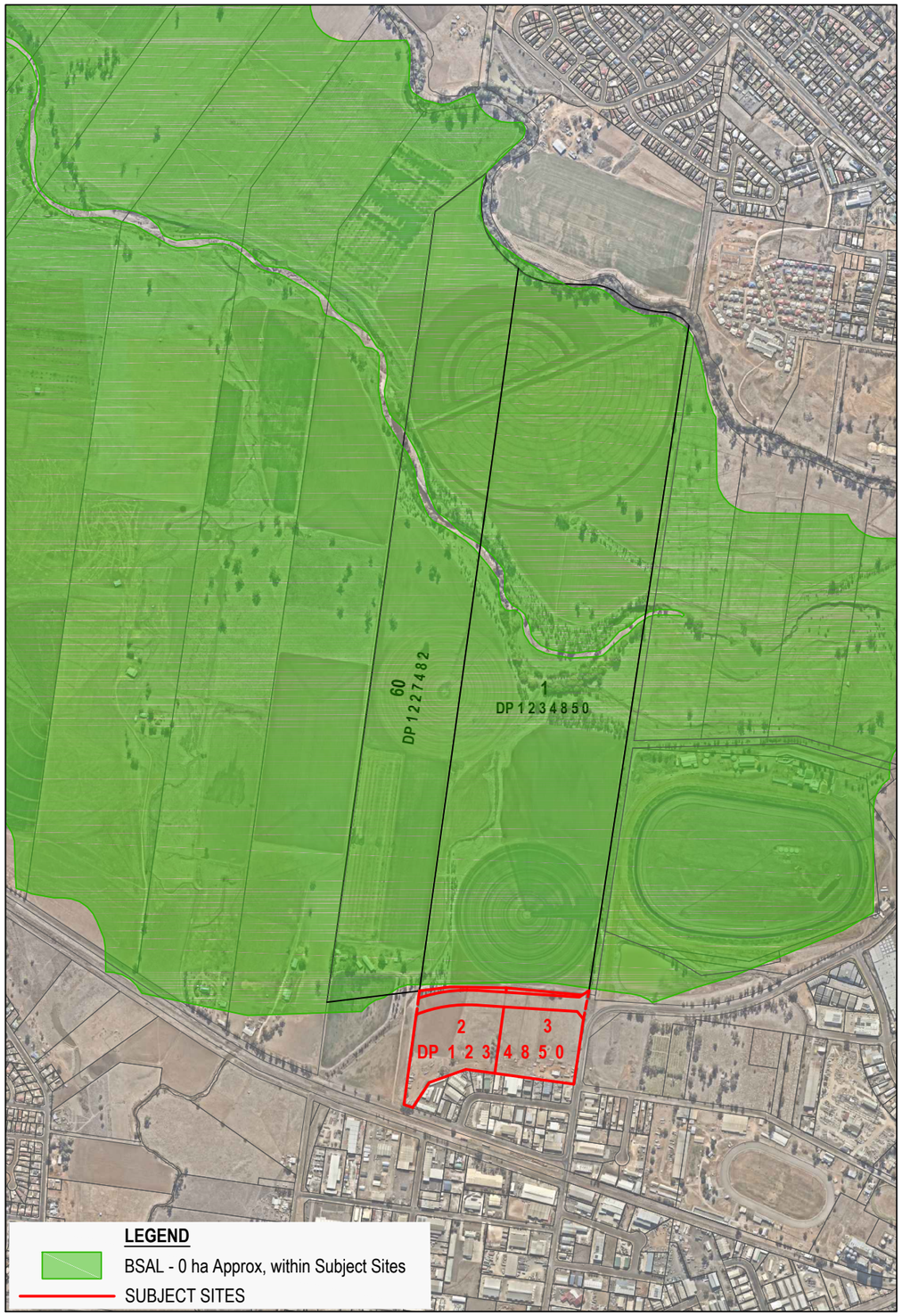
Figure 5



PLAN OF BIOPHYSICAL STRATEGIC AGRICULTURAL LAND (BSAL) ACROSS TAMWORTH REGIONAL COUNCIL

SCALE; 1:800000

MGA



PLAN OF SUBJECT SITE WITH BIOPHYSICAL STRATEGIC AGRICULTURAL LAND (BSAL)

SCALE; 1:15000

SOURCE:
AERIAL: NearMaps
BSAL:https://geo.seed.nsw.gov.au

Design	MV	Scale at A3	1:15000
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Dwg. No.	MG18026-PL01	Sheet No.	1 of 1
		Issue	B

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SCALE 1:15000 AT A1

Project: Lots 1 - 3 DP1234850 & Lot 60 DP1227482, 21 & 72 Wallamore Rd & 55 Dampier St, Taminda

Title: PLAN OF BIOPHYSICAL STRATEGIC AGRICULTURAL LAND (BSAL) **Figure 6**

3. Agricultural Impacts

3.1 Proposal

As described above, the proposal is to rezone 11ha (or approximately 7% of the Study Area) within Lots 2 and 3 to IN1 (6.7ha), B5 (2.4ha) and road reserve (1.9 ha). The remainder of the Area would remain as RU4. The remainder of the Area would remain as RU4. The Solar Farm would be located in Lot 1 which would also not be rezoned. Further, while not being rezoned, approximately 13ha within Lot 60 would be utilised for flood mitigation measures. This area would not be exclusive to flood mitigation as flooding is irregular. That is, the area is likely to be available for use for agricultural purposes (surmised grazing only).

3.2 Agricultural Characteristics

The majority of the Study Area is considered to have good agricultural characteristics. The soils of the site are, in general, considered deep and fertile. The site is relatively flat and irrigation water can be accessed under approved licences.

However, the entire Study Area is located within a floodplain. Thereby, both historically and continuing, agricultural pursuits need to be adaptive to the ephemeral nature of flooding regimes. In addition, the site is located in close proximity to urban and industrial landuses. The latter bounds the south-eastern corner of the site. It is understood Jewry St is earmarked for extension to Wallamore Road and property boundaries confirm this alignment. That is, the road reserve dissects both Lots and 3 in the northern section of those allotments.

The Study Area represents a relatively small area of agricultural land within the LGA as follows:

Land Capability Mapping (Emery 1985 Soil Conservation Service of NSW):

- The Study Area within allotments represents 0.51% of the total area for 'Regular Cultivation' within the Tamworth LGA;
- None of the proposal is located within areas of 'Regular Cultivation' within the Tamworth LGA;
- The Proposal Area is wholly contained within the 'Urban' classification of this mapping;
- Thereby the proposal does not impact on any mapped area of Agriculture (e.g. Regular Cultivation) within the Tamworth LGA.

Land and Soil Capability Mapping (NSW OEH 2013):

- The Study Area within allotments represent:
    - 0.97% of the total area of Class 2 within the Tamworth LGA;
    - 0.06 % of the total area of Class 3 within the Tamworth LGA; and
    - 0.001% of the total area of Class 4 within the Tamworth LGA.
- The proposal area represents:
    - 0.013 % of the total area of Class 3 within the Tamworth LGA; and

- 0.001% of the total area of Class 4 within the Tamworth LGA.

Biophysical Strategic Agricultural Land (BSAL) Mapping (Department of Planning and Environment 2013):

- The Study Area represents 0.302% of the total BSAL area within the Tamworth LGA; and
- None of the proposal area is mapped within the BSAL area.

3.3 Agricultural Impacts by the proposal

The Study Area is considered to consist of relatively good Agricultural lands. It is considered if sufficient water was available, a range of agricultural activities could be pursued. However, a major natural characteristic precludes the Study Area being utilised for a range of high intensity, high value agricultural pursuits (e.g. orchards, plant nursery, intensive animal production). Flooding is considered restrictive for these pursuits as flooding would cripple any infrastructure installed (e.g. machinery, internal roads, buildings and the like). Historically the site has most likely been used for grazing purposes through the majority of its history and this would remain the most viable option for ephemeral use of the land (i.e. ease of moving stock during times of flood).

Recent cropping of the land is possible due to irrigation and crops selected would either be grown out of typical flooding periods (e.g. winter cropping, summer fallow) or crop selection may allow some tolerance to inundation.

The conflicts between Agriculture and urbanisation is likely to possibly be occurring at the site and is considered likely to escalate at the site with the continued growth of Tamworth. Conflicts often occur due to either direct or perceived impacts by both parties and include:

- air quality due to agricultural and rural industry (odour, pesticides, dust, smoke and particulates);
- use and enjoyment of neighbouring land e.g. noise from machinery;
- visual amenity associated with rural industry e.g. the use of netting, planting of monocultures and impacts on views;
- soil erosion leading to land and water pollution;
- clearing of native vegetation;
- stock access to waterways;
- harassment of livestock from straying domestic animals;
- trespass;
- changes to storm water flows or water availability; and
- poor management of pest animals and weeds.

While the proposal removes a small area of medium to good Agricultural land from the Tamworth LGA, the majority of the Study Area would be retained for agricultural purposes. This would include the area earmarked for flood mitigation measures whereby it is considered likely grazing activities could continue.

The Study Area lies in close proximity to the Tamworth urban area. The City of Tamworth is located to the north, south and east. The Study Area is somewhat isolated already from expansive areas of agricultural lands of the Tamworth LGA. Residential areas of Westdale are located to west. As such the proposal does not result in further isolation of agricultural lands. The proposal extends on existing developed lands thereby minimising the impact on agricultural lands in the immediate locality (i.e. Taminda).

4. Discussion and Conclusion

Melaleuca Group Pty Ltd has been commissioned by Elton Consulting on behalf of Chan Abbey Holdings Pty Ltd to undertake an Agricultural Assessment for 55 Dampier Street and 72 Wallamore Road, Taminda NSW 2340 (the site) to allow for the proposed rezoning of part of the Study Area.

The investigation was completed using desktop resources. The Study Area in its current condition is considered degraded due to recent prolonged drought conditions. However, physical characteristics of the Study Area, obtained from desktop resources, indicate the Area is representative of good Agricultural land for the Tamworth area.

However, the Study Area is also flood prone. As such, limitations on intensifying agricultural pursuits are limited due to the inherent risk on infrastructure for such activities. Historical and future agricultural pursuits need to be adaptive to the ephemeral nature of flooding regimes. As such, it is considered likely that low intensity grazing and winter broadscale cropping are the most likely pursuits suitable for the Study Area.

In addition, the Study Area is located within an expanding urban area of the City of Tamworth where urbanisation exists to the north, south and east. Residential development, while not immediately adjacent is located to the west and north. In essence, the Study Area has already become isolated from expansive agricultural lands of the LGA. The proposal expands on urbanisation and does not segregate the remaining portion of the Study Area from agricultural lands.

The Study Area and to a lesser amount, the proposal represents very small areas of good agricultural lands within the LGA. The rezoning proposal would result in areas less than 0.1% of good agricultural land being lost from the LGA. Part of the proposal includes a solar farm.

It is important to note that solar farms do not preclude the use of land for agriculture. Grazing is one agricultural activity that is still possible whilst a solar farm is operating. In addition, it is considered likely that agricultural activities which were occurring prior to the construction of the solar farm would be able to continue once the solar farm is decommissioned and removed. Thereby the loss of agricultural lands by this proposal is considered less than that represented within this report.

In conclusion, this Agricultural Report has identified that while the site demonstrates medium to good agricultural characteristics, flooding, proximity to urbanisation, isolation from other lands and the small scale of the proposal does not represent a significant impact on agricultural lands in the LGA.

5. References

Banks, R.G. 2001, Soil Landscapes of the Tamworth 1:100,000 Sheet Map, Department of Land and Water Conservation, Sydney

Cunningham, G.M., Higginson, F.R., Riddler, A.M.H. , and Emery K.A., 1988, Systems used to classify rural lands in New South Wales.

EJE Town Planning. (2001). Parry Shire community based heritage study : draft report. Newcastle. (cited by Kayandel Archaeological Services 2018).

Emery, K. A. 1985, Rural Land Capability Mapping, Soil Conservation Service of NSW.

Kayandel Archaeological Services 2018, Proposed Industrial Rezoning, 55 Dampier Street (Lot 3 DP1234850), Taminda, Tamworth Regional Council LGA, NSW. Statement of Heritage Impact Prepared for Elton Consulting on behalf of Tamworth Industrial Pty Ltd December 2018. Lance Syme, Natalie Stiles and Meggan Walker.

NSW Agriculture, 2002. Agricultural Land Classification Agfact AC.25. Therese Hulme, Tom Grosskopf, John Hindle.

New South Wales Department of Environment and Planning, 1981, Rural Land Evaluation Manual, Woodward, R., and F. Neilson, Eds.

New South Wales Department of Planning, 1988, Rural Land Evaluation Manual", rev. edn., Woodward, R.

NSW Office of Environment and Heritage 2013, Land and Soil Capability mapping of NSW. Bioregional Assessment Source Dataset.

NSW Department of Primary Industries Office of Water 2018, http://allwaterdata.water.nsw.gov.au/water.stm

Office of Environment and Heritage 2012, The land and soil capability assessment scheme. Second approximation. A general rural land evaluation system for New South Wales.

Riddler A.M.H., 1996, Agricultural suitability maps - uses and limitations, NSW Agriculture Agfact AC.9, 3rd edn.

Stephens, C.G., 1962, A Manual of Australian Soils; Third Edition., CSIRO, Melbourne.

Tamworth Regional Council (TRC) 2010, Local Environmental Plan.

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DISCLAIMER

Melaleuca Group has conducted work concerning the environmental status of the property, which is the subject of this report, and has prepared this report on the basis of that assessment.

The work was conducted, and the report has been prepared, in response to specific instructions from the client or a representative of the client to whom this report is addressed, within the time and budgetary requirements of the client, and in reliance on certain data and information made available to Melaleuca Group. The analysis, evaluations, opinions and conclusions presented in this report are based on that information, and they could change if the information is in fact inaccurate or incomplete.

Melaleuca Group has made no allowance to update this report and has not taken into account events occurring after the time its assessment was conducted.

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9.2 Architect Masterplan package

rothelowman

Brisbane, Melbourne, Sydney
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Solar Farm and Industrial Precinct Planning Proposal

55 Dampier Street and 21 Wallamore Road, Taminda NSW 2340

March 2019



Project Contact

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Principal

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Client
Chan Abbey Holdings Pty Ltd

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Architecture (Industrial Precinct & Masterplan)
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Architecture (Solar Farm)
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North Sydney, NSW 2060



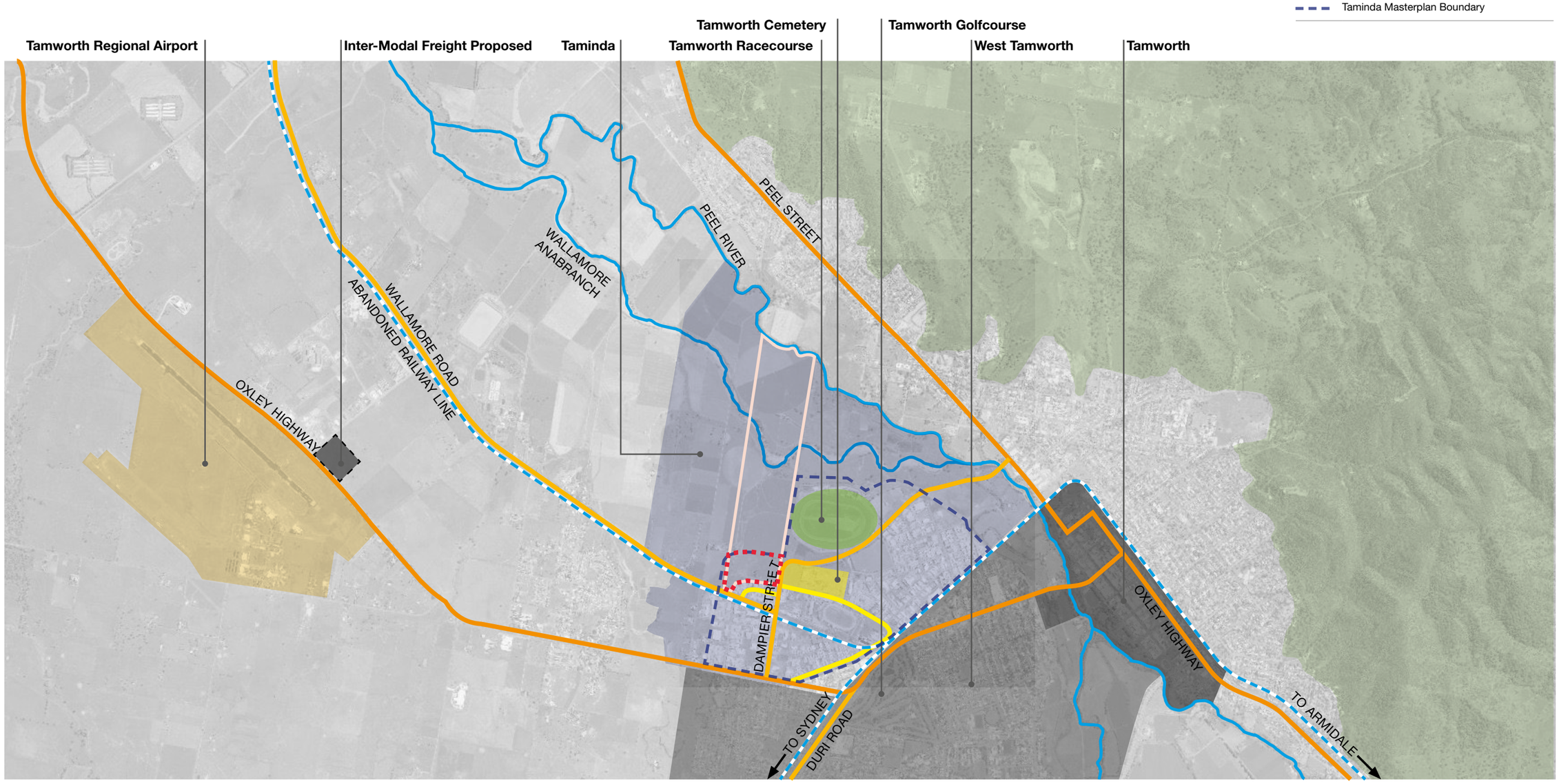
This proposal comprises a unique combination of employment uses to reinvigorate the Taminda industrial precinct.

The key drivers for this new vision are to:

- Establish a dynamic commercial industrial precinct based on current best practice and innovative typologies
- Create a quality development integrated with the solar farm to set a precedent for the future of sustainable development
- Create employment opportunities for the region by delivering a unique benchmark precinct that creates long-term growth
- Facilitate the future extension of the Tamworth bypass and connection between the town and airport

Legend

- Subject Site
- Mountain Ranges
- Taminda Region
- Tamworth
- West Tamworth
- Future Inter-Modal Freight
- Tamworth Regional Airport
- Tamworth Cemetery
- Tamworth Racecourse
- River
- Highway
- Major Road
- Minor Road
- Train Route
- Taminda Masterplan Boundary



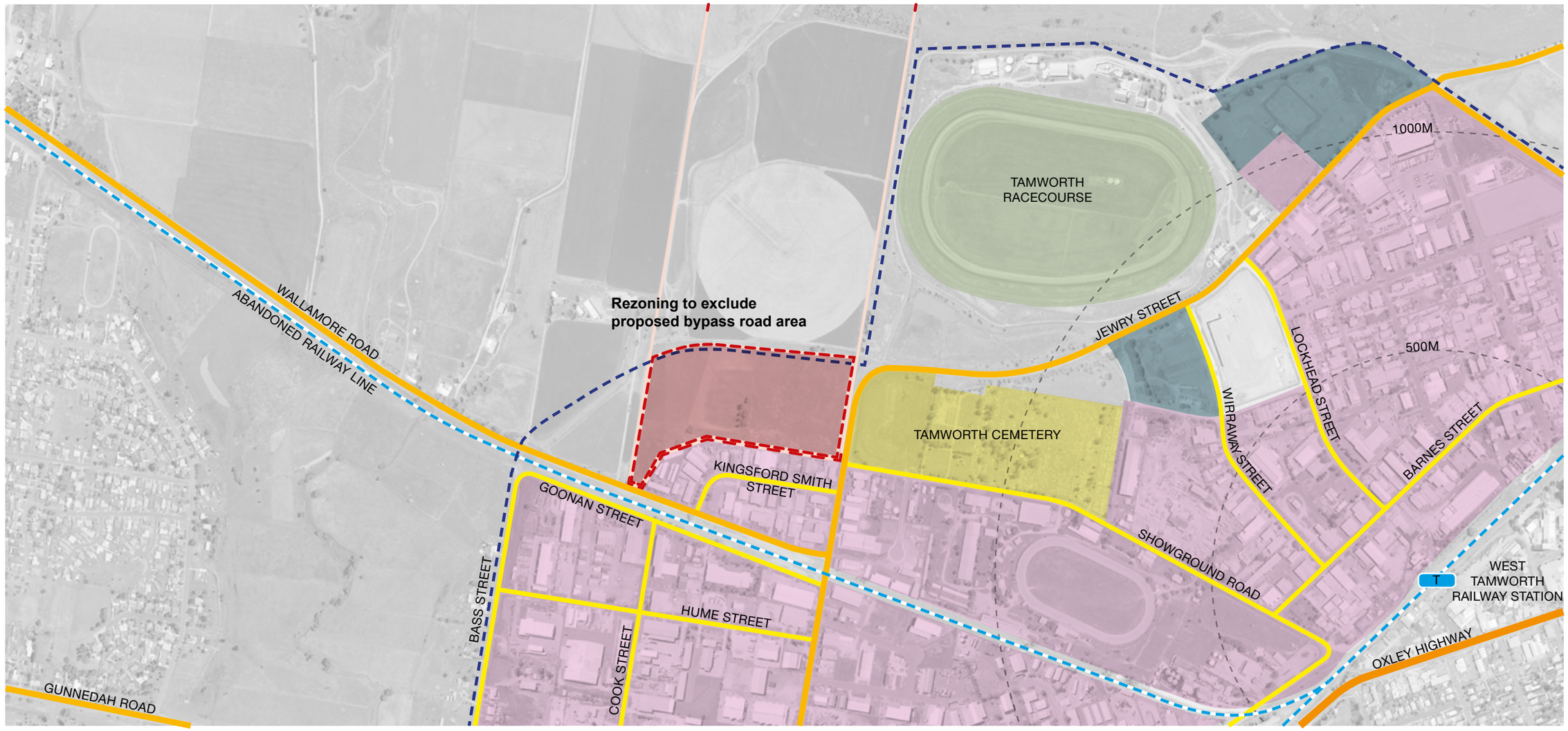
2.02 Site Location

The site is located at 55 Dampier Street and 21 Wallamore Road, Taminda. It occupies the Northern edge of The Taminda Industrial Precinct and agricultural land.

The site is situated within close proximity to local amenities, Tamworth Jockey Club, Tamworth Railway Station and Oxley Highway.

Legend

- Subject Site
- Area to be Rezoned
- Industrial Zone
- B5 Business Development
- Highway
- Major Road
- Minor Road
- Train Route
- Taminda Masterplan Boundary



2.03 Circulation & Accessibility

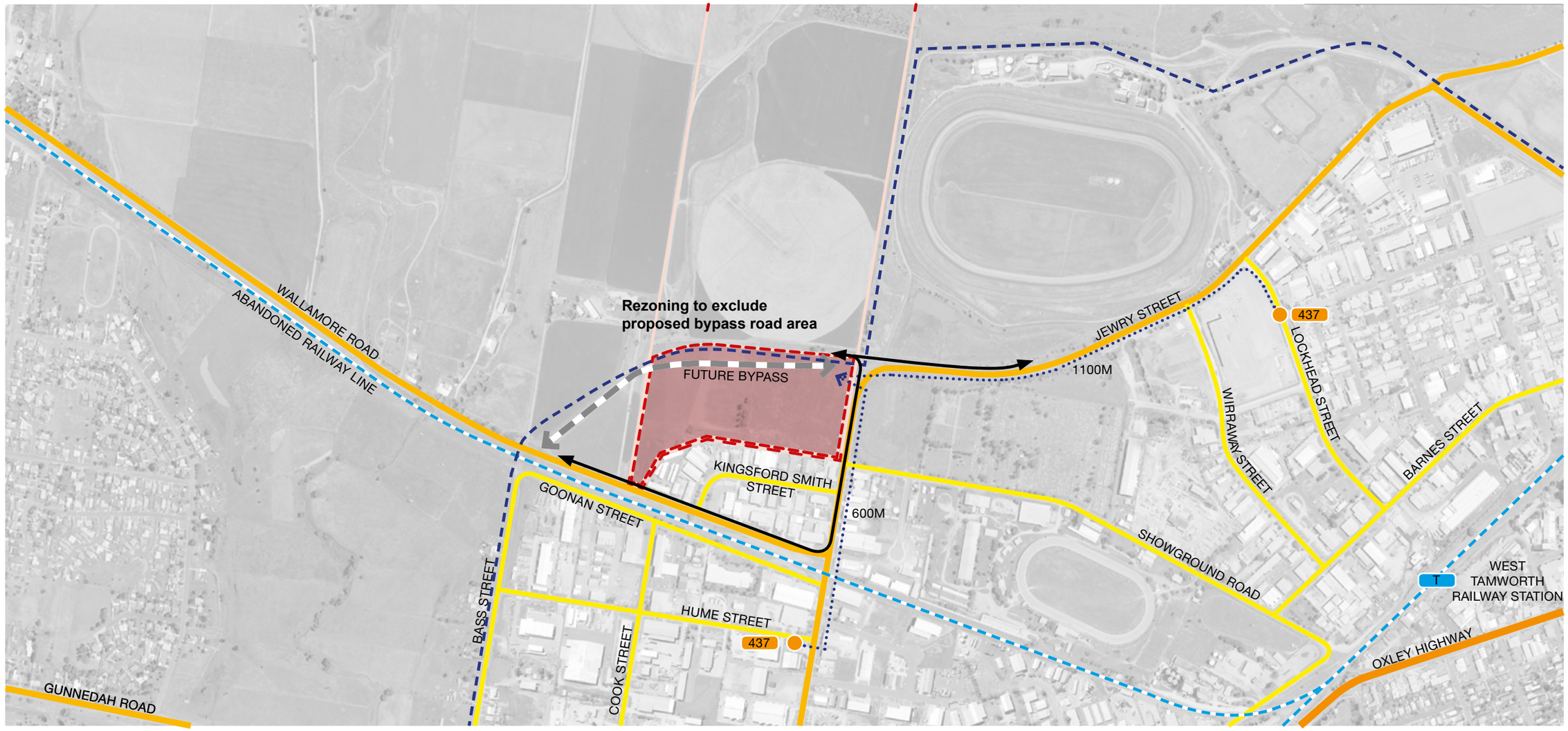
The site is close to Oxley Highway and West Tamworth Train Station.

There are two main vehicular access points into the site, via Dampier Street and Wallamore Road.

The future bypass dissects the site to connect Jewry Street and Oxley Highway.

Legend

- Subject Site
- Area to be Rezoned
- Highway
- Major Road
- Minor Road
- Train Route
- Pedestrian Route
- Vehicular Access
- Bus Stop
- 437 Bus Route
- Taminda Masterplan Boundary





View 1 - Wallamore Road



View 2 - Entrance to site from Wallamore Road



View 3 - Dampier Street





View 4 - Dampier Street



View 5 - Looking north-west from Dampier Street



View 6- Looking north from the Dampier St and Jewry St bend



Opportunities

1. Opportunity for employment land use
2. Higher architectural exposure and entrance development to Taminda and Tamworth via future bypass
3. Solar farm for a renewable energy source
4. Primary and secondary access points via Dampier Street and Wallamore Road respectively
5. Industrial units to the south allow a point of difference to what we propose
6. Connection to neighbouring precincts and racecourse
7. Marker location for retail development
8. Opportunity for future connections to northern site

Constraints

8. Bypass splits site
9. Flood prone land
10. Flood deflection required at boundaries
11. Solar farm position and layout must consider light pollution, particularly due to nearby Tamworth Regional Airport



The existing planning controls identifies the land use as an Primary Production Small Lots. It is proposed to amend the planning controls on site as follows.

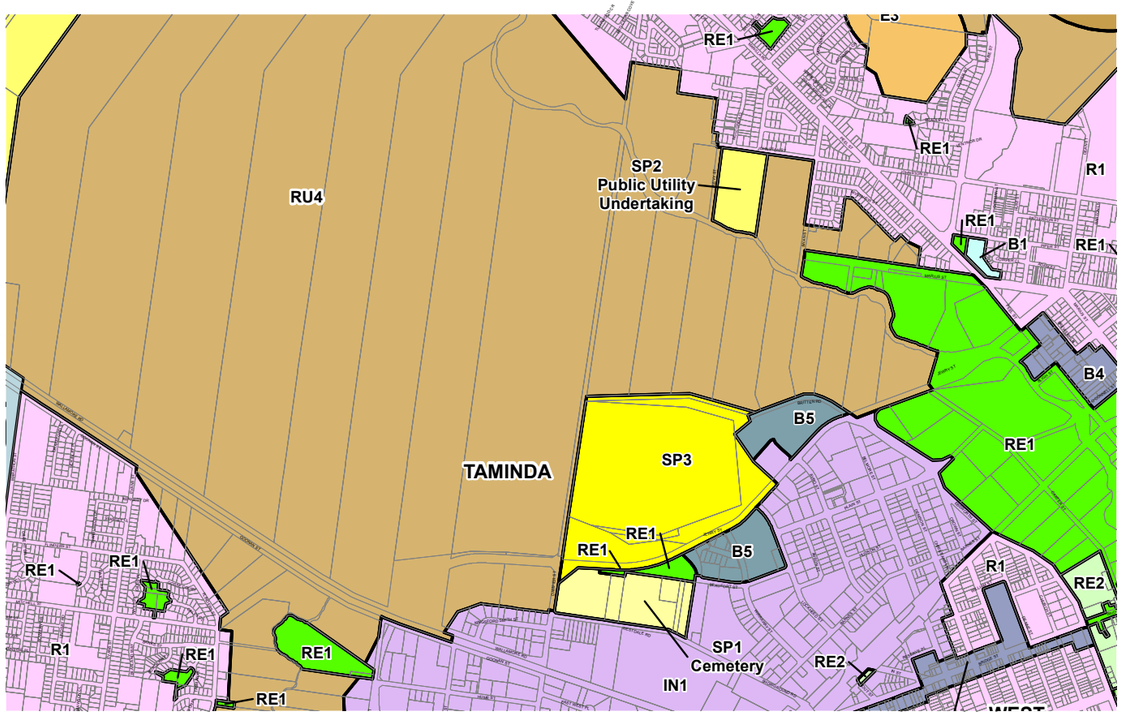
The proposal:

- Amendments to LEP to allow for B5 Business Development and IN1 General Industrial

Total site area = 9Ha

- B5 2.4Ha
- IN1 = 4.6Ha

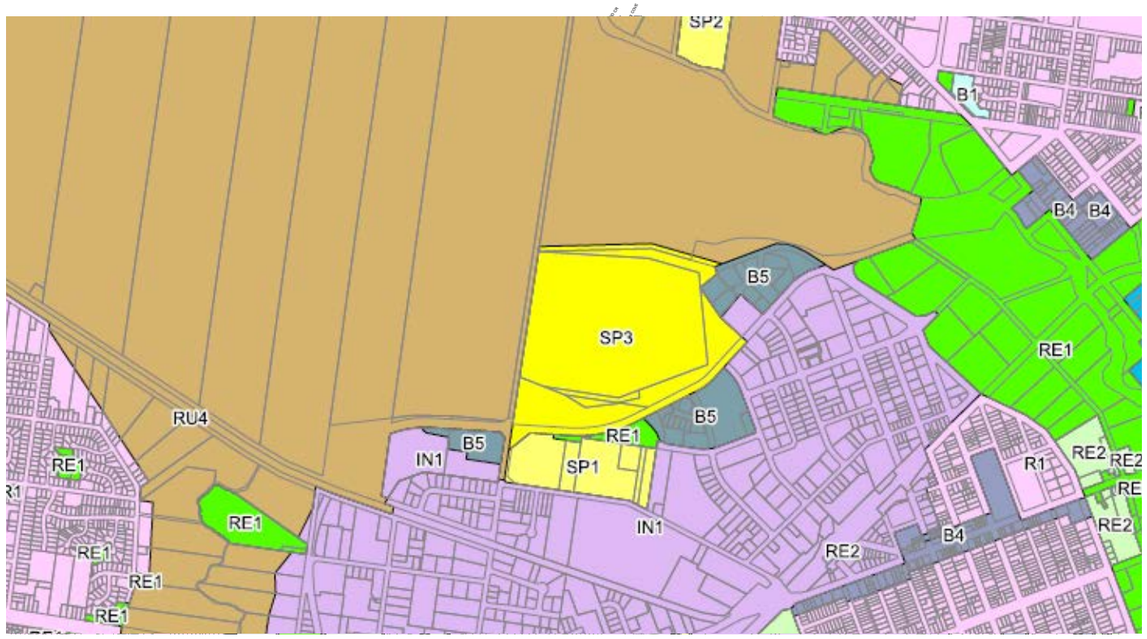
Existing Land Zoning



Zone

B1	Neighbourhood Centre	R2	Low Density Residential
B2	Local Centre	R5	Large Lot Residential
B3	Commercial Core	RE1	Public Recreation
B4	Mixed Use	RE2	Private Recreation
B5	Business Development	RU1	Primary Production
B7	Business Park	RU3	Forestry
E1	National Parks and Nature Reserves	RU4	Primary Production Small Lots
E2	Environmental Conservation	RU5	Village
E3	Environmental Management	RU6	Transition
IN1	General Industrial	SP1	Special Activities
IN3	Heavy Industrial	SP2	Infrastructure
R1	General Residential	SP3	Tourist

Proposed Land Zoning



Zone

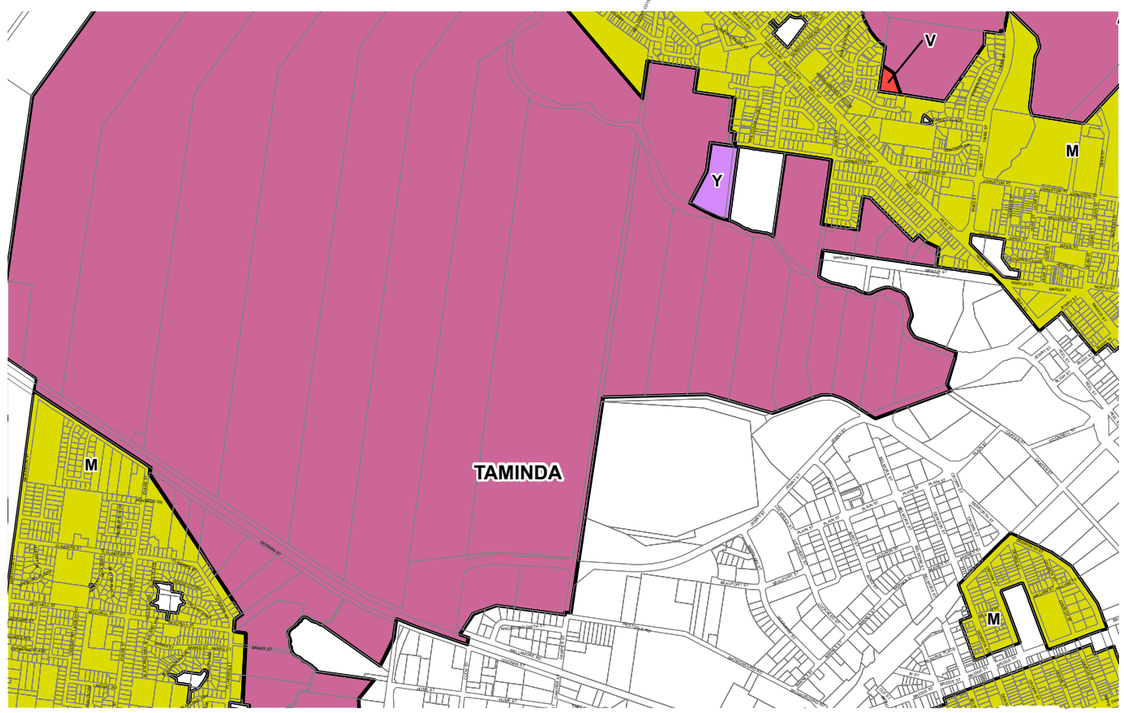
B1	Neighbourhood Centre	R2	Low Density Residential
B2	Local Centre	R5	Large Lot Residential
B3	Commercial Core	RE1	Public Recreation
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B7	Business Park	RU3	Forestry
E1	National Parks and Nature Reserves	RU4	Primary Production Small Lots
E2	Environmental Conservation	RU5	Village
E3	Environmental Management	RU6	Transition
IN1	General Industrial	SP1	Special Activities
IN3	Heavy Industrial	SP2	Infrastructure
R1	General Residential	SP3	Tourist

The existing planning controls identifies the land with a minimum lot size of 40ha. It is proposed to amend the planning controls on site as follows.

The proposal:

- B5 = 2.4Ha minimum
- IN1 = 4.6Ha minimum

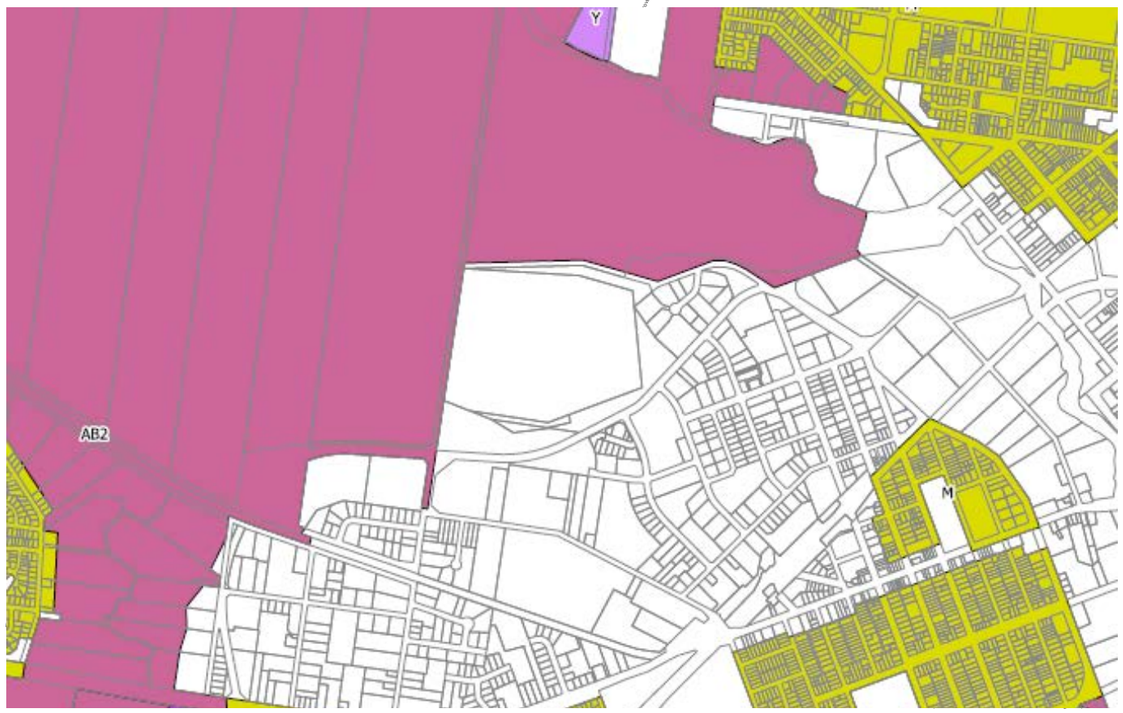
Existing Lot Size Map



Minimum Lot Size (sq m)

M	600
U	1000
V	2000
W	4000
X	7000
Y	1 ha
Z	2 ha
AA1	5 ha
AA2	9.9 ha
AB1	20 ha
AB2	40 ha
AD	100 ha
AF	400 ha
AH	800 ha

Proposed Lot Size Map



Minimum Lot Size (sq m)

M	600
U	1000
V	2000
W	4000
X	7000
Y	1 ha
Z	2 ha
AA1	5 ha
AA2	9.9 ha
AB1	20 ha
AB2	40 ha
AD	100 ha
AF	400 ha
AH	800 ha

The existing planning controls do not identify a floor space ratio control on the subject site. It is proposed to amend the planning controls on site as follows.

The proposal:

- Amendments to LEP to allow a maximum floor space ratio of 1:1 (N) for B5 Business Development land zone.

Existing FSR Map



Proposed FSR Map



Maximum Floor Space Ratio (n:1)

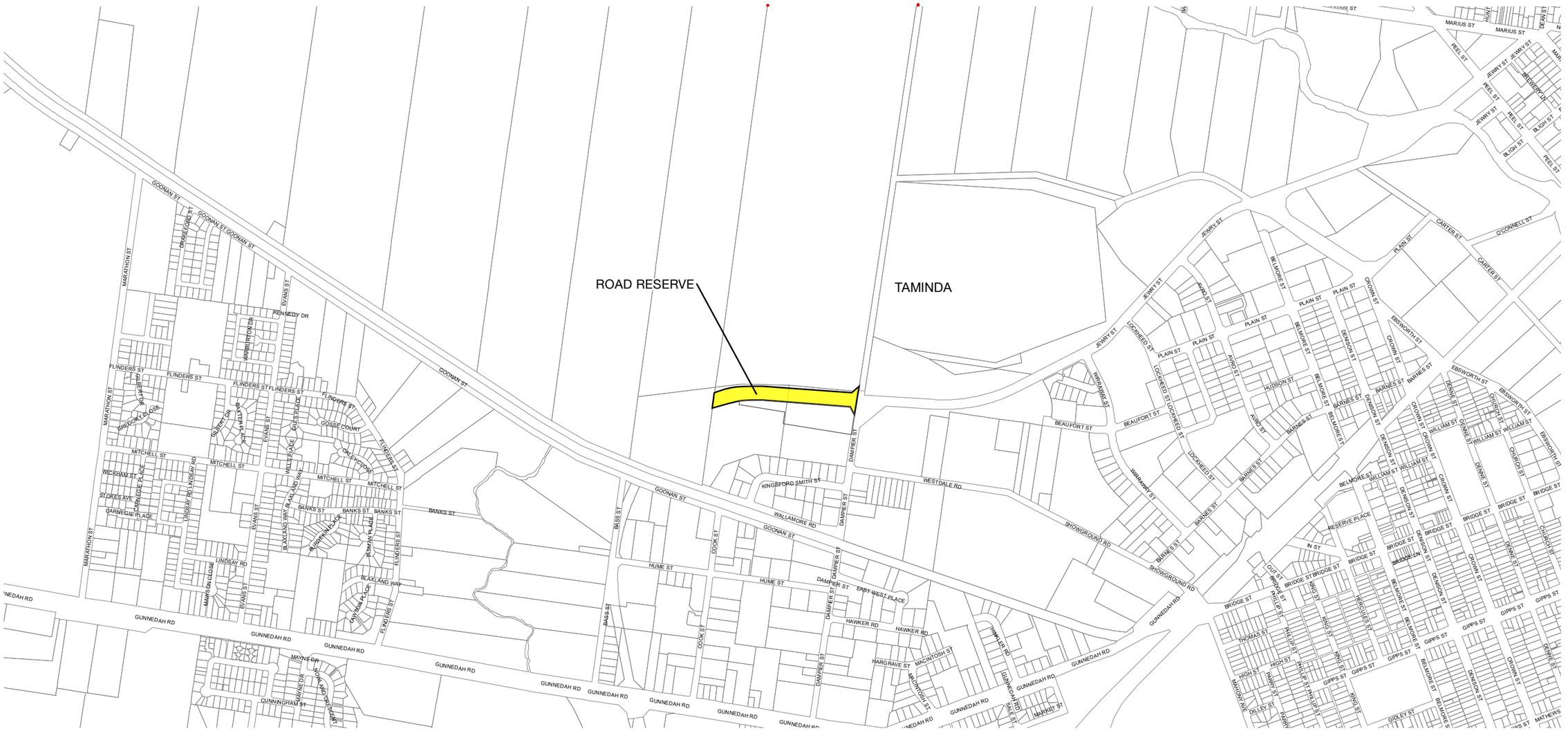
D	0.5
F	0.6
N	1
S	1.5
T	2
X	4
AA	6

Maximum Floor Space Ratio (n:1)

D	0.5
F	0.6
N	1
S	1.5
T	2
X	4
AA	6

A road reserve has been identified for future road infrastructure. It is proposed to add the road reserve easement to the LEP road reservation acquisition map.

Proposed Land Reservation Acquisition Map



Character
Simple industrial buildings to the South and East of subject site, characterised by concrete panels, masonry, metal sheet cladding and gable end roofs.



Simple Forms
Existing single-storey buildings to the West and South of the site, identifiable by the verandah and simple roof forms.



Contemporary
Existing community and recreational building at Tamworth varying from the traditional to contemporary.



Character
Drawing on the industrial and residential character of Tamworth to create individual character for each unit.



Simple Forms
Applying an angular sawtooth roof to a low profile industrial massing articulates uncomplicated elegance.

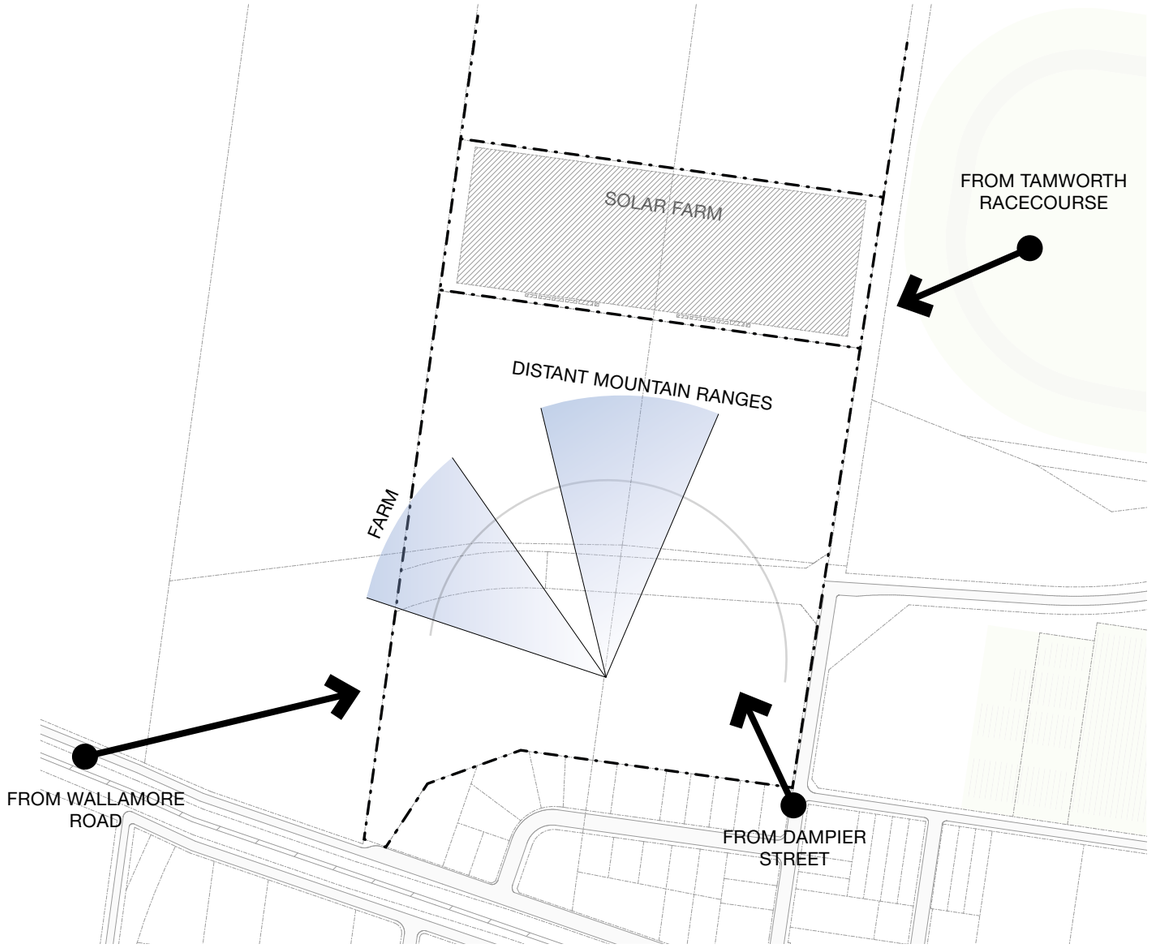


Contemporary
The typical urban studio window to allow vast light to penetrate the building and provide views to the outdoors.



Views + Vistas

The site is relatively flat with high visibility from Tamworth Racecourse, and local streets and roads.
Being highly visible to the public domain, there is opportunity for the proposal to positively respond to the surrounding context whilst capturing views to the distant mountain ranges.



Vehicular Access

Vehicle access points are integrated into the existing and proposed road network.



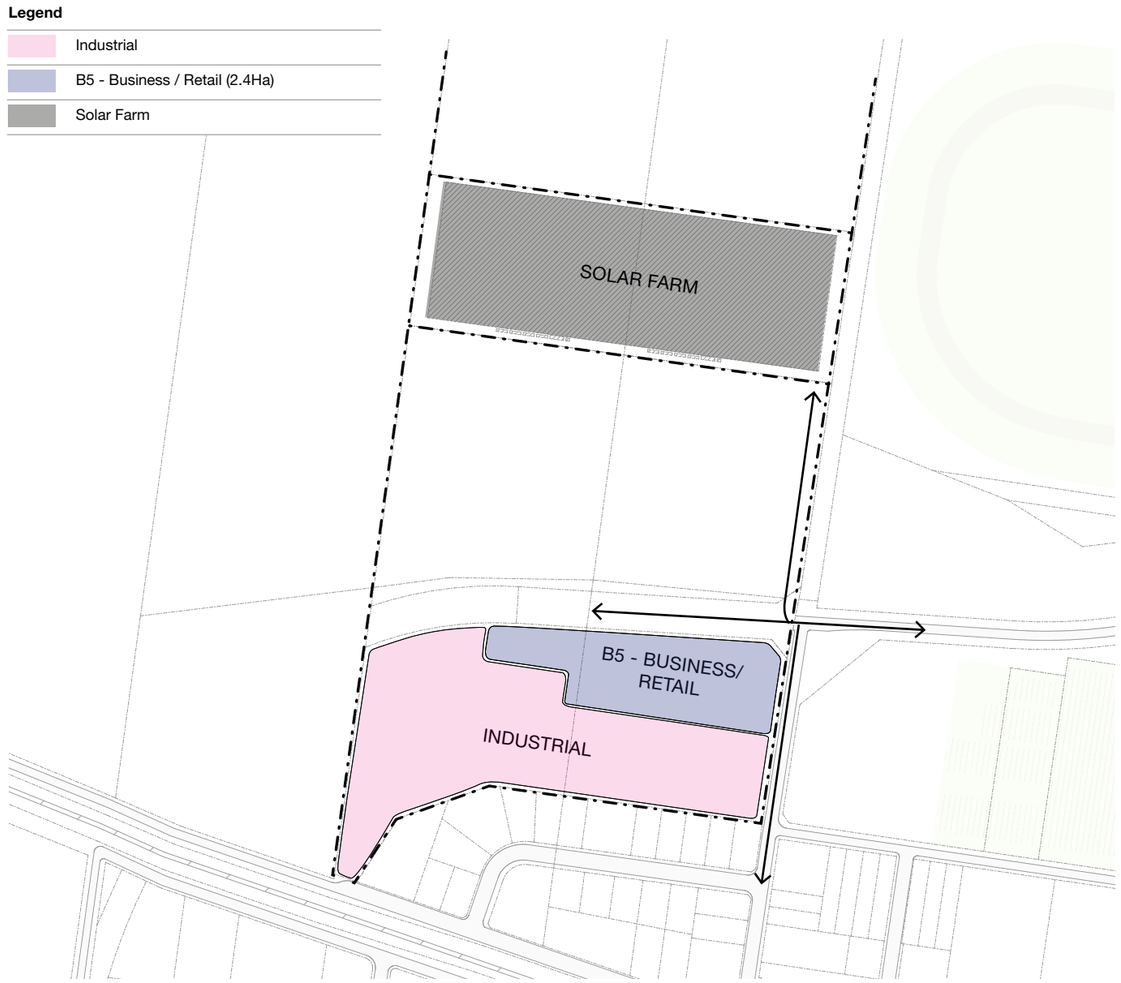
Traffic Management

Safe and separated movement of heavy and light vehicles to promote a safe and flexible environment for users and visitors.



Program

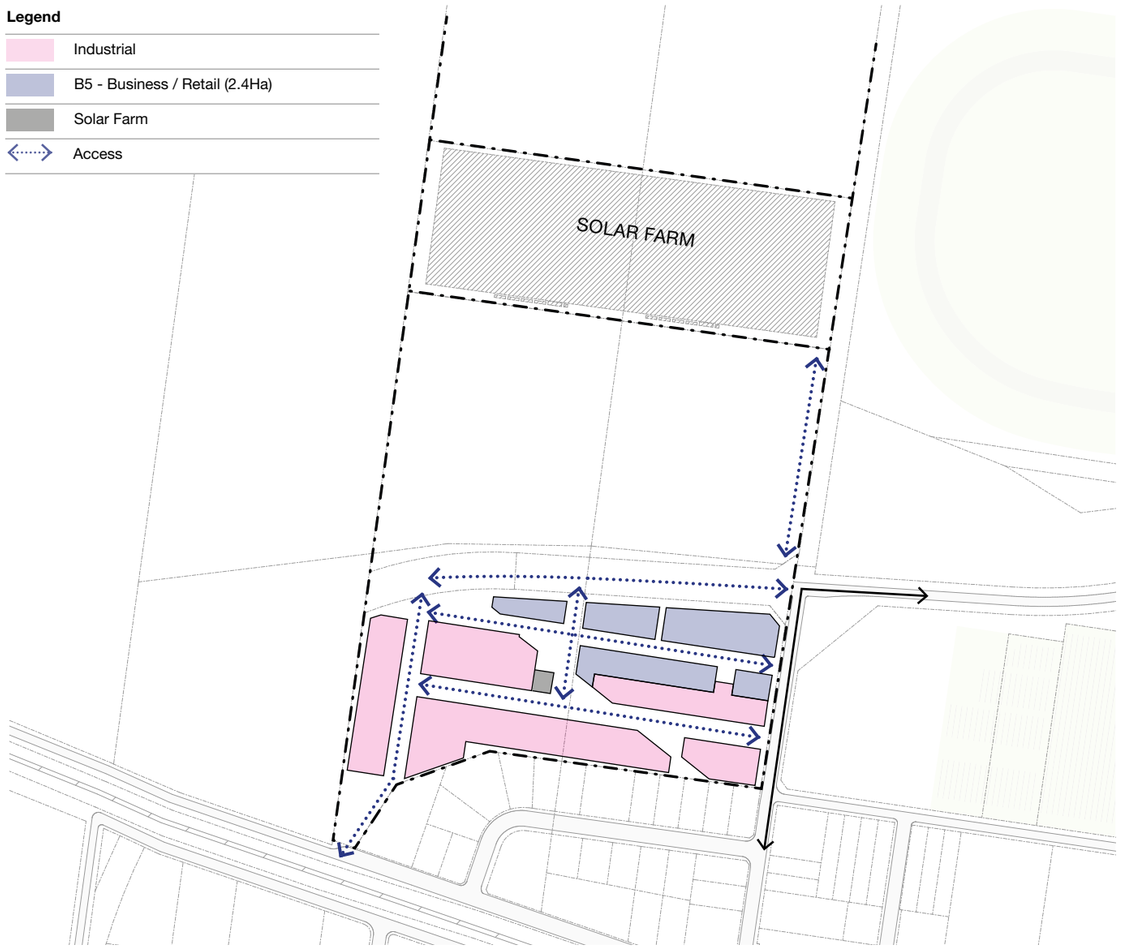
Centrally locating Business/Retail functions creates a strong active community.
The solar farm is located to the North of the site for maximum efficiency.



Permeability

Building form break up to respond to access ways, building seperation and enviornmental factors.

Cross through site links to connect the industrial and B5 business retail zoning and open space.



Open Space

Open spaces located throughout the site activates Business/Retail zoning and creates pathways and view corridors.

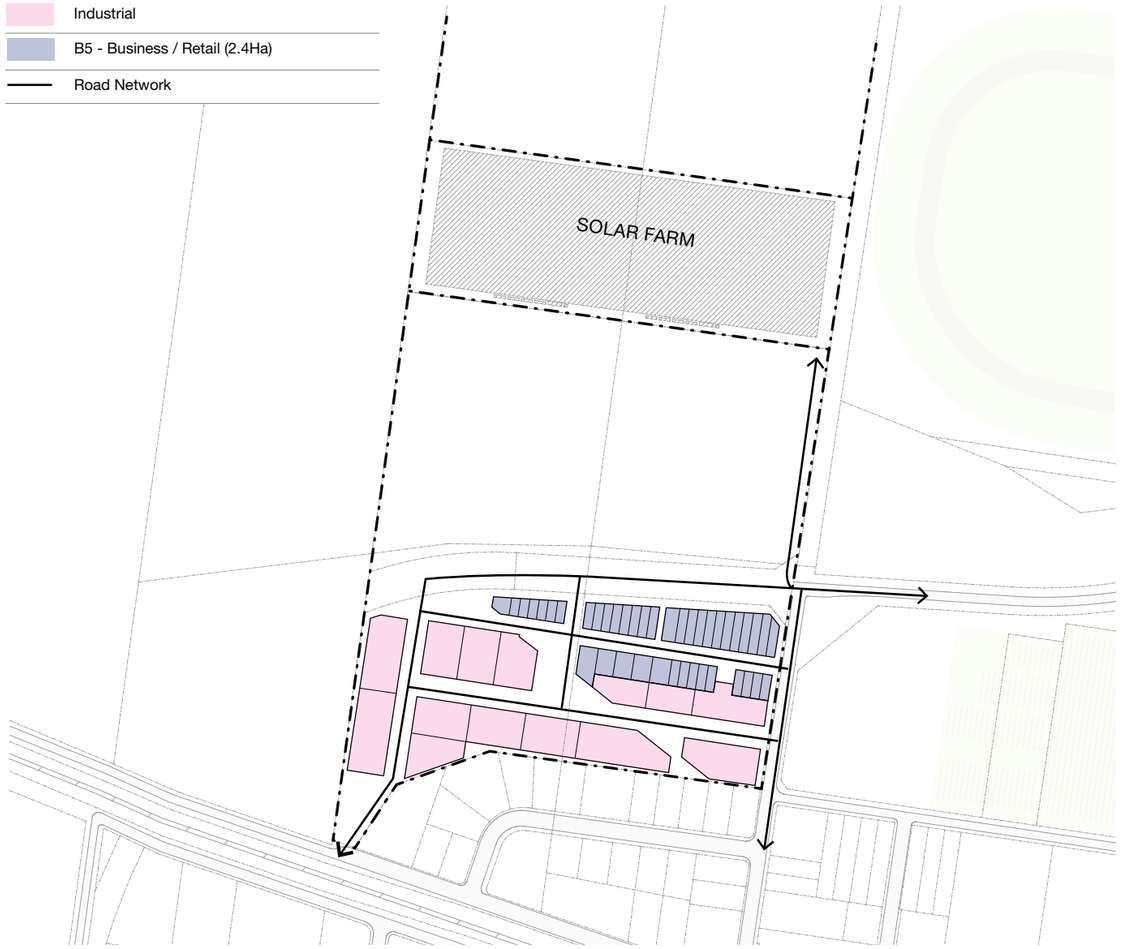


Concept Masterplan (Pre Bypass)
The visionary proposal allows for future growth and expansion of Tamworth's industrial and sustainable sectors, allowing the precinct to adapt for future users, employment and infrastructure upgrades.

An integrated network of open spaces to encourage 'hang-out' areas for employees on their lunch breaks, and roads to a grid layout to facilitate flexibility and legibility within the precinct.

Legend

- Industrial
- B5 - Business / Retail (2.4Ha)
- Road Network

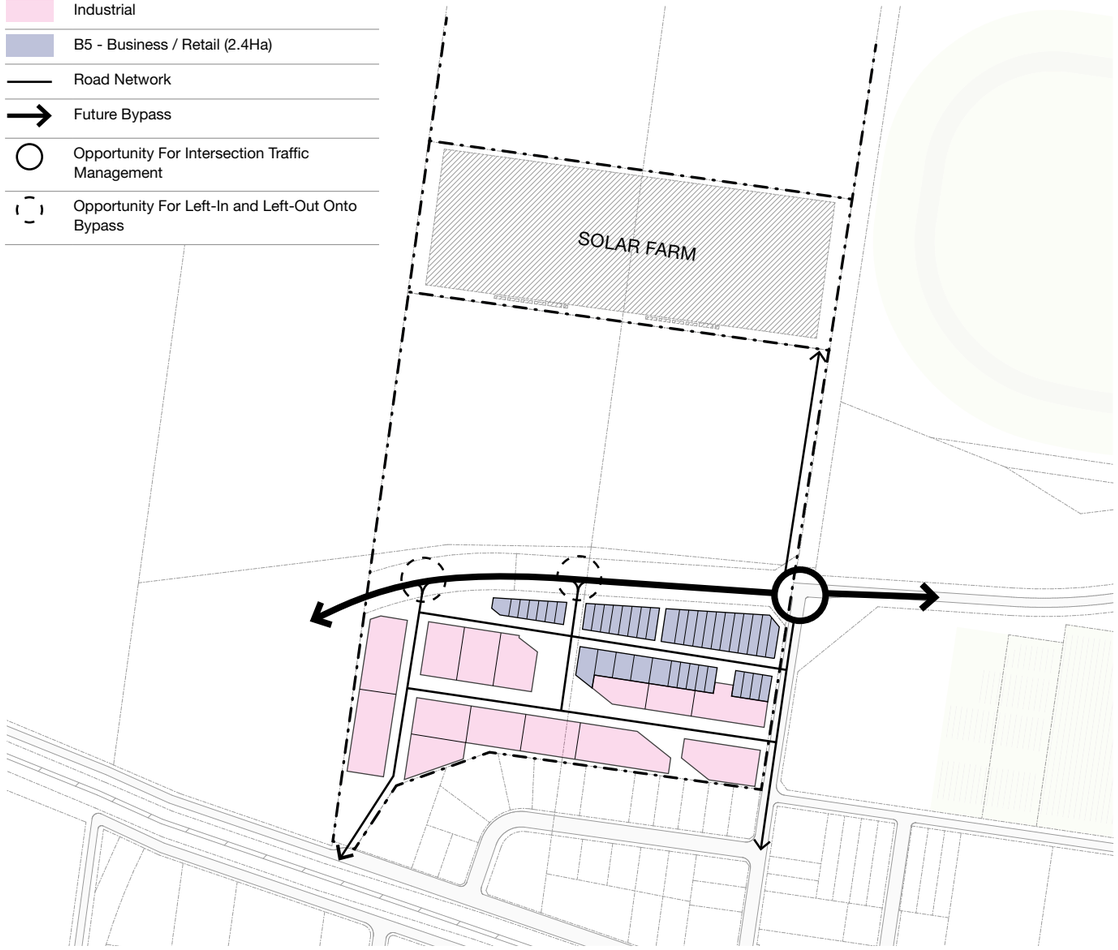


Concept Masterplan (Post Bypass)
The flexibility in the masterplan promotes adaptability, and subsequently limits disruption to traffic flow when the bypass will be introduced.

The simplicity in the internal road network will maintain the visual links and the legibility of the proposal.

Legend

- Industrial
- B5 - Business / Retail (2.4Ha)
- Road Network
- Future Bypass
- Opportunity For Intersection Traffic Management
- Opportunity For Left-In and Left-Out Onto Bypass



Indwe Street
The opportunity to create alternative amenity for the industrial precinct.



Brookvale
The use of colour and material to define spaces.



Footscray
Opportunities for green open spaces to be used for the workers and the wider community.



Indwe Street
Facade articulation to uniquely identify each unit and typology.



Indwe Street
Contemporary construction methods and materials.



Banksmeadow
Facade design to play on light and shadow to redefine industrial units.



Cosgrove Road
Facade articulation that reduces bulk to the larger units.



Sandringham
Cost efficient and effective use of materials.



Indwe Street
Modern construction methods and materials to create contemporary loft style industrial units.



9.3 Architect Drawing Package

Drawing Register

No.	Title	Rev
TP00.01	EXISTING SITE & DEMOLITION PLAN	A
TP00.02	SITE CONSTRAINTS PLAN	A
TP00.03	SITE PLAN	A
TP03.01	SECTIONS	A

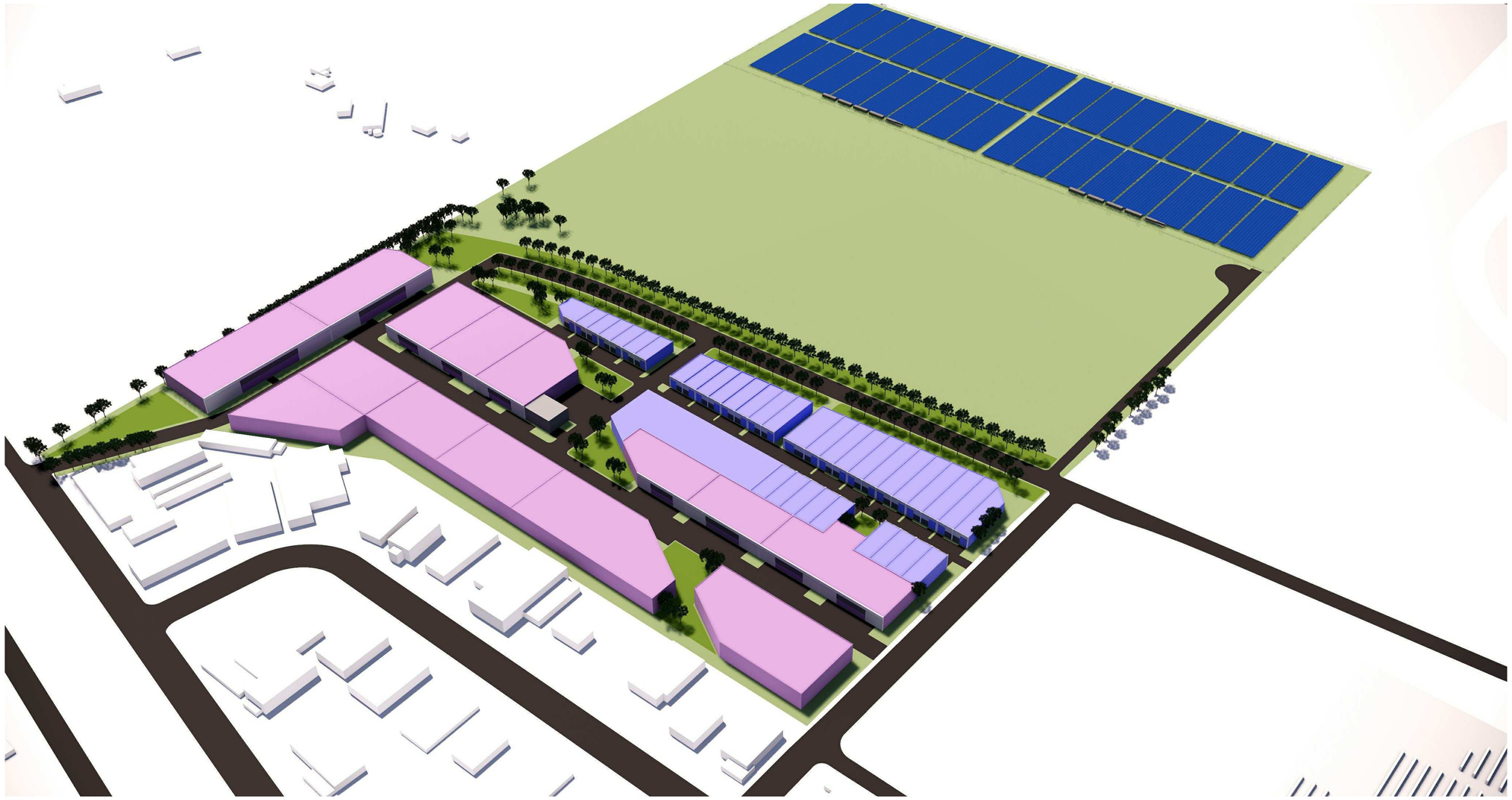
TAMINDA SOLAR FARM AND INDUSTRIAL PRECINCT DEVELOPMENT SUMMARY

SITE AREAS

NAME	AREA	
Solar Farm	~~77,165~~ m²	
IN1 Zone	65,684 m²	Excl. Pt Bypass Easement
B5 Zone	24,114 m²	Excl. Pt Bypass Easement

GFA AREAS

NAME	AREA	FSR
Industrial Units (IN1 Land Zone)	35,410 m² GFA	0.54:1 FSR
Retail/Business Sheds (B5 Land Zone)	14,915 m² GFA	0.62:1 FSR



Taminda Solar Farm & Industrial Precinct

Project
55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

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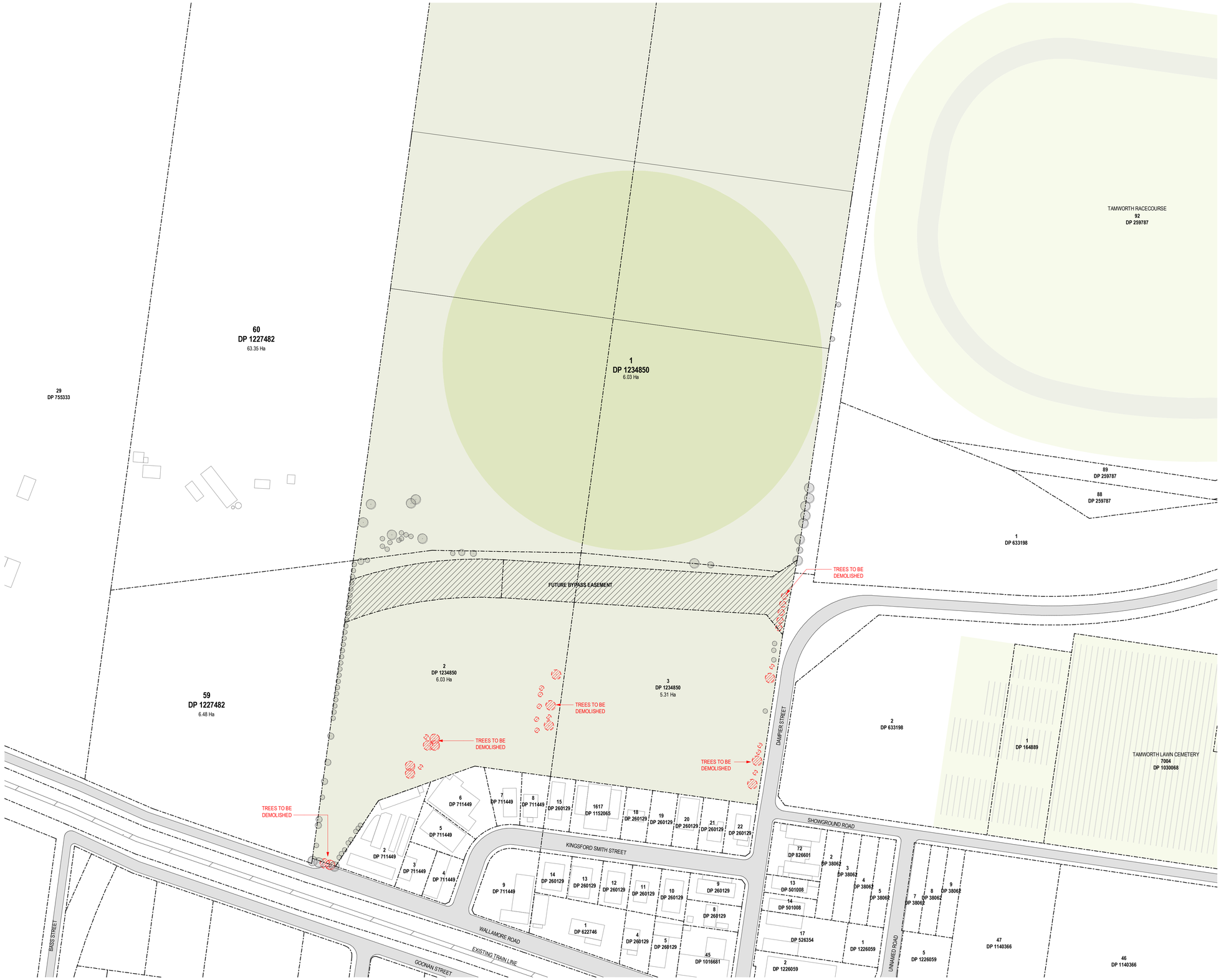
Client
Chan Abbey Holdings Pty Ltd

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PRELIMINARY

Project No	Date
218133	**13.11.18**
Drawing No.	Revision
TP00.00	**B**

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INDICATIVE MASTERPLAN

Revisions

-	20.12.18	PLANNING PROPOSAL	AK
A	27.02.19	AMENDED PLANNING PROPOSAL	AK

6/08/2019 9:06:31 AM

Demolition Notes

Contractor to confirm existing conditions on site.

Contractor to demolish existing structure/remove all materials. Cut and seal services as required in accordance with local authority requirements and a.s. codes for that trade u.n.o

Protection of works as required by local authorities

Cleaning of site to epa requirements by contractor

Preliminary
Precautionary measures to be undertaken as described in AS.2601-2001. A "hazardous substances management plan" is to be implemented before and during demolition if the preliminary investigation of the building identifies any hazardous materials contained therein. These materials will be removed as per the guidelines of the responsible authority and clearance certificate obtained before demolition commences

Safety fencing
Security fences shall be provided to the street boundary of the demolition site and any additional precautionary measures, taken as may be necessary to prevent unauthorised entry to the site, where the demolition site adjoins a public thoroughfare the common boundary between them shall be fenced for its full length with a hoarding unless the least horizontal distance between the common boundary and the nearest part of the structure is greater than twice the height of the structure. The fencing shall be the equivalent of the chain wire as specified in AS.1725

Notices lettered in accordance with AS.1319 and displaying the words "warning demolition in progress", or similar, shall be fixed to the fencing at appropriate places to warn the public. Provision shall be made for ready access to the site by emergency services personnel in the event of fire or accident

Demolition work
Structures shall be demolished in the reverse order to that of their construction. The order of demolition for buildings shall be progressive, storey by storey, having proper regard to the type of construction. No part of any structure shall be left unsupported or unattended in such a condition that it may collapse or become dangerous. Precautions shall be taken to ensure that the stability of all parts of the structure, and the safety of persons on and outside the site, will be maintained in the event of sudden and severe weather changes.

Walls on the boundaries are to be demolished in a safe and workmanship like manner. Walls shall not be laterally loaded by accumulated debris or rubble, to the extent that they are in danger of collapse, allowable loading of the suspended floors shall be determined by an independent structural engineer.

Dust control
The techniques adopted for stripping out and for demolition shall minimise the release of dust into the atmosphere. Before the commencement of stripping or demolition in an area of a structure, any existing accumulations of dust in that area shall be collected, placed in suitable containers and removed. Selection of an appropriate collection technique, such as vacuuming or hosing down, shall take due account of the nature of the dust and the type of hazard it presents. Dust generated during stripping, or during the breaking down of the building fabric to removable sized pieces, shall be kept damp until it is removed from the site or can be otherwise contained. The use of excess water for this purposed shall be avoided.

Noise control
Noise shall be minimised as far as practicable, by the selection of appropriate methods and equipment, and by the use of silencing devices wherever practicable to epa/code requirements.

Note:
1. Attention is drawn to recommendations in AS.2436
2. Hours of operating equipment may be restricted by regulatory authority

Fire services
Where a fire hydrant service or a fire hose reel service is provided in a building, it shall be available at all times during the demolition of the building, so that all remaining storeys except the two uppermost storeys, are serviced. Access to the fire protection services, including any booster fitting, shall be maintained at all times. If a sprinkler system is installed in a building to be demolished, it shall be maintained in an operable condition at each storey below the two uppermost unstripped storeys.

Suitable portable fire extinguishers shall be kept at all times in working area and are not protected by other fire services, and maintained in an operable condition.

Adjoining properties
Safe access to and egress from adjoining buildings shall be maintained at all times for the duration of the demolition work. No demolition activity shall cause damage to or adversely affect the structural integrity of adjoining buildings. The effects of vibration and conversion on adjoining buildings and their occupants shall be minimised by selecting demolition methods and equipment appropriate to the circumstances. Where any surface of an adjoining building is exposed by demolition, the need for weatherproofing the exposed surface shall be investigated and temporary or permanent protection provided as appropriate. Precautions shall be taken to minimise the spreading of mud and debris by vehicles leaving the site.

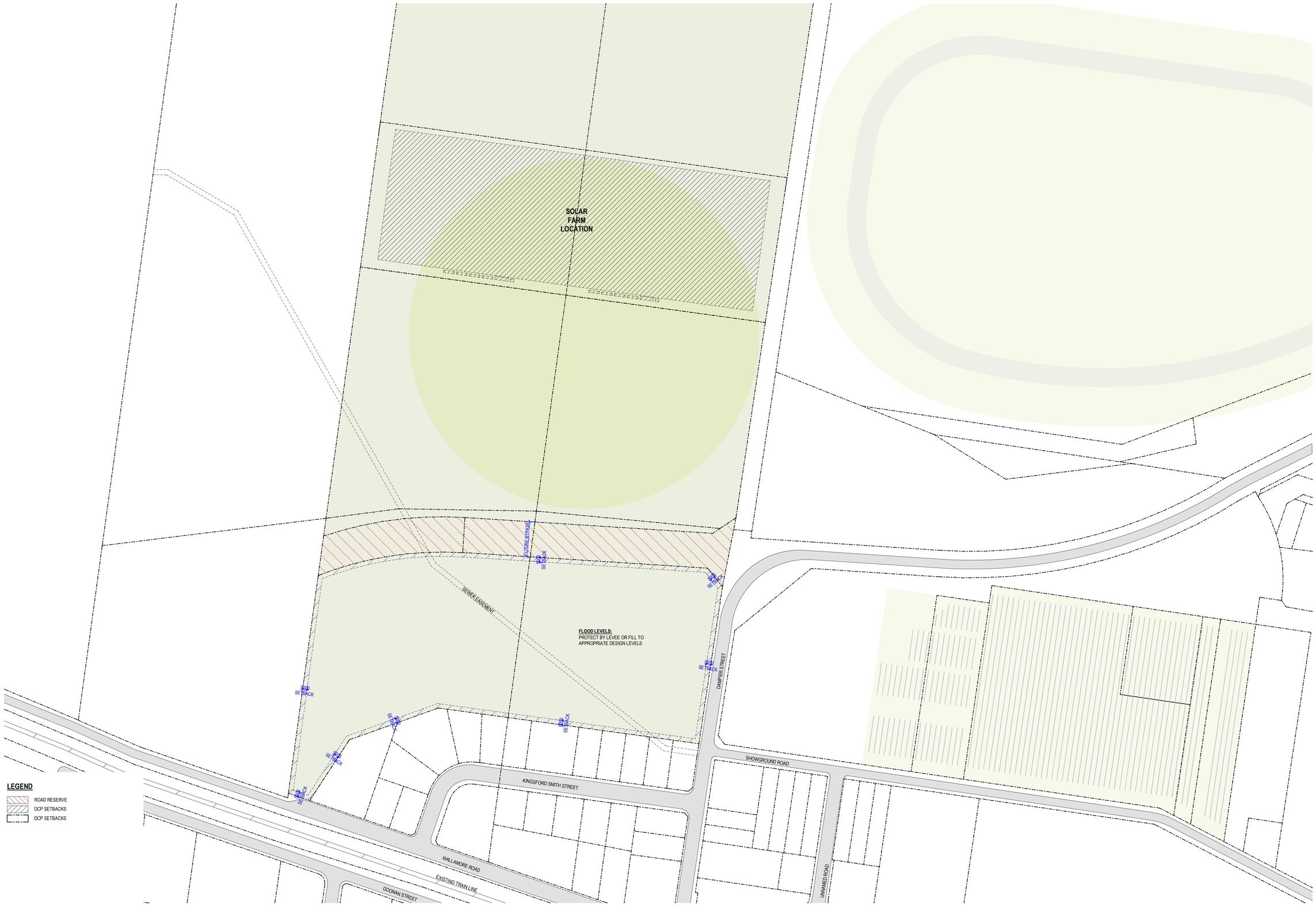
Project: **Taminda Solar Farm & Industrial Precinct**
55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

Drawing: **EXISTING SITE & DEMOLITION PLAN**

Project No. 218133 | Date 08.11.18 | Author AK | Scale: @ A1 1 : 2000 | Drawing No. TP00.01 A

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Revisions			
-	20.12.18	PLANNING PROPOSAL	AK
A	27.02.19	AMENDED PLANNING PROPOSAL	AK

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Project: **Taminda Solar Farm & Industrial Precinct**
55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

Drawing: **SITE CONSTRAINTS PLAN**

Project No: **218133**

Date: **11/22/18**

Author: **AK**

Scale: @ A1: **1 : 2000**

Drawing No.: **TP00.02 A**

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Project: **Taminda Solar Farm & Industrial Precinct**
55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

Drawing: **SITE PLAN**

Project No: **218133** Date: **13.11.18** Author: **AK** Scale: @ A1 **1 : 2000** Drawing No.: **TP00.03 A**

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Revisions

-	20.12.18	PLANNING PROPOSAL	AK
A	27.02.19	AMENDED PLANNING PROPOSAL	AK
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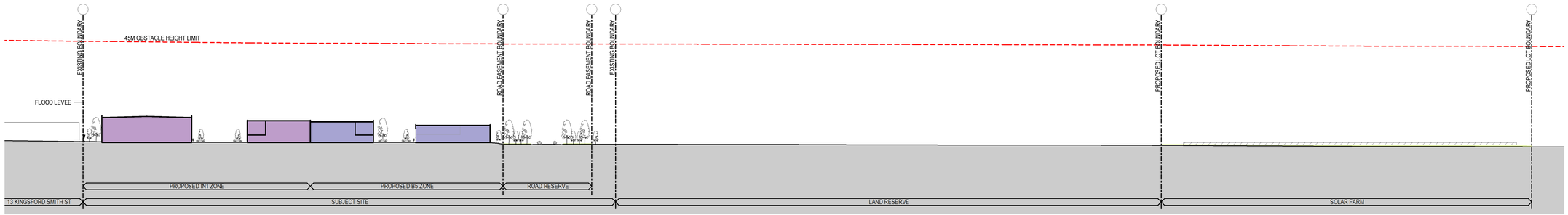
Project: **Taminda Solar Farm & Industrial Precinct**
55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

Drawing: **GROUND FLOOR PLAN** | Project No: **218133** | Date: **11/13/18** | Author: **AK** | Scale: @ A1 **1 : 1000** | Drawing No.: **TP01.01 B**

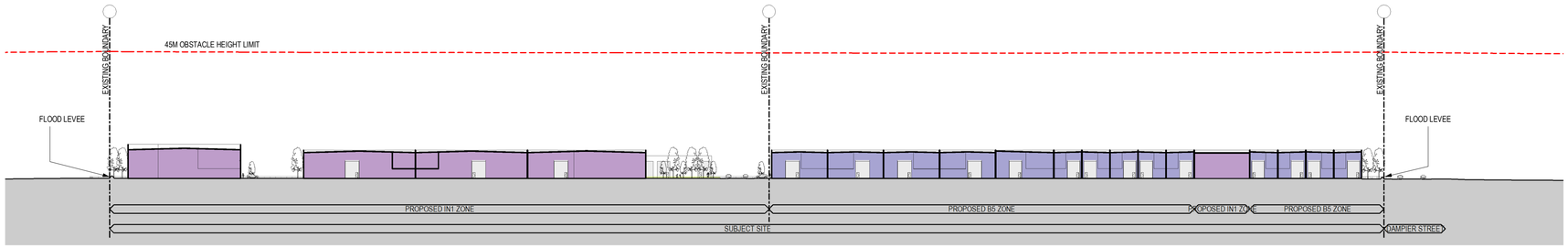
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Section 01



Section 02

INDICATIVE MASTERPLAN

Revisions

-	20.12.18	PLANNING PROPOSAL	AK
A	27.02.19	AMENDED PLANNING PROPOSAL	AK

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Project
Taminda Solar Farm & Industrial Precinct
55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

Drawing **SECTIONS**

Project No **218133**

Date **13.11.18**

Author **AK**

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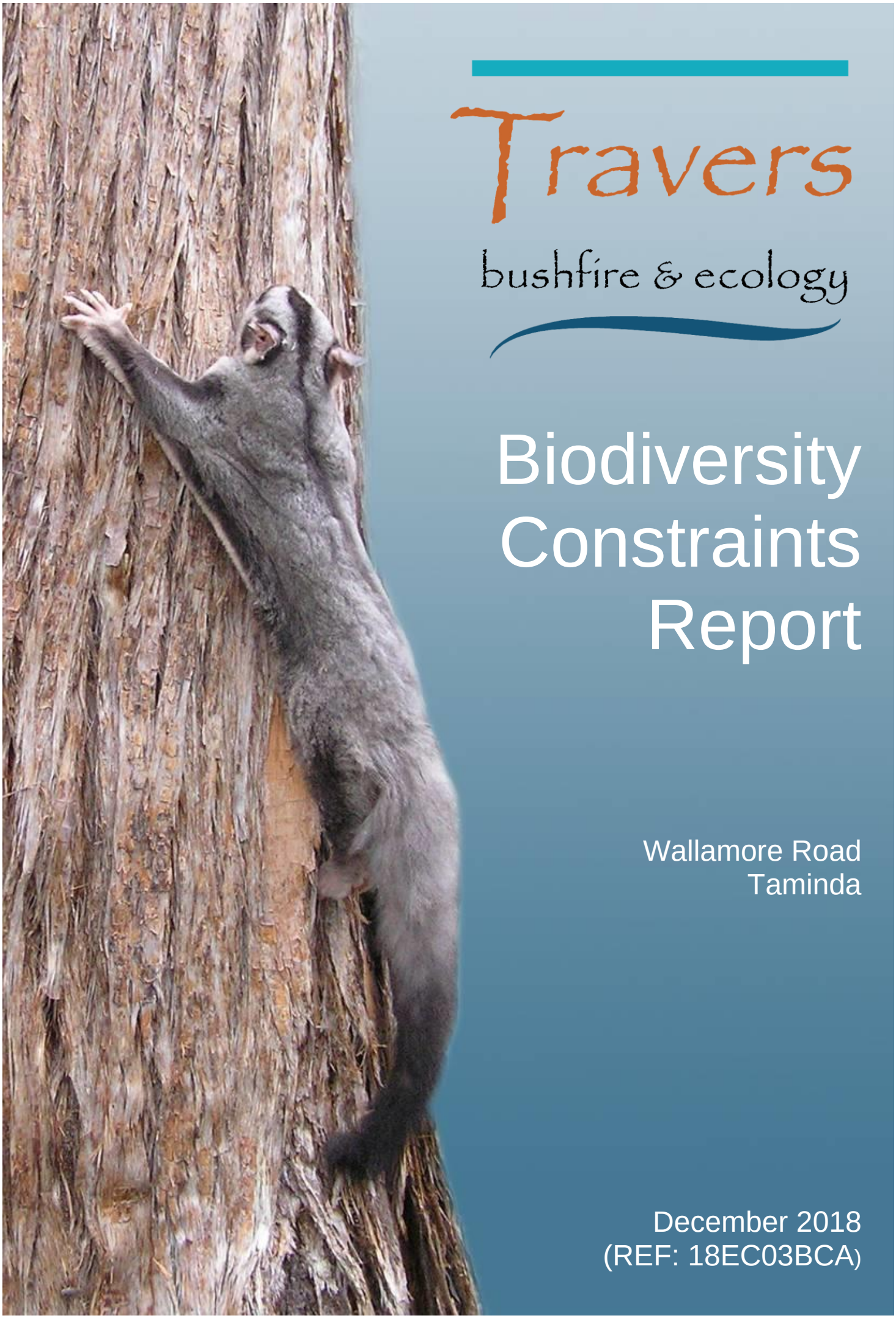
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9.4 Biodiversity constraints assessment



Travers

bushfire & ecology

Biodiversity Constraints Report

Wallamore Road
Taminda

December 2018
(REF: 18EC03BCA)

Biodiversity Constraints Report

72 and 21 Wallamore Rd,
55 Dampier Street
Taminda

Report Authors:	Michael Sheather-Reid B. Nat. Res. (Hons.) – Managing Director Robert Sansom B. Sc. (Hons.) – Botanist George Plunkett B. Sc. (Hons) PhD – Botanist
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Checked by:	Lindsay Holmes/Michael Sheather-Reid
Date:	01/03/2019
File:	18EC03BCA

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Survey effort has been reduced to provide an indication of the insitu vegetation and fauna habitat present. Consequently, further target threatened species survey may be required by the determining authority. The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy. Consequently, the location of all mapped features is to be confirmed by a registered surveyor.

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Appendix 1 – Flora Species List
Appendix 2 – Threatened Flora and Fauna Species Habitat Assessment

List of abbreviations

APZ	asset protection zone
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act (2016)*
BCR	*Biodiversity Conservation Regulation (2017)*
BDAR	Biodiversity Development Assessment Report
BPA	bushfire protection assessment
CLUMP	conservation land use management plan
DCP	Development Control Plan
DEC	NSW Department of Environment and Conservation (superseded by DECC from April 2007)
DECC	NSW Department of Environment and Climate Change (superseded by DECCW from October 2009)
DECCW	NSW Department of Environment, Climate Change and Water (superseded by OEH from April 2011)
DEWHA	Commonwealth Department of Environment, Water, Heritage & the Arts (superseded by SEWPAC)
DOEE	Commonwealth Department of Environment and Energy
EEC	endangered ecological community
EPA	Environmental Protection Agency
EP&A Act	*Environmental Planning and Assessment Act (1979)*
EPBC Act	*Environment Protection and Biodiversity Conservation Act (1999)*
ESMP	ecological site management plan
FF	flora and fauna assessment
FM Act	*Fisheries Management Act*
FMP	fuel management plan
HTA	habitat tree assessment
IPA	inner protection area
LEP	Local Environment Plan
LGA	local government area
NES	national environmental significance
NPWS	NSW National Parks and Wildlife Service
NSW DPI	NSW Department of Primary Industries
OEH	Office of Environment and Heritage (Part of the NSW Department of Premier and Cabinet)
OPA	outer protection area
PBP	*Planning for bushfire protection 2006*
POM	plan of management
RF Act	*Rural Fires Act (1997)*
RFS	NSW Rural Fire Service
ROTAP	rare or threatened Australian plants
SEPP 44	*State Environmental Protection Policy No 44 – Koala Habitat Protection*
SEWPAC	Commonwealth Dept. of Sustainability, Environment, Water, Population & Communities (superseded by DOEE)
SIS	species impact statement
SULE	safe useful life expectancy
TPO	tree preservation order
TPZ	tree preservation zone
TRRP	tree retention and removal plan
TSC Act	*Threatened Species Conservation Act 1995*
VMP	vegetation management plan



Biodiversity Assessment

1.0 Background

Travers bushfire & ecology has been engaged to undertake a biodiversity constraints assessment within the following properties:

Lot 1 DP 1234850 – 72 Wallamore Road, Taminda
Lot 2 DP 1234850 – 21 Wallamore Road, Taminda
Lot 3 DP 1234850 – 55 Dampier Street, Taminda
Lot 60 DP 1227482 – 72 Wallamore Road, Taminda

These lots are located within the Tamworth local government area (LGA). The extent of these lots to the south of the Wallamore anabranch of the Peel River has been subject to detailed survey and is referred to as the 'study area' (Figure 1).



Figure 1 – Aerial appraisal of the study area (red).

1.1 Proposed rezoning

The proposal involves the rezoning of the two southern lots of the study area.

The future development consists of employment lands created by either filling or a levee system at the two lots. A solar farm, a high flow channel and a low flow channel is depicted in Figure 2.

Access to the site may be provided via Wallamore Road, Dampier Street and a future extension of Jewry Street along the existing (unformed) road reserve.

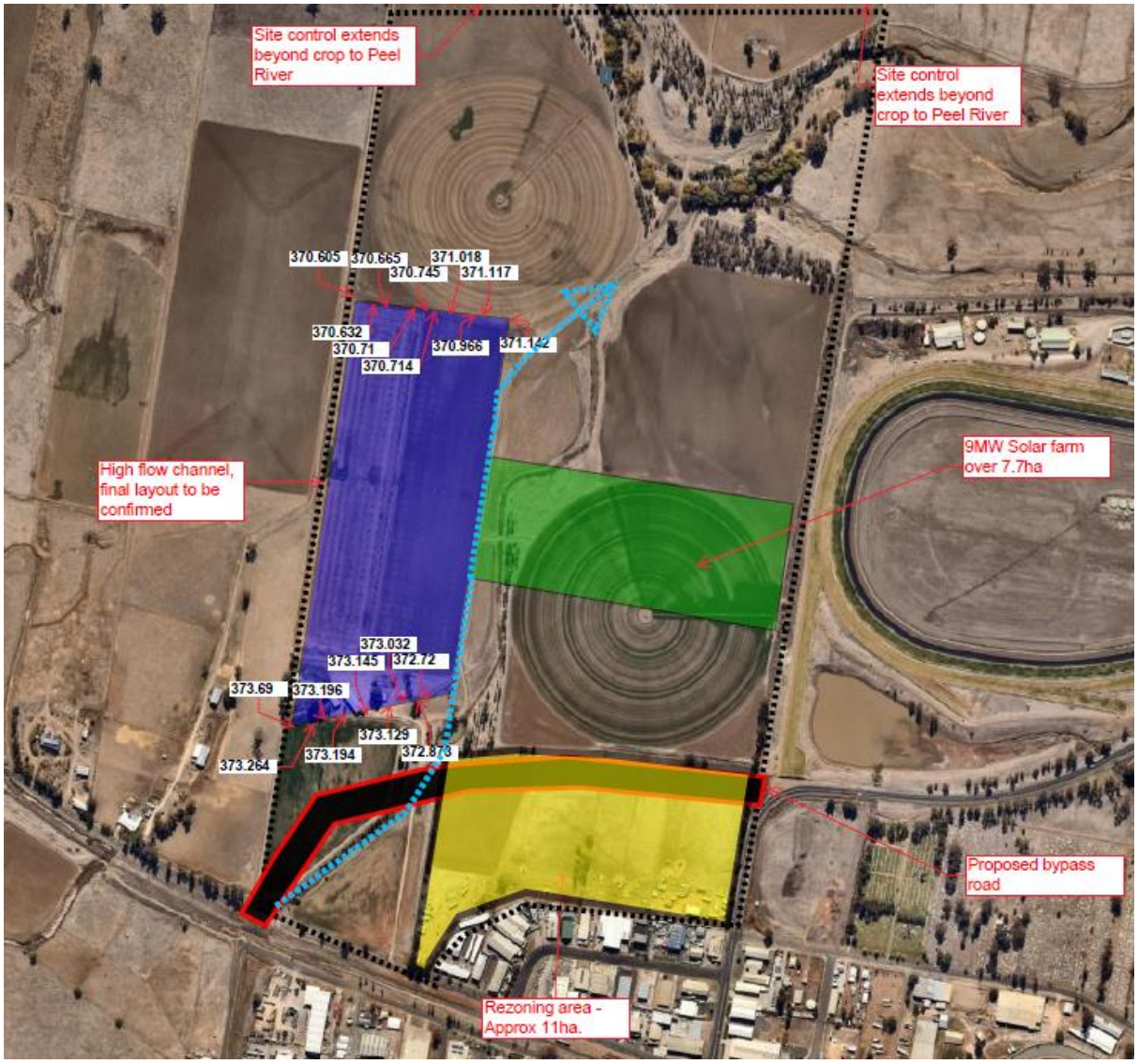


Figure 2 – Proposed rezoning
(Source: Elton Consulting - February 2019)

1.2 Site description

Table 1 provides a summary of the planning, cadastral, topographical, and disturbance details of the study area.

Table 1 – Site features

Location	Lot 1 DP 1234850 – 72 Wallamore Road, Taminda Lot 2 DP 1234850 – 21 Wallamore Road, Taminda Lot 3 DP 1234850 – 55 Dampier Street, Taminda Lot 60 DP 1227482 – 72 Wallamore Road, Taminda
Location description	The site is located approximately 3 km to the west of Tamworth Town Centre. Wallamore Road and existing industrial development along Kingsford Smith Street forms the boundary to the south, with part of the eastern boundary formed by Dampier Street. Adjoining rural lots are located on the entire length of the western boundary. The study area extends northwards and stops short of the top of bank of the Wallamore Anabranch channel associated with the Peel River. The allotments extend further north and are not included in this study north from the southern bank of the anabranch.
Area	Approx. 92ha
Local government area	Tamworth
Zoning	RU4 – Primary production small lots
Grid reference MGA-56	299215E 6558940N
Elevation	Approx. 371 - 377m AHD
Topography	Situated on very gently sloping floodplain, slopes of less than 0.4% with a northerly aspect.
Catchment and drainage	Catchment – Peel River Overland flow into a drainage swale which flows in a NNE direction into the Wallamore anabranch of Peel River.
Existing land use	The property currently contains a rural residence, the remainder of the study area is used for agricultural purposes.

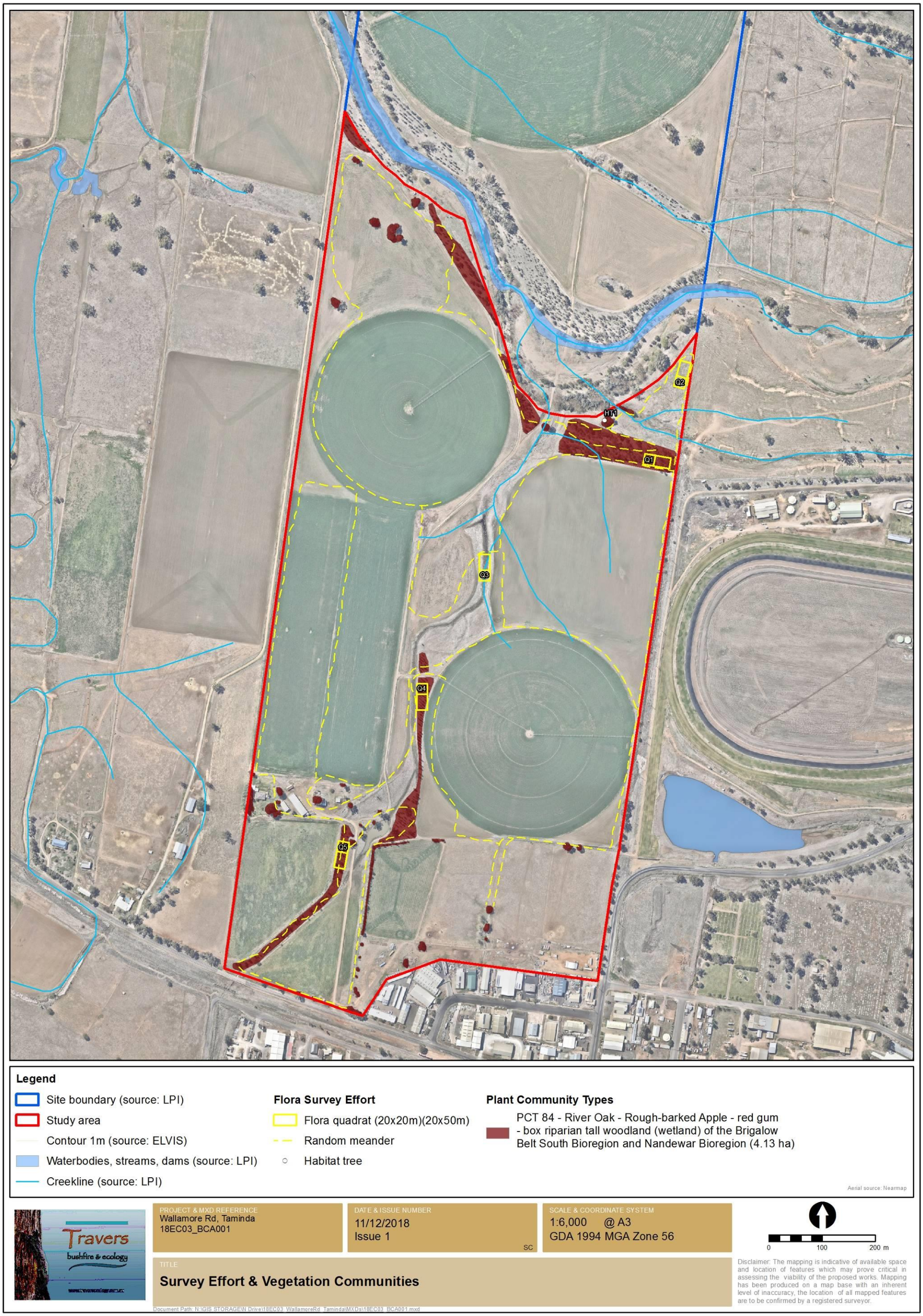


Figure 3 – Field survey effort and vegetation communities

2.0 Biodiversity Offsets Scheme (BOS)

The *BC Act* repeals the *Threatened Species Conservation Act (TSA Act) 1995*, the *Nature Conservation Trust Act 2001* and the animal and plant provisions of the *National Parks and Wildlife Act 1974*.

Together with the *Biodiversity Conservation Regulation 2017*, the *BC Act* establishes a new regulatory framework for assessing and offsetting biodiversity impacts on proposed developments and clearing. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme. Where development consent is granted, the authority may impose as a condition of consent an obligation to retire a number and type of biodiversity credits determined under the new Biodiversity Assessment Method (BAM).

2.1 Threshold assessment

The BOS includes two (2) elements to the threshold test – an area trigger and a Sensitive Biodiversity Values Land Map trigger. If clearing exceeds either trigger, the Biodiversity Offset Scheme applies to the proposed clearing.

2.1.1 Sensitive Biodiversity Land Map

Sensitive Biodiversity Values Land has not been mapped within the study area – an offset is not required under this trigger. Figure 4 shows the site (blue) in relation to those areas (coloured mauve) as having biodiversity values.

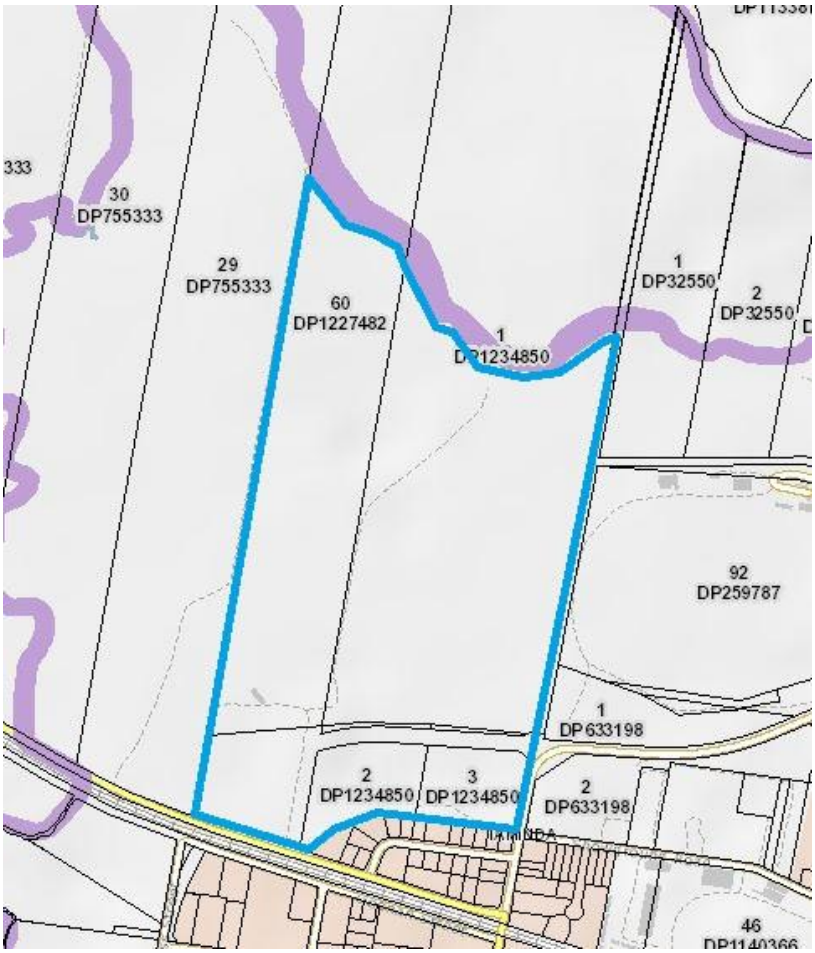


Figure 4 – Biodiversity value land (mauve shading) in the local area
(Source: OEH – Biodiversity Values Map – November 2018)

The area proposed for rezoning is not located on lands mapped as Sensitive Biodiversity Values Land – an offsetting is not required

2.1.2 Area clearing threshold

The area threshold varies depending on the minimum lot size (shown in the Lot Size Maps made under the relevant Local Environmental Plan (LEP)), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP).

Table 2 – BOS entry threshold report

Date of Calculation	01/03/2019 10:20 AM		**BDAR Required***
Total Digitised Area	55.85	ha	
Minimum Lot Size Method	Lot size		
Minimum Lot Size	4.4	ha	
Area Clearing Threshold	0.5	ha	
Area clearing trigger Area of native vegetation cleared	Unknown #		Unknown #
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no		no
Date of the 90 day Expiry	N/A		

Table 2 identifies that BOS entry threshold report has determined the area threshold based on the smallest lot size within the study area (given as 4.4ha). However, the Current LEP states that the minimum lot size for the study area is 40ha. Based on either of these methods, the area clearing threshold for which the BOS applies is 0.5ha. Clearing of 'native vegetation' that exceeds 0.5ha will require a biodiversity offset to be obtained. Note that 'native vegetation' includes planted native species.

The proposed rezoning area is not located within any area mapped as Sensitive Biodiversity Land. However, based upon the preliminary design, the impacts will be above 0.5ha and will trigger the BOS. The total impacts upon paddock trees which are included in the Area Clearing Threshold of native vegetation will need to be established at the development application stage to finalise the overall impact areas.

2.2 Serious and irreversible impacts on biodiversity values

Reference is made to the '*Guidance to assist a decision-maker to determine a serious and irreversible impact Office of Environment & Heritage 2017'.* Development consent cannot be granted for non-State significant development under Part 4 of the *Environmental Planning and Assessment Act, 1979* (NSW) if the consent authority is of the opinion it is likely to have serious and irreversible impacts (SAII) on biodiversity values. The determination of SAII is to be made in accordance with principles prescribed section 6.7 of the BC Regulation (2017). The principles have been designed to capture those impacts which are likely to contribute significantly to the risk of extinction of a threatened species or ecological community in New South Wales.

The principles have been designed to capture those impacts which are likely to contribute significantly to the risk of extinction of a threatened species or ecological community in New South Wales. These are impacts that:

- will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or

- will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or
- impact on the habitat of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or
- impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.

The first three principles broadly align with the IUCN (2017) (see also Bland *et al*. (2016)) criteria used to identify entities at the greatest risk of extinction (i.e. critically endangered entities) and the fourth principle captures impacts on entities that cannot be offset.

Impacts upon the remnant paddock trees or small areas of replanted canopy commensurate with the vegetation type known as PCT 84 – River Oak / Rough-barked Apple red gum box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion & Nandewar Bioregion is not considered to be a potential SAII as this vegetation type is not listed as a threatened ecological community, and therefore by default, does not meet any of the four (4) principles for nomination as a potential SAII.

Reference to the *threatened biodiversity data collection* for the most up-to-date information on ecological communities that are potential SAII and for entity-specific thresholds is recommended if an application is intended to be submitted or is likely to be delayed.

2.3 BOS Conclusion

For council to assess any development proposal a Biodiversity Development Assessment Report (BDAR) will be required. This may involve additional targeted flora and fauna searches and surveys to determine the presence or absence of threatened species or their habitats and to assess the likely impacts of the proposed works upon threatened species, populations or ecological communities or their habitats in accordance with the Significance of Impact Test as specified in the *BC Act.*

The Significance of Impact Test within the BDAR will determine if the proposal is likely to trigger biodiversity offsets or is likely to cause a serious or irreversible impact (SAII) upon threatened species, endangered populations or endangered ecological communities.

3.0 Flora

3.1 Survey

A field inspection was undertaken by Botanist, Mr Robert Sansom B. Sc. (Hons.) on 6-7 November, 2018 over the time frame of approximately 11hrs. This field inspection was restricted to the study area as shown in red within Figure 2 and was undertaken primarily to confirm the plant community type (PCT) or to determine the ecological and habitat value of the site.

Five (5) flora quadrats of 20m x 50m in accordance with the Biodiversity Assessment Method (BAM) were undertaken within the existing replanted native vegetation of the lot to assist in the identification of any PCT present.

Botanical survey included a random meander in accordance with *Cropper* (1993) to gain a full species list of the plants within the site. A review of the *Atlas of NSW Wildlife* (OEH 2019) was undertaken prior to the site visit to determine threatened species previously recorded within 10km of the study area, and relevant target searches were undertaken as suited, generally as meandering transects as shown in Figure 3.

All naturally occurring species were identified to species level where possible, and tabulated in Appendix 1.

3.2 Vegetation communities

Within the study area native vegetation occurs as widely scattered remnant trees within large areas of agricultural land. There are also small areas of replanted native trees which do not contain any native shrubs and the ground layer is dominated by exotics grasses, herbs and forbs. These tree planting areas occupy a total of approximately 0.57ha. The vast majority of the study area contains agricultural land currently used for growing Lucerne, oats and a small-grained wheat which are all used for making Hay and stock feed. There is a small area of household gardens located around the dwelling and ancillary farm structures. A variety of small trees consisting of exotic and planted native species occur along the centrally located drainage swale.

The vegetation in the locality has been mapped within *extant and potential natural vegetation of Tamworth, Manilla and Cobbadah VIS_3796* (Rolhauser, Thonell and Peackock 2009) as River Red Gum – River Oak riparian open forest of Brigalow Belt South and Nandewar Bioregions. This corresponds to *River Oak – Rough-barked Apple – Red Gum box riparian tall Woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar South Bioregion* (PCT 84). Our quadrat and ecological survey results support this classification.

The vegetation within the study site (PCT 84) is not commensurate with any Threatened Ecological Community (TEC) listed under the *Biodiversity Conservation Act 2016 (BC Act)* or *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).*

The remaining vegetation in the study area occurs as planted trees, garden beds and managed cropping and pastoral areas.

Field verification of the study area found the following vegetation communities for the purposes of biodiversity constraints assessment include:

- managed agricultural lands, and
- PCT 84 – *River Oak, Rough-barked Apple, Red Gum, box riparian tall Woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar South Bioregion* (remnant trees or planted canopy only)

Managed Agricultural Lands

Canopy
Widely scattered *Eucalyptus camaldulensis, Eucalyptus sideroxylon, Eucalyptus albens* occur within the agricultural areas of the study area. Canopy projected foliage cover is estimated at less than 1% with a height of 15-24m.

Mid-storey

The mid-storey is generally absent but consists of very sparse occurrences of individual or small clumps of exotic species and contributes less than 1% PFC within the whole study area. Species present include *Lycium ferocissimum, Melaleuca armillaris, Callistemon viminalis* and *Indigofera adesmiifolia*. These species are either exotic weeds or were planted within the household gardens or escaped.

Ground layer

Cropping areas consisted of large areas (95%) of the study area were under cultivation of oats, lucerne or small-seeded wheat. These crops are grown to produce bales of hay or stock feed.

There are introduced or exotic species mixed with these crops and located along farm tracks and within the drainage swale which runs north through the centre of the study area. Typical exotic species observed were *Brassica tournefortii, Capsella bursa-pastoris, Carthamus lanatus, Chenopodium album, Lolium perrenne, Malva parviflora, Rorippa palustris*, and *Rapistrum rugosum.*



Photo 1 – Agricultural land in the north-east corner of the study area (quadrat 2) looking north.



Photo 2 – Agricultural land in use, looking west from the centre of the study area. Note crops of Lucerne (right) and Wheat (left) and isolated scattered individual trees in the middle distance

PCT 84 – *River Oak, Rough-barked Apple, Red Gum, box riparian tall Woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar South Bioregion* (remnant trees or planted canopy only)

Canopy

There are areas of tree replanting within areas shown in Figure 3. These areas have been replanted with species that are likely to occur naturally on the Peel River floodplain. These patches of replanted trees all contain the same mixture of species such as *Eucalyptus camaldulensis, Eucalyptus sideroxylon, Eucalyptus albens* and presently have a canopy projected foliage cover of 25 to 35% with a height of 8 to 12m.

Travers bushfire & ecology notes that 'native vegetation' either naturally occurring or planted, if impacted by any future proposed works, is assessed under the Biodiversity Assessment Methodology as impacted native vegetation for determination of biodiversity offsetting.

Mid-storey

The mid-storey is absent (see photos 3 and 4).

Ground layer

This layer was generally disturbed through previous removal and impacts from cattle such as grazing and sheltering under the canopy resulting in soil disturbance (see photos 3 and 4). No planting within the ground layer appears to have been undertaken.

There are some exotic species present within the patches of planted trees. Typical exotic species observed were *Rapistrum rugosum, Brassica tournefortii, Capsella bursa-pastoris, Lolium perrenne, Alternanthera pungens, Asphodelus fistulosus*, *Chenopodium album* and *Rorippa palustris.*

This Planted trees vegetation is commensurate with Plant Community Type (PCT) 84 – *River oak, Rough-barked Apple, Red Gum, Box riparian Tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion*. PCT 84 is not commensurate with any Threatened Ecological Community (TEC) listed within the *Biodiversity Conservation Act 2016* (*BC Act*) or *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*).



Photo 3 – Planted Trees within Quadrat 1 looking west. Note lack of Mid-storey



Photo 4 – Planted trees within Quadrat 4, looking south.
Note lack of mid storey and ground disturbance from cattle



Photo 5 – Remnant trees located approximately 60 metres NE of Quadrat 5, looking N.E.

3.3 Threatened flora species

BC Act – A search of the *Atlas of NSW Wildlife* (OEH, 2019) indicated a list of species that have been recorded within a 10 km radius of the study area. These species are listed in Appendix 2 Table A2.1 and are considered for potential habitat within the study area.

EPBC Act – A review of the schedules of the *EPBC Act* indicated the potential for a list of threatened flora species to occur within a 10km radius of the study area. These species have also been listed in Appendix 2 Table A2.1 for consideration of potential to occur.

Based on the habitat assessment within Table A2.1 it is considered that the study area provides potential habitat for the following threatened flora species. These species should be considered in any Significance of Impact Test included within a BDAR for any future development application.

Table 2 – Threatened flora species with suitable habitat present

Scientific name	*BC Act*	*EPBC Act*	Potential to occur
Dichanthium setosum	V	V	Very low

All threatened flora species in both the Bionet (NSW) and *EPBC Act* coordinate search (National) were considered to have very low potential suitable habitat within the study area possibly due to factors such as previous clearing and landscaping works, past and ongoing land management practices, unsuitable soils / geology, unsuitable previous vegetation type or large distance to known specimens.

3.4 Endangered flora populations

No endangered flora populations occur within Tamworth Council LGA.

No specimens of any endangered flora population were observed within the study area during the flora survey. Therefore, it is considered that no endangered populations occur within the study area.

3.5 Endangered ecological communities

No endangered ecological community occurs within Tamworth Council LGA. PCT 84 is not commensurate with any Threatened Ecological Community (TEC) listed within the *Biodiversity Conservation Act 2016* (*BC Act*) or *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*).

Therefore, no endangered ecological communities were observed within the study area during the flora survey.

3.6 State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

The *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* (Vegetation SEPP) was one of a suite of Land Management and Biodiversity Conservation (LMBC) reforms that commenced in New South Wales on 25 August 2017. The Vegetation SEPP (the SEPP) works together with the *BC Act* and the *Local Land Services Amendment Act 2016* to create a framework for the regulation of clearing of native vegetation in NSW.

The SEPP will ensure the biodiversity offset scheme (established under the Land Management and Biodiversity reforms) will apply to all clearing of native vegetation that

exceeds the offset thresholds in urban areas and environmental conservation zones that does not require development consent.

Vegetation SEPP applies to the following local government areas:

Bayside, City of Blacktown, Burwood, Camden, City of Campbelltown, Canterbury-Bankstown, Canada Bay, Cumberland, City of Fairfield, Georges River, City of Hawkesbury, Hornsby, Hunter's Hill, Georges River, Inner West, Ku-ring-gai, Lane Cove, City of Liverpool, Mosman, Newcastle, North Sydney, Northern Beaches, City of Parramatta, City of Penrith, City of Randwick, City of Ryde, Strathfield, Sutherland Shire, City of Sydney, The Hills Shire, Waverley, City of Willoughby, Woollahra.

The Vegetation SEPP also applies to land within a variety of zones as set out in the legislation 'Land to which the policy applies'. The zonings that the SEPP applies to include

Zone RU5 Village, Zone R1 General Residential, Zone R2 Low Density Residential, Zone R3 Medium Density Residential, Zone R4 High Density Residential, Zone R5 Large Lot Residential, Zone B1 Neighbourhood Centre, Zone B2 Local Centre, Zone B3 Commercial Core, Zone B4 Mixed Use, Zone B5 Business Development, Zone B6 Enterprise Corridor, Zone B7 Business Park, Zone B8 Metropolitan Centre, Zone IN1 General Industrial, Zone IN2 Light Industrial, Zone IN3 Heavy Industrial, Zone IN4 Working Waterfront, Zone SP1 Special Activities, Zone SP2 Infrastructure, Zone SP3 Tourist, Zone RE1 Public Recreation, Zone RE2 Private Recreation, Zone E2 Environmental Conservation, Zone E3 Environmental Management, Zone E4 Environmental Living or Zone W3 Working Waterways.

3.6.1 Is an Authority to clear vegetation required

As 'development consent' is required for the proposed works the Vegetation SEPP does not apply.

3.7 Local Land Services Act 2013

The *Local Land Services Act 2013* became fully operational in January 2014. The amended *Local Land Services Act* 2013, provides a new regulatory framework for native vegetation and land management activities in NSW. The amended Act:

- categorises regulated and exempt land to provide certainty and clarity for landholders
- creates Allowable Activities which simplify and expand the former routine agricultural management activities (RAMAs)
- creates the Land Management (Native Vegetation) Code
- establishes a Native Vegetation Panel
- enables landholders to use the Biodiversity Offsets Scheme for agricultural development.

The *Local Land Services Act 2013* repeals the *Rural Lands Protection Act 1998,* the *Rural Lands Protection Amendment Act 2008,* and the *Catchment Management Authorities Act 2003*.

The new Land Management Framework provides landholders with more options to manage native vegetation on their property. Land in NSW is categorised into three main categories including, Category 1 (exempt land), Category 2 (regulated land) and excluded land. Categorisation of land provides certainty to landholders and defines options available for each category for native vegetation management.

The NVR Map generally covers rural land in NSW. It categorises land where management of native vegetation can occur without approval or where management of native vegetation may

be carried out in accordance with Part 5A of the LLS Act. A summary of categories used in the NVR Map is shown below (Figure 5) as it applies to the study area.

Reference to the Native Vegetation Regulation Map identifies that the subject land is not mapped as sensitive or vulnerable regulated land and therefore the Local Land Services Act does not apply. The proposal does not impact vulnerable regulated land.

For the purposes of this assessment we have assumed the land is exempt Land and determination of the proposal is subject to development assessment under the Biodiversity Conservation Act.

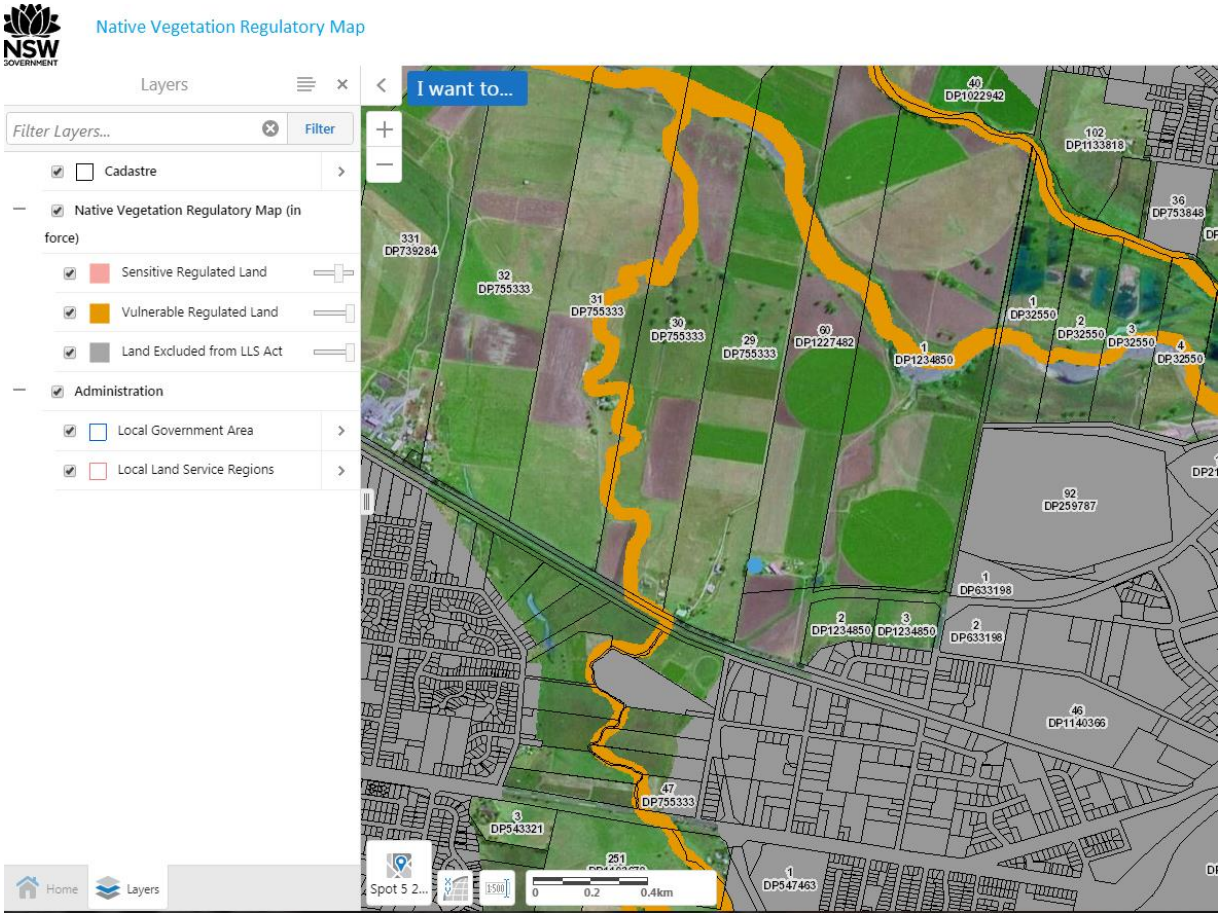


Figure 5 – Native Vegetation Regulation Map
(Source: OEH – Native Vegetation Regulation Map – November 2018)

4.0 Fauna

4.1 Survey / Habitat assessment

A fauna habitat assessment was undertaken during the botanical survey to identify the habitat types available and its quality and to identify any specific or important features.

The fauna habitat assessment is based on a site inspection with notes and photographs taken where required, desktop analysis, threatened species records (OEH 2019) and habitat attributes identified during the flora survey. Particular note was taken to search for the following potential threatened fauna species habitat:

- A count of tree species present to determine 'Potential Koala Habitat' according to the definitions of SEPP 44.
- Hollow-bearing trees present.
- Presence of any raptor nests.

- Terrestrial shelters, burrows and/or hollows.
- Connectivity potential to and from the site.
- Presence of drainages for frog species habitat.

Significant habitat trees are defined as trees containing large hollows suitable for owls/cockatoos and/or two or more good quality medium hollows and/or several small hollows and/or a tree showing notable use by a threatened species (eg. sap feed tree, raptor nest tree or microbat roost).

A review of the *Atlas of NSW Wildlife* (OEH 2019) was undertaken prior to the site visit to determine threatened fauna species previously recorded within 10km of the study area.

The following notable habitat features were observed present:

- At least three (3) habitat trees containing good quality medium or small hollows.
- Year-round nectar producing tree species, principally *Eucalyptus* or *Angophora* species
- Seed producing C*asuarina* trees
- Ephemeral constructed drainage lines
- Commercial buildings
- Large areas undergoing agricultural use for stock feed

4.2 Hollow-bearing trees

Hollow-bearing trees were not generally surveyed during the flora survey. However, one tree HT01 was assessed as an unidentified raptor was seen leaving the tree on approach by the botanist. Hollow-bearing tree data for HT01 is provided in Table 3. The location of HT001 is in the north-eastern parts of the study area as shown in Figure 3. This Habitat tree will not be impacted by the proposed works.

Table 3 – Hollow-bearing tree data

No	Common name	DBH (cm)	Height (m)	Spread (m)	Vigour (%)	Hollows recorded
HT001	River Red Gum	180	23	16	75	1x 5-10cm branch hollow 1x 15-20cm branch hollow 2x 20-30cm branch hollows

The recorded hollows may be suitable for hollow-dependent threatened species with considered potential to occur.

The proposed development layout enables retention of this recorded hollow-bearing tree.

4.3 Threatened fauna species

BC Act – A search of the *Atlas of NSW Wildlife* (OEH, 2018) provided a list of threatened fauna species previously recorded within a 10km radius of the study area. These species are listed in Appendix Table A2.2 and are considered for potential habitat within the study area.

Fisheries Management Act (*FM Act*) – No habitats suitable for threatened aquatic species were observed within the study area and as such the provisions of this act do not require any further consideration.

EPBC Act – A review of the schedules of the *EPBC Act* identified a list of threatened fauna species or species habitat likely to occur within a 10km radius of the study area. These species have also been listed in Appendix Table A2.2.

In accordance with Table A2.2 the following state and nationally listed threatened fauna species are considered to have suitable habitat with varying potential to occur within the study area. The state listed species will be considered in the seven-part test (Appendix 3):

Table 4 – Threatened fauna species with suitable habitat present

Common name	*BC Act*	*EPBC Act*	Potential to occur
Grey-headed Flying-fox	V	V	Low
Eastern Bentwing-bat	V	-	Low
Swift Parrot	E	E	Low
Square-tailed Kite	V	-	unlikely
Little Lorikeet	V	-	unlikely
Dusky Woodswallow	V	-	unlikely
Turquoise Parrot	V	-	unlikely
Speckled Warbler	V	-	unlikely
Diamond Firetail	V	-	unlikely
Koala	V	V	unlikely
Black Falcon	V	-	unlikely

Additional protected migratory species listed under the *EPBC Act* are considered for habitat potential in Table A2.3.

It is concluded that there will be no likely serious or irreversible impact any state or nationally listed threatened fauna species with considered potential to occur.

4.4 Protected migratory species (National)

The EPBC Act Protected Matters Report provides additionally listed terrestrial, wetland and marine migratory species of national significance likely to occur, or with habitat for these species likely to occur, within a 10km radius of the study area. The habitat potential of migratory species is considered in Table A2.3 (Appendix 2).

No nationally protected migratory bird species were recorded present within the study area during the preliminary survey. The study area does not contain any breeding habitat or habitat of other unique importance for foraging or breeding for nationally listed migratory species. Therefore these species will not likely offer constraint to the proposal.

4.5 Endangered fauna populations

There are no endangered fauna populations known to occur within the Tamworth local government area.

4.6 Connectivity

The vegetation within the study area is already highly fragmented and disconnected from other areas of contiguous bushland. The nearest natural vegetation occurs immediately to the north of the study area along the banks of the Wallamore Anabranch. The planted canopy vegetation within the study area (shown as reddish-brown patches in Figure 6) are discontinuous and lack any native ground or shrub layers. Other isolated remnant trees are located within the site but do not provide any more than small widely separated single or small groups of trees. Therefore the study area provides no local or regionally important connective values to warrant protection within a conservation corridor. However, the banks of the Wallamore Anabranch located immediately to the north of the study area do support narrow bands of mixed native and exotic (Willows) vegetation.



Figure 6 – Local connectivity

5.0 Wetlands, Groundwater dependent Ecosystems and Watercourses

5.1 Endangered wetland communities

A number of wetland communities have been listed as an 'endangered ecological community' under the NSW *BC Act*. We note that ‘wetlands’ are included in the definition of ‘waterfront lands’ in accordance with the *Water Management Act* (*WM Act*) 2000 due to their inclusion in the definition of a ‘lake’ under the same act.

Impacts on wetland communities must be assessed under the *BC Act* and if present the management of wetland communities must be given due consideration in accordance with the objectives and principles of management as contained within the NSW Wetlands Policy (2010), and appropriate management as determined by NSW DPI - Office of Water in their general terms of approval (GTA’s). This may include but not limited to the provision of buffers, management of stormwater runoff and maintenance of natural inflows or runoff into those wetland communities.

- Artesian springs ecological community - endangered ecological community listing
- Castlereagh swamp woodland community - endangered ecological community listing
- Coastal saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions - endangered ecological community listing
- Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions - endangered ecological community listing
- Kurri sand swamp woodland in the Sydney Basin Bioregion - endangered ecological community listing
- Lagunaria swamp forest on Lord Howe Island - endangered ecological community listing
- Maroota Sands swamp forest - endangered ecological community listing
- Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion - endangered ecological community listing
- Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions - endangered ecological community listing
- Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions - endangered ecological listing
- Sydney Freshwater Wetlands in the Sydney Basin Bioregion - endangered ecological community listing
- The shorebird community occurring on the relict tidal delta sands at Taren Point - endangered ecological community listing
- Upland wetlands of the drainage divide of the New England Tableland Bioregion - endangered ecological community listing
- Wingecarribee Swamp - endangered ecological community listing

In accordance with the *WM Act*, endangered wetland communities are through the definition of ‘lakes’ potentially classed as waterfront land. Referral to DPI WaterNSW may be required for determination under the *WM Act* as a controlled activity. As well as protection, a buffer may be applied to these communities as specified by DPI WaterNSW.

No endangered wetland communities were present within the study area and therefore a referral to WaterNSW is not required.

5.2 Groundwater dependent ecosystems (GDEs)

Groundwater dependent ecosystems are communities of plants, animals and other organisms whose extent and life processes are dependent on groundwater. Some examples of ecosystems which depend on groundwater are:

- wetlands;
- red gum forests, vegetation on coastal sand dunes and other terrestrial vegetation;
- ecosystems in streams fed by groundwater;
- limestone cave systems;
- springs; and
- hanging valleys and swamps.

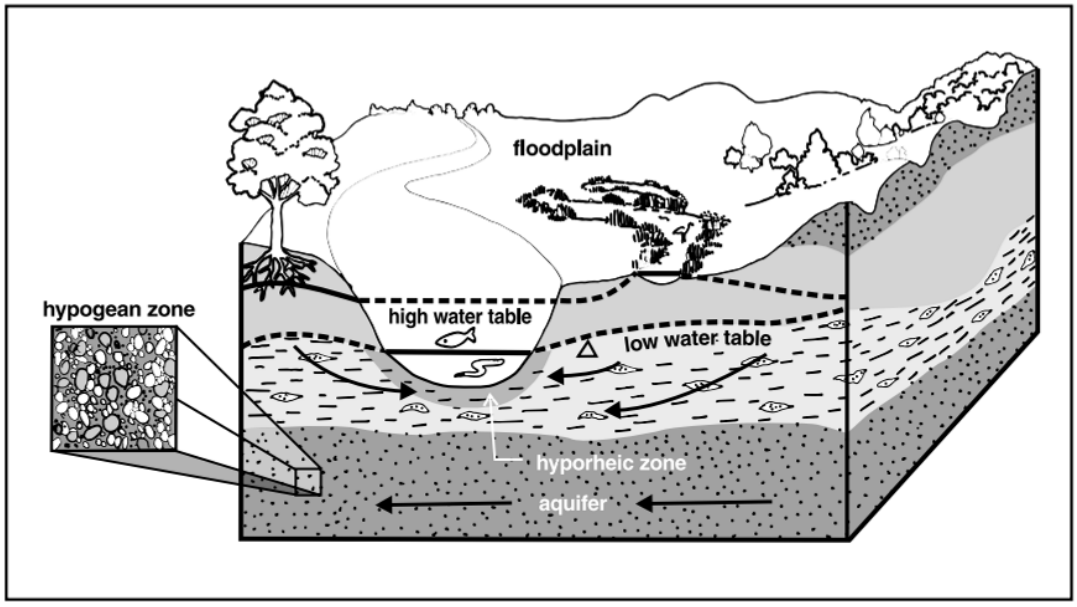


Figure 7 – Alluvial groundwater system discharging into a river

Groundwater dependent ecosystems are therefore ecosystems which have their species composition and their natural ecological processes determined by groundwater (NSW State Groundwater Dependent Ecosystems Policy April 2002).

Remnants of Groundwater Dependent Ecosystems (GDEs) in the form of remnant trees and planted patches of tree species commensurate with PCT 84 - *River Oak – Rough-barked Apple – Red Gum box riparian tall Woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar South Bioregion* were observed within the study area This community corresponds to a Red Gum Forest as shown in point two above.

This vegetation community has in the past been reliant on flooding events along the river to create and maintain the floodplain vegetation and its habitat. Impacts on groundwater dependent ecosystems is to be determined and considered in any future biodiversity or impact assessment.

5.3 Watercourses

Topographic maps indicate presence of watercourses within the northern portion of the site (Figure 8).

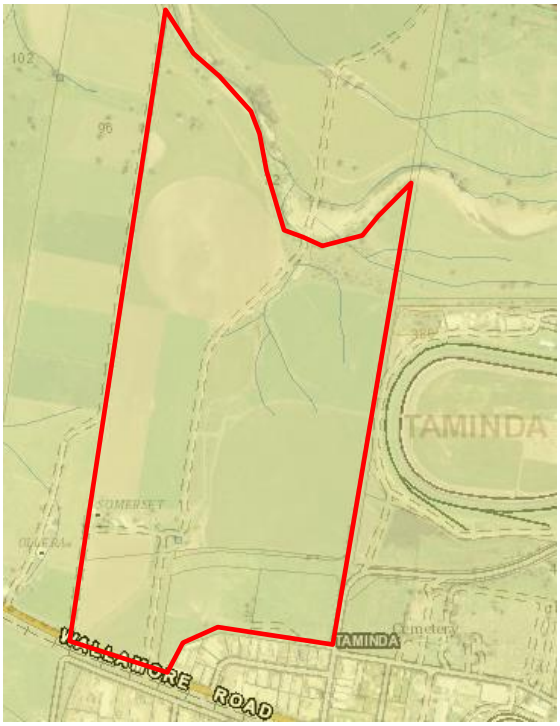


Figure 8 – Mapped Watercourses

A constructed drainage channel also passes through site and discharges into the mapped streams and hence into Wallamore Anabranch as shown as a solid blue line within Figure 9. This constructed drainage channel is also fed by several small depressions which constitute overland flow within large, almost flat cropping areas as shown by blue dashed lines. The drainage channel and ephemeral overland flows are ephemeral in nature.

The parts of the main constructed drainage channel located south of the small dam as shown in Figure 9 are characterised by a series of remnant or planted endemic native trees and also planted exotics and non-endemic trees as shown in Photo 6.



Figure 9 – Ephemeral watercourses within the site



Photo 6 – Looking south along the constructed drainage swale within Quadrat 5



Photo 7 – Looking south along the constructed drainage swale within Quadrat 3

Another ephemeral drainage line exists outside the study area which is located approximately ten (10) metres outside and parallel to the eastern boundary of the study area. This drainage channel primarily drains the verges of Dampier and Jewry Streets and the horse racing property to the east.

The constructed drainage channel forms as an extension to the existing mapped streams as shown on SixMaps therefore a referral for general terms of approval and controlled activity approval may be required under the *Water Management Act 2000* (*WM Act*).

6.0 Conclusions

Ecological survey and has been undertaken within Lot 1 DP 1234850 – 72 Wallamore Road, Lot 2 DP 1234850 – 21 Wallamore Road, Lot 3 DP 1234850 – 55 Dampier Street and Lot 60 DP 1227482 – 72 Wallamore Road, Taminda.

No threatened flora species, populations or ecological communities have been observed or considered likely to occur in a natural state within the study area.

Whilst fauna survey has not been undertaken, it is considered that the habitat attributes within the study area do not provide any significant or unique habitat of breeding importance for any threatened fauna species. Remnant and planted vegetation may provide low key foraging value. The single recorded hollow-bearing tree will be retained and will not be further fragmented from other local adjacent natural habitats.

The native vegetation present within the study area is attributable to highly modified remnants or planted trees (canopy only) commensurate with Plant Community Type (PCT) 84 - *River Oak, Rough-barked Apple, Red Gum, box riparian tall Woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar South Bioregion* which is not listed within the NSW *BC Act* (2016) or within the Commonwealth *EPBC Act* (1999) as a Threatened Ecological Community (TEC).

The area clearing threshold for this site is 0.5ha, that is, impacts of more than 0.5ha need to be adequately offset through the BOS. Based upon the preliminary design, the impacts will be above 0.5ha and will trigger the entry into the BOS.

6.1 Recommendations

To minimise adverse ecological impacts, the following mitigation measures are proposed:

1. Assessment of the project in accordance with the Biodiversity Offsetting Scheme (BOS) is recommended.

2. Biodiversity offsetting of impacts is likely to be required. Consideration to the establishment of a Biodiversity Stewardship Site either within the site or within the riparian zone associated with the Wallamore Anabranch is recommended.

3. Alternatively, assess the Biodiversity Credit value of the vegetation to be removed and purchase biodiversity offset credits from the NSW BioBanking Trust.

4. Revegetation such as along the existing or redirected drainage line, is to utilise locally-occurring native species commensurate with PCT 84 – *River Oak, Rough-barked Apple, Red Gum, box riparian tall Woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar South Bioregion* including trees, shrubs and ground covers to encourage local fauna use, to consolidate remnant vegetation linkages and to provide ‘island’ refuges for native flora and fauna species within the locality.

5. Sediment and erosion control measures in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom 2004) to minimise impact of possible sedimentation to local drainage lines.

6. Control and eradication of invasive ecological weeds should be undertaken to prevent further invasion by these species. High threat weed species listed within the NSW *BC Act* (2016) such as Canary Island Date Palm, White Poplar, Weeping Willow, Khaki Weed, Mediterranean Turnip, Saffron Thistle and Coolatai Grass were observed within the study area.

7. It is recommended that a Vegetation Management Plan (VMP) be produced to ensure that any proposed revegetation areas within the site address the potential to expand the extent of PCT 84 along drainage lines or within the riparian corridor associated with the Wallamore Anabranch and to control or eradicate high threat and environmental weeds which are required to be controlled in accordance with the NSW *Biosecurity Act* (2015).

8. The future development of the site is to consider drainage and native vegetation restoration actions within the site.

Appendix 1
Flora Species List

Table A1.1 – Flora species recorded

Family	Scientific name	Common name
TREES		
Sterculiaceae	*Brachychiton populneus* subsp. *populneus*	Kurrajong
Cupressaceae	*Callitris spp.*	
Casuarinaceae	*Casuarina cunninghamiana* subsp. *cunninghamiana*	River Oak
Myrtaceae	*Eucalyptus albens*	White Box
Myrtaceae	*Eucalyptus camaldulensis*	River Red Gum
Myrtaceae	*Eucalyptus melanophloia*	Silver-leaved Ironbark
Myrtaceae	*Eucalyptus melliodora*	Yellow Box
Myrtaceae	*Eucalyptus sideroxylon*	Red Ironbark
Arecaceae	*Livistona australis*	Cabbage Tree Palm
Meliaceae	*Melia azedarach*	White Cedar
Oleaceae	*Notelaea microcarpa* var. *microcarpa*	Velvet Mock Olive
Arecaceae	*Phoenix canariensis**	Canary Island Date Palm
Salicaceae	*Populus alba**	White Poplar
Salicaceae	*Salix babylonica**	Weeping Willow
Anacardiaceae	*Schinus areira**	Pepper Tree
SHRUBS		
Myrtaceae	*Callistemon viminalis*	Weeping Bottlebrush
Faboideae	*Indigofera adesmiifolia*	Tick Indigo
Solanaceae	*Lycium ferocissimum**	African Boxthorn
Myrtaceae	*Melaleuca armillaris* subsp. *armillaris*	Bracelet Honey Myrtle
Chenopodiaceae	*Sclerolaena tetracuspis*	Brigalow Burr
GROUNDCOVERS		
Amaranthaceae	*Alternanthera pungens**	Khaki Weed
Asphodelaceae	*Asphodelus fistulosus**	Onion Weed
Poaceae	*Austrostipa pubescens*	Tall Speargrass
Poaceae	*Austrostipa ramosissima*	Stout Bamboo Grass
Poaceae	*Avena sativa**	Oats
Asteraceae	*Bidens pilosa**	Cobbler's Pegs
Brassicaceae	*Brassica rapa**	Wild Turnip
Brassicaceae	*Brassica tournefortii**	Mediterranean Turnip
Poaceae	*Bromus cartharticus**	Prairie Grass
Brassicaceae	*Capsella bursa-pastoris**	Shepherds purse
Cyperaceae	*Carex incomitata*	-
Asteraceae	*Carthamus lanatus**	Saffron Thistle
Asteraceae	*Centaurea calcitrapa**	Star Thistle
Chenopodiaceae	*Chenopodium album**	Fat Hen
Asteraceae	*Cirsium vulgare**	Spear Thistle
Asteraceae	*Conyza sumatrensis**	Tall Fleabane

Family	Scientific name	Common name
Apiaceae	*Cyclospermum leptophyllum**	Slender Celery
Poaceae	*Cynodon dactylon*	Common Couch
Cyperaceae	*Cyperus eragrostis**	Umbrella Sedge
Poaceae	*Echinochloa crus-galli**	Barnyard Grass
Boraginaceae	*Echium plantagineum**	Paterson's Curse
Poaceae	*Ehrharta erecta**	Panic Veldtgrass
Chenopodiaceae	*Einadia polygonoides*	-
Apiaceae	*Foeniculum vulgare**	Fennel
Poaceae	*Hyparrhenia hirta**	Coolatai Grass
Juncaceae	*Juncus usitatus*	Common Rush
Poaceae	*Lachnagrostis filiformis*	Blown Grass
Asteraceae	*Lactuca serriola**	Prickly Lettuce
Brassicaceae	*Lepidium africanum*	Common Peppercress
Poaceae	*Lolium perrenne**	Perennial Ryegrass
Malvaceae	*Malva parviflora**	Small-flowered Mallow
Malvaceae	*Malvastrum americanum**	Spiked Malvastrum
Faboideae	*Medicago sativa**	Lucerne
Poaceae	*Microlaena stipoides* var. *stipoides*	Weeping Rice Grass
Malvaceae	*Modiola caroliniana**	Red-flowered Mallow
Alliaceae	*Nothoscordum borbonicum**	Onion Weed
Poaceae	*Notodanthonia spp.*	-
Poaceae	*Paspalum dilatatum**	Paspalum
Poaceae	*Phalaris aquatica**	Phalaris
Plantaginaceae	*Plantago lanceolata**	Ribwort
Polygonaceae	*Polygonum aviculare**	Wire Weed
Lobeliaceae	*Pratia concolor*	Poison Pratia
Brassicaceae	*Rapistrum rugosum**	Turnip Weed
Brassicaceae	*Rorippa palustris**	Yellow Cress
Polygonaceae	*Rumex crispus**	Curled Dock
Malvaceae	*Sida corrugata*	Corrugated Sida
Malvaceae	*Sida rhombifolia**	Paddy's Lucerne
Asteraceae	*Silybum marianum**	Variegated Thistle
Brassicaceae	*Sisymbrium irio**	London Rocket
Asteraceae	*Sonchus asper* subsp. *asper**	Prickly Sowthistle
Asteraceae	*Sonchus oleraceus**	Common Sow-thistle
Asteraceae	*Tragopogon porrifolius* subsp. *porrifolius**	Salsify
Faboideae	*Trifolium repens**	White Clover
Poaceae	*Triticum aestivum**	Wheat
Verbenaceae	*Verbena bonariensis**	Purpletop
Verbenaceae	*Verbena x brasiliensis**	Gin Case
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell
Waterplants		
Juncaceae	*Juncus effusus**	-

Family	Scientific name	Common name
Cyperaceae	*Bolboschoenus medianus*	a Clubrush
Typhaceae	*Typha orientalis*	Cumbungi
VINES		
Fabaceae	*Vicia sativa subsp. sativa**	Common Vetch
* denotes exotic species		

It should be noted that not all garden, cultivar or landscape species have been identified as part of this assessment.

Appendix 2
Threatened Flora and Fauna Species Habitat Assessment

Table A2.1 – Threatened flora species habitat assessment

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Cadellia pentastylis EPBC	V	V	Occurs along the western edge of the North West Slopes from north of Gunnedah to west of Tenterfield. Occurrs within vine thickets and dry rainforest. There appears to be a strong correlation between the presence of Ooline and low- to medium-nutrient soils of sandy clay or clayey consistencies, with a typical soil profile having a sandy loam surface layer, grading from a light clay to a medium clay with depth.	x	x	-	-	x	x
Callistemon pungens EPBC	-	V	Habitats range from riparian areas dominated by *Casuarina cunninghamiana* subsp. *cunninghamiana* to woodland and rocky shrubland. Often in rocky watercourses, usually with sandy granite (occasionally basalt) creek beds. Flowers over spring and summer, mostly in November.	x	Sub-optimal	x	x	x	x
Dichanthium setosum OEH EPBC	V	V	An erect perennial grass to <1m high. Flowers in summer. Grows in woodland and is associated with heavy basaltic black soils and stony red-brown hard-setting loam with clay subsoil. *Known chiefly on the northern tablelands in the Saumarez area, west of Armidale, and 18-30 km east of Guyra. It is more rarely found on the north-western slopes, central western slopes and north-western plains of NSW*	x	Sub-optimal	3 km E. (4 records within 10km)	2003	Very Low	✓

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Eucalyptus nicholii OEH	V	-	This species is widely planted as an urban street tree and in gardens but is quite rare in the wild. *It is confined to the New England Tablelands of NSW, where it occurs from Nundle to north of Tenterfield, largely on private property.*	x	x	-	-	x	x
Euphrasia arguta EPBC	CE	CE	An annual herb to 35cm tall, flowers October to January. Grows in grassy areas near rivers. *Recorded from Bathurst to Walcha area.* Considered extinct until recent rediscovery in 2008 near Nundle.	x	x	-	-	x	x
Picris evae EPBC	V	V	Its main habitat is open Eucalypt forest including a canopy of *Eucalyptus melliodora, E. crebra, E. populnea, E. albens, Angophora subvelutina, Allocasuarina torulosa*, and/or *Casuarina cunninghamiana* with a *Dichanthium* grassy understory. Soils are black, dark grey or red-brown (specified as shallow, stony soil over basalt for one collection) and reddish clay-loam or medium clay soils. The flowering and fruiting period is mainly October to January, with a few plants collected in flower or fruit until May. Known in NSW north from the Inverell area, in the north-western slopes and plains regions. It has been collected from Elsmore and Myall Creek (both near Inverell) as well as in Inverell, Oxley Park (Tamworth) and also from Dangar Falls	x	x	-	-	x	x

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Prasophyllum sp. Wybong EPBC	-	CE	Known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga areas. A perennial orchid, appearing as a single leaf over winter and spring. Flowers in spring and dies back to a dormant tuber over summer and autumn. Known to occur in open eucalypt woodland and grassland	x	x	-	-	x	x
Syzygium paniculatum OEH EPBC	V	V	Small tree. Subtropical and littoral rainforest on sandy soil. *Distribution limits N-Forster S-Jervis Bay.*	x	x	-	-	x	x
Thesium australe EPBC	V	V	Erect herb to 0.4m high. Root parasite. Themeda grassland or woodland often damp. *Distribution limits N-Tweed Heads S-south of Eden.*	x	x	-	-	x	x
Tylophora linearis EPBC	V	E	Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla* and *Allocasuarina luehmannii*. Also grows in association with *Acacia hakeoides, Acacia lineata, Melaleuca uncinata, Myoporum* species and *Casuarina* species. Flowers in spring, with flowers recorded in November or May with fruiting probably 2 to 3 months later.	x	x	-	-	x	x

OEH	- Denotes species listed within 10km of the subject site on the *Atlas of NSW Wildlife*
EPBC	- Denotes species listed within 10km of the subject site in the *EPBC Act* habitat search
V	- Denotes vulnerable listed species under the relevant Act

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
E or E1	- Denotes endangered listed species under the relevant Act								
E4a or CE	- Denotes critically endangered listed species under the relevant Act								
NOTE:	1. This field is not considered if no suitable habitat is present within the subject site 2. 'records' refer to those provided by the *Atlas of NSW Wildlife* 3. 'nearby' or 'recent' records are species specific accounting for home range, dispersal ability and life cycle								

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Table A2.2 – Threatened fauna species habitat assessment

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Booroolong Frog *Litoria booroolongensis* EPBC	E	E	Found near rocky mountain streams on the slopes and tablelands of the Great Dividing Range. *Distribution limit: QLD border to VIC border restricted to highlands.*	x	x	-	-	x	x
Bell's Turtle *Wollumbinia belli* EPBC	E	V	Shallow to deep pools in upper reaches or small tributaries of major rivers in granite country. Occupied pools are most commonly less than 3 m deep with rocky or sandy bottoms and patches of vegetation. Most typically uses narrow stretches of rivers 30 - 40 m wide. Most surrounding habitat has been converted to grazing land. *Distribution limit: four disjunct populations in the upper reaches of the Namoi, Gwydir and Border Rivers systems, on the escarpment of the North West Slopes.*	x	x	-	-	x	x
Pink-tailed Legless Lizard *Aprasia parapulchella* EPBC	V	V	Inhabits open areas of native grasses and rocky outcrops and scattered rocks. *Distribution from Central tablelands, Southern tablelands, Central Western Slopes, and South West Slopes.*	x	x	-	-	x	x

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Border Thick-tailed Gecko *Uvidicolus sphyrurus* OEH EPBC	V	V	Occurs on steep rocky or scree slopes, especially granite. Recent records from basalt and metasediment slopes and flats indicate its habitat selection may have extended into areas that were cleared for agriculture. Favours forest and woodland areas with boulders, rock slabs, fallen timber and deep leaf litter. Occupied sites often have a dense tree canopy that helps create a sparse understorey. Active at night and shelter by day under rock slabs, in or under logs, and under the bark of standing trees. *Distribution limit: West of the ranges from New England Tableland to Liverpool Range and west to Moree.*	x	x	-	-	x	x
Australasian Bittern *Botaurus poiciloptilus* EPBC	E	E	Found in or over water of shallow freshwater or brackish wetlands with tall reed beds, sedges, rushes, Cumbungi, lignum and also in rice fields, drains in tussocky paddocks, occasionally saltmarsh, brackish wetlands. *Distribution limit: N-North of Lismore. S- Eden.*	x	x	-	-	x	x
Little Eagle *Hieraaetus morphnoides* OEH	V	-	Utilises plains, foothills, open forests, woodlands and scrublands; river red gums on watercourses and lakes. *Distribution limit - N-Tweed Heads. S-South of Eden.*	x	✓	5.5km NE (1 record within 10km)	1999	Not Likely	x

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Square-tailed Kite *Lophoictinia isura* OEH	V	-	Utilises mostly coastal and sub-coastal open forest, woodland or lightly timbered habitats and inland habitats along watercourses and mallee that are rich in passerine birds. *Distribution limit: N-Goondiwindi. S-South of Eden.*	x	Sub-optimal	4.5 km SE (1 record within 10km)	2013	Unlikely	✓
Red Goshawk *Erythrotriorchis radiatus* EPBC	E	V	Inhabits tall open forests and woodlands. Breeds in tall trees adjacent to watercourses of wetlands. *Distribution limit: N-Border Ranges National Park. S-Foster.*	x	x	-	-	x	x
Black Falcon *Falco subniger* OEH	V	-	Inhabits plains, grasslands, foothills, timbered watercourses, wetland environs, crops; occasionally over towns and cities. *N-Tweed Heads. S-South of Eden*	x	✓	4 km ESE (4 records within 10km)	3013	Unlikely	✓
Australian Painted Snipe *Rostratula australis* EPBC	E	E	Most numerous within the Murray-Darling basin and inland Australia within marshes and freshwater wetlands with swampy vegetation. *Distribution limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x
Curlew Sandpiper *Callidris ferruginea* EPBC	E	CE	Mainly coastal, but many inland feeding along tidal mudflats, salt marsh, salt fields, fresh, brackish or saline wetlands and sewerage ponds. *Distribution limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Little Lorikeet *Glossopsitta pusilla* OEH	V	-	Inhabits forests, woodlands; large trees in open country; timbered watercourses, shelterbeds, and street trees. *Distribution limit: N-Tweed Heads. S-South of Eden*.	x	✓	3 km N (1 record within 10km)	2004	Unlikely	✓
Swift Parrot *Lathamus discolor* OEH EPBC	E	E	Inhabits eucalypt forests and woodlands with winter flowering eucalypts. *Distribution limit: N-Border Ranges National Park. S-South of Eden*.	x	✓	6 km E (2 records within 10km)	2002	Low	✓
Turquoise Parrot *Neophema pulchella* OEH	V	-	Inhabits coastal scrubland, open forest and timbered grassland, especially ecotones between dry hardwood forests and grasslands. *Distribution limit: N-Near Tenterfield. S-South of Eden.*	x	Sub-optimal	4 km NE (6 records within 10km)	1999	Unlikely	✓
Brown Treecreeper *Climacteris picumnus victoriae* OEH	V	-	Occupies eucalypt woodlands, open woodland lacking a dense understorey with fallen dead timber. *Distribution limit: (Sub species victoriae) Central NSW west of Great Div. Cumberland Plains, Hunter Valley, Richmond, Clarence, and Snowy River Valleys.*	x	x	-	-	x	x
Speckled Warbler *Chthonicola sagittata* OEH	V	-	Found in temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts. *Distribution limit: N-Urbanville. S-Eden.*	x	Sub-optimal	11 km NE (2 records within 10km)	2005	Unlikely	✓

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Regent Honeyeater *Xanthomyza Phrygia* EPBC	E4A	CE	Found in temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts. *Distribution limit: N-Urbanville. S-Eden.*	x	x	-	-	x	x
Painted Honeyeater *Grantiella picta* EPBC	V	V	A nomadic bird occurring in low densities within open forest, woodland and scrubland feeding on mistletoe fruits. Inhabits primarily Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. *Distribution limit: N-Boggabilla. S-Albury with greatest occurrences on the inland slopes of the Great Dividing Range.*	x	x	-	-	x	x
Dusky Woodswallow *Artamus cyanopterus cyanopterus* OEH	V	-	Found in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests. Prefers habitat with an open understorey. Often observed in farmland tree patches or roadside remnants. *Widespread in eastern, southern and south-western Australia.*	x	✓	3 km N (1 record within 10km)	2004	Unlikely	✓
Diamond Firetail *Stagonopleura guttata* OEH	V	-	Found in eucalypt woodlands, forests and mallee where there is grassy understorey west of the Great Div. also drier coastal woodlands of the Cumberland Plain and Hunter Richmond and Clarence River Valleys. *Distribution limit: N-Rockhampton Q. S-Eyre Pen Kangaroo Is. SA.*	x	✓	3 km N (4 records within 10km)	2004	Unlikely	✓

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Spotted-tailed Quoll *Dasyurus maculatus* OEH EPBC	V	E	Dry and moist open forests containing rock caves, hollow logs or trees. *Distribution limit: N-Mt Warning National Park. S-South of Eden.*	x	x	-	-	x	x
Koala *Phascolarctos cinereus* OEH EPBC	V	V	Inhabits both wet and dry eucalypt forest on high nutrient soils containing preferred feed trees. *Distribution limit: N-Tweed Heads. S-South of Eden.*	x	Sub-optimal	2km E (2 records within 10km)	2006	Unlikely	✓
Squirrel Glider *Petaurus norfolcensis* OEH	V	-	Mixed aged stands of eucalypt forest & woodlands including gum barked & high nectar producing species & hollow bearing trees. *Distribution limit: N-Tweed Heads. S-Albury.*	x	x	-	-	x	x
Greater Glider *Petauroides volans* EPBC	-	V	Favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species. Population density is optimal at elevation levels at 845 m above sea level. Prefer overstorey basal areas in old-growth tree stands. Highest abundance typically in taller, montane, moist eucalypt forests, with relatively old trees and abundant hollows *Distribution limit: N-Border Ranges National Park. S- South of Eden.*	x	x	-	-	x	x

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Brush-tailed Rock-wallaby *Petrogale penicillata* EPBC	E	V	Found in rocky gorges with a vegetation of rainforest or open forests to isolated rocky outcrops in semi-arid woodland country. *Distribution limit: N-North of Tenterfield. S-Bombala.*	x	x	-	-	x	x
Grey-headed Flying-fox *Pteropus poliocephalus* OEH EPBC	V	V	Found in a variety of habitats including rainforest, mangroves, paperbark swamp, wet and dry open forest and cultivated areas. Forms camps commonly found in gullies and in vegetation with a dense canopy. *Distribution limit: N-Tweed Heads. S-Eden.*	x	Foraging only	6 km ESE (1 record within 10km)	2015	Low	✓
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris* OEH	V	-	Rainforests, sclerophyll forests and woodlands. *Distribution limit: N-North of Walgett. S-Sydney.*	x	x	-	-	x	x
East-coast Freetail Bat *Micronomus norfolkensis* OEH	V	-	Inhabits open forests and woodlands foraging above the canopy and along the edge of forests. Roosts in tree hollows, under bark and buildings. *Distribution limit: N-Woodenbong. S-Pambula.*	x	✓	5.5 km NE (1 record within 10km)	1999	Not likely	x

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Large-eared Pied Bat *Chalinolobus dwyeri* OEH EPBC	V	V	Warm-temperate to subtropical dry sclerophyll forest and woodland. Roosts in caves, tunnels and tree hollows in colonies of up to 30 animals. *Distribution limit: N-Border Ranges National Park. S-Wollongong.*	x	✓	4.5 km NE (1 record within 10km)	1999	Not likely	x
Eastern Falsistrelle *Falsistrellus tasmaniensis* OEH	V	-	Recorded roosting in caves, old buildings and tree hollows. *Distribution limit: N-Border Ranges National Park. S-Pambula.*	x	✓	7 km WNW (1 record within 10km)	1995	Not likely	x
Eastern Bentwing-bat *Miniopterus orianae oceanensis* OEH	V	-	Prefers areas where there are caves, old mines, old buildings, stormwater drains and well-timbered areas. *Distribution limit: N-Border Ranges National Park. S-South of Eden.*	x	✓	3 km N (3 records within 10km)	2004	Low	✓

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Corbens Long-eared Bat *Nyctophilus corbeni* EPBC	V	V	Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina luehmannii* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark. Slow flying agile bat, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground. *Distribution limit: Central NSW west of the ranges.*	x	x	-	-	x	x
Murray Cod *Maccullochella peelii* EPBC	-	V	Utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW (including the ACT), to slow-flowing, turbid lowland rivers and billabongs. Preferred microhabitat consists of complex structural features in streams such as large rocks, snags (pieces of large submerged woody debris), overhanging stream banks and vegetation, tree stumps, logs, branches and other woody structures. *Distribution limit:* throughout the Murray-Darling Basin	x	x	-	-	x	x

OEH	Denotes species listed within 10km of the subject site on the *Atlas of NSW Wildlife*
EPBC	Denotes species listed within 10km of the subject site in the *EPBC Act* habitat search
V	Denotes vulnerable listed species under the relevant Act
E or E1	Denotes endangered listed species under the relevant Act
E4a or CE	Denotes critically endangered listed species under the relevant Act

Common name ***Scientific name*** Database source	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Required assessment of significance test (✓) (at DA stage)**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
NOTE:	1. This field is not considered if no suitable habitat is present within the subject site 2. 'records' refer to those provided by the *Atlas of NSW Wildlife* 3. 'nearby' or 'recent' records are species specific accounting for home range, dispersal ability and life cycle								
Unlikely	Represents such a low margin but not enough to 100% rule it one. A significance of impact test is required.								
Not likely	Means 0% change of occurring, despite there being potential habitat. A significance of impact test is not applied to these species.								

Table A2.3 provides an assessment of potential habitat within the study area for nationally *protected* migratory fauna species recorded within 10km on the *EPBC Act* Protected Matters Tool. Nationally *threatened* migratory species are considered in Table A2.3.

Table A2.3 – Migratory fauna habitat assessment

Common name ***Scientific name***	**Preferred habitat** ***Migratory breeding***	**Suitable habitat present (✓)**	**Comments on potential impacts**
Osprey *Pandion cristatus*	Utilises waterbodies including coastal waters, inlets, lakes, estuaries and offshore islands with a dead tree for perching and feeding. *Distribution Limit: N-Tweed Heads. S-South of Eden.*	×	-
White-throated Needletail (*Hirundapus caudacutus*)	Airspace over forests, woodlands, farmlands, plains, lakes, coasts, towns; companies forage often along favoured hilltops and timbered ranges. *Breeds Siberia, Himalayas, east to Japan. Summer migrant to eastern Australia.*	✓	No likely significant impact
Yellow Wagtail (*Motacilla flava*)	The yellow wagtail typically forages in damp grassland and on relatively bare open ground at edges of rivers, lakes and wetlands, but also feeds in dry grassland and in fields of cereal crops.	✓	No likely significant impact
Satin Flycatcher (*Myiagra cyanoleuca*)	Heavily vegetated gullies in forests, taller woodlands, usually above shrub-layer; during migration, coastal forests, woodlands, mangroves, trees in open country, gardens. *Breeds mostly south east Australia and Tasmania over warmer months, winters in north east Qld.*	×	-
Rufous Fantail (*Rhipidura rufifrons*)	Undergrowth of rainforests / wetter eucalypt forests / gullies; monsoon forests, paperbarks, sub-inland and coastal scrubs; mangroves, watercourses; parks, gardens. On migration, farms, streets buildings. *Breeding migrant to south east Australia over warmer months. Altitudinal migrant in north east NSW in mountain forests during warmer months.*	✓	No likely significant impact
Fork-tailed Swift (*Apus pacificus*)	Aerial: over open country, from semi-arid deserts to coasts, islands; sometimes over forests, cities. *Breeds Siberia, Himalayas, east to Japan south east Asia. Summer migrant to east Australia. Mass movements associated with late summer low pressure systems into east Australia. Otherwise uncommon.*	✓	No likely significant impact

9.5 Cultural Heritage

Proposed Industrial Rezoning, 21 Wallamore Road (Lot 2 DP1234850) & 55 Dampier Street (Lot 3 DP1234850), Taminda, Tamworth Regional Council LGA, NSW

Aboriginal Cultural Heritage Due Diligence Assessment

Prepared for Elton Consulting on behalf of Tamworth Industrial Pty Ltd

March 2019

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1.0	Internal Edits	MW	NS	22/10/2018	LS	11/12/2018
1.1	Client Review	NS	JF	12/12/2018	LS	20/12/2018
2.0	Final Report	NS	LS	20/12/2018	LS	20/12/2018
2.1	Amendments to Figure 1 to Figure 4, and Section 1.1	NS	LS	1/03/2019	LS	1/03/2019

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1 INTRODUCTION

Kayandel Archaeological Services (KAS) has been commissioned by Elton Consulting on behalf of Tamworth-Industrial Pty Ltd (the Proponent) to prepare an Aboriginal Cultural Heritage Due Diligence Assessment in relation to Aboriginal Heritage within 21 Wallamore Road (Lot 2 DP1234850) and 55 Dampier Street (Lot 3 DP1234850), Taminda, NSW.

This report outlines the results of the Aboriginal heritage due diligence assessment which meets the requirements of the *Due Diligence Code of Practice* (DECCW, 2010b) and includes recommendations regarding Aboriginal heritage constraints for the proposed rezoning.

Please note that this report is an initial investigation of constraints and opportunities pertaining to identified Aboriginal heritage sites and places on and/or in the immediate vicinity of the proposed development site. It is not an Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared in accordance with the guidelines issued by the Office of Environment and Heritage (OEH). As such, it would not be sufficient to support an application for an Aboriginal Heritage Impact Permit, in accordance with Section 90 of the *National Parks and Wildlife Act 1974*. Similarly, the report does not consider historical heritage, and would not be sufficient to support an application for a permit under Section 60 or Section 140 of the *Heritage Act 1977*.

1.1 Location of the Subject Area

The Subject Area is located within the Tamworth Regional Council (TRC) Local Government Area (LGA) and the Tamworth Local Aboriginal Land Council (TLALC). The Subject Area is located within the Parish of Murroon, County of Parry (refer to Figure 1).

The Subject Area consists of 21 Wallamore Road (Lot 2 DP1234850) and 55 Dampier Street (Lot 3 DP1234850), Taminda, NSW (refer to Figure 2). The Subject Area covers approximately 11.35ha.

1.2 Proposed Works

Lot 3 DP1234850 is currently zoned as RU4 (Primary Production Small Lots) under the TRC Local Environment Plan 2010 (LEP).

The Proponent has proposed that the Subject Area is rezoned to IN1 (General Industrial).

1.3 Study Limitations

This report is based on a review of available Aboriginal archaeological assessments (sourced from the Heritage Branch library, grey literature and KAS' report library). It is possible that further Aboriginal archaeological assessments or the emergence of new analysis of the Historic archaeological landscape within the Tamworth area may support different interpretations of the evidence in this report.

This report is based exclusively upon desktop assessment.

A summary of the statutory requirements regarding heritage is provided in Section 2. This is made based on our experience of working with the NSW Aboriginal heritage and European heritage systems and does not purport to be legal advice. It should be noted that legislation, regulations, and guidelines change over time and users of this report should satisfy themselves that the statutory requirements have not changed since the report was written.

The results from the 'AHIMS Database Search' (Section 4.2) are valid for 12 months from the date of the search. If this report has not been finalised and/or if it is necessary to update this report, and the

previous AHIMS search is over 12 months old, it will be necessary to undertake another search of the AHIMS to ensure information is current.

1.4 Personnel

This study has been carried out by KAS (refer to Table 1). Background research was undertaken by Meggan Walker. Natalie Stiles completed the mapping. This report was drafted by Meggan Walker; and reviewed by Natalie Stiles and Lance Syme.

Person	Qualification	Experience	Tasks
Lance Syme	BArts (Arch/Paleo), Grad. Dip (Heritage Cons.), M. ICOMOS	20 years	Project Supervision, mapping, report review
Natalie Stiles	BArts (Arch/Paleo), Grad Cert. Arts (Arch), MGIS&RemoteSens	7 years	Mapping & GIS review
Meggan Walker	BArts (Arch/Ancient) (Hons)	<1 year	Background research, report drafting

Table 1: KAS Personnel involved in the preparation of this report

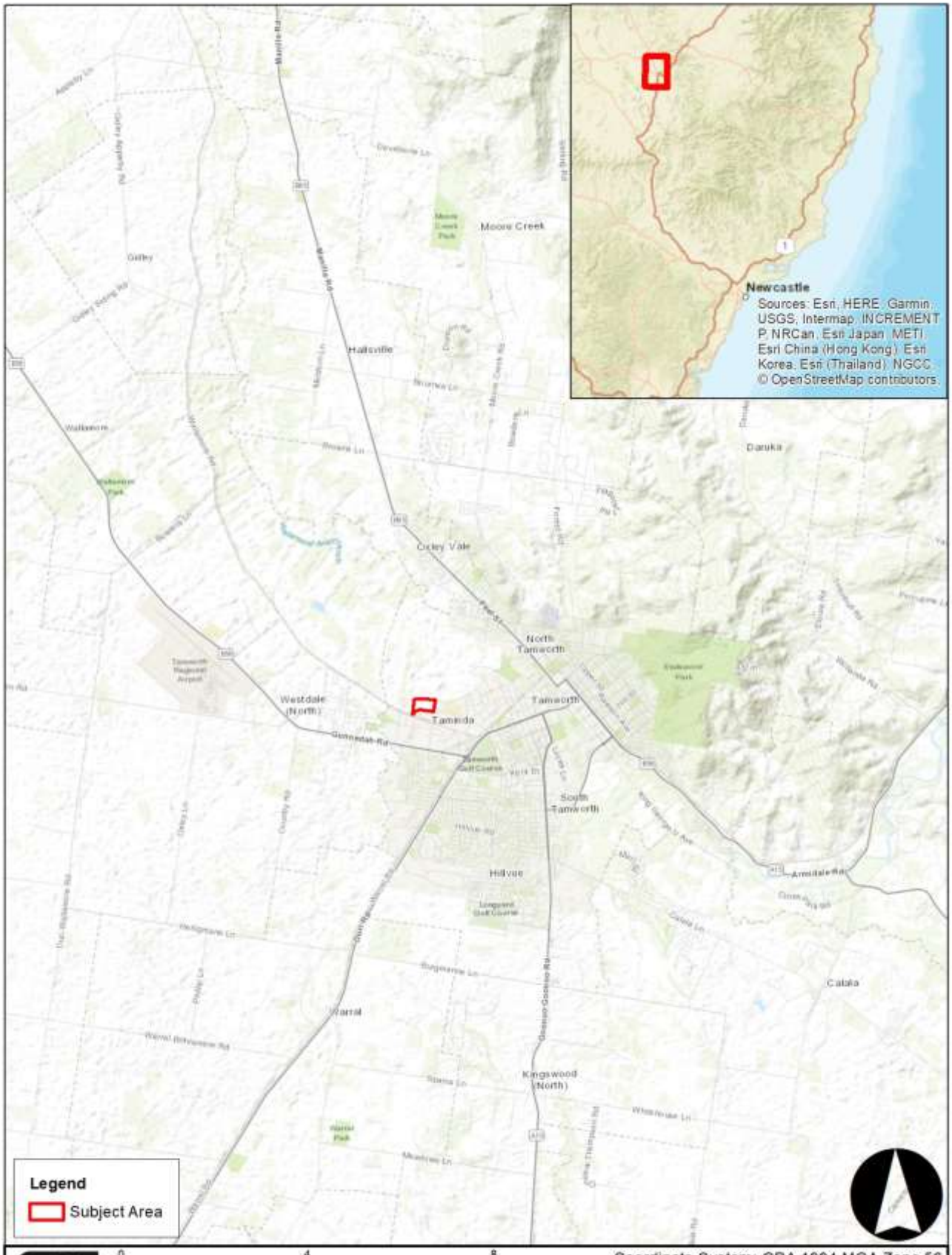


Figure 1: Project Location



Figure 2: Subject Area

2 LEGISLATIVE CONTEXT

The *National Parks & Wildlife Act 1974* provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community). Under Section 86 of the *National Parks and Wildlife Act, 1974*, Aboriginal objects are afforded automatic statutory protection in NSW whereby it is an offence to:

> Damage, defence or destroy Aboriginal sites without the prior consent of the Director-General of the National Parks and Wildlife Service (now referred to as the Office of Environment and Heritage (OEH).

The Act defines an Aboriginal 'Object' as:

> Any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation before or concurrent with the occupation of that area by persons of non-Aboriginal European extraction, and includes Aboriginal remains.

The *Due Diligence Code of Practice* was introduced in October 2010 by the OEH (formerly the Department of Environment, Climate Change and Water (DECCW)). The aim of the guidelines is to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for consent in the form of an Aboriginal Heritage Impact Permit (AHIP).

A due diligence assessment should take reasonable and practicable steps to ascertain whether there is a likelihood that Aboriginal sites will be disturbed or impacted during the proposed works. If it is assessed that sites exist or have a likelihood of existing within the development area and may be impacted by the proposed development, further archaeological investigations may be required. If it is found that Aboriginal sites were to exist within the Subject Area, an AHIP would be required if the proposed impacts cannot be avoided. If it is found to be unlikely that Aboriginal sites were to exist within the Subject Area and the due diligence assessment has been conducted in accordance with the Due Diligence Code of Practice, then the proposed works could proceed without an AHIP.

The *Native Title Act 1994* was introduced to work in conjunction with the *Commonwealth Native Title Act 1993.* Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act. A search of the Native Title register identified a claim by the Gomeroi People over the Subject Area.

3 LANDSCAPE CONTEXT

Tamworth is located in the southern portion of the Nandewar Bioregion. The Nandewar bioregion is bounded by the North Coast, New England Tablelands and Brigalow Belt South Bioregions in the south, east and west respectively. The larger scale geology of the Nandewar Bioregion is characterised by Mesozoic sediments, Devonian sedimentary and volcanic rocks, and Triassic sandstones and shales (NSW National Parks and Wildlife Service, 2003).

The Subject Area is situated within the Liverpool Plains, which is typified by prime agricultural land, with multiple depressions which create lakes after long periods of rain and steep hills arising suddenly from the plains. The Liverpool Plains are bordered to the east by the Great Dividing Range, the south by the Liverpool Range and the west by the Warrumbungle Range. The Namoi River drains the area along with its tributaries, the Peel and Mooki rivers. The Subject Area is located on an alluvial floodplain of the Peel River and Wallamore Anabranch.

Data for rainfall at the Subject Area was taken from Tamworth Airport AWS. The highest mean rainfall is attributed to November, with the highest daily rainfall occurring over the summer months (BOM, 2018).

Soils within the Subject Area consist of the Duri (du) and the Goonoo Goonoo (gn) soil landscapes (Banks, 2001).

The Duri soil landscape is described as a complex geological setting with a mixture of the Devovian sedimentary rocks of the Tamworth belt and interdigitated carboniferous geological units, with soil distribution highly variable owing to the underlying geology. Soils range from Chromosols, Rudosols, Vertosols and Sodosols, all of which vary from red through to brown in colouration The Lithology of the Duri landscape includes arenite, polymictic conglomerate, greywacke and mudstone (Banks, 2001) – some of which are known to be resources utilised by Aboriginal people for the manufacture of stone artefacts.

The Goonoo Goonoo soil landscape is comprised of diverse but individually locally extensive soil types. Soils encountered in this landscape include very deep to giant, imperfectly drained Brown Sodosols (solodic soils); deep to giant, imperfectly drained, Black Vertosols (black earths); very deep to giant, poorly drained Grey Vertosols (grey clays); shallow, moderately well-drained Calcareous Rudosols (calcareous Alluvial Soils); and deep to giant, imperfectly drained Brown Vertosols (Brown clays). These soils have poor drainage and are identified as a flood hazard (Banks, 2001).

Soils are typically shallow duplex soils, comprised of thin clay loam topsoil (A1 horizon) over heavy clays (B horizon), and usually <50cm deep. The heavy clay unit is generally considered to pre-date the Aboriginal colonisation of Australia, and therefore only the upper A1 horizon has the potential to contain Aboriginal objects. The shallow nature of these deposits has implications for the potential and survivability of Aboriginal objects - even minor disturbance and/ or de-vegetation will often result in the complete removal of the upper parts of the soil profile in which objects may occur. Originally, this area would have been dominated by open and/or dry sclerophyll forest, but most of the area is now urbanised and cleared; only creek lines and associated riparian corridors contain dense bushland that may reflect pre-European vegetation (Murphy & Murphy, 2000).

The Subject Area is located 400m south of Wallamore Anabranch on the associated alluvial floodplain. Timbumburi Creek is approximately 426m west of the Subject Area; and is bisected by a number of 1st and 2nd order streams (as defined by the Strahler model). These streams drain north,

through the Subject Area, into the Wallamore Anabranch, and would have provided a temporary water source.

Wilson and McAdam (2000) noted that aerial photography and testimony from local residents attest to the instability of the Peel River, which migrated back and forth across the floodplain. (Wilson & McAdam) suggested that this was typical for all of the watercourses in the region.

It is difficult to reconstruct an understanding of vegetation present in the Tamworth region owing to European land clearing practices. Landform generally has an impact on the vegetation present, with River red Gum, Yellow Box and She-Oak common in the vicinity of major water courses. Blakelys Red Gum, White Box, Kurrajong and Rough-barked Apple are common on slopes and hill sides, with White Box dominant on hills and slopes south of the Peel River (Wilson & McAdam, 2000). The vegetation present within the Subject Area, while also potentially used as Aboriginal economic plants, would also have supported a range of faunal species that would have been utilised by Aboriginal people. The rivers and watercourses in the Tamworth region would also have provided aquatic flora and fauna.

3.1 Historical Land-Use Disturbance

European presence in the Tamworth Region is recorded as early as 1818, and by 1820 the area was already being employed for sheep and cattle grazing. The land was primarily employed by Europeans for grazing with limited more intensive rural practices until late in the nineteenth century, when the alluvial flats along the peel river began to produce successful crops and the demand was stimulated for further agricultural land releases (Jonathan Falk Planning Consultants Pty Ltd & Rodney Jensen and Associates Pty Ltd, 1988).

While specific information relating to disturbance at the Subject Area is difficult to determine, from aerial photographs and an understanding of the use of the region it can be understood that the Subject Area has been used primarily for agricultural purposes, mainly relating to crop growth and animal grazing. Current aerials of the Subject Area show disturbance relating to irrigation systems and fence installation, as well as the impacts caused by animal grazing.

4 ARCHAEOLOGICAL CONTEXT

4.1 Ethnohistory

The oldest site identified within the Tamworth Region is Bendemeer II, dating to 4,950BP (Wilson & McAdam, 2000); although this is arguably a reflection of the lack of archaeological investigations within the region and preserved datable material rather than a reflection of actual occupation dates.

The Tamworth region and it's surrounds are generally accepted as having been originally inhabited by the Gamilaroi (also referred to as Komilaroi) people, who are recognised by researchers as the primary linguistic group for the greater New England Region (Tindale, 1974; Wilson & McAdam, 2000). Europeans identified a number of groups in the Tamworth region including the Goonoo Goonoo, Gunnedah, Manellae (people who traditionally utilised the Manilla River) and Moonb (Tindale, 1974). Carey (2006) dentifies two sub-communities of the Gamilaroi, who occupied the area now known as Tamworth: the Mooni, and the Goonoo Goonoo people. The Gamilaroi people spoke a range of dialects throughout the New England Region, with Wilson and McAdam (2000) commenting that there were two distinct groups – the Corbon Gamilaroi, who occupied areas surrounding the Peel River including Liverpool Plains, and the Gammon Gamilaroi, who occupied the southern part of the language territory.

European settlement had a devastating effect on the traditional life ways of the Kamilaroi. Violent conflicts between settlers and Aboriginal groups, disease and dispossession of land resulted in population decrease. Conflict in the district was not uncommon. Descendent of Thomas Bowman, one of the early landowners within the project area, passed on stories of Bowman working through the night to build fences to secure them from Aboriginal people (Boileau, 2007). One of the more violent recorded conflicts was the reprisal campaigns of Major James Nunn. Boileau (2007) describes the action thus:

> *"They travelled in a circuit north across the Nandewar Ranges through Archibald Bell's Barraba station, on to Thomas Hall's new station at Bingara, then to Snodgrass Lagoon on Waterloo Creek, midway between the Namoi and the Gwydir, where they massacred an estimated forty or fifty Aboriginal people who were camped there. On their return journey through the foothills the posse engaged in a typical frontier style 'mopping up' operation, hunting down and killing any Aborigine they encountered."*

4.2 AHIMS Database Search

The locations and details of Aboriginal sites are considered culturally sensitive information. It is recommended that this information, including the AHIMS data and GIS imagery, is removed from this report if it is to enter the public domain.

KAS carried out a search of the AHIMS database on the 2nd October 2018 using the Client Service ID 373803 with the coordinates set out in Table 2 below.

	Easting	Northing
Minimum	294806	6554701
Maximum	303806	6563701

Table 2: AHIMS Database Search Criteria

(Zone 56 additional buffer 1kms)

The search area was a 9km by 9km square centred upon the Subject Area, with a 1km buffer (see Figure 3). The results of the AHIMS search are presented in Figure 3 and Table 3. A total of 113 Aboriginal sites have been registered within the search area. Figure 4 shows that Aboriginal sites recorded in proximity to the Subject Area.

It should be noted that the distribution of sites in the AHIMS database is a reflection of where site surveys have been conducted, where exposure and visibility conditions have enabled the detection of sites, and where sites have survived modern land disturbance. The distribution of sites from AHIMS may not be a true reflection of the existing Aboriginal sites in an area.

Site types	Total	%
Open Camp Site	51	*45%*
Isolated Find	38	*34%*
Scarred Tree	10	*9%*
Quarry	5	*4%*
Scarred Tree with Isolated Find	2	*2%*
Open Camp Site with Grinding Groove	1	*1%*
Not an Aboriginal Site	1	*1%*
Open Camp Site and Aboriginal Ceremony and Dreaming	1	*1%*
Open Camp Site with Quarry	1	*1%*
Restricted	1	*1%*
Rock Engraving	1	*1%*
Scarred Tree and Open Camp Site	1	*1%*
Total	***113***	***100%***

Table 3: Site types from AHIMS search (Client Service ID 373803)

The AHIMS search indicates that fifty-three (53) of the one hundred and thirteen (113) identified sites were Open Camp Sites, or Open Camp Sites with other associated features, which comprises of 46.9% of the site types. A further 34% of the site types were identified as Isolated Finds. The site types present from the AHIMS search reflect the landforms present within the region.

4.3 Regional Archaeological Context

Extensive archaeological studies are rare within the Tamworth region or Subject Area. These extensive studies provide material evidence of Aboriginal occupation in the Tamworth region, and provide an indication of where and what types of Aboriginal sites may be located in the landscape.

The most comprehensive analysis of Aboriginal Archaeology in the Tamworth Area is that undertaken by Wilson and McAdam (2000), which involved the survey of a number of areas within the region. The Tamworth Heritage Study (Jonathan Falk Planning Consultants Pty Ltd & Rodney Jensen and Associates Pty Ltd, 1988) is another regional study, which focused on European Heritage within the Region generally and specific areas within it, as opposed to exclusively focusing on a limited Study Area.

Other archaeological studies within the Tamworth region have involved specific focus on a study area, and primarily restricted to archaeological survey.

Within the greater region, there have been few Aboriginal archaeological studies, most focused on specific study areas and involving primarily archaeological survey. Below is a discussion of various relevant Aboriginal archaeological investigations within the Tamworth Region.

Everick Heritage Consultants (2015)

Everick Heritage Consultants (Everick) (2015) undertook an archaeological study across a range of properties in 2015, on behalf of the Tamworth Regional Council for the Glen Artney Industrial Development. Their Subject Area was approximately 745ha; and was located 6km northwest of the Subject Area.

Everick (2015) undertook a desktop study, and a targeted archaeological field inspection in the process of completing their Aboriginal Cultural Heritage Assessment Report which was undertaken in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW, 2010b). A total of six (6) Aboriginal sites during the inspection: four (4) isolated artefacts, one (1) low density artefact scatter and one (1) scarred tree.

Wilson and McAdam (2000)

The Tamworth Aboriginal/Archaeological Site Study was undertaken in 2000 by Wilson and McAdam (2000), and involved an extensive series of surveys across the Tamworth city region.

Wilson and McAdam (2000) identified a number of sites across their study area, including one (1) scarred tree (Wallamore Anabranch Scarred Tree (AHIMS #29-2-0285) in proximity to the Subject Area, to the west on the southern bank of the Wallamore Anabranch.

4.4 Previous Archaeological Investigations

There have been no previous archaeological investigations within the Subject Area.

4.5 Previous Predictive Models

Wilson and McAdam (2000)

Wilson and McAdam (2000) proposed a predictive model for the Tamworth region based on their extensive survey and analysis of background information:

- The climatic information suggests Tamworth would have allowed for year-round Aboriginal occupation, with the topographic data suggesting favourable conditions for Aboriginal habitation south of the Peel River (which corresponds to our Subject Area);
- Even though major watercourse are the most likely places for Aboriginal people to congregate, the wandering nature of the Peel River and its tributaries along the flood plain suggest a low likelihood of locating preserved Aboriginal camp sites;
- Aboriginal camp sites are most likely to be preserved in the deep, brown, structured clays or solodic soils of the lower slopes where they meet the alluvial flats but above the flood plain;
- Isolated finds will most likely be located in areas of low gradient within 200m of a watercourse, with artefacts likely to be large or made from highly observable stone;
- Artefact scatters will be most likely located in areas of low gradient in close proximity to a watercourse, and are most likely to contain flakes, retouched flakes, broken flakes, flaked pieces and cores. With axes, mullers and grindstone predicted to be rare. The size of scatters is anticipated to increase with the proximity to reliable watercourses;
- Scarred trees will likely be located within 100m of a watercourse, but are anticipated to be rare extrapolating from previous data owing to European land clearance, with tree types most likely to contain scars being white box and river red gums;
- Carved trees are considered unlikely owing to the tradition of their removal to museums;
- Stone quarry sites are likely to be located on ridges, hill tops and areas of steep slopes, not in proximity to watercourses;

- Grinding grooves may be located where weathered andestitic greywacke outcrops, especially if these outcrops are in proximity to an Aboriginal axe quarry; and,
- Stone arrangements related to ceremony are not anticipated in proximity to watercourses and are unlikely to occur in the region.

Everick Heritage Consultants (2015)

Everick Heritage Consultants (2015) observed that:

- Specific environment contexts including alluvial landforms, low kills, lower slopes and spurs are likely to contain the majority of evidence of Aboriginal occupation;
- Isolated artefacts will be the result of random discard and may occur in almost any environmental context;
- Open Campsites will be primarily secondary flakes in low- or high-density scatters, and associated with other features, potentially containing burials when located on sand strata
- Middens, while the Peel River does contain freshwater Shellfish, are unlikely given their absence in the region; and,
- Modified trees will potentially be present within 100m of the watercourses in old stands of trees.

4.6 Aboriginal Heritage Predictions for the Subject Area

The following predictions for Aboriginal sites to be present within the Subject Area are based on the landforms present:

- Open artefact scatters are more likely in areas less than 100m from a major watercourse, or from a confluence of watercourses;
- The size, density and significance of sites will vary, although it is anticipated that sites will be considerably less complex and less dense at distances greater than 100m from a major watercourse;
- The wandering nature of the Peel River, and the presence of the Subject Area on a floodplain suggests that the potential for surface artefacts is low;
- Where mature trees are present, there is moderate potential for modified trees to exist;
- As past land use disturbance increases in intensity, the ability for Aboriginal objects to provide spatial and chronological information about past Aboriginal land use will decrease;
- Burials are not anticipated to be present in the Subject Area. No instances of Aboriginal burials were identified from the AHIMS search within 9km of the Subject Area; and,
- Areas of Potential Archaeological Deposits (PADs) may be present in locations with minimal previous land disturbance and in close proximity to a watercourse.

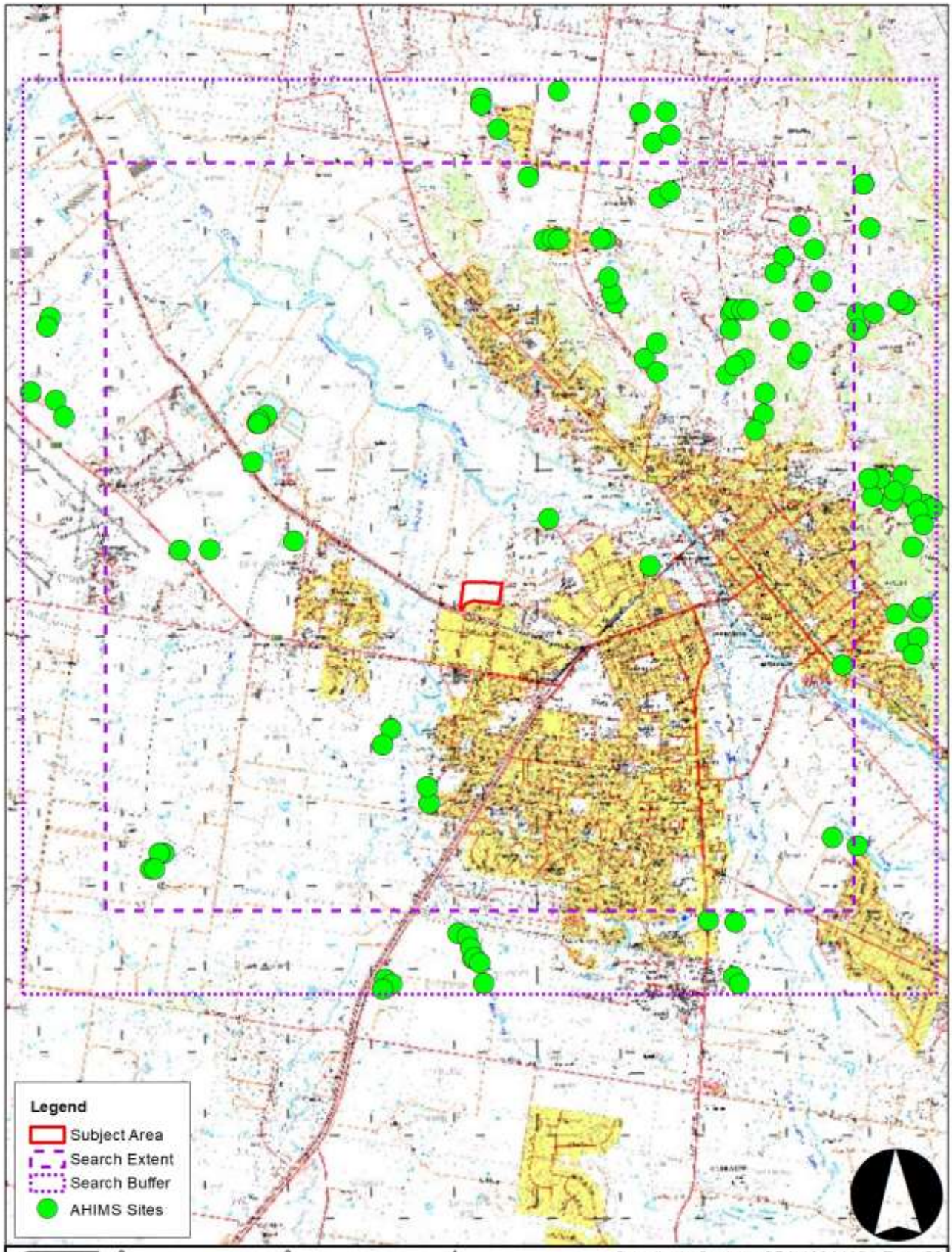


Figure 3: AHIMS Sites from Search Data



Figure 4: AHIMS Sites in Proximity

5 PRELIMINARY ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

This due diligence assessment provides a preliminary assessment of archaeological potential, that is to determine likelihood of potential archaeological deposits (PAD) being present within the Subject Area. A more comprehensive and detailed investigation of the extent and nature of any archaeological potential would be completed during an archaeological survey report (ASR), where required, under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010 (now referred to as the Office of Environment and Heritage).

This desktop assessment has identified no Aboriginal cultural material within or abutting the Subject Area. One (1) AHIMS site is located approximately 962m to the northeast of the Subject Area, identified as WAB ST 1 (Wallamore Anabranch Scarred Tree 1) (AHIMS #29-2-0285). Given the lack of mature vegetation within the Subject Area resulting from land clearance for agricultural and pastoral activities, it is unlikely that scarred trees will be present. Furthermore, Wilson & McAdam (2000) commented that any artefact-bearing deposits that may have been present across the alluvial plain of the Peel River and its tributaries are likely to have disappeared as a result of the unstable creek line.

Based on the information presented above, no further archaeological investigation is recommended for the Subject Area. If the proposed works as identified in Section 1.2, do uncover any Aboriginal cultural material, further archaeological work will be necessary.

6 DUE DILIGENCE ASSESSMENT

KAS was asked to conduct an Aboriginal archaeological assessment of the Investigation Area in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010b). This *Due Diligence Code of Practice* sets out the matters which are to be addressed when assessing whether or not an activity may harm Aboriginal Objects.

The *Due Diligence Code of Practice*, with reference to the DECCW process (Appendix VI), outlines in regard to the proposed project (refer to Section 1.2) within the Subject Area, the following:

1. It is not an activity under Part 3 under s.75B of the EP&A Act;
2. The proposed activity is not exempt under the *National Parks and Wildlife Act, 1974* or *National Parks and Wildlife Regulation, 2009*;
3. The proposed activity will not involve harm that is trivial or negligible;
4. The activity is not within an Aboriginal place and no previous investigations meeting the requirements of this code have identified Aboriginal objects;
5. The proposed activity is not a low impact one for which there is a defense in the *National Parks and Wildlife Regulation, 2009*; and,
6. The proponent is not eligible to use an industry specific code of practice.

Consequently, the Generic Due Diligence Code of Practice (DECCW, 2010b) is to be followed. The decision process determining whether an Aboriginal Heritage Impact Permit (AHIP) is required is as follows (Appendix VI):

1. The activity will disturb the ground surface, but will not disturb any culturally modified trees;
2. a. the Subject Area does not have previously confirmed site records or other associated landscape feature information on AHIMS;

   b. there are no sites identified within the Subject Area;

   c. there are landscape features that are likely to indicate the presence of Aboriginal objects;
3. The carrying out of the proposed activity can be avoided at the relevant landscape features identified over the Subject Area; and,
4. The desktop assessment completed indicate that the likelihood of Aboriginal objects being present is low.

As such, it is determined that an AHIP is not required for the project as currently proposed, however caution must be exercised. It is extremely important to note that the above conclusions are relevant only to the current Investigation Area and not the Subject Area as a whole, which does contain a registered Aboriginal site and therefore will require further investigation.

7 RECOMMENDATIONS

The following recommendations regarding Aboriginal heritage are based on consideration of:

- The legal requirements of the *National Parks and Wildlife Act 1974* (as amended), whereby it is illegal to damage, deface or destroy an Aboriginal relic without first obtaining the written consent of the Director General of National Parks & Wildlife Service;
- The legal requirements of the *Heritage Act 1977*, whereby it is illegal to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit;
- The results of the background research, and the desktop assessment; and,
- The likely impacts of the proposed works (refer to Section 1.2 and **Error! Reference source not found.**).

It was found that:

- The desktop assessment did not identify any Aboriginal sites within the Subject Area.

It is therefore recommended that:

1. Works as currently specified can proceed with caution, subject to the recommendations included below;
2. This due diligence assessment must be kept by the Proponent so that it can be presented, if needed, as a defence from prosecution under Section 86(2) of the *National Parks and Wildlife Act 1974*;
3. All relevant staff and contractors should be made aware of their statutory obligations for heritage under the *National Parks and Wildlife Act 1974*, which may be implemented as a heritage induction;
4. Should the design and/or extent of the proposed development be altered, further archaeological assessment may be required. This may include the need to complete an Aboriginal Cultural Heritage Assessment (ACHA), the full Aboriginal Cultural Heritage Consultation Requirements (ACHCR), sub surface investigations under the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010a) and apply for an Aboriginal Heritage Impact Permit (AHIP) from the Office of Environment and Heritage (OEH), NSW;
5. If unrecorded Aboriginal object or objects are identified in the Subject Area during works, then all works in the immediate area must cease and the area should be cordoned off. OEH must be notified by ringing the Enviroline 131 555 so that the site can be adequately assessed and managed;
6. In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene, or possible Aboriginal remains. If the remains are thought to be Aboriginal, OEH must be contacted by ringing the Enviroline 131 555. An OEH officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the relevant Aboriginal stakeholders before works recommence; and,
7. If, during the course of development works, suspected historic cultural heritage material is uncovered, work should cease in that area immediately. The Heritage Branch, Office of

Environment & Heritage (Enviroline 131 555) should be notified and works only recommence when an approved management strategy has been developed.

8 REFERENCE

Banks, R. G. (2001). *Soil Landscapes of the Tamworth 1:100,000 Sheet (Calala, Currabubula, Duri, Nemingha, Quirindi, Tamworth, Werris Creek)*. Sydney: Department of Land and Water Conservation, Sydney.

Boileau, J. (2007). *Thematic History of Nundle, Manilla and Barraba: Tamworth Regional Council Community Based Heritage Study*. Report for Tamworth Regional Council.

BOM. (2018). Rainfall Data from Tamworth Airport AWS. Retrieved from http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_startYear=&p_c=&p_stn_num=055325

Carey, J. (2006). *Tamworth and Districts: Early History*. Report for Tamworth Regional Council: Tamworth.

DECCW. (2010a). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. Sydney South: Department of Enviroment, Climate Change and Water NSW.

DECCW. (2010b). *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. Sydney South: Department of Environment, Climate Change and Water NSW.

Everick Heritage Consultants. (2015). *Aboriginal Cultural Heritage Assessment, Glen Artney Industrial Development, West Tamworth NSW*. Prepared for GHD and Tamworth Regional Council.

Jonathan Falk Planning Consultants Pty Ltd, & Rodney Jensen and Associates Pty Ltd. (1988). *Tamworth Heritage Study: Final Report.* (Vol. 1: Heritage Study). Prepared for Tamworth City Council and Department of Environment and Planning

Murphy, B. W., & Murphy, C. L. (2000). The Soil Profile. In B. W. Murphy (Ed.), *Soils: their properties and management* (pp. 70-82). Oxford: Oxford University Press.

NSW National Parks and Wildlife Service. (2003). The Nandewar Bioregion. In The Bioregions of New South Wales: their biodiversity, conservation and history (pp. 145-156). Sydney: NSW National Parks and Wildlife Service.

Tindale, N. B. (1974). *Aboriginal Tribes of Australia - Their Terrain, Environmental Controls, Distribution, Limits and Proper Names*. Canberra: Australian National University Press.

Wilson, J., & McAdam, L. (2000). *The Tamworth Aboriginal/Archaeological Site Study*. Prepared for Tamworth City Council.

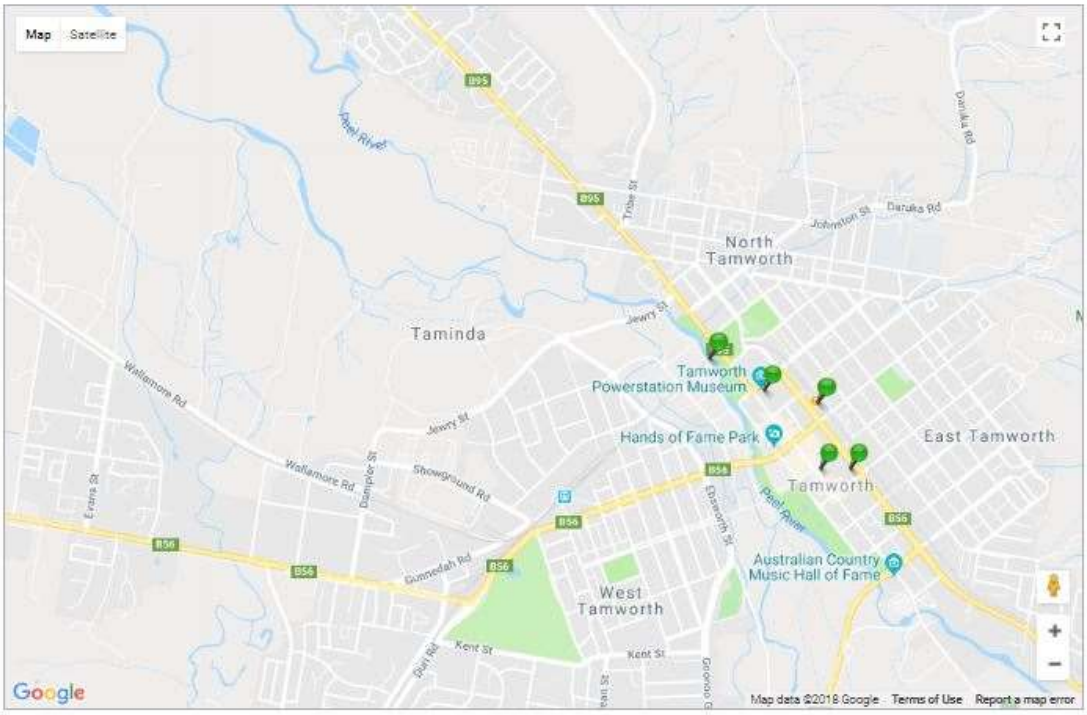
APPENDIX I. State Heritage Register Search Results

Location information for some Aboriginal Places (e.g. burial grounds and sacred sites) have been generalised because of their cultural sensitivity. Location information for restricted Aboriginal Places is not shown at all. If an activity or development is proposed that may potentially impact on or harm (i.e., damage, deface or destroy) an Aboriginal Place, then proponents must undertake a search for the exact boundaries of Aboriginal Places through **AHIMS Web Services**.

Downloading of State Heritage Register spatial datasets and associated metadata into a Geographical Information System (GIS) software package is available through **Data NSW**

Listing Type:	◉ All ○ Aboriginal Places ○ State Heritage Register
Local government area:	Please Choose...
Item name/Database ID:	
SHR number:	
Location:	tamworth
Local Aboriginal Land Council (LALC):	Please Choose...
State theme:	Please Choose...
Item type:	Please Choose...
Item Group:	Please Choose...
Item category:	Please Choose...

Search Reset



APPENDIX II. State Heritage Inventory Search Results



Home > Topics > Heritage places and items > Search for heritage

Search for NSW heritage

Your search did not return any matching results. Please refine your search and try again.

The State Heritage Inventory is a list of heritage items in New South Wales including Aboriginal Places, State Heritage Register, Interim Heritage Orders, State Agency Heritage Registers and Local Environmental Plans.

The Heritage Division is directly responsible for maintaining **Aboriginal Places** and the **State Heritage Register**. A new **combined map search** is now available. For further information about Aboriginal Places and Sites refer to **AHIMS Web Services**

Whilst the Heritage Division seeks to keep the Inventory up to date, it is reliant on State agencies and local councils to provide their data. Always check with the relevant State agency or local council for the most up-to-date information.

Visit **State Heritage Inventory help** if you are unfamiliar with this search facility.

Basic search criteria

Item name/database ID:	
Street name:	
Suburb/town:	taminda
Local Government Area:	Please Choose...
Local Aboriginal Land Council (LALC):	Please Choose...
Heritage listings:	(For Aboriginal Place and State Heritage Register only) Please Choose...
SHR number:	

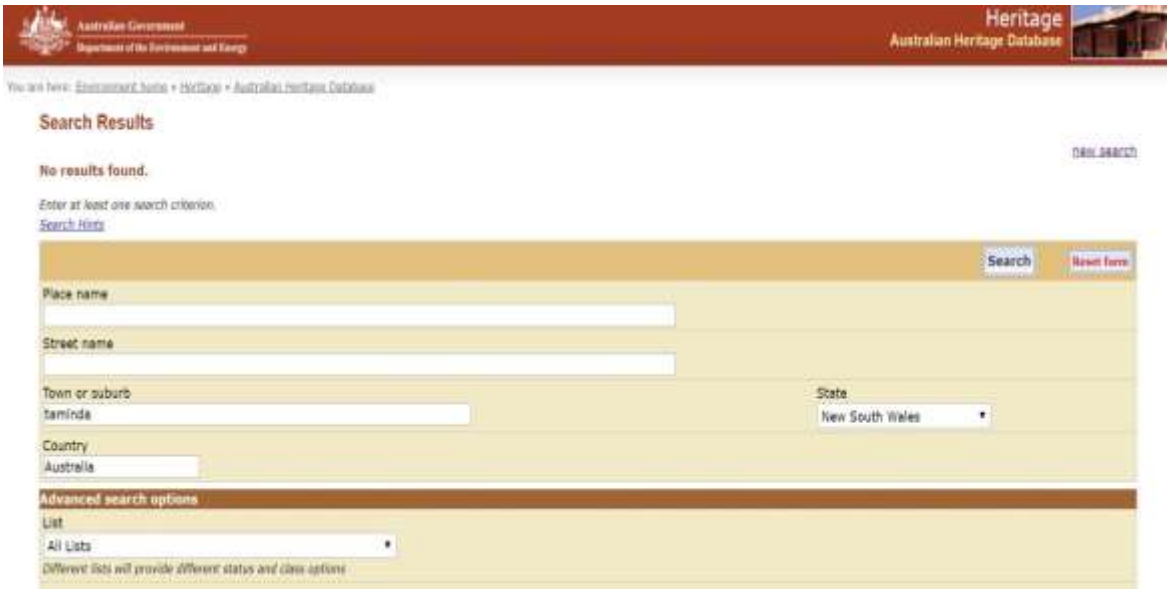
Additional search criteria

NOTE: For items listed by local councils, there may not be information in the additional search criteria fields.

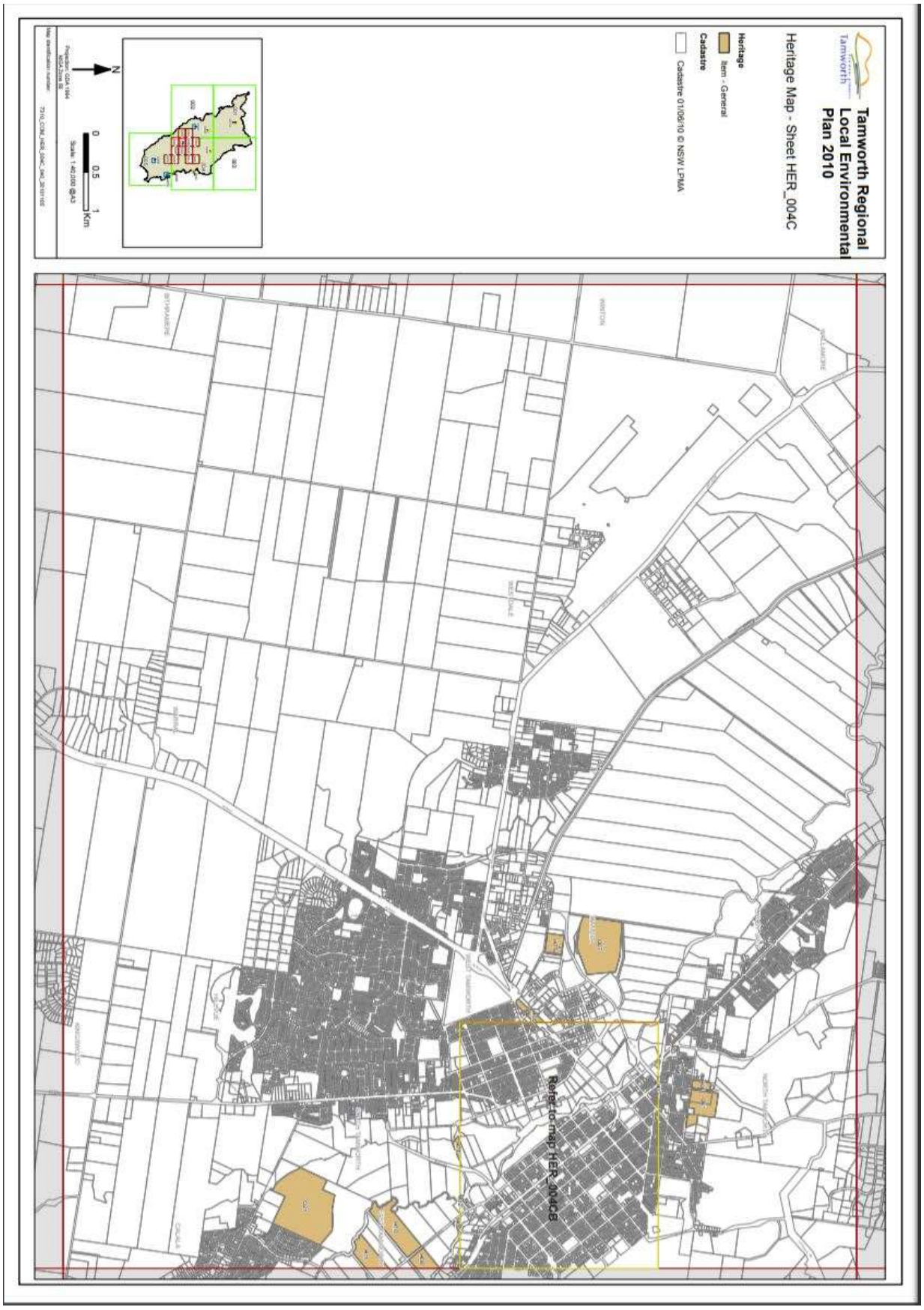
Owner organisation*:	
Designer/builder:	
Year of construction:	from to:
Item type:	Please Choose...
Item group:	Please Choose...
Item category:	Please Choose...
Australian historic theme:	Please Choose...
NSW historic theme:	Please Choose...
Significance, description, historical notes:	
Information complete:	

Search Reset

Appendix III. Register of the National Estate Search Results



Appendix IV. Tamworth Local Environment Plan 2010



Appendix V. AHIMS Search Results

Office of Environment & Heritage
NSW

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : Taminda_2
Client Service ID : 373803

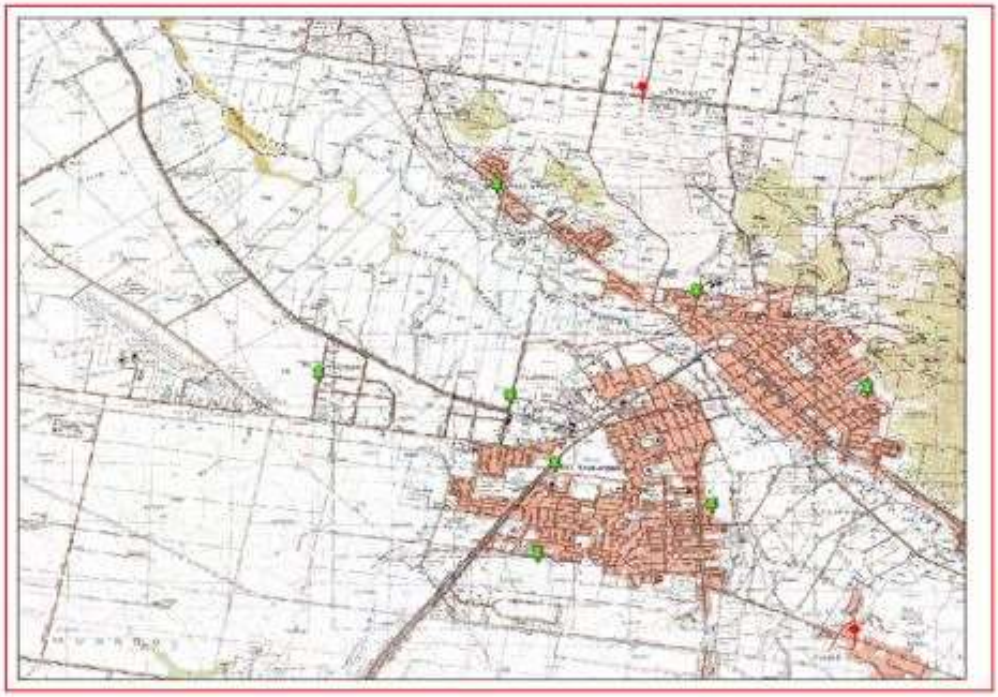
Kayandel Archaeological Services
PO Box 440 15 Henry Street
Picton New South Wales 2571
Attention: Lance Syme
Email: lance.syme@kayandel.com.au

Date: 02 October 2018

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 294806 - 303806, Northings : 6554701 - 6563701 with a Buffer of 1000 meters, conducted by Lance Syme on 02 October 2018.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

113	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Taminda_2
Client Service ID : 373803

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
29-2-0078	Marsupial Park Endevour Drive Marsupial Park	AGD	56	304550	6559400	Open site	Valid	Artefact : -	Open Camp Site	102239
	Contact	**Recorders**	Joanna Newby					**Permits**		
29-2-0059	Marengo 2;	AGD	56	303750	6561500	Open site	Valid	Artefact : -, Stone Quarry : -	Quarry	
	Contact	**Recorders**	J.M Wilson,Archaeological Surveys & Salvage					**Permits**		
29-2-0001	Tamworth;West Tamworth;	AGD	56	298600	6555800	Open site	Not a Site	Artefact : -	Not an Aboriginal Site	1474
	Contact	**Recorders**	Harry Creamer,Davies Heritage Consultants Pty Ltd					**Permits**		
29-2-0124	Hills Plain 5	AGD	56	303320	6562077	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Janice Wilson,Leila McAdam,Ivan Johnson					**Permits**		
29-2-0160	Timbumburi Creek Coledale	AGD	56	298575	6556000	Open site	Valid	Artefact : 34		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0150	Garrieties Gully 3	AGD	56	304489	6558108	Open site	Valid	Artefact : -		102239
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0151	MacPherson Hill 1	AGD	56	304324	6557729	Open site	Valid	Artefact : 8		102239
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0152	MacPherson Hill 2	AGD	56	304476	6557795	Open site	Valid	Artefact : 1		102239
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0153	MacPherson Hill 3	AGD	56	304426	6557602	Open site	Valid	Artefact : 33		102239
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0154	Moore Creek Road 1	AGD	56	300841	6561821	Open site	Valid	Artefact : 11		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0155	Moore Creek Road 2	AGD	56	300796	6561935	Open site	Valid	Artefact : 4		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0156	Moore Creek Road 3	AGD	56	300756	6562125	Open site	Valid	Artefact : 18		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0157	Moore Creek Road 4	AGD	56	301194	6561158	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0158	Moore Creek Road 5	AGD	56	301343	6560990	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0159	Moore Creek Road 6	AGD	56	301332	6561335	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0262	Wentworth Ridge	AGD	56	303110	6561836	Open site	Valid	Grinding Groove : 2, Artefact : 5		

Report generated by AHIMS Web Service on 02/10/2018 for Lance Syme for the following area at Datum :GDA, Zone : 56, Eastings : 294806 - 303806, Northings : 6554701 - 6563701 with a Buffer of 1000 meters. Additional Info : due diligence assessment. Number of Aboriginal sites and Aboriginal objects found is 113

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Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Taminda_2
Client Service ID : 373803

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact T Russell	Recorders	Mr.Bruce Cohen					Permits		
29-2-0106	Hills Plain 1	AGD	56	303060	6562750	Open site	Valid	Stone Quarry : -, Artefact : -	Open Camp Site,Quarry	
	Contact	Recorders	Janice Wilson					Permits		
29-2-0303	Calala Creek IP/1	AGD	56	303753	6555292	Open site	Valid	Artefact : -		102239
	Contact	Recorders	Ivan Johnson,Mr.Patrick Gaynor					Permits	3351,3360	
29-2-0304	Calala Creek IP/2	AGD	56	303454	6555394	Open site	Valid	Artefact : 2		102239
	Contact	Recorders	Mr.Patrick Gaynor					Permits	3351,3360	
29-2-0337	RPS COMMON EAST 1	GDA	56	302362	6561938	Open site	Valid	Artefact : 1		
	Contact	Recorders	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					Permits		
29-2-0338	RPS COMMON EAST 2	GDA	56	302463	6561926	Open site	Valid	Artefact : 1		
	Contact	Recorders	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					Permits		
29-2-0339	RPS COMMON EAST 3	GDA	56	302540	6561926	Open site	Valid	Artefact : 1		
	Contact	Recorders	RPS Australia East Pty Ltd -Hamilton,Ms.Laraine Nelson					Permits		
29-2-0104	Hills Plain 4	AGD	56	302870	6562370	Open site	Valid	Stone Quarry : -, Artefact : -	Quarry	
	Contact	Recorders	L McAdam					Permits		
29-2-0105	Hills Plain 3	AGD	56	303230	6562470	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Janice Wilson					Permits		
29-2-0107	Hills Plain 2	AGD	56	303900	6562720	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Ian Johnson					Permits		
29-2-0103	Hills Plain 6	AGD	56	303030	6561150	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Janice Wilson,Leila McAdam,Ivan Johnson					Permits	2313,2356	
29-2-0132	Boltons Creek 4	AGD	56	294039	6561643	Open site	Valid	Artefact : 141		97360
	Contact	Recorders	Janice Wilson					Permits		
29-2-0134	Spring Creek 1 (SC 1)	AGD	56	302227	6561696	Open site	Valid	Artefact : 355		
	Contact	Recorders	Janice Wilson					Permits		
29-2-0135	Spring Creek 2 (SC 2)	AGD	56	302819	6561506	Open site	Valid	Artefact : 1		
	Contact	Recorders	Janice Wilson					Permits		
29-2-0136	Spring Creek 3 (SC 3)	AGD	56	303075	6561229	Open site	Valid	Artefact : 16		
	Contact	Recorders	Janice Wilson					Permits		
29-2-0137	Spring Creek 4 (SC 4)	AGD	56	302224	6561500	Open site	Valid	Artefact : 9		
	Contact	Recorders	Janice Wilson					Permits		
29-2-0126	Kamilaroi Walking Track 1	AGD	56	304418	6558883	Open site	Valid	Artefact : 7		102239
	Contact	Recorders	Janice Wilson,Leila McAdam,Ivan Johnson					Permits		

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Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Taminda_2

Client Service ID : 373803

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
29-2-0138	Spring Creek 5 (SC 5)	AGD	56	302395	6561151	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0139	Spring Creek 6-Tamworth	AGD	56	302634	6560739	Open site	Valid	Artefact : 5		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0296	Wallamore Road ST1	GDA	56	296632	6560564	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Ivan Johnson,Mr.Patrick Gaynor					**Permits**	3146,3152	
29-2-0172	Hills Plain IP/10	AGD	56	299790	6563340	Open site	Valid	Artefact : 3		
	Contact Searle	**Recorders**	Archaeological Surveys & Salvage					**Permits**	3153,3154	
29-2-0173	Hills Plain IP/11	AGD	56	299982	6562580	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	Archaeological Surveys & Salvage					**Permits**	3153,3154	
29-2-0174	Hills Plain IP/12	AGD	56	300073	6562594	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	Archaeological Surveys & Salvage					**Permits**	3153,3154	
29-2-0175	Hills Plain IP/13	AGD	56	300158	6562586	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Archaeological Surveys & Salvage					**Permits**	3153,3154	
29-2-0176	Hills Plain IP/14	AGD	56	300717	6562584	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Archaeological Surveys & Salvage					**Permits**		
29-2-0177	Hills Plain IP/15	AGD	56	300658	6562595	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Archaeological Surveys & Salvage					**Permits**		
29-2-0178	Barnes Gully IP/1	AGD	56	301256	6558659	Open site	Valid	Artefact : 1		99292
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**		
29-2-0214	Oakburn 3	AGD	56	294100	6560650	Open site	Valid	Artefact : 1		103183
	Contact T Russell	**Recorders**	Archaeological Surveys & Salvage					**Permits**		
29-2-0275	DTG/OC 2-Murroon Creek 2	GDA	56	295350	6555200	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	Stephanie Garling					**Permits**		
29-2-0277	DTG/ST 1-Timbumburi Ck	GDA	56	298140	6556700	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Stephanie Garling					**Permits**		
29-2-0280	Garawul Gurar 1	GDA	56	304300	6559750	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Janice Wilson					**Permits**		
29-2-0281	Hill Plain 4	GDA	56	302870	6562370	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Janice Wilson,Leila McAdam,Ivan Johnson					**Permits**		
29-2-0282	Spring Creek ST 2	GDA	56	302622	6560484	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Janice Wilson,Leila McAdam					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Taminda_2

Client Service ID : 373803

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
29-2-0285	WAB ST 1 (Wallamore Anabranch Scarred Tree 1)	GDA	56	300143	6559413	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Janice Wilson,Leila McAdam					**Permits**		
25-2-0008	Heather Brae Scarred Tree	AGD	56	296468	6559903	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	**Recorders**	Ms.Suzanne Hudson					**Permits**		
29-2-0288	Garrieties Gully Historic Site	GDA	56	304637	6558345	Open site	Valid	Artefact : -		102239
	Contact	**Recorders**	Janice Wilson,Leila McAdam					**Permits**		
29-2-0289	DTG/OC 1 Murron Creek 1	GDA	56	295400	6555200	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Stephanie Garling					**Permits**		
29-2-0306	Tamworth Botanical Gardens Cultural Artefact Area & Scarred Tree Sections 1 & 2	GDA	56	304130	6559908	Open site	Valid	Artefact : 200, Modified Tree (Carved or Scarred) : 6		
	Contact Mr.Brian Allan	**Recorders**	Barry Cain					**Permits**		
25-2-0009	Marsupial Park 2	GDA	56	304648	6559347	Open site	Valid	Artefact : -		
	Contact	**Recorders**	PJG Consulting,Mr.Patrick Gaynor					**Permits**	3798	
29-2-0334	Heatherbrae 1	GDA	56	296064	6559045	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Adrian Piper					**Permits**		
29-2-0335	Heather brae 2	GDA	56	295698	6559035	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Adrian Piper					**Permits**		
29-2-0336	Heather brea 3	GDA	56	297071	6559146	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Adrian Piper					**Permits**		
29-2-0346	VICTORIA PARK SITE 1	GDA	56	303994	6559895	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Tamworth LALC,Mr.Donnie (Chris) Fermor					**Permits**		
29-2-0347	Victoria Park 2	GDA	56	303676	6557653	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Tamworth LALC,Mr.Donnie (Chris) Fermor					**Permits**		
29-2-0093	DTG/OC1 - Murroon Creek 1	AGD	56	295400	6555200	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Mr.Mark Rawson					**Permits**		
29-2-0094	DTG/ST1 - Timbumduri Creek	AGD	56	298140	6556700	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	**Recorders**	Mr.Mark Rawson					**Permits**		
29-2-0092	DTG/OC2 - Murroon Creek 2	AGD	56	295350	6555200	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Stephanie Garling					**Permits**		

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Extensive search - Site list report

Your Ref/PO Number : Taminda_2
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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
29-2-0012	Tamworth Oxley Lookout	AGD	56	304400	6559500	Open site	Valid	Artefact : -	Open Camp Site	102239
	Contact	Recorders	Eugene Stockton					Permits		
29-2-0060	Marengo 3	AGD	56	303750	6561700	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0061	Marengo 4	AGD	56	304250	6561850	Open site	Valid	Artefact : -, Aboriginal Ceremony and Dreaming : -		
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0062	Marengo 5	AGD	56	304320	6561800	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0068	Marengo 5.	AGD	56	304320	6561800	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0069	Marengo 4.	AGD	56	304250	6561850	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0070	Marengo 3.	AGD	56	303950	6561700	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0071	Marengo 2	AGD	56	303750	6561500	Open site	Valid	Stone Quarry : -, Artefact : -	Quarry	
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0072	Marengo 1;	AGD	56	303820	6563250	Open site	Valid	Stone Quarry : -, Artefact : -	Quarry	
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage					Permits		
29-2-0073	Garawul Gurar	AGD	56	304300	6559750	Open site	Valid	Artefact : -	Open Camp Site	3487,102239
	Contact	Recorders	Archaeological Surveys & Salvage					Permits	1129,1645	
29-2-0076	Oakburn 1	AGD	56	293800	6560750	Open site	Valid	Artefact : -	Isolated Find	103183
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage ,Mr.Richard Kelly					Permits	1139	
29-2-0077	Oakburn 2	AGD	56	294200	6560450	Open site	Valid	Artefact : -	Isolated Find	103183
	Contact	Recorders	J.M Wilson,Archaeological Surveys & Salvage ,Mr.Richard Kelly					Permits	1139	
29-5-0028	Marengo 1	AGD	56	303820	6563250	Open site	Valid	Stone Quarry : -, Artefact : -	Quarry	
	Contact	Recorders	Archaeological Surveys & Salvage ,Mr.Jason Wilson					Permits		
29-2-0298	Wallamore Road ST 3	GDA	56	296744	6560659	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Patrick Gaynor					Permits	3146,3152	

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Extensive search - Site list report

Your Ref/PO Number : Taminda_2
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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
29-2-0299	Wallamore Road ST 4	GDA	56	296654	6560600	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	P.J Gaynor Consultant Archaeologist,Ivan Johnson					Permits	3146,3152	
29-2-0300	Wallamore Road ST 5	GDA	56	296645	6560564	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	P.J Gaynor Consultant Archaeologist					Permits	3146,3152	
29-2-0148	Garrieties Gully 1	AGD	56	304217	6558077	Open site	Valid	Artefact : 1		
	Contact	Recorders	Janice Wilson					Permits		
29-2-0149	Garrieties Gully 2	AGD	56	304489	6558108	Open site	Valid	Artefact : 4		102239
	Contact	Recorders	Janice Wilson					Permits		
29-2-0140	Spring Creek 7 - Tamworth	AGD	56	302181	6560958	Open site	Valid	Artefact : 7		
	Contact	Recorders	Janice Wilson					Permits		
29-2-0141	Spring Creek ST2	AGD	56	302622	6560484	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Janice Wilson					Permits		
29-2-0143	Garawul Gurar 2	AGD	56	304650	6559354	Open site	Valid	Artefact : 600		102239
	Contact	Recorders	Janice Wilson					Permits		
29-2-0145	Garawul Gurar 4	AGD	56	304482	6559324	Open site	Valid	Art (Pigment or Engraved) : 16		102239
	Contact	Recorders	Janice Wilson					Permits		
29-2-0146	Garawul Gurar 5	AGD	56	304166	6559439	Open site	Valid	Artefact : 22		102239
	Contact	Recorders	Janice Wilson					Permits		
29-2-0147	Garawul Gurar 6	AGD	56	303934	6559492	Open site	Valid	Artefact : 1		102239
	Contact	Recorders	Janice Wilson					Permits		
29-2-0236	Tamworth Hills Plain 2 (THP 2)	AGD	56	301292	6563749	Open site	Valid	Artefact : 7		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0237	THP 5	AGD	56	301133	6564104	Open site	Valid	Artefact : 6		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0238	THP 4	AGD	56	301455	6564119	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0239	THP 3	AGD	56	301500	6563843	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		
29-2-0240	THP 7	AGD	56	301363	6563089	Open site	Valid	Artefact : -		
	Contact T Russell	Recorders	Mrs.Angela Besant					Permits		

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NSW GOVERNMENT

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Taminda_2

Client Service ID : 373803

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
29-2-0241	THP6	AGD	56	301498	6563160	Open site	Valid	Artefact : -		
	Contact: T Russell	Recorders: Mrs.Angela Besant						Permits:		
29-2-0212	Glenmore IP/5	AGD	56	300156	6564370	Open site	Valid	Artefact : 1		
	Contact: Searle	Recorders: Archaeological Surveys & Salvage						Permits:	2663	
29-2-0258	Rockleigh 1P/3	AGD	56	299425	6563918	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Archaeological Surveys & Salvage ,Tamworth LALC,Ivan Johnson						Permits:	3125,3148	
29-2-0260	Rockleigh 1P/2	AGD	56	299222	6564284	Open site	Valid	Artefact : 24		
	Contact:	Recorders: Archaeological Surveys & Salvage ,Ivan Johnson						Permits:	3125,3148	
29-2-0261	Rockleigh 1P/1	AGD	56	299223	6564206	Open site	Valid	Artefact : 10		
	Contact:	Recorders: Archaeological Surveys & Salvage ,Ivan Johnson						Permits:	3125,3148	
29-2-0330	Spring Creek Bridge Site 1	AGD	56	302279	6561066	Open site	Valid	Artefact : -		
	Contact: Tamworth LALC	Recorders: Mr.Patrick Gaynor						Permits:		
29-2-0325	GG05	GDA	56	302372	6553905	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		
29-2-0326	GG06	GDA	56	302437	6553821	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		
29-2-0328	GG03	GDA	56	302390	6554565	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		
29-2-0329	GG01	GDA	56	302063	6554587	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		
29-2-0309	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			103085,103086
	Contact:	Recorders: Barry Cain,Mr.Russell Reid						Permits:		
29-2-0331	Boltons Creek 01	GDA	56	294105	6561724	Open site	Valid	Artefact : -		
	Contact:	Recorders: Mr.Adrian Piper						Permits:		
29-2-0314	DR05	GDA	56	299361	6553823	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		
29-2-0315	DR06	GDA	56	299223	6554130	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		
29-2-0316	DR07	GDA	56	299053	6554428	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		
29-2-0317	DR08	GDA	56	299161	6554386	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		
29-2-0318	DR09	GDA	56	299201	6554255	Open site	Valid	Artefact : 1		
	Contact:	Recorders: Mr.Tim Robins						Permits:		

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Extensive search - Site list report

Your Ref/PO Number : Taminda_2

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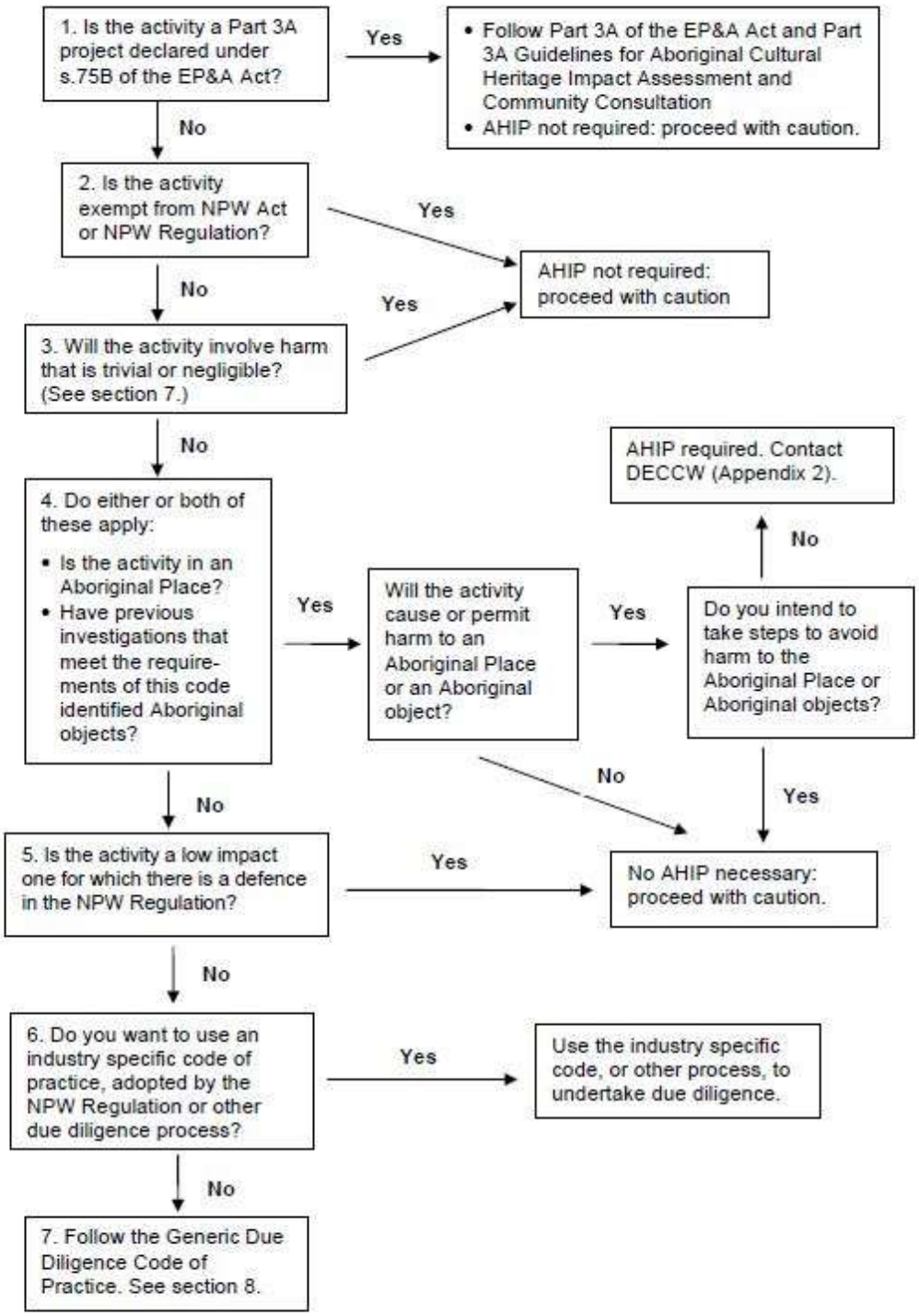
SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
29-2-0319	DR10-1	GDA	56	299249	6554138	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Tim Robins					Permits		
29-2-0320	DR11-1	GDA	56	299312	6554072	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Tim Robins					Permits		
29-2-0321	DR12-1	GDA	56	298176	6553878	Open site	Valid	Modified Tree (Carved or Scarred) : 1, Artefact : 1		
	Contact	Recorders	Mr.Tim Robins					Permits		
29-2-0322	DR13-1	GDA	56	298252	6553818	Open site	Valid	Artefact : 1, Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Mr.Tim Robins					Permits		
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	Contact	Recorders	Mr.Tim Robins					Permits		

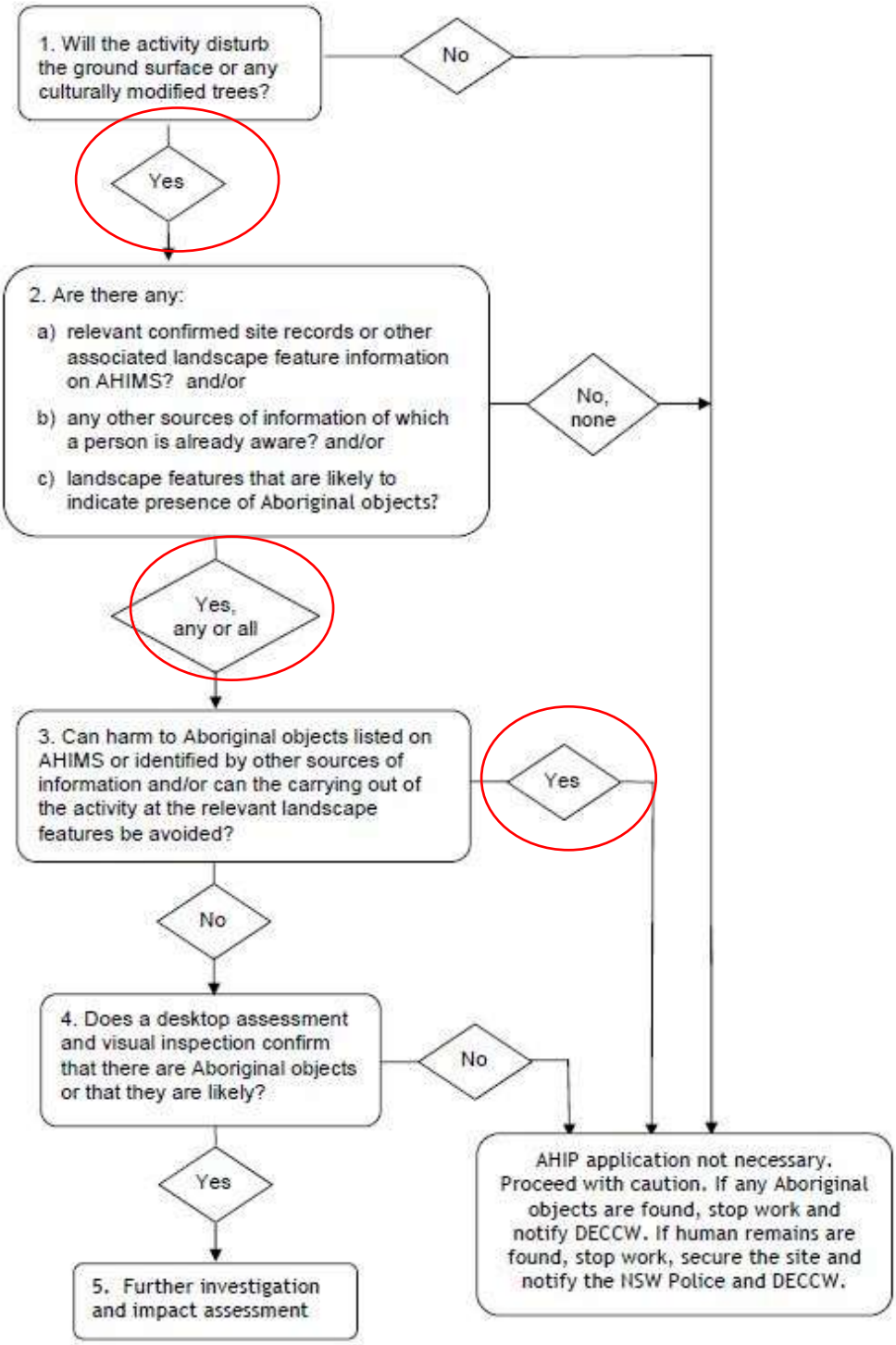
Report generated by AHIMS Web Service on 02/10/2018 for Lance Syme for the following area at Datum :GDA, Zone : 56, Eastings : 294806 - 303806, Northings : 6554701 - 6563701 with a Buffer of 1000 meters. Additional Info : due diligence assessment. Number of Aboriginal sites and Aboriginal objects found is 113

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Appendix VI. Due Diligence Decision Process (DECCW, 2010b, p. 1 & 10)





Banks, R. G. (2001). *Soil Landscapes of the Tamworth 1:100,000 Sheet (Calala, Currabubula, Duri, Nemingha, Quirindi, Tamworth, Werris Creek)*. Sydney: Department of Land and Water Conservation, Sydney.

Boileau, J. (2007). *Thematic History of Nundle, Manilla and Barraba: Tamworth Regional Council Community Based Heritage Study*. Report for Tamworth Regional Council.

BOM. (2018). Rainfall Data from Tamworth Airport AWS. Retrieved from http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_startYear=&p_c=&p_stn_num=055325

Carey, J. (2006). *Tamworth and Districts: Early History*. Report for Tamworth Regional Council: Tamworth.

DECCW. (2010a). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. Sydney South: Department of Enviroment, Climate Change and Water NSW.

DECCW. (2010b). *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. Sydney South: Department of Environment, Climate Change and Water NSW.

Everick Heritage Consultants. (2015). *Aboriginal Cultural Heritage Assessment, Glen Artney Industrial Development, West Tamworth NSW*. Prepared for GHD and Tamworth Regional Council.

Jonathan Falk Planning Consultants Pty Ltd, & Rodney Jensen and Associates Pty Ltd. (1988). *Tamworth Heritage Study: Final Report.* (Vol. 1: Heritage Study). Prepared for Tamworth City Council and Department of Environment and Planning

Murphy, B. W., & Murphy, C. L. (2000). The Soil Profile. In B. W. Murphy (Ed.), *Soils: their properties and management* (pp. 70-82). Oxford: Oxford University Press.

NSW National Parks and Wildlife Service. (2003). The Nandewar Bioregion. In The Bioregions of New South Wales: their biodiversity, conservation and history (pp. 145-156). Sydney: NSW National Parks and Wildlife Service.

Tindale, N. B. (1974). *Aboriginal Tribes of Australia - Their Terrain, Environmental Controls, Distribution, Limits and Proper Names*. Canberra: Australian National University Press.

Wilson, J., & McAdam, L. (2000). *The Tamworth Aboriginal/Archaeological Site Study*. Prepared for Tamworth City Council.

9.6 Economic Impacts and Demand

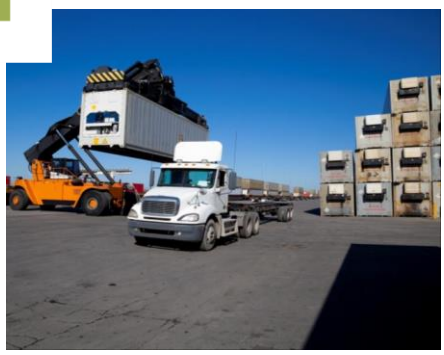
HillPDA CONSULTING

TAMWORTH

Industrial lands review







Prepared for Chan Abbey Holdings

December 2018

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This document is for discussion purposes only unless signed and dated by a Principal of HillPDA.

Reviewer

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EXECUTIVE SUMMARY

Chan Abbey Holdings Pty Ltd (the Client) is preparing a planning proposal to rezone around 30 hectares of land located in Tamworth Township (the township), from its current RU4 - Primary Production Small Lots zoning to IN1 General Industrial and B5 Business Development. HillPDA was commissioned to provide an understanding of the likely future demand for industrial floorspace and its implication on the amount of land required.

As stated, the planning proposal seeks to rezone around 30 hectares of land located approximately a ten minute drive west of Tamworth CBD. The subject site adjoins an existing industrial precinct known as Taminda and is broadly bounded to the south by Wallamore Road and light industrial properties along Kingsford Smith Street, to the north by rural land and Peel River, and to the east by Dampier Street and the Tamworth Racecourse (Figure 1).

In 2008, the Taminda Revitalisation and Economic Development Strategy provided Council with a strategy to effectively manage, both from an urban design and economic viewpoint, the future development of the Taminda industrial precinct. Recommendations in the strategy were to ensure that the precinct maintains its regional significance as an industrial precinct while also protecting the ongoing economic viability of the area.

The subject site was previously identified as being an appropriate location for an expansion of Taminda industrial precinct in order to meet the townships needs for additional industrial and bulky goods zoned land. Specifically, the Strategy recommended that part of the subject site be zoned for bulky goods retailing and industrial uses. However, this recommendation has not yet been initiated.

In light of this, the following undertakes a high level assessment of Tamworth's economic profile and existing industrial precincts in order to forecast the likely demand for industrial zoned land. It then further projects the demand for IN1 General Industrial and B5 Business Development land and the appropriateness of the subject site to meet this forecast need.

Population and employment profile

Industries associated with 'blue collar' occupations[1] have historically been a major component of Tamworth's local economy and employment generator, with this trend likely to continue into the future. These industries make up a quarter of Tamworth economy and generate over 5,000 jobs (almost one fifth of all jobs generated in the LGA).

Tamworth also enjoys rates of low unemployment, high self-sufficiency and high job self-containment. These economic factors, combined with 4,700 new working age residents forecast to reside in the LGA over the next 25 years, demonstrates the need to provide increased employment opportunities and the need to plan for appropriate zoned land to accommodate them.

Furthermore, Tamworth is in a strategic position being a regional employment hub and service provider for the region. Over the coming years there would likely be an increased demand for additional industrial land to be provided in close proximity to the town centre and transportation nodes. This will be required to both support and service Tamworth's growing population and its strategic position.

[1] Defined for the purpose of this study as including the industries of mining; manufacturing; electricity, gas, water and waste services; wholesale trade; and transport, postal and warehousing.

Tamworth industrial lands review

Currently, the LGA provides just over 763 hectares of land zoned for industrial purposes (heavy industrial, general industrial and business park zoning) with 416 hectares or 55% being vacant. The majority of this vacant land is located outside the town, near the airport.

Thirty nine per cent (39%) of the employment area (299 hectares) is zoned IN1 General Industrial. The largest and most developed of these precincts is Taminda. 8 hectares of Taminda was recently rezoned and the amount of vacant land in the precinct has increased to around 32 hectares (26 hectares of IN1 General Industrial and 6 hectares of B5 Business Development). However removing the Showground site and the Greyhound racecourse reduces the vacancy to 14 hectares – 5.5% of the whole estate.

Total industrial land needs assessment

In order to project the demand for industrial land we forecasted employment growth in the LGA under a low and high scenario.

Under a low growth scenario employment in the LGA is forecast to increase to around 33,220 by 2036. This represents an increase of around 6,690 jobs or 25% from 2016. Under this scenario, employment increases proportionally with population growth, while workforce participation rate remains steady at around 55%.

Under a high growth scenario employment in the LGA is forecast to increase to around 35,990 jobs by 2036. This represents an increase of around 9,462 jobs or 36% from that recorded in 2016. Under this scenario, employment increases proportionally at a higher rate assuming the intermodal terminal proceeds.

Under these two scenarios, it was estimated that between 1,365 and 2,778 additional jobs would be accommodated in Tamworth's industrial precincts. This increase in employment would generate demand for an additional 140,000sqm to 285,000sqm of industrial floor space. Between 34 hectares and 114 hectares of industrial zoned land would be required to accommodate the extra floor space.

Currently, the LGA contains around an estimated 416 hectares of industrial zoned land which is vacant. This is sufficient to accommodate the projected growth in demand over the next 20 years.

However, the bulk of this land is not suitable or, at a minimum, not ideal to accommodate the future growth in urban services. Some of these sites are in isolated locations and may incur significant additional capital investment to service the land and provide necessary infrastructure. Other precincts rely heavily on proposed or anticipated investment with lead times difficult to factor or provide market certainty to. The geographic location of some precincts lends to more specialised tenants that either have a relationship with the airport or require relative isolation to other uses, for example a poultry abattoir / processing plant.

General Industrial land needs assessment

The Taminda estate is uniquely positioned to provide land for the expansion of urban services and light industries that support the growing township. It is superior to any alternative areas given the area is generally free of land use conflicts, is adequately serviced, enjoys agglomeration with existing businesses and has proximity to labour, capital and consumer markets. Our market research has shown that typical buyers show a strong preference for these attributes and that Taminda is preferred to alternative locations.

If we assumed that 50% of future demand for industrial land is directed towards general industrial zoned land and light industries, then around 17 to 57 hectares of additional land would be required to accommodate the growth over the next 20 years. There is currently around 32 hectares of vacant IN1 and B5 zoned land in

Tamworth Township or only 14 hectares net of the Showground and Greyhound racecourse. This is insufficient to meet long-term demand - say over the next 20 years.

The subject site is currently the most appropriate location to meet short-term demand for IN1 zoned land in the Township given:

1. The uncertainly in timeframes surrounding the proposed expansion areas
2. Proximity to the Township and existing infrastructure
3. Strong market appeal for light industries and urban services
4. The fact that the subject site was previously recommended for rezoning for bulky goods or general industrial purposes in Council's *Taminda Revitalisation + Economic Development Strategy 2008.*

INTRODUCTION

1.0 INTRODUCTION

Chan Abbey Holdings Pty Ltd (the Client) is preparing a planning proposal to rezone around 30 hectares of land located in Tamworth Township (the township), from its current RU4 - Primary Production Small Lots zoning to permit B5 Business Development uses (around 5 hectares), solar farm (around 7 hectares) and General Industrial (around 18 hectares).

The Client has commissioned HillPDA to undertake a study that provides an understanding as to the likely future demand for industrial floorspace within Tamworth local government area (LGA) and the implications that this demand would have upon on the current and future supply of land zoned for industrial purposes.

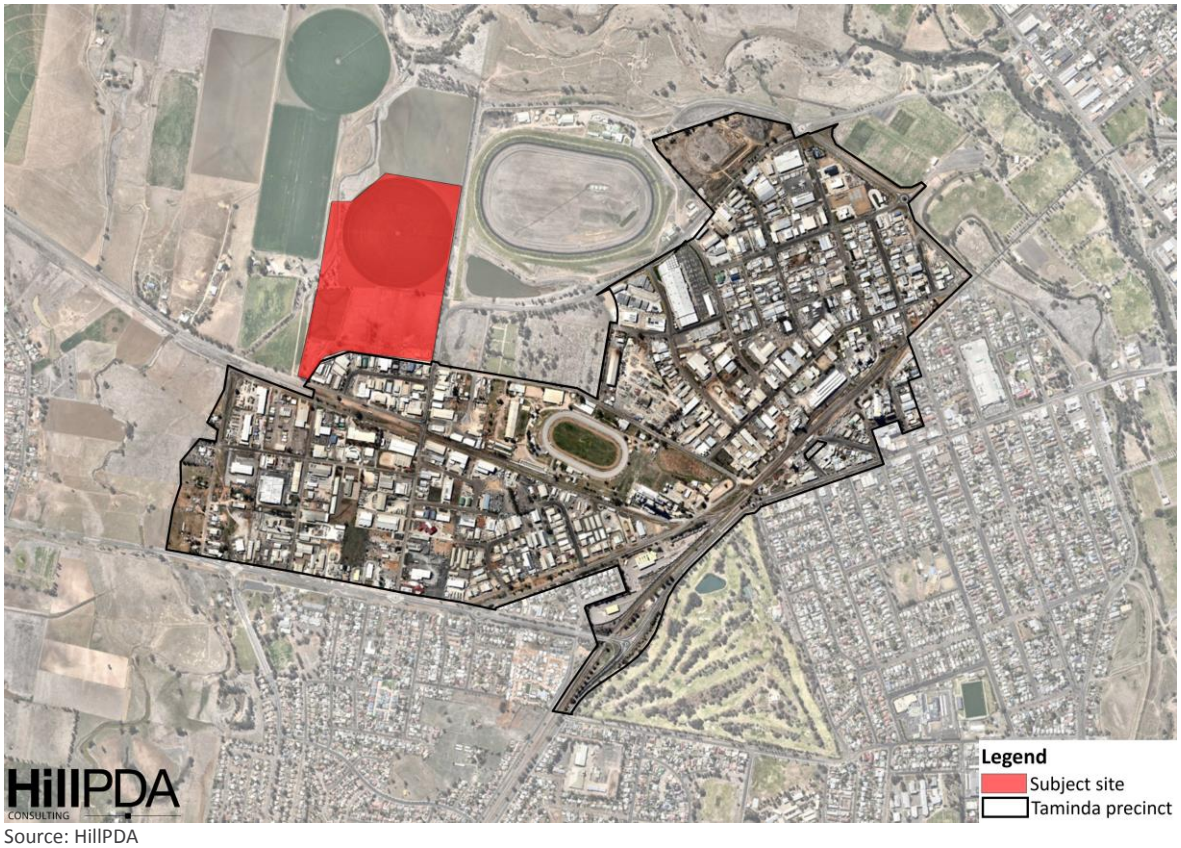
1.1 Planning Proposal

As stated the Client is preparing a planning proposal to rezone around 102 hectares of land located approximately a ten minute drive west of Tamworth CBD in an area known as Taminda.

The subject site is bounded to the south by Wallamore Road and light industrial properties along Kingsford Smith Street, to the north by rural land and Peel River, and to the east by Dampier Street and the Tamworth Racecourse.

The subject site is currently vacant, however if rezoned it could provide around 72 industrial lots, giving capacity for a range of industrial like uses. The site benefits from proximity to the town, existing industrial uses and residential populations. These locational attributes and increased efficiencies through the increased synergy of uses elevate the subject site's attractiveness for industrial development. The site also straddles the proposed bypass providing additional potential for increased accessibility and connectivity in the future.

Figure 1: Subject site



Source: HillPDA

1.2 Report structure

To meet the requirements of the brief, the study has been structured in the following manner:

- **Chapter 2: Contextual review|** undertakes a high-level review of recent planning policies that guide and promote the development of industrial land in the locality
- **Chapter 3: Economic profile |** undertakes an analysis of economic trends in the LGA, with a particular focus on those trends that impact the demand for additional industrial land
- **Chapter 4: Industrial precinct profiles |** undertakes an assessment of the current state of each industrial precinct, locational attributes, other characteristics and capacity to accommodate additional growth
- **Chapter 5: Industry engagement |** undertakes engagement with local industry representatives to understand the key drivers, constraints, buyers' locational preferences and any long term trends in demand
- **Chapter 6: Demand & gap analysis |** undertakes an assessment of the likely demand for additional floorspace in the township. The chapter also undertakes a gap analysis to determine the quantum of additional employment lands required to accommodate forecast growth.

2.0 CONTEXTUAL REVIEW

This Chapter undertakes a review of background planning policies of relevance to industrial land provision and development within Tamworth Township.

2.1 New England North West Regional Plan 2036

The New England North West Regional Plan 2036 is a 20-year blueprint for the future of the New England North West region, commissioned in 2015. The Plan outlines a vision to create a leading and diverse regional economy in NSW through the delivery of four goals:

1. A strong and dynamic regional economy
2. A healthy environment with pristine waterways
3. Strong infrastructure and transport networks for a connected future
4. Attractive and thriving communities.

Of relevance to this study are the following excerpts:

- Armidale and Tamworth will accommodate over half of the region's population by 2036. Each city has assets that support a growing population and the provision of services to the wider region
- Well-located employment land is a key component to a successful centre. Employment land supply will be encouraged in locations supported by freight access and protected from encroachment by incompatible development
- New international freight opportunities through the Brisbane West Wellcamp Airport and expanded Tamworth Regional Airport
- The region is uniquely positioned to leverage opportunities associated with growing global and domestic markets
- Narrabri, Moree and Tamworth support existing and proposed intermodal terminals and will continue to be significant areas for outbound containerised freight.

Page 31 of the Plan identifies a future industrial investigation area flanking each side of the existing heavy industrial zoning adjoining Tamworth Airport. However, any possible expansion in this area would likely be related to and dependent on the development of an intermodal hub. In November of 2017, Tamworth secured $7.4 million from Growing Local Economies fund for the project. This money would go towards repairing and then re-instating the Barraba branch line from West Tamworth to Westdale along Wallamore Road. If fully developed the intermodal hub would increase Tamworth's profile for investment and attract a number of industrial businesses. Tamworth Council has bought a large land holding in this area.

2.2 Lower North West Regional Economic Development Strategy 2018-22

This Strategy has been developed for the Lower North West Region which encompasses the Tamworth Regional, Gunnedah Shire and Liverpool Plains Shire Local Government Areas (LGAs). The Strategy has four categories of strategies and actions being:

- Delivery key infrastructure as a foundation for growth
- Provide a positive, supportive environment to facilitate business growth and investment
- Support and leverage key sectors

- Position and promote the region as a location of choice

Specific strategies include "investing in key road and road transport infrastructure such as upgrading New England highway to reduce transportation costs" and improving and leveraging "airport Infrastructure such as the upgrade of Tamworth Airport to support greater capacity". Of particular relevance is the strategy to "plan for and provide suitable land for business expansion and growth".

The planning proposal is consistent with these policies.

2.3 Tamworth Tomorrow 2016-2021

Tamworth Tomorrow is a strategy focussed on driving the economic growth of the Tamworth region through increasing the region's population base, which fuels the economy, driving innovation, investment, cultural activity and entrepreneurial spirit. The Strategy notes the importance that manufacturing provides to Tamworth's local economy.

Of relevance to this study are the following action(s) and excerpts:

- The Strategy states that the uptake of advanced manufacturing will support existing manufacturers to enter new markets, devise new products and improve productivity. It will also help establish innovative local industries by creating new business models, products and processes
- The Strategy states that approximately 70 hectares of unconstrained industrial land can be developed and Tamworth Regional Council has strategically planned to expand the industrial zone exponentially. However, the location of the 'unconstrained developable or expansion areas' are not identified in the Strategy nor has allocation been given to the composition of these areas, in terms of zonings
- **Action 4.5 |** Encourage regional collaboration between researchers and the advanced manufacturing sector centred on commercial outcomes to generate new global growth markets for the sector.

2.4 Taminda Revitalisation + Economic Development Strategy 2008

The Taminda Revitalisation + Economic Development Strategy provided Council with a strategy to effectively manage, both from an urban design and economic viewpoint, the future development of the Taminda industrial precinct. Recommendations in the strategy were to ensure that the precinct maintains its regional significance as an industrial precinct while also protecting the ongoing economic viability of the area.

The strategy identified six precincts that could provide additional industrial and bulky goods zoned land to accommodate the projected demand. The precincts are identified in the figure below.

Figure 2: Taminda Revitalisation – precinct identification



Source: Taminda Revitalisation + Economic Development Strategy 2008

Of relevance to this study are the following key findings and recommendations:

- Precinct 6 as shown in the figure above, comprises a proportion of the subject site, and was identified as being suitable for both bulky goods retailing and industrial uses. With the precinct being large enough to support up to twenty-two 5000sqm lots, or up to fifty smaller lots

- The strategy identified that improved access could be achieved through the development of a "thoroughfare" along Jewery Street southward to Gunnedah Street, it states:

  The Masterplan proposes the possible extension and reinforcement of Jewry Street at the major thoroughfare through Taminda. Jewry Street would continue due west along an elevated flood levee from its current western most point at the intersection with Dampier Street; lying within an existing road easement, it would sweep southwards briefly intersecting with Bass Street before meeting Gunnedah Road at a major intersection.

  This would have the benefit of removing unnecessary traffic from internal streets; provide the opportunity to create well defined entrance points to the estate; and increase traffic movement along Jewry Street to support development of adjacent land parcels.

  The capital works program could be funded through a mix of s.94 contributions and developer agreements over new land releases within Taminda, funds raised from the sale of Council land, and Council's usual capital works budget.

- Future demand for industrial land ranged between a low of an additional 21 hectares to a high of 77 hectares of land with a likely level of 47 hectares over the next 20 years (assumed to be 2028).

Recommendations and proposed land use by precinct are provided below:

Table 1: Recommendations by precinct

Precinct	Description	Proposed Use	Total area (ha)	Probable development footprint (ha)	Proposed average lot size (sqm)	Lots Created no.
1	Belmore Street	Light Industrial	3.74	3.18	2,000	16
4	Jewry & Dampier	Light Industrial	3.88	3.29	2,500	13
2	Jewry Road	Bulky Goods	10.01	8.51	3,000	28
3	Showground	Heavy Industrial	17.25	14.66	4,000	37
5	Racecourse	Tourism/Commercial	7.87	3.94	5,000	8
6	Jewry Road Extension	Light Industrial/Bulky Goods	12.92	10.98	5,000	22
Total Land Area			**55.67**	**44.56**		
Total Industrial and Bulky Goods			**47.8**	**40.62**		

Source: Taminda Revitalisation + Economic Development Strategy 2008

The above recommendations were implemented except for:

- Precinct 3 - remains undeveloped for industrial purposes, with it being zoned as light industrial rather than the recommended heavy industrial
- Precinct 5 - 8 hectares of land was rezoned in 2018 providing an additional 6.4 hectares of B5 and 1.6 hectares of IN2 zoned land.
- Precinct 6 – was not zoned for industrial or bulky goods purposes rather RU4 - Primary Production Small Lots.

3.0 ECONOMIC PROFILE

The following Chapter undertakes a review of economic data and trends in Tamworth LGA which are likely to influence the demand for additional industrial land.

3.1 Resident population characteristics

Over a 15 year period from 2001, the population of Tamworth LGA increased by 7,832 persons or 15%. This represents an annual compound growth of 0.94% which was higher than Regional NSW (0.75%) over the same period.

Over the same period Tamworth's population aged, evident in persons over 60 years comprising 25% of the population in 2016 compared to 19% in 2001. The proportion of persons aged 18 to 59 years declined from 53% to 51% in 2016 and persons aged less than 18 years decreased from 28% of the population in 2006 to 24% of the population in 2016.

Despite this, persons in the working age bracket of 18 to 59 years increased over the period by 2,566 persons. Persons in this age bracket would drive demand for increased employment opportunities while the overall increase in the population would increase demand for industrial and urban services.

Figure 3: Population growth by age composition (LGA)



Source: Community id, HillPDA

3.1.1 Population projections

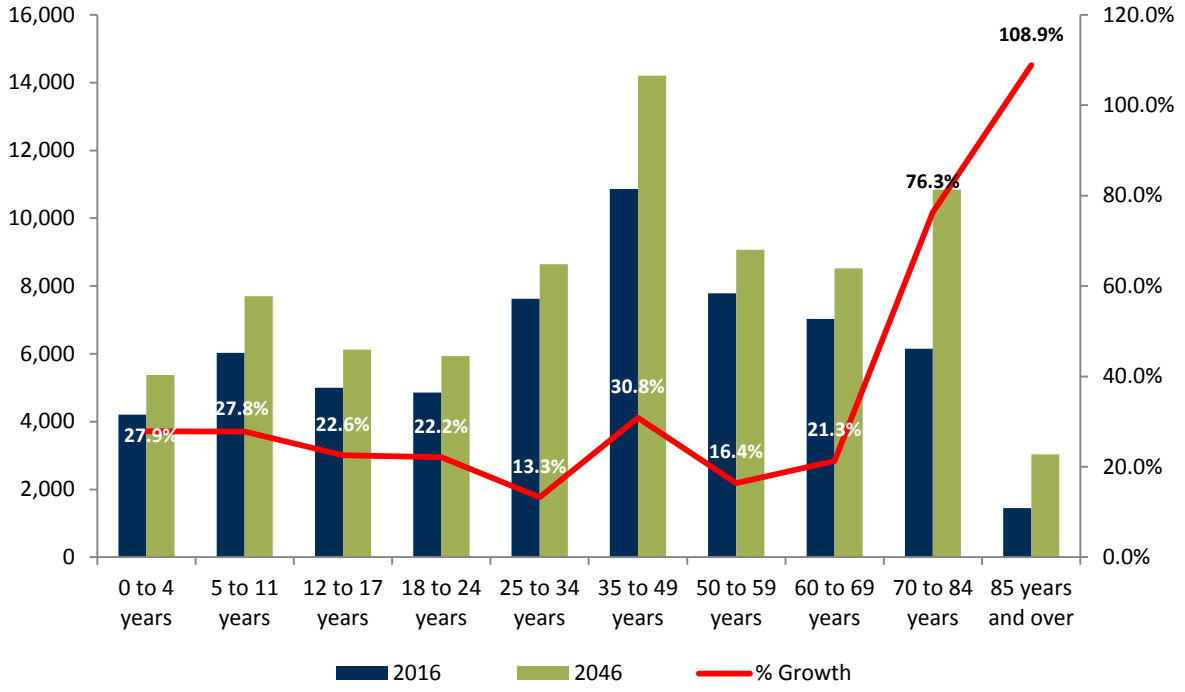
Over the next 25 years, Tamworth is expected to experience relatively strong population growth – more than the previous 15 years. The population is expected to increase from around 61,000[2] in 2016 to 79,470 in 2041, an increase of around 18,465 or 30%. This represents an annual compound growth rate of 1.06%.

[2] Forecast id estimated the resident population in Tamworth LGA at 61,003 residents in 2016. The Census is generally considered an undercount

Over this period the population is expected to continue to age, a trend reflective of Regional NSW. By 2026 it is forecast that just over a quarter of the population would be aged 60 years and over.

Despite the ageing of the population, persons in the working cohort of 18 to 60 years are expected to experience strong growth, with an additional 6,720 residents in this cohort expected to reside in the LGA by 2041.

Figure 4: Population projection by age cohort 2016-2041



Source: Community id, HillPDA

3.1.2 Employment by industry

The top four industries that residents of Tamworth were employed in remained relatively stable over the last five years. These were health care and social assistance; retail trade; and education and training. Interestingly manufacturing was the third largest employment industry in 2011. However, by 2016 it had dropped two places with construction replacing it in 2016 as the fourth largest employment industry.

Over the period, the top three industries that experienced the greatest growth in employment were health care and social assistance (357 more jobs); education and training (178 more jobs); and construction (173 more jobs).

The top two industries that experienced the largest contraction over the period were manufacturing (a decrease of 369 jobs) and financial and insurance services (a decrease of 115 jobs). Manufacturing is predominantly located in industrial precincts. A decline in employment in this industry could lead to a reduced demand for industrial floorspace and zoned land.

Despite a decline in residents seeking employment in manufacturing, total employment generated by 'blue collar' industries which are typically located in industrial precincts[3] accounted for 17% of the resident workforce. This indicates that manufacturing was still an important employment generator for residents of Tamworth.

[3] This includes the industries of manufacturing; electricity, gas, water and waste services; wholesale trade; and transport, postal and warehousing.

As of 2016, the combined blue collar industries accounted for around a quarter of the total jobs that residents of Tamworth were employed in. This provides an understanding of the significant contribution these industries provide to the local economy and workforce.

Table 2: Resident employment by industry 2011-2016

Industry	2011	2016	Growth	% growth 11-16
Agriculture, Forestry and Fishing	1,661	1,727	66	4.0%
Mining	193	281	88	45.6%
Manufacturing	2,322	1,953	-369	-15.9%
Electricity, Gas, Water and Waste Services	288	246	-42	-14.6%
Construction	1,863	2,036	173	9.3%
Retail Trade	2,863	2,879	16	0.6%
Wholesale trade	879	749	-130	-14.8%
Accommodation and Food Services	1,748	1,761	13	0.7%
Transport, Postal and Warehousing	1,266	1,254	-12	-0.9%
Information Media and Telecommunications	283	257	-26	-9.2%
Financial and Insurance Services	594	489	-105	-17.7%
Rental, Hiring and Real Estate Services	363	364	1	0.3%
Professional, Scientific and Technical Services	881	956	75	8.5%
Administrative and Support Services	651	817	166	25.5%
Public Administration and Safety	1,491	1,581	90	6.0%
Education and Training	2,152	2,330	178	8.3%
Health Care and Social Assistance	3,543	3,900	357	10.1%
Arts and Recreation Services	249	257	8	3.2%
Other Services	1,088	1,070	-18	-1.7%
Inadequately described or not stated	517	1,079	562	108.7%
Total	**24,895**	**25,986**	**1,091**	**4.4%**

Source: Community id, HillPDA

3.1.3 Unemployment

The unemployment rate in Tamworth decreased from 8.8% in 2001 to 5.8% in 2016. This rate has remained lower than that recorded for Regional NSW which decreased from 9.2% to 6.6% over the same period.

3.1.4 Resident workforce industry location quotient

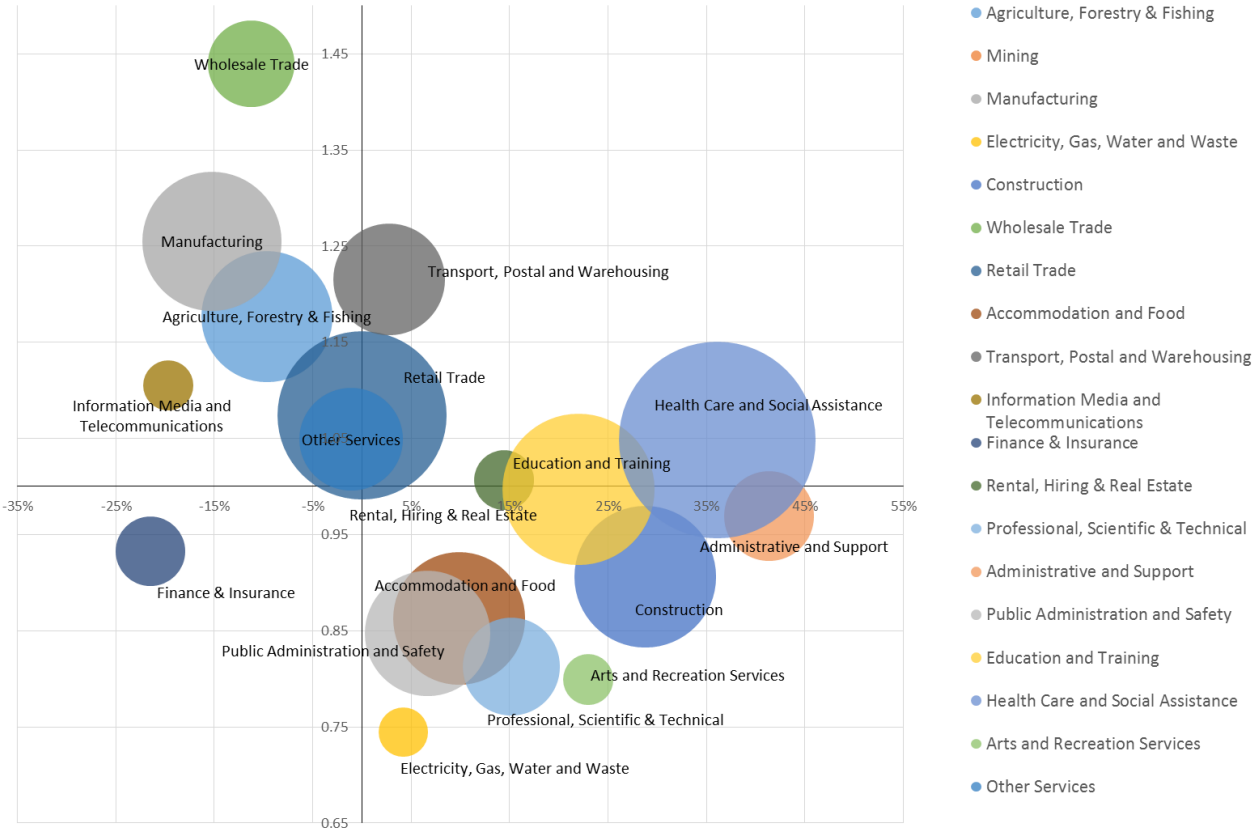
Location quotient (LQ) is a valuable way of quantifying how concentrated a particular industry is in a region as compared to a benchmark, in this case, Regional NSW. A LQ of greater than 1 reveals that there is an above representation of production in that industry.

The LQ is shown on the vertical axis while the change in employment from 2006 to 2016 is on the horizontal axis.

Interpreting the graph:

1. The size of the circle represents the relative size of the industry
2. Industries to the right of the origin are growth industries
3. Industries to the left of the origin are declining
4. Industries above the origin have high specialisation (above representation relative to Regional NSW)
5. Industries below the origin have low specialisation.

Figure 5: Resident workforce growth-share matrix (2006-2016)



Source: Community id, ABS 2016 Community Profiles, HillPDA

In the graph above the following industries were in the following quadrants

Quadrant	Indication	Industries
North eastern	High industry specialisation and growth "industries likely experiencing an expanding stage"	**Wholesale Trade**; Rental, Hiring and Real Estate Services; Education and Training; Health Care and Social Assistance; and **Transport, Postal and Warehousing**
South eastern	Low industry specialisation and high growth "industries likely to be at the emerging stage"	**Mining**; **Electricity, Gas, Water and Waste Services;** Construction; Accommodation and Food Services; Professional, Scientific and Technical Services; Administrative and Support Services; Public Administration and Safety; and Arts and Recreation Services
North western	High industry specialisation but low growth	Agriculture, Forestry and Fishing; **Wholesale Trade**; **Manufacturing**; Information Media and Telecommunications; and Other Services
South western	Low industry specialisation and low growth	Financial and Insurance Services

3.2 Businesses and industry characteristics

As of 2017, there were 5,426 businesses located within Tamworth which was a slight increase from that recorded in 2013 (5,393 businesses).

Industries that have recorded positive growth over the period and that are relevant to this study include: transport, postal and warehousing (+4 businesses); and mining (+2 businesses).

Businesses that generally locate in the industrial areas but recorded negative growth and relevant to this study include: manufacturing (-14 businesses); electricity, gas, water and waste services (-5 businesses); and wholesale trade (-18 businesses).

Table 3: Counts of businesses – Tamworth LGA

Industry	2013	2017	Change #	Change %
Agriculture, Forestry and Fishing	1363	1369	6	0%
Mining	8	10	2	25%
Manufacturing	208	194	-14	-7%
Electricity, Gas, Water & Waste Services	19	14	-5	-26%
Construction	830	845	15	2%
Wholesale trade	146	128	-18	-12%
Retail trade	320	284	-36	-11%
Accommodation and food services	211	213	2	1%
Transport, Postal and Warehousing	331	335	4	1%
Information media and telecommunications	14	17	3	21%
Financial and insurance services	367	404	37	10%
Rental, Hiring, & Real Estate Services	435	432	-3	-1%
Professional Scientific & Technical Services	316	309	-7	-2%
Administrative and support services	148	158	10	7%
Public administration and safety	14	12	-2	-14%
Education and training	48	50	2	4%
Health care and social assistance	260	276	16	6%
Arts and recreation services	68	58	-10	-15%
Other services	256	264	8	3%
Currently unknown	49	36	-13	-27%
Total	**5,393**	**5,426**	**33**	**1%**

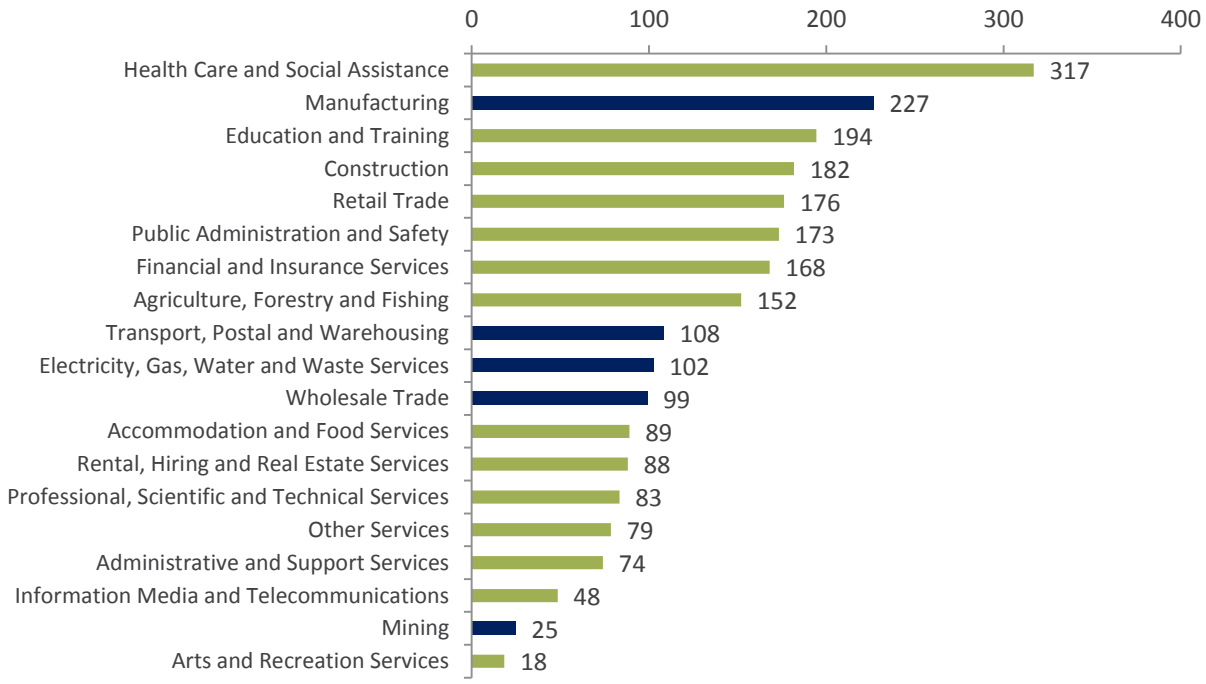
Source: ABS Regional Summaries

3.2.1 Industry value added

As of 2016 local industries contributed $2.4 billion to Tamworth's local economy. Of this, manufacturing was the second most productive industry, generating $227 million.

Combined, 'blue collar' industries contributed almost a quarter of the value added by all industries in Tamworth. This highlights the significant contribution these businesses provide to the local economy and the importance of providing appropriately located land for their continued growth and expansion.

Figure 6: Industry value added 2015/2016 ($million)



Source: Economy id

3.3 Employment characteristics

In 2016, Tamworth generated around 26,530 jobs, a 19% increase from 2001 (around 22,325 jobs). The top four employment industries in 2016 were:

1. Health care and social assistance – generating 3,963 or 15% of jobs
2. Retail trade – generating 3,107 or 12% of jobs
3. Manufacturing - generating 2,513 or 9% of jobs
4. Education and training – generating 2,419 or 9% of jobs.

Although manufacturing has recently witnessed a decline in the total number of businesses present in the LGA, it still remains a significant employment generator. Also, as of 2016 manufacturing generated more jobs than the total number of Tamworth residents employed in the industry. This implies that the industry provides enough jobs for Tamworth residents while also attracting additional employees from surrounding LGA's, further increasing its importance across the region.

The top four growth industries over the last 16 years, by total employment, were as follows:

1. Health Care and Social Assistance - generating an additional 1,362 jobs
2. Construction - generating an additional 871 jobs
3. Education and Training - generating an additional 6,99 jobs
4. Manufacturing - generating an additional 542 jobs.

Although manufacturing has generated an additional 542 jobs over the last 16 years, it must be noted that over the last five years there has been a 31 job retraction. Combined, 'blue collar' industries generated around one-fifth of all jobs generated in the LGA over the last 16 years.

The change of employment, over the last 16 years, by individual industry is provided in the table below.

Table 4: Employment generation by industry 2001-2016

Industry	2001	2006	2011	2016	2001-16 Growth #	2006-16 Growth #	2011-16 Growth #
Agriculture, Forestry and Fishing	2,315	2,300	1,985	1,959	-356	-341	-26
Mining	18	29	53	57	39	28	4
Manufacturing	1,971	2,491	2,544	2,513	542	22	-31
Electricity, Gas, Water and Waste Services	215	262	309	389	174	127	80
Construction	1,308	1,808	2,271	2,179	871	371	-92
Wholesale Trade	1,084	943	935	869	-214	-73	-65
Retail Trade	2,864	3,010	3,022	3,107	243	97	85
Accommodation and Food Services	1,931	1,649	1,838	1,794	-136	145	-44
Transport, Postal and Warehousing	1,164	1,259	1,311	1,255	91	-5	-56
Information Media & Telecommunications	356	325	345	320	-36	-5	-25
Financial and Insurance Services	577	606	613	598	21	-8	-16
Rental, Hiring and Real Estate Services	290	339	425	418	128	78	-7
Professional, Scientific & Technical Services	860	842	962	894	34	52	-69
Administrative and Support Services	581	601	704	690	109	89	-14
Public Administration and Safety	1,164	1,527	1,633	1,565	400	38	-68
Education and Training	1,720	1,980	2,312	2,419	699	439	107
Health Care and Social Assistance	2,601	3,033	3,623	3,963	1,362	930	340
Arts and Recreation Services	232	202	256	256	24	54	0
Other Services	1,074	1,157	1,225	1,285	211	128	60
Total	**22,325**	**24,363**	**26,367**	**26,530**	**4,205**	**21,66**	**162**

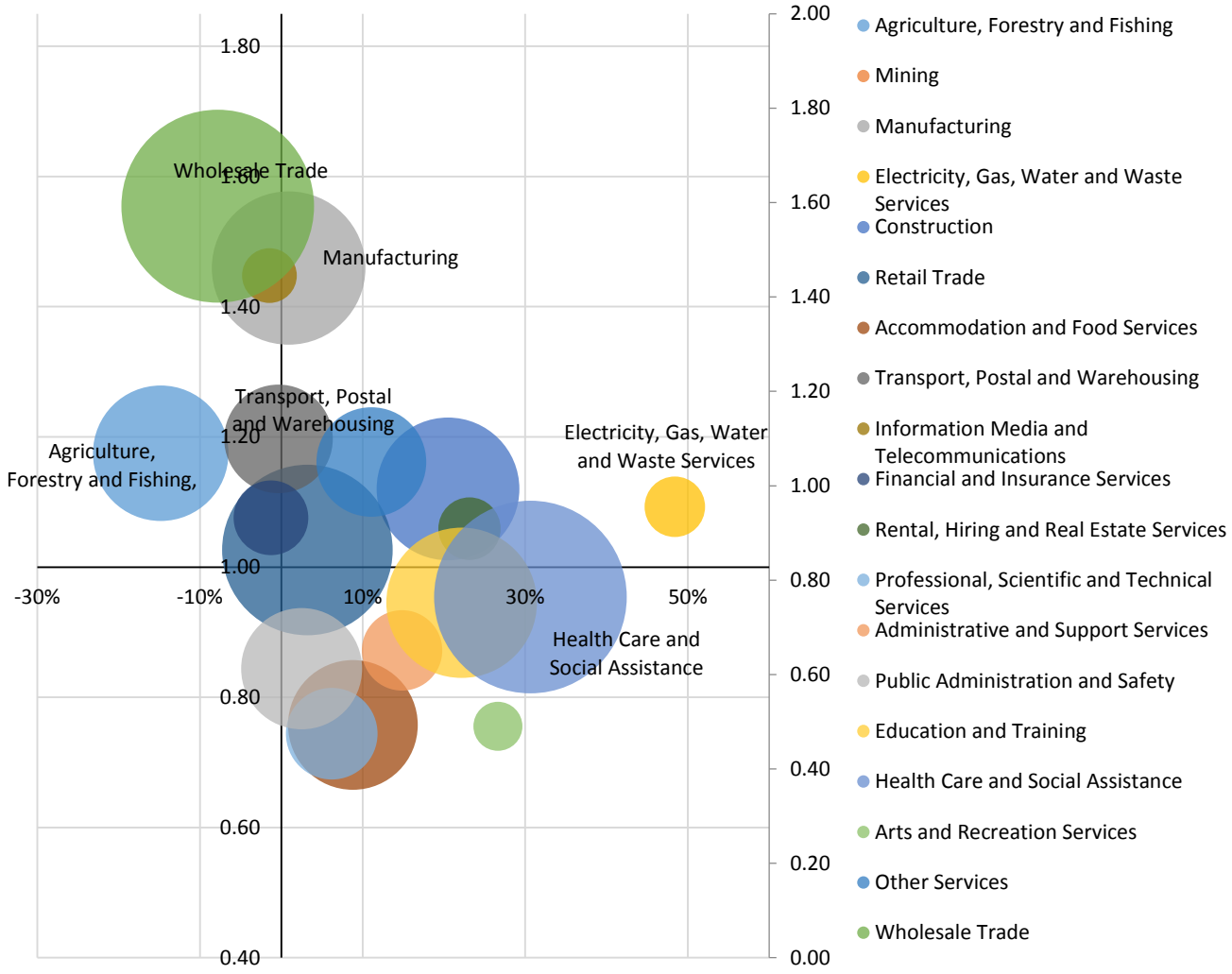
Source: Economy id

3.3.1 Local employment industry location quotient

Location quotient (LQ) is a valuable way of quantifying how concentrated a particular industry is in a region as compared to a benchmark, in this case, Regional NSW. A LQ of greater than 1 indicates that that industry is more concentrated in Tamworth compared to Regional NSW.

The LQ is shown on the vertical axis while the change in employment generation from 2006 to 2016 is on the horizontal axis.

Figure 7: Employment growth-share matrix (2006-2016)



Source: Community id, ABS 2016 Community Profiles, HillPDA

In the graph above the following industries were in the following quadrants

Quadrant	Indication	Industries
North eastern	High industry specialisation and growth "industries likely experiencing an expanding stage"	**Manufacturing; Electricity, Gas, Water and Waste Services**; Construction; Retail Trade; Rental, Hiring and Real Estate Services; and Other Services
South eastern	Low industry specialisation and low growth "industries likely to be at the emerging stage"	**Mining**; Accommodation and Food Services; Professional, Scientific and Technical Services; Administrative and Support Services; Public Administration and Safety; Education and Training; Health Care and Social Assistance; and Arts and Recreation Services
North western	High industry specialisation and low growth	Agriculture, Forestry and Fishing; **Wholesale Trade; Transport, Postal and Warehousing;** Information Media and Telecommunications**; and** Financial and Insurance Services
South western	Low industry specialisation and low growth	

3.3.2 Tamworth self-sufficiency

Self-sufficiency is calculated by dividing the number of jobs located in Tamworth LGA by the number of employed residents.

Tamworth had a self-sufficiency rate of 97% indicating that there were 0.97 jobs provided for every employed resident. This rate was the third largest rate, with only to Walcha and Narrabri LGA's when comparing the surrounding LGAs self-sufficiency rates.

Note that Tamworth generated significantly more employment opportunities in 2011 than the surrounding LGAs, further highlighting the LGAs importance as a regional economic generator.

Table 5: Self-sufficiency rate 2011

LGA	Jobs (a)	Employed residents (b)	Self-sufficiency rate (a/b)
Walcha	1,490	1,443	1.03
Narrabri	5,891	5,791	1.02
Tamworth Regional	**23,958**	**24,746**	**0.97**
Liverpool Plains	2,855	3,068	0.93
Gunnedah	4,834	5,195	0.93
Upper Hunter Shire	4,986	6,498	0.77
Gwydir	1,489	1,979	0.75
Uralla	1,688	2,722	0.62

Source: TPA 2011 JTW, HillPDA

3.3.3 Tamworth self-containment

Self-containment measures the proportion of local residents that live and work within the same geographical area.

Of the 24,746 jobs generated in Tamworth, around 22,789 lived and worked within the LGA. This indicates a high self-containment rate of 92%, which has the highest rate when comparing surrounding LGAs.

The high containment rate is typical of regional areas where the longer travel distances, when compared to capital city rates, tend to influence local residents to live and work in the same LGA.

Table 6: Self-containment rate 2011

LGA	Live and work in LGA (a)	Employed residents (b)	Self-containment (a/b)
Tamworth Regional	22,789	24,746	92%
Narrabri	5,279	5,791	91%
Walcha	1,254	1,443	87%
Gunnedah	4,347	5,195	84%
Liverpool Plains	2,398	3,068	78%
Gwydir	1,329	1,979	67%
Upper Hunter Shire	4,312	6,498	66%
Uralla	1,148	2,722	42%

Source: TPA 2011 JTW, HillPDA

3.3.4 Self-containment by individual industry 2011

The majority of industries have a high self-containment rate of 90% and above. The industry of mining had the lowest rate probably owning to the fly in fly out nature of its employment base.

Excluding mining, 'blue collar' industries combined had a containment rate of 92% with 4,329 residents living and working in the LGA.

Table 7: Self-containment rate by industry 2011

Industry	Live and work within the LGA	Employed residents	Self-containment
Accommodation and Food Services	1,705	1,740	98%
Financial and Insurance Services	578	592	98%
Electricity, Gas, Water and Waste Services	274	281	98%
Retail Trade	2,778	2,851	97%
Health Care and Social Assistance	3,402	3,540	96%
Rental, Hiring and Real Estate Services	351	366	96%
Manufacturing	2,191	2,310	95%
Education and Training	2,033	2,150	95%
Public Administration and Safety	1,400	1,482	94%
Other Services	1,023	1,084	94%
Arts and Recreation Services	231	245	94%
Professional, Scientific and Technical Services	822	873	94%
Information Media and Telecommunications	263	285	92%
Wholesale Trade	804	880	91%
Agriculture, Forestry and Fishing	1,455	1,639	89%
Administrative and Support Services	561	652	86%
Transport, Postal and Warehousing	1,060	1,237	86%
Construction	1,345	1,847	73%
Mining	51	186	27%
Inadequately described	204	232	88%
Not stated	258	274	94%
Total	22,789	24,746	92%

Source: TPA 2011 JTW, HillPDA

3.4 Key findings

- There would be demand for additional urban services and appropriate land to accommodate these services as the resident population increases
- Tamworth's population is forecast to continue to age over the coming decade, leading to a possible increase in demand for health care and social assistance businesses
- Despite this forecast ageing, persons within the primary working age cohort of 18 to 60 years are forecast to increase by just over 6,700 residents. Indicating that increased employment opportunities would be required over the coming years
- Combined, 'blue collar' industries generated around one-fifth of all jobs generated in Tamworth as of 2016
- Manufacturing was the second most productive industry in Tamworth, contributing $227 million to the local economy
- Combined, 'blue collar' industries contributed almost a quarter of the value added by all industries in Tamworth
- Tamworth's benefits from a low unemployment rate, high self-sufficiency rate and high self-containment rate – implying that increases in the primary working age cohorts would likely see a corresponding increase in employment opportunities and demand for employment lands.

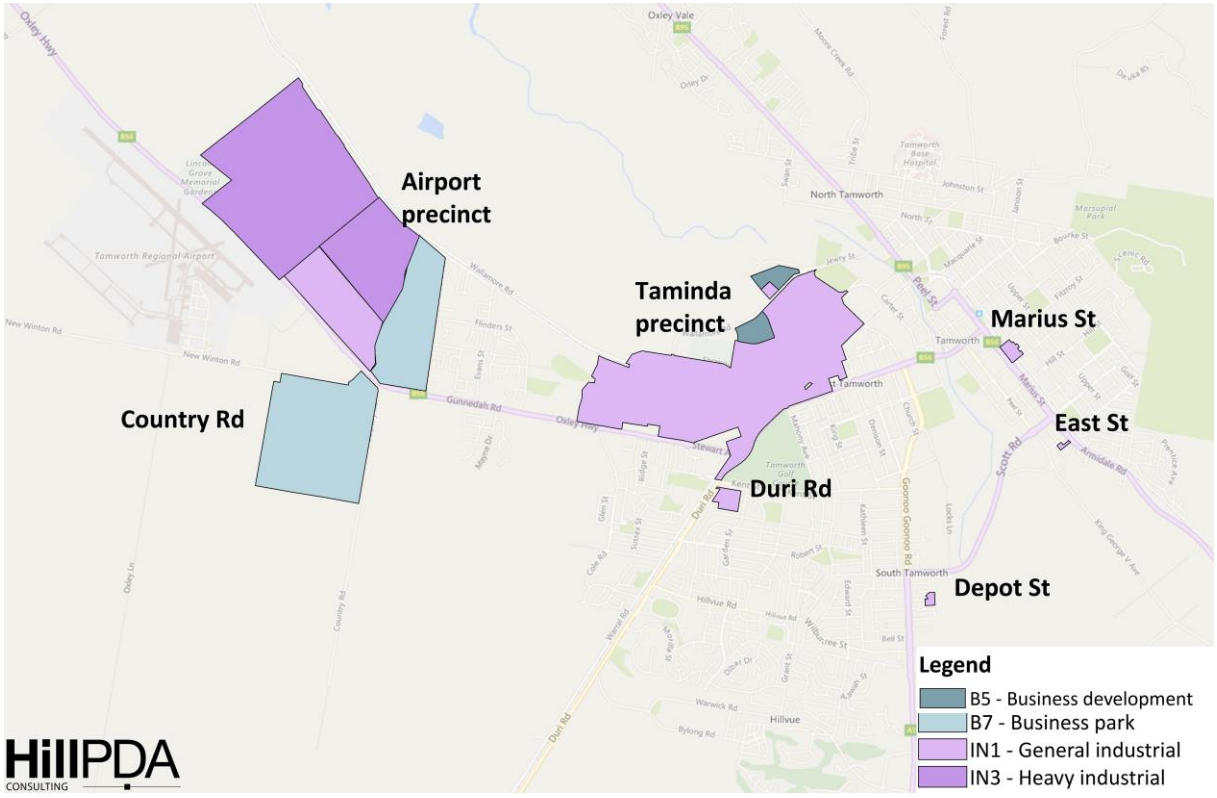
4.0 INDUSTRIAL PRECINCTS

The following provides an overview of industrial precincts in the Tamworth Township. The chapter identifies attributes, such as the total size, developed and vacant land and other locational attributes.

To assess the amount of undeveloped land we have measured vacant lots in each precinct. Lots that seemed to be used for storage by an adjoining lot or within a lot were excluded while large lots which could be subdivided were included, where appropriate.

The figure below provides an overview of the industrial precincts within Tamworth Township.

Figure 8: Tamworth industrial precinct overview



Source: HillPDA

4.1 Tamworth airport industrial precinct

Tamworth airport industrial precinct is located adjacent to Tamworth regional airport around 8.3 kilometres west or a 12 minute drive from Tamworth city centre[4]. The precinct is approximately 375 hectares in size and is zoned as IN3 - heavy industrial (~258 hectares), IN1 – General Industrial (~50 hectares) and B7 – Business Park (~67 hectares).

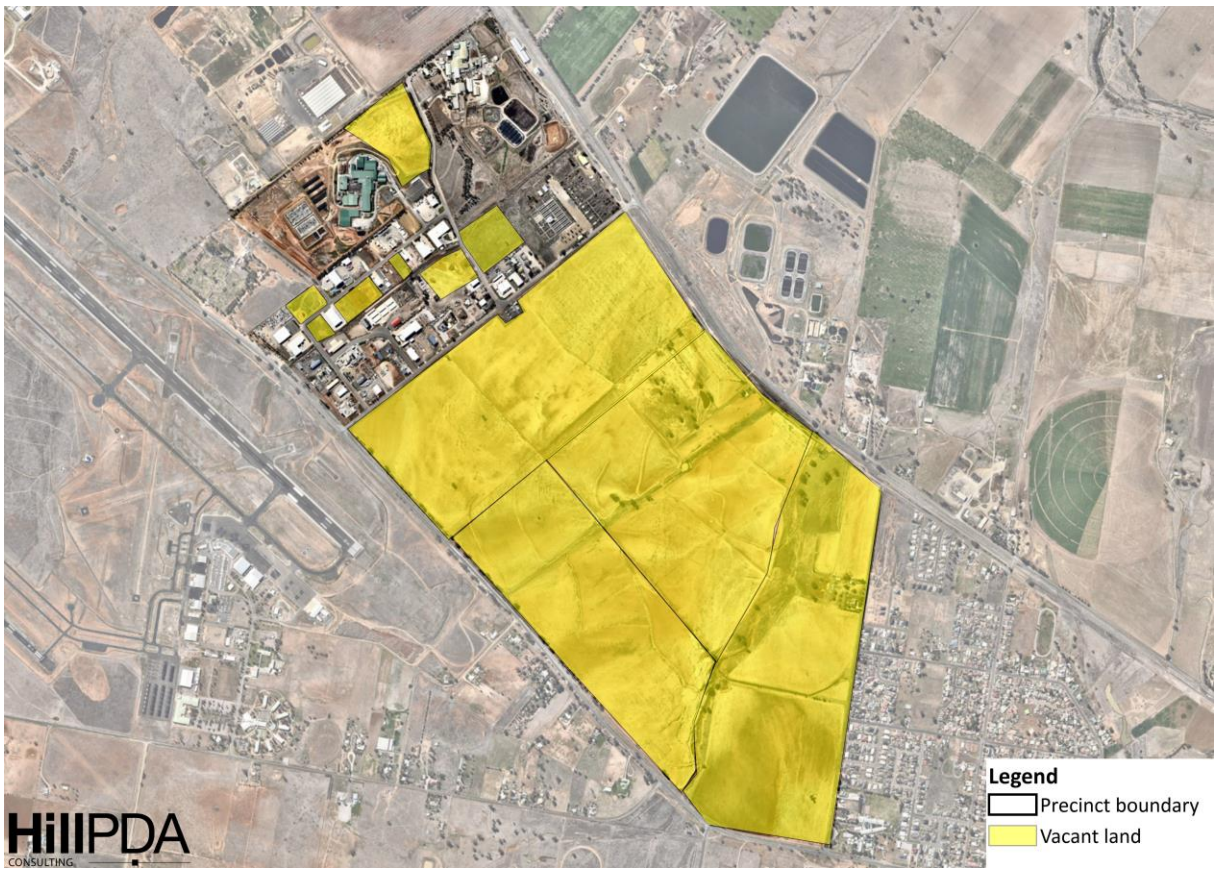
The location near the airport and distance from Tamworth city centre provide the opportunity for businesses associated with the airport to co-locate nearby, while also providing a suitable area for those industries that need to be separated from other more sensitive land uses, such as light industrial, residential and retail in Taminda.

[4] Google drive times

The precinct has good access to heavy vehicles and is not surrounded by conflicting land uses. We have estimated that there is around 260 hectares of vacant land remaining in the precinct although 69 hectares of this has been identified as a possible site for the development of an intermodal facility and there is also a water course through the site (Murroon Creek).

Future uses to the precinct are likely to be heavy industrial uses or those directly associated with the airport/intermodal facility. In contrast, urban support services and other various industrial uses would still prefer a location closer to urban populations such as the Taminda industrial precinct.

Figure 9: Tamworth airport industrial precinct



Source: HillPDA – vacant land either vacant lots or a large proportion of a lot that is vacant and not being utilised

4.2 Country road precinct

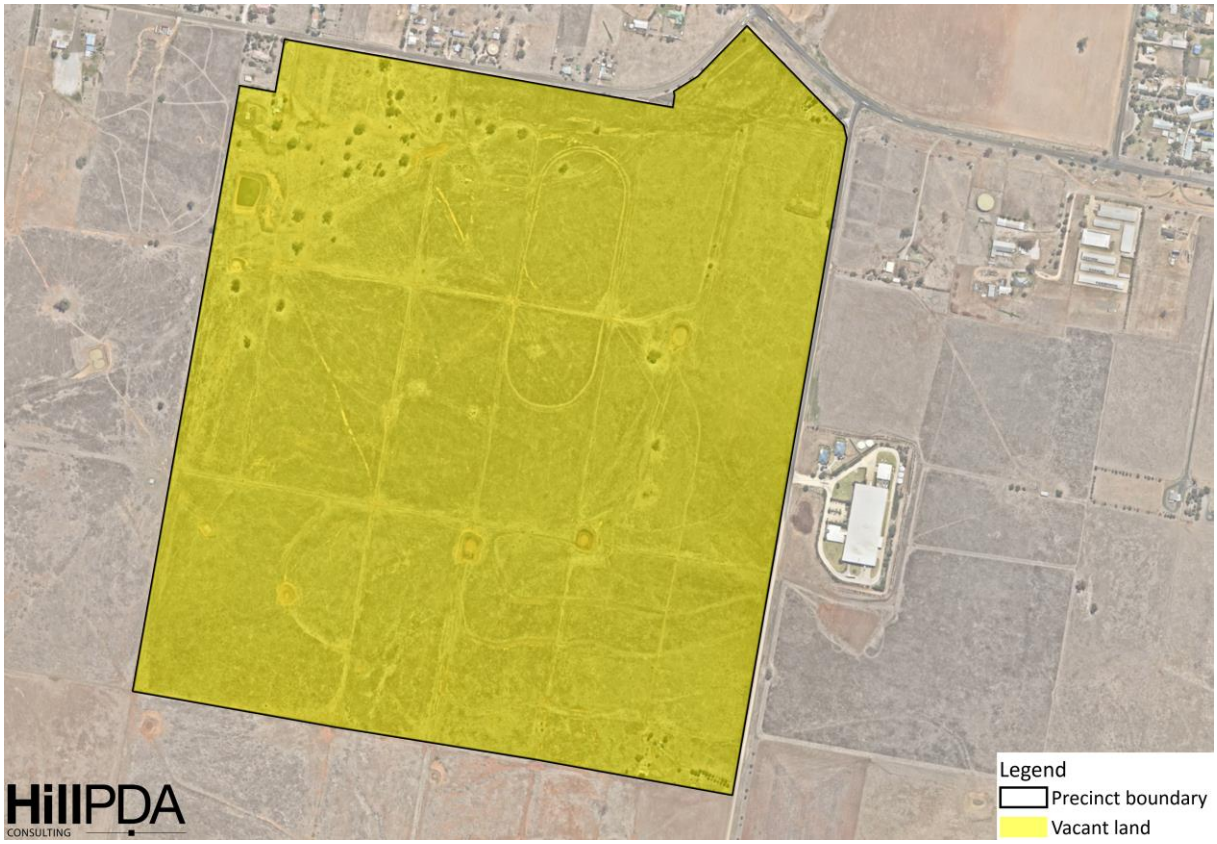
The country road precinct is located just to the south of Tamworth regional airport 6.1 kilometres west or a 10 minute drive from Tamworth city centre[5]. The precinct is somewhat isolated geographically, being quite detached from Taminda and the airport. The precinct is approximately 123 hectares in size and is zoned as B7 - business park.

The precinct has good access for heavy vehicles and is not surrounded by conflicting land uses. The entire precinct is currently vacant except for one residential building. Also there would be infrastructure costs to service the land - particularly water and sewer.

The land has remained undeveloped. We understand that development approval has been given for commercial and industrial uses, however development has not commenced.

[5] Google drive times

Figure 10: Country Road industrial precinct



Source: HillPDA

4.3 Taminda industrial estate

The Taminda precinct is located just to the south of Tamworth Jockey Club. It is 1.1 kilometres west or a 3 minute drive from Tamworth city centre[6]. The precinct is approximately 255 hectares in size and is mostly zoned as IN1 – general industrial (~240 hectares). Around 14 hectares is zoned B5 including the recently rezoned parcel of land around Federation Park north of Jewry Street immediately east of the Racecourse. The B4 – mixed use zoning has been excluded from the above figures.

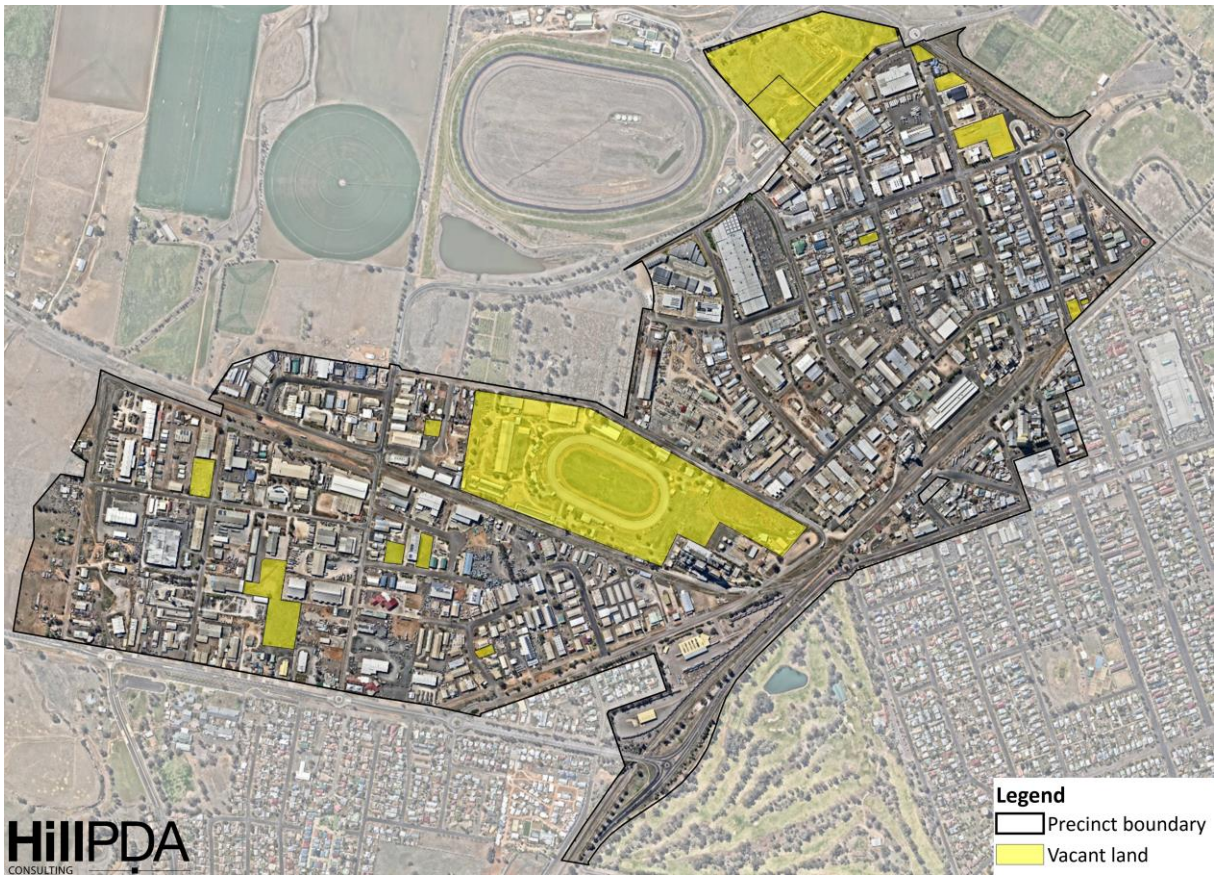
The precinct has good access to heavy vehicles and is separated from surrounding sensitive land uses, although some residential properties are located in the precinct. Land uses are predominantly related to urban services, transport and warehousing, storage, building supplies and bulky goods. These land uses support and provide urban services for the Tamworth residents and businesses.

We have estimated that there is around 32 hectares of vacant land remaining in the precinct, of this around 26 hectares is zoned for general industrial purposes. This includes the Showground and the Greyhound racecourse. If we remove these properties then vacant land is 14 hectares (5.5% of the total estate) of which 8 hectares are IN1 (3.3% of total IN1 land in the estate).

Around eight hectares has recently been zoned north of Jewry Street leaving around 24 hectares vacant south of Jewry Street. Three hectares of this land is Precinct 6 as identified in the Taminda Revitalisation Strategy (Section 2.3 of this study). This area has remained largely un-used and undeveloped since its recommendation for rezoning for industrial purposes.

[6] Google drive times

Figure 11: Taminda industrial precinct



Source: HillPDA – vacant land either vacant lots or a large proportion of a lot that is vacant and not being used as storage

4.4 Smaller township industrial precincts

There are four smaller industrial precincts located in the township, these are:

East Street precinct | is located on the southern extreme of Tamworth City Centre and could provide around 0.5 hectares of IN1 – general industrial zoned land. A substation is located in the precinct with the remaining 0.2hecatres being vacant land. Residential uses do adjoin a proportion of its border.

Marius Street precinct | is located on the border of Tamworth City Centre and could provide around 3 hectares of IN1 – general industrial zoned land. Agricultural and warehousing uses are located in the precinct. Expansion options are limited due to residential uses bordering the precinct and uses in place already.

Duri Street precinct | the precinct is located just to the south of Taminda precinct around 3.1 kilometres southwest or a 5 minute drive from Tamworth city centre[7]. The precinct is approximately 4.8 hectares in size and is zoned as IN1 – general industrial. The precinct is occupied by a single use and contains no vacant land. There are no expansion options for the precinct and it is surrounded by residential uses.

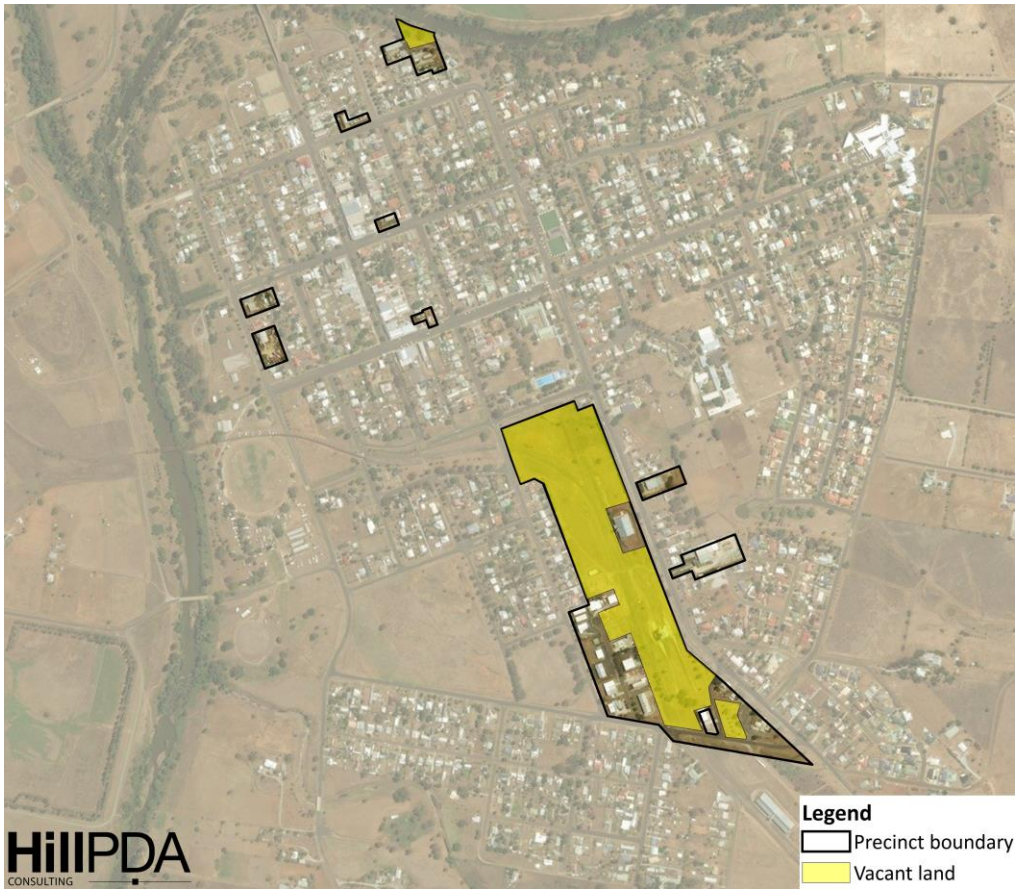
Depot Street precinct, South Tamworth| the precinct is located around 3.1 kilometres west or a 5 minute drive from Tamworth city centre[8]. The precinct is approximately 1 hectare in size and is zoned as IN1 – general industrial. The site is occupied by a Council depot. There are no expansion options for the precinct, as it is surrounded by residential homes and access is through the residential area.

[7] Google drive times
[8] Google drive times

4.5 Manilla industrial precincts

Additional land zoned for industrial purposes exists in the town of Manilla located around 43 kilometres or a 34 minute drive to the north of Tamworth Township. The town contains one large industrial precinct and eight smaller precincts. Combined these precincts provide around 19 hectares of zoned land of which around 11 hectares is estimated to be vacant.

Figure 12: Manilla industrial precincts



Source: HillPDA

4.6 Assessment of Tamworth Township industrial precinct summary

The table below provides a high level summary of the above analysed precincts zonings, land area and vacant land.

Table 8: Industrial precinct summary

Precinct	Zoning	Land area (ha)	Vacant land (ha)
Airport precinct	IN3	375	260
Country Rd	B7	123.0	123.0
Taminda	IN1 and B5	254.6	32.4
Duri Rd	IN1	4.8	
Marius St	IN1	2.8	
East ST	IN1	0.5	0.2
Depot St	IN1	1.1	
Total		**761.8**	**415.6**

Source: HillPDA

The following provides a summary of the assessment of each precinct in terms of market appeal. The evaluation of each category has been given a high, medium or low ranking based on value judgements with a "High" rating being positive towards high market appeal and "Low" rating being negative.

Table 9: Industrial precincts locational or site specific characteristics

Category	Airport	Country Rd	Taminda	Duri St	Marius St	East St	Depot St
Access for heavy vehicles	High	High	High	Medium	High	High	High
Free of Land use conflicts	High	Medium	High	Low	Low	Medium	Low
Possible expansion areas	High	High	Medium	Low	Low	Low	Low
Flood free	High	High	High	High	High	High	High
Existing Business Agglomeration	Medium	Low	High	Low	Medium	Medium	Low
Proximity to Town Centre	Medium	Medium	High	Low	High	High	Low
Proximity to Labour	Medium	Medium	High	Low	High	High	Low
Total Score	18	16	20	10	16	17	11

Source: HillPDA

In the above table the "Total Score" row refers to the sum of the above with a "High" rating achieving a score of 3 and a "low" rating achieving a score of zero. Clearly the Taminda precinct scores the highest due largely to its high level of existing business agglomeration and proximity to the town centre and surrounding residential areas.

The airport precinct also scores quite well in its own right but it doesn't score as well as Taminda due to its lack of proximity to the town centre and supporting, established labour and consumer markets. The other precincts are relatively inferior largely due to their location, small scale and in some cases adjoining residential land resulting in potential land use conflicts.

5.0 MARKET APPRAISAL

This Chapter is an analysis of recent sales data within Tamworth's industrial precincts. Industry engagement was undertaken to understand the local market demand.

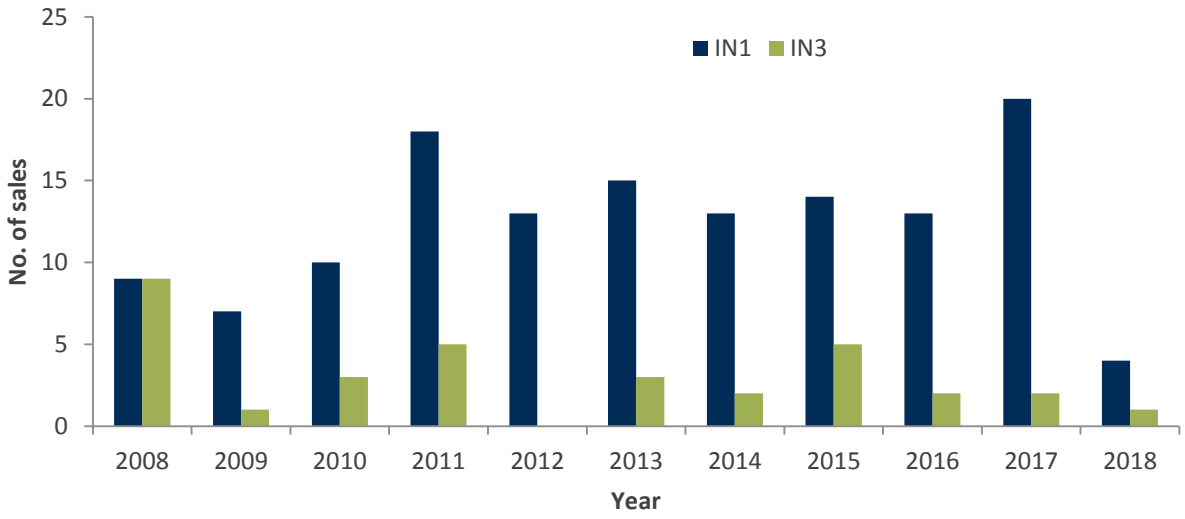
5.1 Industrial market research

5.1.1 Industrial sales volume

An analysis of industrial property sales within the Tamworth locality over the past ten years highlights a consistent low transactional activity for properties particularly in the IN3 Heavy Industrial zoned lands. There has been a reasonable level of transactional activity between 2011 and 2017 with the number of sales peaking in those years. More recently, IN1 Light Industrial zoned land peaked in 2017 which saw 20 properties sold in the calendar year while on average 10 to 15 properties are usually sold in any one calendar year. Heavy industrial properties range from one to five properties per calendar year but peaked in 2008 which saw nine property transfers.

There have been few sales of Strata Titled properties in our findings.

Figure 13: Sales volume for IN1 & IN3 zoned properties between years 2008-2018



There appears to be no direct correlation between median sale prices for either light or heavy industrial properties and the volume of sales transactions.

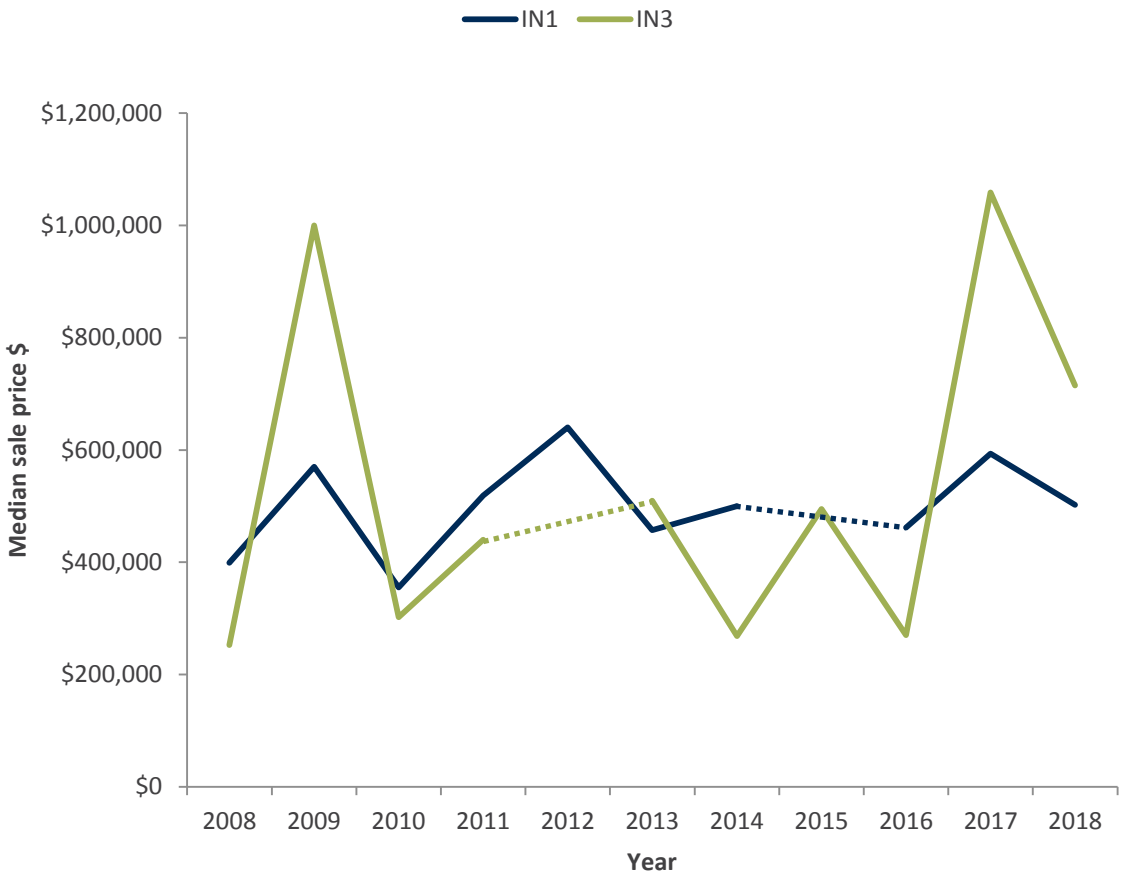
5.1.2 Industrial median sales prices

The figure below provides an indication of the volatility in median sales prices for industrial properties within the Tamworth locality. This is mainly due to the varying age and quality of improvements.

Given the small data set, it is challenging to draw definitive conclusions regarding the trend but we are able to derive that the median sale price for IN1 Light Industrial property has been consistent, peaking in 2009, 2012 and 2017 with median sale values ranging between $570,000 and $640,000 on a median lot size of 2,314 sqm. Sale prices fell slightly in the post GFC years from 2010 and between 2013 to 2016. Median sale prices between 2010 to 2016 ranged from $355,000 to $462,000 on an median lot size of 2,207sqm.

The peak in median sale price in 2017 for IN3 zoned land is due to only two sale transactions in the year and is not a reliable indication of an increase of median sale prices.

Figure 14: Median sale prices of IN1 & IN3 zoned properties between years 2008-2018



We have also analysed land sales (or minimally improved land) over the past ten years that shows significant fluctuations in the median land sale rates. The below figure shows that the median sale rate of IN1 land has increased from $104 to $115/sqm of site area reflecting a 10% increase over a seven year period (averaging a growth trend equivalent to CPI). However, the median sale rate of IN3 land has increased significantly from $45 to $94/sqm reflecting a 108% increase over a seven year period.

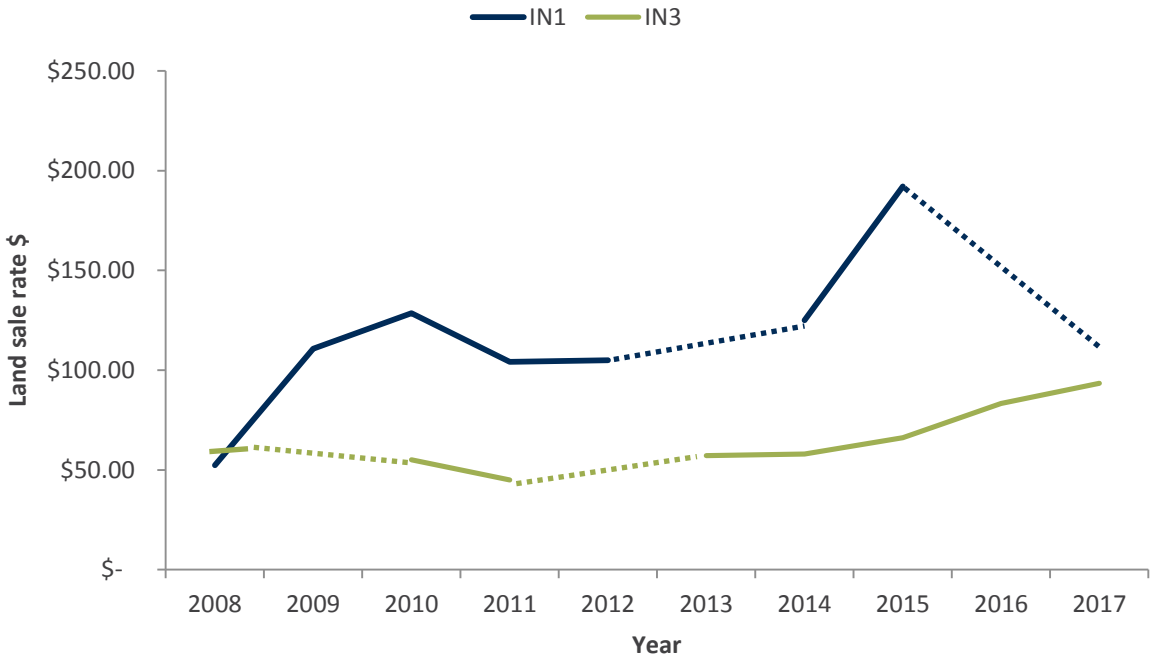
In 2015, 29 Belmore Street was sold for $192/sqm of site area to the adjoining property owner to potentially provide a secondary street access. A premium appears to have been paid and has caused an unusual peak in median land values and is not reflective of typical land values for this locality.

There has been consistent growth (in line with CPI) in land values for IN1 zoned land, although IN2 land appears to have strengthened. The figure below highlights an increase in values for both light and heavy industrial however experienced a marginal drop within the period of 2011 to 2013 and strengthening in 2017.

An alternative source is the Valuers General which reported a 10.2% increase over the 2016/2017 FY, driven by a recent increased demand for industrial land.

Discussions with three local selling agents have indicated that serviced unimproved IN1 zoned land would have a market land value rate of $100-$125/sqm and serviced IN3 zoned land would have a market land value rate of $80-$100/sqm.

Figure 15: Land sales rate for IN1 and IN3 zone between years 2008-2017



Dashed line indicates that there had been no sales in the year.

5.1.3 Industrial Rents

Agents have reported that industrial rents range from $100 to $150/sqm gross of GLA (average building size of 250sqm). On average, a 1-3 month rent free period is negotiated and is dependent on the length of the lease term.

5.2 Industrial market commentary

5.2.1 Location preference

The Tamworth Industrial market comprises a mixture of older style industrial warehousing and workshops with a number of newer stock interspersed throughout.

There are two main distinct precincts; Taminda (East Tamworth) and the Airport or Intermodal Precinct.

Taminda (East Tamworth) is an established industrial precinct located west of the CBD area. Bounded by the Peel River, rural acreages (to the north) and residential (to the south) and is considered to be fully-developed. The precinct is desirable for light industrial operators such as trades, bulky goods, yards, manufacturers, engineering and mechanical businesses and workshops.

The Intermodal Precinct (Airport) is considered to be a growth area and lies adjacent to Tamworth Airport. The land is currently partly zoned IN3 Heavy Industrial, RU4 Primary Production Large Lots and RU5 Large Lot Residential. This precinct caters for heavy industries such as livestock, agriculture, logistics and mining which will benefit from the soon to be competed freight rail project. The Glen Artney estate was recently expanded to include additional IN1, IN3 and B7 zones. This area will be desirable for large multi-national companies that require road access and the airport.

5.2.2 Competing stock

In our investigation we have found limited unimproved industrial land holdings. The most notable site with similar potential is Tamworth Regional Council's land that lies adjacent to the proposed multi-user Rail Freight Intermodal Terminal.

Another notable site is a parcel of land zoned B7 and is situated south of the Intermodal Precinct (Airport) precinct, more particularly on the southern corner of the intersection of New Winton Road, Oxley Highway and Country Road. The parcel is owned by Hunter Land Holding Pty Ltd which has subsequently gained development consent for a staged 26 lot industrial subdivision with new roads. To date there has been no construction or sale activity and the project has been put on hold.

5.2.3 Land characteristic and constraints

The Intermodal Precinct (Airport) is considered to be a growth area but extending services to it is undermining development feasibility. The proximity to the airport, main road and proposed freight rail are strong positive attributes.

Taminda (East Tamworth) is located closer to the town centre and is bounded by residential properties to the south. It is affected by surrounding flood prone land but is located within an established precinct with services to the road boundary. Lower civil work costs are anticipated comparatively to land in the Intermodal Precinct (Airport).

5.2.4 What types of businesses are likely to locate to the subject site?

- In the current market, the industrial market is dominated by owner-occupiers.
- The subject site has direct and quick access to Wallamore Road from Dampier Street and is positioned on the fringe of Taminda (East Tamworth). Current occupiers in Taminda are light industrial users comprising urban services such as auto repairers, hardware and bulky goods, building and landscaping supplies, pet stores, engineering and mechanical businesses and workshops. Similar operators are anticipated if the subject site is rezoned and redeveloped.
- The Airport site is likely to attract wholesalers, livestock, agriculture, logistics and mining industries with the completion of multi-user Rail Freight Intermodal Terminal.
- Agents have reported an increased in the level of enquires from institutional and national companies for industrial space for warehousing and processing.
- Agents have reported a lack of willingness by some business operators and clients to travel 5 kilometres for work and business. Business precincts such as those located in an Intermodal Precinct (Airport) and are considered to be too isolated. Taminda currently provides light industrial urban services and proximity to the town centre and residential areas is a strong attribute for these businesses.

5.2.5 What size lots are the most being demanded?

- At present, 1,000 – 1,500sqm lots in the Taminda precinct with older industrial warehouses of 200-400sqm are highly sought after.
- Larger lots of 5,000sqm plus are highly sought in the Intermodal Precinct (Airport) by multi-national companies.
- Average size lot in the IN3 precinct is 6.3 hectares (or 2.0 hectares after removing the largely undeveloped land between Marathon Street and Goddard Lane). Median size is 5,665sqm.

- Average size lot in the Taminda precinct is 4,124sqm – less than a quarter of the average size lot in the Westdale IN3 precinct. The median size lot in Taminda is 2,023sqm – almost one third the median size lot in the Westdale IN3 precinct.
- The smaller lots in Taminda are suitable for urban services such as auto repairs, home improvements, engineering services and the like.

5.2.6 Is there adequate appropriately zoned land? Should there be more industrial land?

- Real estate agents have reported an increased level of enquires and the leading indicator is the short selling period of land/stock averaging one to two months.
- They have also reported purchases' intentions to knock down older industrial sheds on 1,000 to 1,500sqm lots for redevelopment in Taminda which indicates a lack of new stock on the market.
- As heavy industries expand or new businesses establish headquarters in Tamworth, an increase of demand from supporting businesses will require industrial land resulting in additional strain on current low supply. The best example of the effect of a new transport hub is located in Wagga Wagga, the Riverina intermodal Freight and Logistics (RiFL) hub which comprises new major rail and road infrastructure and a freight terminal. This has attracted new enterprises to the area and has generated considerable employment and economic activity.

6.0 DEMAND & GAP ANALYSIS

The following Chapter projects the additional demand for industrial land in the township, with a particular focus on the demand for IN1 – general industrial land.

6.1 Supply and demand methodology

The following methodology has been applied to project the amount of additional industrial land the township would require to accommodate the forecast growth in employment.

1. Analyse the growth in employment by industry type in the LGA over the last 15 years
2. Project employment generated in the LGA by industry type over the next 20 years
3. Quantify the increase in employment for industries typically located in industrial precincts
4. Project the amount of floorspace to accommodate the increase in employment based on typical full-time equivalent employment densities
5. Project the amount of land required to accommodate the additional employment floorspace
6. Examine whether the amount demanded is greater than the current and potential future employment lands total in the Tamworth Township.

6.2 Employment projections

6.2.1 Historic employment growth trends

As noted in Chapter 3, the number of jobs generated in Tamworth LGA reached 26,530 jobs in 2016. This represented an increase of 19% or just over 4,200 job over that recorded in 2001 (22,325 jobs). Of this net growth, 631 jobs or 15% were related to 'blue collar' industries.

The right three columns provide the annual compound growth rate for a particular industry over a certain time over in the last 15 years.

These compound growth rates are used to project out three possible employment growth scenarios.

Table 10: Employment growth and annual growth rates

					Annual growth rate		
Industry	**2000/01**	**2005/06**	**2010/11**	**2015/16**	**2001-16**	**2006-16**	**2011-16**
Agriculture, Forestry and Fishing	2315	2300	1985	1959	-1.1%	-1.6%	-0.3%
Mining	18	29	53	57	8.0%	7.0%	1.5%
Manufacturing	1971	2491	2544	2513	1.6%	0.1%	-0.2%
Electricity, Gas, Water & Waste Services	215	262	309	389	4.0%	4.0%	4.7%
Construction	1308	1808	2271	2179	3.5%	1.9%	-0.8%
Wholesale Trade	1084	943	935	869	-1.5%	-0.8%	-1.4%
Retail Trade	2864	3010	3022	3107	0.5%	0.3%	0.6%
Accommodation and Food Services	1931	1649	1838	1794	-0.5%	0.8%	-0.5%
Transport, Postal and Warehousing	1164	1259	1311	1255	0.5%	0.0%	-0.9%
Information Media & Telec.	356	325	345	320	-0.7%	-0.2%	-1.5%
Financial and Insurance Services	577	606	613	598	0.2%	-0.1%	-0.5%
Rental, Hiring and Real Estate Services	290	339	425	418	2.5%	2.1%	-0.3%

Professional, Scientific & Technical Ser.	860	842	962	894	0.3%	0.6%	-1.5%
Administrative and Support Services	581	601	704	690	1.1%	1.4%	-0.4%
Public Administration and Safety	1164	1527	1633	1565	2.0%	0.2%	-0.9%
Education and Training	1720	1980	2312	2419	2.3%	2.0%	0.9%
Health Care and Social Assistance	2601	3033	3623	3963	2.8%	2.7%	1.8%
Arts and Recreation Services	232	202	256	256	0.7%	2.4%	0.0%
Other Services	1074	1157	1225	1285	1.2%	1.1%	1.0%
Total Industries	**22325**	**24363**	**26367**	**26530**	**1.2%**	**0.9%**	**0.1%**
'blue collar' industries	4452	4984	5152	5083	0.9%	0.2%	-0.3%

Source: Economy id, HillPDA

6.2.2 Employment projections

Projecting the above compound growth rates to 2036 formed the basis of out three employment growth scenarios:

- **Scenario 1 – low growth |** extrapolated the individual industry annual growth rate experienced over the last 10 years (from 2006 to 2016) to project employment growth to 2036.
- **Scenario 2 – high growth |** extrapolated the individual industry annual growth rate experienced over the last 15 years (from 2001 to 2016) to project employment growth to 2036.

Using the above methodology the following employment projections were derived:

6.2.2.1 Scenario 1 – low growth employment projection

Under Scenario 1 employment generated in the LGA increases to around 33,220 jobs by 2036. This represents an increase of around 6,690 jobs or 25% from that recorded in 2016.

Under this scenario, employment increases proportionally with population growth, while workforce participation rate (ratio of workers to residents above 15 years old) remains steady at around 55%.

Table 11: Scenario 1 – low growth employment projections

Industry	2016	2021	2026	2031	2036
Agriculture, Forestry and Fishing	1959	1808	1669	1540	1429
Mining	57	80	112	157	223
Manufacturing	2513	2524	2535	2546	2597
Electricity, Gas, Water and Waste Ser.	389	474	577	703	856
Construction	2179	2392	2626	2882	3213
Wholesale Trade	869	835	802	770	734
Retail Trade	3107	3157	3208	3259	3319
Accommodation and Food Services	1794	1871	1952	2036	2096
Transport, Postal and Warehousing	1255	1253	1250	1248	1253
Information Media and Telec.	320	317	315	312	308
Financial and Insurance Services	598	593	589	585	583
Rental, Hiring and Real Estate Services	418	464	515	572	637
Professional, Scientific & Technical Services	894	921	949	978	1004
Administrative and Support Services	690	739	791	848	906
Public Administration and Safety	1565	1584	1603	1623	1671

Education and Training	2419	2674	2956	3267	3621
Health Care and Social Assistance	3963	4531	5179	5920	6777
Arts and Recreation Services	256	288	324	365	404
Other Services	1285	1355	1428	1505	1589
Total Industries	**26530**	**27859**	**29380**	**31117**	**33219**
'blue collar' industries	5083	5133	5184	5235	5323

Source: HillPDA

6.2.2.2 Scenario 2 – high growth projection

Under Scenario 2, employment generated in the LGA increases to around 35,990 jobs by 2036. This represents an increase of around 9,462 jobs or 36% from that recorded in 2016.

Under this scenario, employment increases proportionally at a higher rate (~11% higher with population growth, while workforce participation rate increases to 60%).

Table 12: Scenario 2 – high growth employment projections

	2016	2021	2026	2031	2036
Agriculture, Forestry and Fishing	1959	1853	1753	1658	1569
Mining	57	84	123	181	265
Manufacturing	2513	2725	2955	3204	3474
Electricity, Gas, Water and Waste Ser.	389	474	577	703	856
Construction	2179	2583	3062	3629	4302
Wholesale Trade	869	808	751	697	648
Retail Trade	3107	3193	3281	3371	3464
Accommodation and Food Services	1794	1751	1708	1667	1627
Transport, Postal and Warehousing	1255	1286	1319	1352	1387
Information Media and Telec.	320	308	298	287	277
Financial and Insurance Services	598	605	612	619	626
Rental, Hiring and Real Estate Services	418	472	533	602	680
Professional, Scientific and Technical Ser.	894	905	917	929	941
Administrative and Support Services	690	730	773	819	867
Public Administration and Safety	1565	1727	1906	2103	2321
Education and Training	2419	2711	3037	3403	3812
Health Care and Social Assistance	3963	4561	5248	6039	6949
Arts and Recreation Services	256	265	273	282	292
Other Services	1285	1365	1449	1538	1633
Total Industries	**26530**	**28404**	**30574**	**33085**	**35991**
'blue collar' industries	5083	5312	5552	5803	6065

Source: HillPDA

6.3 Employment directed towards industrial precincts

The next step is to allocate the amount of employment directed towards Tamworth's industrial precincts based on individual industry types, composition and land use requirements. The first second column in the table below is the proportion of an industry's total employment typically directed accommodated in industrial precincts.

Table 13: Employment directed to industrial precincts

Industry	% directed to Industrial zoned land	Scenario 1		Scenario 2	
		2016	2036	2016	2036
Mining	70%	40	156	40	186
Manufacturing	100%	2,513	2,597	2,513	3,474
Electricity, Gas, Water & Waste Ser	100%	389	856	389	856
Construction	50%	1,089	1,607	1,089	2,151
Wholesale Trade	70%	609	514	609	454
Retail Trade	10%	311	332	311	346
Accommodation and Food Services	30%	538	629	538	488
Transport, Postal and Warehousing	90%	1,129	1,127	1,129	1,248
Rental, Hiring & Real Estate Services*	20%	84	127	84	136
Other Services**	40%	514	635	514	653
Total		**7,215**	**8,580**	**7,215**	**9,993**

Source: HillPDA, *includes agricultural farming equipment's sales and renting, **includes automotive repairs

6.4 Industrial floorspace demand

We have applied industry standard employment densities[9] to the growth in employment directed to Tamworth's industrial precincts in order to quantify the amount of additional floorspace required.

Under the two scenarios an additional 141,390sqm to 285,165sqm would be required in the LGA's industrial precincts to meet employment growth over the next 20 years.

Table 14: Industrial floorspace demand (2016-2036)

Industry	Industrial employment density (sqm/worker)	Scenario 1	Scenario 2
Mining	200	23,192	29,180
Manufacturing	100	8,378	96,100
Electricity, Gas, Water and Waste Services	150	70,086	70,149
Construction	75	38,792	79,635
Wholesale Trade	150	-14,198	-23,261
Retail Trade	80	1,692	2,854
Accommodation and Food Services	60	5,430	-3,015
Transport, Postal and Warehousing	200	-347	23,757
Rental, Hiring and Real Estate Services	80	3,511	4,198
Other Services	40	4,851	5,565
Total		**141,387**	**285,163**

Source: HillPDA

6.5 Demand for industrial land

We have applied average floorspace ratios (FSRs) typically developed in regional industrial precincts to the above total floorspace demand under each scenario in order to estimate the amount of additional land required.

[9] Number of employees per square metre

Typically, the building area of industrial developments does not encompass the entirety of the developable land of the parcel they reside within. This is as a result of the specific site requirements of typical industrial occupiers which require setbacks from property boundaries and the need for truck turning areas, parking areas, loading and unloading, etc. As such HillPDA has applied a ratio of 0.3 and 0.5 to the projected additional industrial floorspace demand.

Using this methodology it is forecast that Tamworth LGA is likely to absorb an additional 28 hectares to 95 hectares of industrial zoned land to accommodate the projected demand in employment floorspace over the next 20 years.

It is prudent to provide an additional supply of land (or contingency) above that projected in the interest of maintaining a healthy market through consumer choice, price competition and futureproof. Without some level of vacancies, land values could be inflated undermining further economic growth and investment. A healthy positive supply of land (or contingency level) is considered to range between 20% and 40% and we have adopted a contingency level of 20%.

With this taken into account, a minimum of 34 hectares to 114 hectares of industrial zoned land would be required to meet demand over the next 20 years.

Table 15: Forecast demand for additional industrial zoned land by 2036

	Scenario 1	Scenario 2
Total additional floorspace	141,387	285,162
Land required @ 0.3 FSR (ha)	47	95
Land required @ 0.5 FSR (ha)	28	57

Source: HillPDA

6.6 Supply and demand

Currently, Tamworth LGA provides around 762 hectares of land that is zoned for industrial purposes with an estimated 416 hectares of this being vacant. Refer to the table immediately below.

Table 16: Current and potential supply of industrial zoned land in Tamworth LGA

Precinct	Zoning	Land area (ha)	Vacant land (ha)
Airport precinct	IN3, IN1 and B7	375	260
Country Rd	B7	123	123
Taminda	IN1 and B5	254.6	32.4
Duri Rd	IN1	4.8	
Marius St	IN1	2.8	
East ST	IN1	0.5	0.2
Depot St	IN1	1.1	
Total		**761.8**	**415.6**

Source: HillPDA

The current 416 hectares of vacant land is sufficient to accommodate the projected growth in demand over the next 20 years (Table 16). However the majority of this vacant land is located outside the town, near the airport, and/or on land that would need to be serviced.

Thirty nine per cent (39%) of the employment area (299 hectares) is zoned IN1 General Industrial. The largest and most developed of these precincts is Taminda. Around 240 hectares of Taminda is zoned IN1 and a further 14 hectares is zoned B5. Only 32 hectares or 12.5% of the estate is currently vacant. If we removed the

Showground and greyhound race track it brings the amount of vacant land down to 14 hectares – only 5.5% of the total estate.

6.7 Implications for general industrial zoned land

A closer look at the amount of industrial land in the LGA reveals that of the 584 hectares currently zoned, 267 hectares or 46% is zoned for general industrial purposes with only 7% of this being vacant.

This is compared to heavy industrial zoned land, which comprises 194 hectares or 33% of industrial land stocks, of which 79 hectares or 41% is vacant.

Land zoned for business parks purposes, which permits light industrial uses, comprises 123 hectares of land or 21% of all industrial related zoned land. Of this total, 100% is vacant land.

This highlights the high demand for general industrial land to accommodate local services, indicated by the low level of vacancies.

If we assumed that 50% of the future demand for industrial land is directed towards light and general industrial zoned land, then around 17 to 57 hectares of additional land would be required to accommodate the growth in urban services over the next 20 years.

With only 26 hectares of vacant general industrial land currently present in the Tamworth Township (or 8 hectares net of the Showground and Greyhound racetrack), additional land zoned for general industrial purposes will be required over the coming years.

The subject site is currently the most appropriate location to meet the immediate future demand within the Township given:

1. The uncertainly in timeframes surrounding the proposed expansion and rezoning of further lands
2. Proximity to the Township and existing infrastructure
3. Its high market appeal
4. The fact that the subject site was previously recommended for rezoning for general industrial purposes in Council's *Taminda Revitalisation + Economic Development Strategy 2008.*

6.8 Implications for the subject site

Notwithstanding the large potential supply of land, there remain a few other issues to consider. Taminda achieved the highest score for market appeal given it's the most developed precinct and its proximity to the town centre and established residential areas.

The other precincts that are in proximity to the township are in isolated locations and may incur significant additional capital investment due to costs associated with servicing the land or the provision of infrastructure.

Some other precincts rely heavily on proposed or anticipated investment with lead times difficult to factor or provide market certainty to. The geographic location of some precincts lends to more specialised tenants that either have a relationship with the airport or require relative isolation to other uses, for example a poultry processing plant. Taminda is uniquely positioned to provide land for the expansion of urban services in line with the growing community of the township.

7.0 SUGGESTED LAND USE MIX

This chapter explores the idea of alternate uses for the subject site in Taminda by exploring a number of case studies or example estates. Due to the evolving nature of existing industrial areas experiencing an increase in demand for commercial uses the case studies examined includes commercial focused business parks where a hybrid of industrial and commercial uses are visible. Note that these examples do not include out-of-centre retail and commercial businesses that potentially compete with the traditional existing town centres.

7.1 Case Studies

The case studies explored are:

- Norwest Business Park;
- Riverside Corporate Park, North Ryde;
- Wetherill Park Employment Area; and
- West Byron Employment Area

Each of these is explored below.

7.1.1 Norwest

Norwest Business Park is located off Windsor Road in the outer suburbs the Baulkham Hills Local Government Area (The Hills Shire), approximately 36km to the northwest of Sydney CBD10. It covers approximately 377ha11 of land (equivalent in size to Sydney CBD), of which around 172 hectares (say 135ha net of internal roads) is zoned for employment uses. The balance was developed as the Bella Vista residential estate. The Norwest Business Park is located immediately to the east of Old Windsor Road and approximately 1km north of the M2 Motorway.

Today Norwest Business Park contains more than 450,000sqm of business floorspace space which predominately constitutes commercial floorspace[12]. 800 companies are located in the park employing around 23,000 people[13]. The complex consists of a mix of commercial, professional & health care services and a number of mixed tenanted office buildings. Business tenants within Norwest are diverse, ranging from information technology (e.g. Alltech, Cathay Pacific) and pharmaceuticals (e.g. Douglas, Rhone Polenc, Sigma Pharmaceuticals, Wyeth, ResMed), to manufacturing (e.g. Schneider Electric, Bullivants), construction (e.g. AV Jennings, Clarendon Homes) and financial and service companies (e.g. AAMI Insurance, The Reserve Bank of Australia, Capital Finance). The Hills Shire Council also recently moved into the park and Woolworths established their headquarters here employing over 4,000 workers in one building.

The primary employment function of Norwest is supported by two shopping centres:

- Marketown Shopping Centre which provides 8,300sqm (gross lettable area or GLA) of retail floorspace including a 4,000sqm Coles supermarket. It is a single level shopping centre on a site of 4.4 hectares with 53 shops including 20 restaurants and take-away food stores[14].

[10] Source: Googlemaps
[11] Source: Invest Sydney Hills, The Hills Shire Council (2011)
[12] Source: Potential Locations for a Business Park in the South West, Hill PDA 2011
[13] Source: http://norwestbusinesspark.com.au/, Wikipedia, NSW TPA
[14] Source: Property Council of Australia Shopping Centres Directory (2018)

- Circa Retail Shopping Centre was opened recently in 2009 and provides approximately 21 shops totalling 5,200sqm[15] (GLA) shopfront floorspace including a Woolworths supermarket of 3,045sqm. Site area is 1.14 hectares.

These retail facilities provide important support services to employees on site and residents in the surrounding area. Clustering appropriate retail uses on-site is consistent with the principles of sustainable development by reducing the need for workers to travel to access such facilities and diversifying job opportunities. The two centres comprise 4.2% of the total area of the business park. Combined with the ice rink and the three main hotels these facilities comprise more than 9% of the area of the business park.

Norwest was very slow to develop in the first 10 years of its life. Despite much investment in roads and services businesses were reluctant to locate there. Perhaps the three strongest catalysts that attracted businesses were:

- The construction and opening of the M2 motorway, which gave much more rapid access to other main parts of Sydney such as Sydney CBD, Macquarie Park and the Airport;
- The development of the Bella Vista housing estate which provided executive style living right next to the business park; and
- The Marketown which gave it a centre for providing retail and commercial services to workers in the business park and also to the residents of Bella Vista.

In 2005, the Woolworths Limited head office was constructed, and now employs several thousand staff. Norwest became more than just a place to work. It became a place to live, shop and work. Since then the development was vastly more rapid and today there are few remaining development sites. The estate now accommodates a range of other uses including a private hospital, Hillsong mega-Church and a second shopping centre. There are also several hotels – Novotel, Adina Apartments and Quest Bella Vista. Employment by occupation type is shown in the table below

Table 17: Norwest – Employment by Occupation Type 2016

Occupation	No.	% of Total
Managers	4,082	17.3%
Professionals	7,583	32.1%
Technicians and Trades Workers	2,124	9.0%
Community and Personal Service Workers	1,739	7.4%
Clerical and Administrative Workers	4,209	17.8%
Sales Workers	1,688	7.2%
Machinery Operators and Drivers	596	2.5%
Labourers	1,149	4.9%
Inadequately described/ Not stated	419	1.8%
TOTAL	23,589	100.0%

Source: ABS Working Population Profile for Bella Vista SA2 2016

Construction of the Northwest Rail Line commenced in 2014, with two railway stations being built in the Norwest Business Park - Bella Vista Station and Norwest Station. The North West Rail Link is scheduled to open to the public in 2019. There are a number of planning proposals relating to the redevelopment of sites in

[15] Source: Property Council of Australia Shopping Centres Directory (2018)

proximity to train stations for considerably higher density living and employment uses including the Marketown Shopping Centre. Norwest continues to expand and by 2031 it is expected to house 32,000 jobs[16].

7.1.2 Riverside Corporate Park

The Riverside Corporate Park is located in the suburb of North Ryde, approximately 14 kilometres to the north east of the Sydney Central Business District, immediately to the east of the intersection of Epping Road, Delhi Road and the M2 Motorway.

The Riverside Corporate Park is located on the former site of the CSIRO. Its development was initiated by the CSIRO in the early 1990s through the sale of surplus parcels of land to private enterprise. The intention was to foster the development of commercial activity which complemented the research based activities of the CSIRO. Initially it was slow to attract business essentially because the locality lacked the identity, facilities and support services sought by potential investors and occupants.

CSIRO developed the "Central Services Facility" – now called the Village – in the middle of the estate. Later came several substantial office complexes, notably those of Oracle, Microsoft, Fujitsu and Quest Serviced Apartments, which has made it become one of Sydney's most prominent business locations. Today the Park occupies 26.6 hectares (excluding the residential sites and the area of internal roads). It accommodates an estimated 220,000 square metres of business floor space employing around 10,000 workers and is now serviced by the new train station at North Ryde. Employment by industry type is provided in the table below:

Table 18: Riverside Corporate Park – Employment by Industry Type 2016

Industry	No.	% of Total
Primary	72	0.7%
Manufacturing	1561	15.7%
Utilities	25	0.3%
Construction	1,239	12.5%
Wholesale Trade	1,253	12.6%
Retail Trade	301	3.0%
Accommodation and Food Services	147	1.5%
Transport, Postal and Warehousing	62	0.6%
Information Media and Telecommunications	118	1.2%
Financial and Insurance Services	111	1.1%
Rental, Hiring and Real Estate Services	45	0.5%
Professional, Scientific and Technical Services	3,837	38.6%
Administrative and Support Services	682	6.9%
Public Administration and Safety	34	0.3%
Education and Training	85	0.9%
Health Care and Social Assistance	218	2.2%
Other	152	1.5%
TOTAL	9,942	100.0%

Source: Transport for NSW TPA 2018

The site of the Village is approximately one hectare and accommodates a tennis court, A 25m swimming pool, 2 financial services, a newsagency, two medical services, three food services (restaurant and take-away), an

[16] Source: Wikipedia

animal pharmacy, printing services, a telecommunications service provider and a child care centre. The village occupies around 4% of the total area of the business park. The Village and Quest apartments combined make up 6.5% of the business park area.

Riverside Corporate Park is more a business park filled with A and B-grade commercial buildings rather than an industrial park like Taminda. Nevertheless it provides a good case study of the importance of a central services facility to the marketing and economic success of an employment area. In this case The Village is the only example of a retail and commercial services centre which captures its entire revenue from workers and businesses in the estate and none from residents in the locality.

7.1.3 Wetherill Park Employment Area

The Wetherill Park industrial area is bounded by Prospect Reservoir and the LGA boundary with Holroyd to the North, Cowpasture Road to the West, The Horsley Drive and Victoria Street to the South and Hassall Street to the East. This is shown on the aerial photo below.

Figure 1 - Aerial View of Wetherill Park Employment Area



Source: NSW Department of Lands Six Viewer

The area is also defined by employment zones under Fairfield LEP 2013. The predominant zone is IN1 but there are also areas of IN2, B5 along Horsley Drive and a small pocket of B1 which accommodates a McDonalds restaurant.

Total area is 600 hectares of which around 43 hectares (7%) is zoned B5.

The area accommodates almost 21,000 workers. Job density is 35 workers per hectare which is considerably lower than more traditional industrial areas with densities at around 70 to 80 jobs per hectare. This reflects the nature of the employment zone which is large warehouses for storage and transport related industries. Whilst manufacturing businesses are quite predominant they are larger and more automated.

Table 19: Wetherill Park Industrial Area – Employment by Industry Type 2016

Industry	No.	% of Total
Primary	72	0.3%
Manufacturing	8,010	38.3%
Utilities	270	1.3%
Construction	2,380	11.4%
Wholesale Trade	3,259	15.6%
Retail Trade	830	4.0%
Accommodation and Food Services	385	1.8%
Transport, Postal and Warehousing	2,378	11.4%
Information Media and Telecommunications	76	0.4%
Financial and Insurance Services	257	1.2%
Rental, Hiring and Real Estate Services	270	1.3%
Professional, Scientific and Technical Services	471	2.3%
Administrative and Support Services	766	3.7%
Public Administration and Safety	170	0.8%
Education and Training	57	0.3%
Health Care and Social Assistance	206	1.0%
Other	1,030	4.9%
TOTAL	20,887	100.0%

Source: Transport for NSW TPA 2018

Within the B5 zone is a shopping centre called Greenway Plaza on the corner of Horsley Drive and Elizabeth Street. Site area is 6.385 hectares. Greenway Plaza has a leasable floor area of approximately 28,000sqm (of which around 20,000sqm is occupied). Large format stores include:

- Three gymnasium/fitness centres,
- Spotlight (2,500sqm),
- Officeworks (2,100sqm),
- The Good Guys (2,200sqm),
- Supercheap Auto,
- BCF (bulky goods),
- Intersport (sportswear and equipment),
- Petbarn, Beds-R-Us, Rugs and flooring and Service NSW
- Joe's Fruit shop (700sqm)
- Four specialty food stores (bakery, butcher, seafoods, cakes)
- 14 restaurants and take-away food stores
- five non-food specialty stores
- two personal services (hair and dry cleaners).
- There are also 10 non-retail commercial premises providing a range of services including legal, financial, medical and real estate services.

There are a number of large format retailers (lighting, hardware, bridal, etc) along Horsley Drive in the B5 zone but the area never developed as a destination bulky goods centre.

In the middle of the industrial estate, at 447 Victoria Street, a small multi-function commercial building was recently constructed on a 7,400sqm site. It comprises a single level tavern, an occupation health centre and four levels of commercial suites providing a range of services including real estate, legal, financial, accountancy, travel, employment and food (café and restaurant).

Wetherill Park is a more direct comparable being mostly industrial with lower than typical job density ratios (at around 35 jobs per hectare) with industries that are mainly manufacturing, warehousing and transport related. However its retail and commercial centre is on the boundary of the precinct and it is likely to capture a fair proportion of its trade from the adjacent residential area – not just from workers in the industrial area. Furthermore the employment area is very large at 600 hectares and hence few workers would be walking to

7.1.4 West Byron Employment Area

The West Byron Employment Area also known as the "Byron Arts and Industry Employment Precinct" is the largest industrial estate in Byron LGA, comprising over 140 industrial premises (not including individual strata allotments). The precinct has a number of employment zonings, being IN2 General Industrial, B1 Neighbourhood Centre, B4 Mixed Use and B7 Business Park. Uses in the precinct are highly variable, including urban support services. Services support the strong tourist retail market with a number of retail outlets and internet businesses operating out of the precinct.

Total areas by zone are as follows:

- IN2 Light Industrial zone: 30.0 ha
- B7 Business Park zone: 9.8 ha
- B1 Neighbourhood centre: 0.9 ha
- B4 Mixed Use: 7.3 ha
- TOTAL 48.0 ha

The precinct is located 4.5 kilometres to the west of Byron Bay town centre along one of the two entry corridors into the town. This close proximity to Byron Bay Town Centre and significant clustering of commercial, retail and industrial businesses in the precinct have contributed to the success of the precinct. The precinct has experienced very strong increases in land values – almost doubling from 2013 to 2017 – driven by strong demand, limited supply and very strong increases in rents (Valuers Australia, 2017).

Figure 16: Byron Arts and Industry employment precinct



At the northern end of the employment precinct is the Sunrise Boulevard Centre which comprises the Byron West Shopping Fair and the "Habitat".

Figure 17: Byron Bay Sunrise Boulevard Centre



The Byron West Shopping Fair is a 2,700sqm shopping centre anchored by a 1,600sqm supermarket. Specialty shops include two cafes/restaurants, liquor store, medical services and a pharmacy. The remaining retail space scattered throughout the industrial area is bulky goods such as lighting, furniture, hardware and the like as well a few cafes and fast food stores and a petrol/auto-service station. There is a range of other services in the industrial area to support workers including a couple of gymnasiums. There are 1,200 residents that live immediately to the northeast of the industrial area that patronise the shopping centre, but that number is insufficient to support the centre which means that a significant level of its trade comes from workers in the locality.

The Habitat is a mixed use business hub currently under construction. It will combine live and work, commercial office, retail and cafe spaces. The site is 7.3ha and zoned B4 Mixed Use.

As shown in the table below the floor space audit identified the following employment uses as occupying the greatest proportion of gross floor area: retail trade (23%); manufacturing (13%) and wholesale trade (12%). The precinct has a floor space vacancy rate of 4.6% and approximately 85,554sqm of vacant land. Fifteen per cent of properties in the precinct incorporated some form of sustainability element.

Table 20: Byron Arts and Industry employment precinct floor space audit

Industry	Floor space (sqm)	(%)
Manufacturing	20,385	13.3%
Electricity, Gas, Water and Waste Services	60	0.0%
Construction	2,022	1.3%
Wholesale Trade	18,096	11.8%
Retail Trade	34,900	22.8%
Accommodation and Food Services	1,223	0.8%
Transport, Postal and Warehousing	12,630	8.3%
Information Media and Telecommunications	449	0.3%
Financial and Insurance Services	241	0.2%
Rental, Hiring and Real Estate Services	11,715	7.7%
Professional, Scientific and Technical Services	5,689	3.7%
Administrative and Support Services	4,184	2.7%
Public Administration and Safety	1,859	1.2%
Education and Training	1,402	0.9%
Health Care and Social Assistance	2,336	1.5%
Arts and Recreation Services	11,924	7.8%
Other Services	14,498	9.5%
Inadequately described	446	0.3%
Residential	1,862	1.2%
Vacant Floor Space	6,990	4.6%
TOTAL FLOOR SPACE	153,000	100%
Vacant land	85,554	57%

Source: HillPDA Survey 2017

The range of retail, commercial, medical and recreational services in the locality has assisted the employment area to be one of the most successful in the far north coast region. Other factors have been the location between the highway and the Byron Town Centre with direct access in all directions. The estate has developed and continues to develop in an interest mix of creative industries and support services.

7.2 Suggestions for Taminda

Commercial services, retail and human support services including accommodation, food services and childcare facilities are important components in successful employment precincts whether they are predominantly white-collar office precincts or blue-collar industrial estates. Two of the above cases studies (Norwest and Riverside Corporate Park) are commercial business parks which differ from the more traditional industrial area of Taminda. Nevertheless the support service demand of workers is similar particularly given the shift towards a more quasi-commercial role observed in many traditional precincts. Wetherill Park is a good benchmark being mostly industrial with lower than typical job density ratios and industries that are mainly manufacturing, warehousing and transport related. However its retail and commercial centre is on the boundary of the precinct and it is likely to capture a fair proportion of its trade from the adjacent residential area.

Riverside Corporate Park is more of a business park than an industrial area but its retail and commercial centre is more modest in scale. It is almost entirely dependent on the workers and businesses in the estate getting no trade from residents in the surrounding suburbs.

Byron Bay provides a good benchmark given that it is a regional employment area, is of similar size to Taminda and has similar employment numbers. However the jobs are a little more weighted towards the creative and boutique industries.

Overall the proportion of total workers in these estates that work in retail and hospitality services is between 6% and 16% - around 20% in the case of West Byron. The site area occupied by these uses ranges generally between 8% and 15% of the total employment precinct.

Taminda is around 255 hectares of zoned employment land predominantly IN1. Around 7 hectares south of Jewry Street is zoned B5 but this is already developed. Bunnings occupies around 4 hectares of this land and existing industrial units occupies the balance. The estate lacks a central services facility to support businesses and workers.

There is a parcel of land of 6.4 hectares on the north side of Jewry Street just to the east of the Racecourse that was recently rezoned to B5 but this site is not central (middle of the estate or at a main entry point). It's likely to be developed in the future for bulky goods or industrial uses rather than for commercial services.

With direct frontage on the collector road through the estate No. 55 Dampier Street is a reasonable location for a B5 zone. We would recommend a site area of around 5 hectares. Notwithstanding employment density in Taminda is around 30-35 jobs per hectare – similar to Wetherill Park but considerably lower than business parks. Wetherill Park however has more than 20,000 workers and more than 6,000 residents supporting the Greenway Plaza. The advantage of the B5 zone is that it will allow more traditional industrial services should commercial and retail services fail to be delivered due to lack of market interest.

8.0 ECONOMIC OUTPUT

This chapter quantifies the likely economic output from the development of the estate assuming full occupancy. Economic output can be measured in a number of ways including gross output (revenue), employment and gross value added (contribution to gross regional product) both direct (production on site) and indirect (production and consumption off site).

8.1.1 Direct Impacts

Assuming all 30 hectares is developed and based on an average density 70 jobs per hectare over 5 hectares in the B5 zone, 3 jobs per hectare on the solar farm and 35 jobs per hectare over the IN1 zone then we estimate total employment on site to reach 1,000. Gross revenue is likely to be $384m, total salaries $57m and gross value added (GVA) to be $119m every year. The performance indicators by a likely mix of industry type are shown in the table below.

Table 21: Direct Economic Impacts of the Planning Proposal

Industry	No. of Workers	Revenue ($m)	Salaries ($m)	GVA ($m)
Manufacturing	284	123.2	18.8	34.0
Electricity, Gas, Water and Waste Services	37	38.2	4.0	17.4
Construction	148	53.6	7.8	16.2
Wholesale trade	109	35.0	3.6	6.3
Retail Trade	62	52.3	4.6	7.5
Accommodation and Food Services	38	4.1	1.0	1.6
Transport, Postal and Warehousing	182	50.8	10.4	23.1
Information Media and Telecommunications	8	3.5	0.7	1.7
Financial and Insurance Services	10	3.9	0.4	2.1
Rental, Hiring and Real Estate Services	8	1.7	0.6	0.9
Professional, Scientific and Technical Services	14	1.5	0.7	0.9
Administrative and Support Services	12	1.6	0.6	0.9
Public Administration and Safety	23	1.4	1.1	1.5
Health Care and Social Assistance	42	6.9	1.3	2.6
Other Services	23	6.4	1.2	2.4
Total	**1,000**	**384.0**	**56.8**	**118.9**

Source: HillPDA from ABS Australian Industry 2016-17

8.1.2 Indirect Impacts

Industries have strong linkages with other sectors of the economy so their impacts go further than direct contribution. "Multipliers" refer to the level of additional economic activity generated by a source industry.

There are two types of multipliers:

- Production induced: which is made up of:

- First round effect: which is all outputs and employment required to produce the inputs for construction;
- An industrial support effect: which is the induced extra output and employment from all industries to support the production of the first round effect; and

- Consumption induced: which relates to the demand for additional goods and services due to increased spending by the wage and salary earners across all industries arising from employment.

The source of the multipliers adopted in this report is ABS Australian National Accounts: Input-Output Tables 2015-16 (ABS Pub: 5209.0). These tables identify first round effects, industrial support effects and consumption induced multiplier effects in respect of gross revenue, employment and gross value added.

The table below quantifies associated economic multipliers resulting from the construction process. This table illustrates with economic multipliers from the Australian National Accounts that the likely industries occupying the site would have the following indirect impacts in terms of GVA (contribution to national GDP):

- Production induced GVA of $145m; and
- Consumption induced GVA of $152m

Table 22: Indirect Economic Impacts of the Planning Proposal

Industry	Direct GVA ($m)	Production Induced	Consumption Induced	Total GVA
Manufacturing	34.0	55.9	52.6	142.5
Electricity, Gas, Water and Waste Services	17.4	21.8	16.9	56.1
Construction	16.2	28.4	26.4	70.9
Wholesale trade	6.3	5.0	7.2	18.6
Retail Trade	7.5	4.2	7.7	19.4
Accommodation and Food Services	1.6	1.3	1.9	4.7
Transport, Postal and Warehousing	23.1	21.3	25.7	70.0
Information Media and Telecommunications	1.7	1.7	1.7	5.1
Financial and Insurance Services	2.1	1.1	1.3	4.5
Rental, Hiring and Real Estate Services	0.9	0.4	0.3	1.6
Professional, Scientific and Technical Services	0.9	0.7	1.2	2.8
Administrative and Support Services	0.9	0.5	1.1	2.5
Public Administration and Safety	1.5	0.7	1.8	4.1
Health Care and Social Assistance	2.6	0.8	3.0	6.5
Other Services	2.4	0.8	2.8	5.9
Total	**118.9**	**144.5**	**151.6**	**415.0**

Source: HillPDA and ABS Input Output Tables 2015-16

Total direct and indirect contribution to the Australian economy every year from businesses on the site would amount to $415m every year.

Note that the multiplier effects will occur over a national reach and are not necessarily local. The ABS states that:

> *"Care is needed in interpreting multiplier effects; their theoretical basis produces estimates which somewhat overstate the actual impacts in terms of output and employment. Nevertheless, the estimates illustrate the*

high flow-on effects of construction activity to the rest of the economy. Clearly, through its multipliers, construction activity has a high impact on the economy."

In particular the multiplier impacts can leave the impression that resources would not have been used elsewhere in the economy had development not proceeded. In reality many of these resources would have been employed elsewhere. It should also be noted, as stated in the NSW Treasury guidelines, that:

"Direct or flow on jobs will not necessarily occur in the immediate vicinity of the project – they may be located in head office of the supplier or in a factory in another region or State that supplies the project"[17].

Notwithstanding these limitations, economic multiplier impacts represent considerable added value to the local and broader Australian economy.

[17] Source: Office of Financial Management Policy & Guidelines Paper: Policy & Guidelines: Guidelines for estimating employment supported by the actions, programs and policies of the NSW Government (TPP 09-7) NSW Treasury

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9.7 Non-Aboriginal Heritage

Proposed Industrial Rezoning, 21 Wallamore Road (Lot 2 DP1234850) & 55 Dampier Street (Lot 3 DP1234850), Taminda, Tamworth Regional Council LGA, NSW

Statement of Heritage Impact

Prepared for Elton Consulting on behalf of Tamworth Industrial Pty Ltd

March 2019

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1 INTRODUCTION

Kayandel Archaeological Services (KAS) has been commissioned by Elton Consulting on behalf of Tamworth-Industrial Pty Ltd (the Proponent) to prepare a Statement of Heritage Impact (SoHI) for the proposed industrial rezoning of the properties 21 Wallamore Road (Lot 2 DP1234850) and 55 Dampier Street (Lot 3 DP1234850), Taminda, NSW.

This SoHI was undertaken as a desktop study, with consideration of the plans prepared by Eltons Consulting (dated 22/10/2018) and of the appropriate Local Government Legislation.

This report has been developed to satisfy the requirements of the Heritage Office Guidelines (HO & DUAP, 2002), the Heritage Office Manual (NSW Heritage Office, 1996) and the Burra Charter (ICOMOS, 1999) and demonstrates the suitability of the development on the site.

1.1 Location of the Subject Area

The Subject Area is located within the Tamworth Regional Council (TRC) Local Government Area (LGA) in the Parish of Murroon, and County of Parry (refer to Figure 1).

The Subject Area consists of the 21 Wallamore Road (Lot 2 DP1234850) & 55 Dampier Street (Lot 3 DP1234850), Taminda (refer to Figure 2). The Subject Area covers approximately 11.35ha.

1.2 Proposed Works

Lot 3 DP1234850 is currently zoned as RU4 (Primary Production Small Lots) under the TRC Local Environment Plan 2010 (LEP).

The Proponent has proposed that the Subject Area is rezoned to IN1 (General Industrial).

1.3 Study Limitations

This report is based on a review of available Historic archaeological assessments (sourced from the Heritage Branch library, grey literature and KAS' report library). It is possible that further Historic archaeological assessments or the emergence of new analysis of the Historic archaeological landscape within the Tamworth area may support different interpretations of the evidence in this report.

This report is based exclusively upon desktop assessment.

The 'Statement of Significance' (Section 4.3) made in this report is a combination of both facts and interpretation of those facts in accordance with a standard set of assessment criteria. It is possible that another professional may interpret the Historic archaeological landscape within the Tamworth area and physical evidence in a different way.

A summary of the statutory requirements regarding heritage is provided in Section 2. This is made based on our experience of working with the NSW Aboriginal heritage and European heritage systems and does not purport to be legal advice. It should be noted that legislation, regulations, and guidelines change over time and users of this report should satisfy themselves that the statutory requirements have not changed since the report was written.

1.4 Authorship

This study has been carried out by Kayandel Archaeological Services (KAS). Background research was undertaken by Meggan Walker. Natalie Stiles completed the mapping. This report was drafted by Meggan Walker; and reviewed by Natalie Stiles and Lance Syme.

Person	Qualification	Experience	Tasks
Lance Syme	BArts (Arch/Paleo), Grad. Dip (Heritage Cons.), M. ICOMOS	20 years	Project Supervision, mapping, report review
Natalie Stiles	BArts (Arch/Paleo), Grad Cert. Arts (Arch), MGIS&RemoteSens	7 years	Mapping & GIS, report review
Meggan Walker	BArts (Arch/Ancient) (Hons)	<1 year	Background research, report drafting

Table 1: KAS personnel involved with the preparation of this report

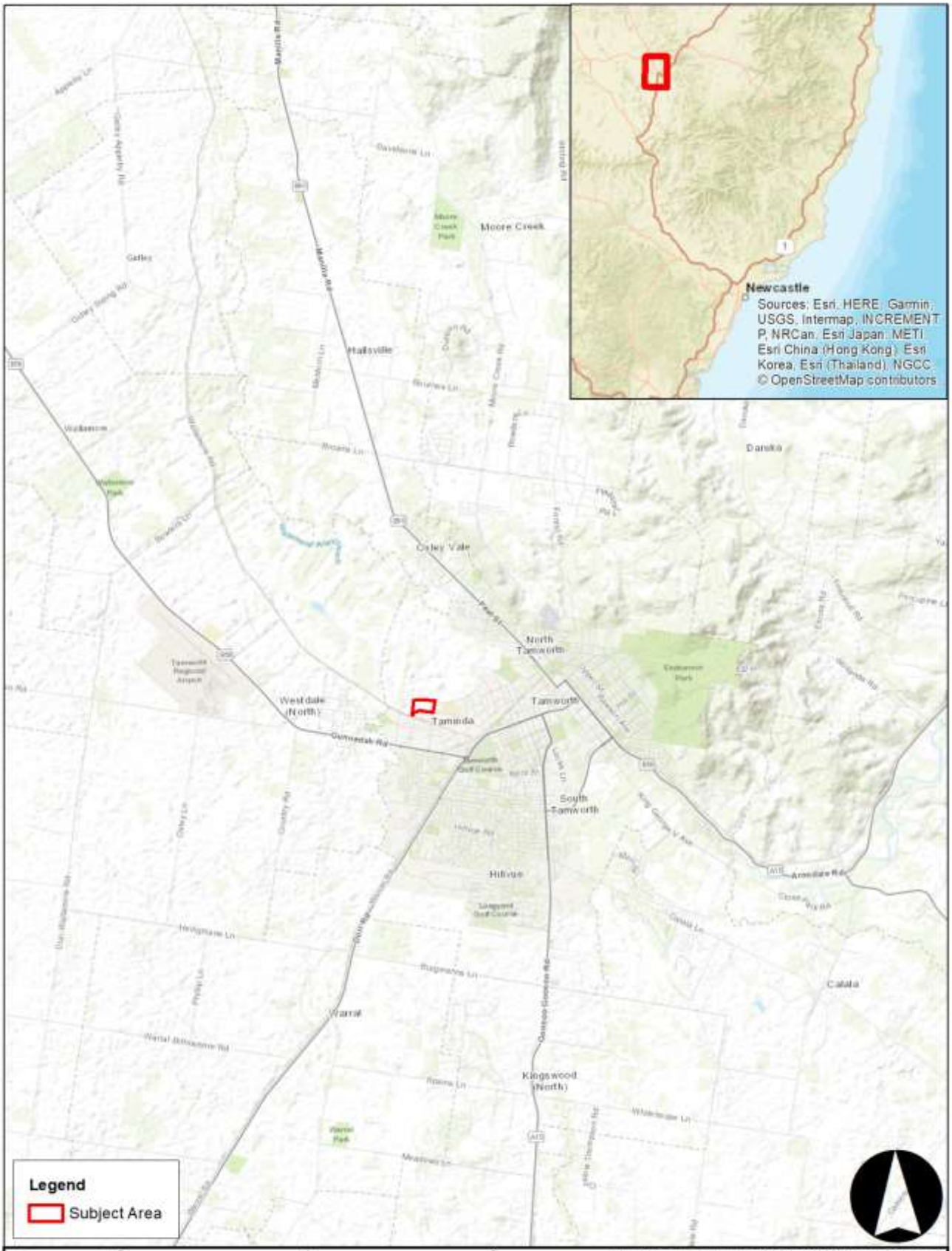


Figure 1: Project Location



Figure 2: Subject Area

2 APPLICABLE POLICY AND LEGISLATION

European and Aboriginal cultural heritage in Australia is protected and managed under a variety of legislation. The following section provides a brief summary of the Acts which are relevant to the management of cultural heritage in NSW. It is important to note that these Acts are presented as a guide and are not legal interpretations of legislation by the consultant.

2.1 Commonwealth Legislation

2.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The purpose of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Heritage Protection Act) is the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters that are of particular significance to Aboriginal people in accordance with Aboriginal tradition.

Under the Heritage Protection Act the responsible Minister can make temporary or long-term declarations to protect areas and objects of significance under threat of injury or desecration. The Act can, in certain circumstances, override state and territory provisions, or it can be implemented in circumstances where state or territory provisions are lacking or are not enforced. The Act must be invoked by or on behalf of an Aboriginal or Torres Strait Islander or organisation.

2.1.2 Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act)

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) took effect on 16 July 2000. Under Part 9 of the EPBC Act, any action that has, or is likely to have, a significant impact on a matter of National Environmental Significance (known as a controlled action under the Act), may only progress with approval of the Commonwealth Minister for the Environment. An action is defined as a project, development, undertaking, activity (or series of activities), or alteration to any of these. Where an exception applies, an action will also require approval if:

It is undertaken on Commonwealth land and will have or is likely to have a significant impact;

1. It is undertaken outside Commonwealth land and will have or is likely to have a significant impact on the environment on Commonwealth land; and,
2. It is undertaken by the Commonwealth and will have or is likely to have a significant impact.

Under Section 28 subsection (1) "The Commonwealth or Commonwealth Agency must not take inside or outside Australian jurisdiction an action that has, will have, or is likely to have a significant impact on the environment inside or outside Australian jurisdiction." The EPBC Act defines 'environment' as both natural and cultural environments and therefore Aboriginal and historic cultural heritage items included on the Register of the National Estate are regarded as part of the cultural environment.

Recently, Australia has changed legislation that protects its national heritage places. Three new laws came into effect in January 2004 and are essentially a combination of previous heritage system with a number of changes that include the establishment of a National Heritage List (NHL) and a Commonwealth Heritage List (CHL).

The National Heritage List records places with outstanding natural and cultural heritage values that contribute to Australia's National identity. The Commonwealth Heritage List will comprise natural, Aboriginal and historic places owned or managed by the Commonwealth. The new laws provide changes that offer greater legal protection under the existing *Environment Conservation and*

Biodiversity Conservation Act 1999 (EPBC Act). Under the new system, National Heritage will join six other important 'matters of national environmental significance' (NES) already protected by the EPBC Act.

The three new Acts are:

- The *Environment and Heritage Legislation Amendment Act (No.1) 2003*;
- The *Australian Heritage Council Act 2003*; and
- The *Australian Heritage Council (Consequential and Transitional Provisions) Act 2003.*

Approval under the EPBC Act is required if you are proposing to take an action that will have, or is likely to have, a significant impact on the National Heritage values of a National Heritage place and/or any other NES matter. This action must be referred to the Australian Government Minister for the Environment and Heritage. The Minister will decide whether an action will, or is likely to, have a significant impact on a matter of national environmental significance.

The heritage provisions of the EPBC Act allow for a transition period whilst the National and Commonwealth Heritage Lists are finalised. During this transition period the Register of the National Estate acts in conjunction with the formative National and Commonwealth lists to provide full coverage for items already identified as having cultural heritage significance.

2.1.3 Native Title Act 1993 (Amended)

The *Native Title Act of 1993*, as amended, recognises and protects native title, and provides that native title cannot be extinguished contrary to the Act. The National Native Title Tribunal (NNTT) is a Commonwealth Government agency set up under this Act to mediate native title claims under the direction of the Federal Court of Australia.

The National Native Title Tribunal maintains the following registers:

- National Native Title Register;
- Register of Native Title Claims;
- Unregistered Claimant Applications; and,
- Register of Indigenous Land Use Agreements.

The objective of a search of the NNTT registers is to identify possible Aboriginal Stakeholders that would not perhaps receive representation as part of the Local Aboriginal Land council or Elders groups.

2.2 New South Wales Legislation

The following New South Wales legislation protects aspects of cultural heritage and is relevant to development activities in the Subject Area.

2.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act requires that consideration be given to environmental impacts as part of the land use planning process. This includes impacts on Aboriginal and non–Aboriginal cultural heritage items and places. The Act also requires that Local Government Areas (LGAs) prepare Local Environmental Plans (LEP) and Development Control Plans (DCP) in accordance with the Act to provide guidance on the level of environmental assessment required. LEPs often list locally significant heritage items. Three parts of the EP&A Act are most relevant to Heritage. Part 3 relates to planning instruments, including those at local and regional levels; Part 4 controls development assessment processes; and Part 5 refers to approvals by determining authorities.

2.2.2 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* provides for protection of Aboriginal objects (sites, relics and cultural material) and Aboriginal places. Under the Act (Section 5), an Aboriginal object is defined as:

> *any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.*

An Aboriginal place is defined under this Act as an area that has been declared by the Minister administering the *National Parks and Wildlife Act* as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

Under Section 86 of the Act it is an offence to knowingly destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place, without the prior written consent from the Director-General of the NSW Office of Environment and Heritage (OEH). In order to obtain such consent, a Section 90 Aboriginal Heritage Impact Permit (AHIP) application must be submitted and approved by the OEH Director-General. In considering whether to issue a permit under Section 90, OEH will take into account:

- The objectives and justifications for the proposed activity;
- The appropriateness of the methodology to achieve the objectives of the proposed activity;
- The significance of the Aboriginal object(s) or place(s) subject to the proposed impacts;
- The effect of the proposed impacts and the mitigation measures proposed;
- The alternatives to the proposed impacts;
- The conservation outcomes that will be achieved if impact is permitted;
- The outcomes of the Aboriginal community consultation regarding the proposed impact and conservation outcomes;
- The views of the Aboriginal community about the proposed activity; and,
- The knowledge, skills, and experience of the nominated person (s) to adequately undertake the proposed activity.

Under Section 89A of the Act it is a requirement to notify the OEH Director-General of the location of an Aboriginal object. Identified Aboriginal items and sites are registered with the NSW OEH on AHIMS.

2.2.3 The Heritage Act 1977 (NSW) (Amended 1999) and the NSW Heritage Division

The *Heritage Act 1977* is the primary piece of State legislation affording protection to all items of environmental heritage (natural and cultural) in New South Wales. "Items of environmental heritage" include places, buildings, works, relics, moveable objects and precincts identified as significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. A 'Place' is defined as an area of land, with or without improvements and a 'Relic' is defined as any deposit, object or material evidence that relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and that is 50 years or more old The *Heritage Act 1977*, established the Heritage Council of NSW, provides advice and recommendations to the Minister for Planning relating to conservation and management of items of environmental heritage. The Heritage Council is also required to maintain a database of items of

State heritage significance: The State Heritage Register (SHR), a database of items of both State and local heritage significance and the State Heritage Inventory (SHI).

If the Heritage Council believes that a heritage item or place needs to be conserved, it can make a recommendation to the Minister, who decides whether to place protection on that item. There are two types of protection available: interim heritage orders and listing on the State Heritage Register. These forms of protection are 'binding directions', which means that the heritage item that is protected in one of these ways cannot be demolished, redeveloped or altered without permission from the Heritage Council.

The *Heritage Act 1977* does not apply to Aboriginal "relics" (any deposit, object or material evidence). These items are protected under the *National Parks and Wildlife Act 1974*; however, some aspects of Aboriginal cultural heritage management and protection are covered by provisions of the *Heritage Act 1977*.

The Heritage Council NSW can recommend that the Minister of Planning make Interim Protection Orders (IPOs) to preserve areas of land that have natural, scientific or cultural significance that can include land with Aboriginal places or relics on it.

Particular Aboriginal places and items that the community has formally recognised as being of high cultural value can also be listed on the State Heritage Register. This provides an extra level of protection in addition to that provided by the *National Parks and Wildlife Act 1974*.

2.2.3.1 State Heritage Register Search

A search of the State Heritage Register for Taminda was carried out as part of preparing this SoHI (refer to Appendix I). No items listed on the State Heritage Register were identified within and/or abutting the Subject Area.

2.2.3.2 State Heritage Inventory Search

A search of the State Heritage Inventory (SHI) for Tamworth was undertaken as part of preparing this SoHI (refer to Appendix II). Table 2 shows the SHI places that are in proximity to the Subject Area.

Item	Address	Database Number	Significance	Relationship to the Subject Area
Tamworth Grandstand	Britten Road	2470010	Local	In the vicinity of the Subject Area (approximately 270m)

Table 2: State Heritage Inventory Items in the vicinity of the Subject Area

2.3 Local Government Controls

2.3.1 Tamworth Regional Local Environment Plan (2010)

Heritage is dealt with under Section 5.10 and Schedule 5 of the Tamworth Regional Local Environment Plan (LEP) 2010. Section 5.10 (1) outlines the objectives of the clause, including:

(a) to conserve Aboriginal objects and Aboriginal places of heritage significance.
(b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,
(c) to conserve archaeological sites,
(d) to conserve Aboriginal objects and Aboriginal places of heritage significance.

The clause states that development consent is required for the following activities:

(a) Demolishing or moving a heritage item, Aboriginal Object, or building within a conservation area;
(b) Altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item;
(c) Disturbing or excavating an archaeological site;
(d) Disturbing or excavating an Aboriginal place of heritage significance;
(e) Erecting a building on land on which an Aboriginal object is located, or that is within an Aboriginal place of significance;
(f) Subdividing land on land on which an Aboriginal object is located, or that is within an Aboriginal place of significance.

Section 5.10 (8) Specifically applies to Aboriginal Places of Heritage Significance and outlines the level of assessment and notification which needs to be undertaken for development affecting Aboriginal places, prior to granting development consents.

Schedule 5 – Environmental Heritage lists places of heritage significance registered on the local listing. These items are primarily European and post-contact sites, however occasionally Aboriginal places are listed at the local level,

2.3.1.1 Tamworth Regional LEP 2010 Schedule 5 Search Results

A search of the Schedule 5 was undertaken for the Subject Area. The heritage map from the LEP pertinent to the Subject Area is included as Appendix IV. Table 3 (refer to Figure 3) lists the heritage items located in proximity to the Subject Area.

Item	Address	Database Number	Significance	Relationship to the Subject Area
Tamworth Grandstand	Britten Road	I307	Local	In the vicinity of the Subject Area (approximately 270m)

Table 3: Tamworth Regional LEP 2010 Schedule 5 Items in proximity to the Subject Area

2.4 Non-Statutory Listings

The National Trust of Australia (NSW) is a community-based organisation with independently constituted Trusts in each state and territory. The NSW National Trust compiles a heritage list primarily of historic places, but they also include some Aboriginal and natural places. Listing helps to provide recognition and promote public appreciation and concern for local heritage.

The National Trust Register has no legal foundation or statutory power but is recognised as an authoritative statement on the significance to the community of particular items and is held in high esteem by the public.

2.4.1 Register of the National Estate Search

A search of the Register of the National Estate was undertaken as part of preparing this SoHI (0).

The Register of the National Estate (RNE) was closed in 2007 and is no longer a statutory list.

The RNE is maintained on a non-statutory basis as a publicly available archive and educational resource.

Items entered in the RNE prior to its closure in 2007 as identified as “registered”. The existence of an entry for a place in the RNE does not in itself create a requirement to protect the place under

Commonwealth law. Nevertheless, information in the register may continue to be current and may be relevant to statutory decisions about protection.

No items listed on the RNE were identified within and/or abutting the Subject Area.

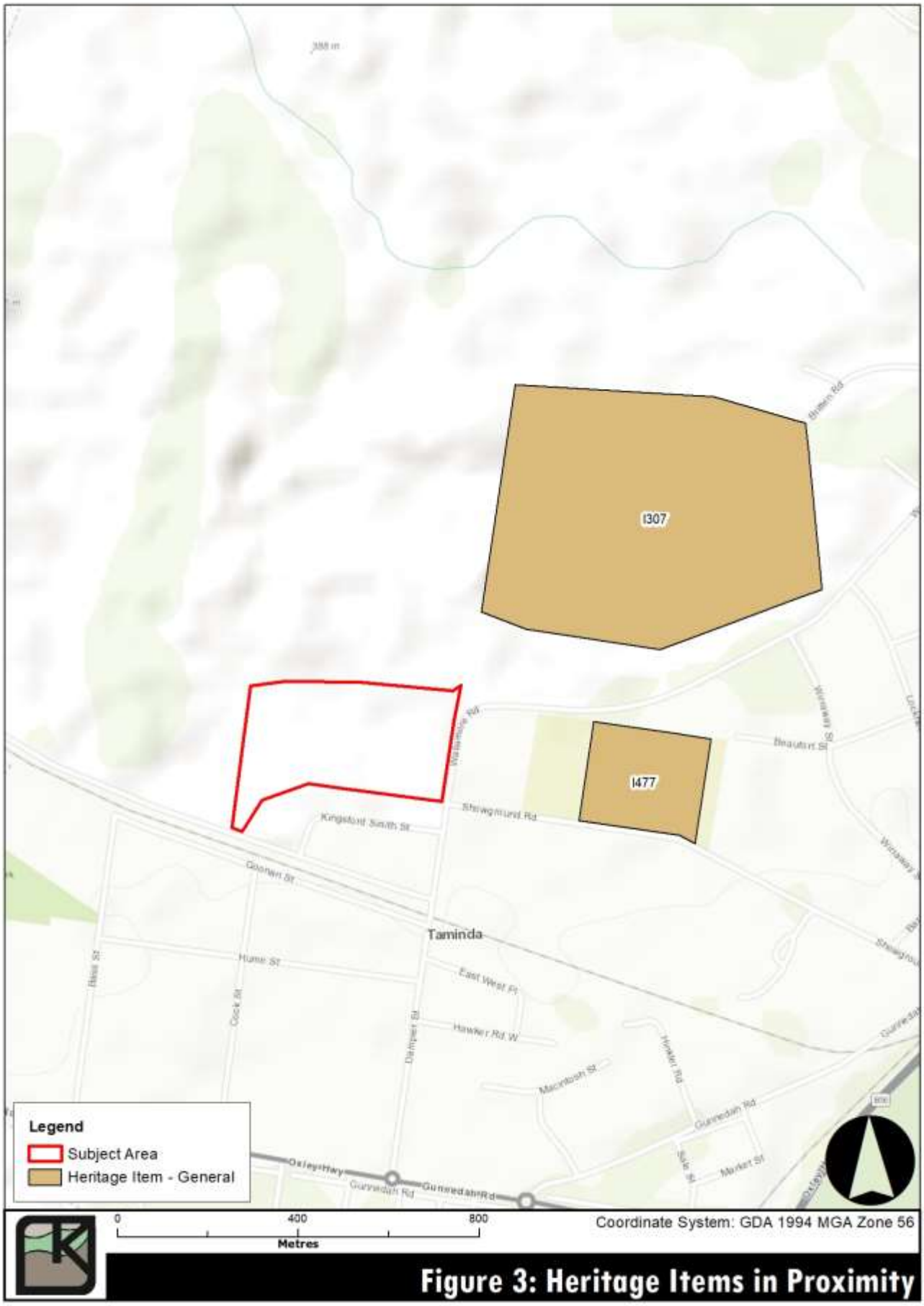


Figure 3: Heritage Items in Proximity

3 HISTORICAL OVERVIEW

3.1 Local Indigenous Groups

The oldest site identified within the Tamworth Region is Bendemeer II, dating to 4,950BP (Wilson & McAdam, 2000); although this is arguably a reflection of the lack of archaeological investigations within the region and preserved datable material rather than a reflection of actual occupation dates.

The Tamworth region and it's surrounds are generally accepted as having been originally inhabited by the Gamilaroi (also referred to as Komilaroi) people, who are recognised by researchers as the primary linguistic group for the greater New England Region (Tindale, 1974; Wilson & McAdam, 2000). Europeans identified a number of groups in the Tamworth region including the Goonoo Goonoo, Gunnedah, Manellae (people who traditionally utilised the Manilla River) and Moonb (Tindale, 1974). Carey (2006) dentifies two sub-communities of the Gamilaroi, who occupied the area now known as Tamworth: the Mooni, and the Goonoo Goonoo people. The Gamilaroi people spoke a range of dialects throughout the New England Region, with Wilson and McAdam (2000) commenting that there were two distinct groups – the Corbon Gamilaroi, who occupied areas surrounding the Peel River including Liverpool Plains, and the Gammon Gamilaroi, who occupied the southern part of the language territory.

European settlement had a devastating effect on the traditional life ways of the Kamilaroi. Violent conflicts between settlers and Aboriginal groups, disease and dispossession of land resulted in population decrease. Conflict in the district was not uncommon. Descendent of Thomas Bowman, one of the early landowners within the project area, passed on stories of Bowman working through the night to build fences to secure them from Aboriginal people (Boileau, 2007). One of the more violent recorded conflicts was the reprisal campaigns of Major James Nunn. Boileau (2007) describes the action thus:

> *"They travelled in a circuit north across the Nandewar Ranges through Archibald Bell's Barraba station, on to Thomas Hall's new station at Bingara, then to Snodgrass Lagoon on Waterloo Creek, midway between the Namoi and the Gwydir, where they massacred an estimated forty or fifty Aboriginal people who were camped there. On their return journey through the foothills the posse engaged in a typical frontier style 'mopping up' operation, hunting down and killing any Aborigine they encountered."*

3.2 The Beginnings of Settlement of Tamworth

The first Europeans to venture into the Tamworth region were led by John Oxley, in his expedition into the northern interior of New South Wales in 1818. Two further expeditions followed, Allan Cunningham's expedition skirted the western edge of Parry Shire in 1827, and Thomas Livingstone Mitchell's in 1831. The lands of the Peel River Valley were not the objective of these expeditions; however, Oxley named a number of the landscape features he saw along the journey, including the Peel River, named in honour of the Right Honourable Robert Peel. Thomas Livingstone Mitchell succeeded Oxley in the surveying of the area, preferring indigenous names for landscape features (EJE Town Planning, 2001). For example, Mount Barragundy was recorded as Warrigundi on his 1834 map and remained the official name for 130 years. The mountain was renamed Mount Terrible in 1967, and it is unsure if this name came from a convict corruption of the name Carrabobila to Terrible Billy, or as a result of the terrorisation of the Aboriginal people of New England. British

pastoralists followed these expeditions, as a result of Oxley's enthusiastic description of the Liverpool Plains and Peel Valley, stating (EJE Town Planning, 2001):

> *"it would be impossible to find a finer or more luxuriant country…the grass was most luxuriant; the timber good and not thick: in short no place in the world can afford more advantages to the industrious settler".*

3.3 Farming at Tamworth

The Australian Agricultural Company was the first major company to operate in the Tamworth region, with unbroken association from 1834 to 1985.

In 1833, 313,298 acres of the Liverpool Plains were granted to the Australian Agricultural Company, which was a British pastoral company (Jonathan Falk Planning Consultants Pty Ltd & Rodney Jensen and Associates Pty Ltd, 1988). Along with their sister company, the Peel River Land and Mineral Company, the Australian Agricultural Company owned most of the land west of Tamworth.

In the late 1820s, the government in Sydney introduced laws regarding Limits of Location – restricting settlement to a roughly 320km radius of Sydney. The Australian Agricultural Company's land grant exceeded this limit and encouraged individual pastoralists to also push these limits (EJE Town Planning, 2001). These settlers had no legal claim to lands, and simply set their cattle and sheep to pasture. Jonathan Falk Planning Consultants Pty Ltd and Rodney Jensen and Associates Pty Ltd (1988) commented that farming in the lands south of the Peel River primarily involved grazing animals on a temporary basis, with squatters using the land and shepherding their animals.

Sheep and cattle were grazed on the alluvial plains of the Peel River, and farming consisted primarily of crops such as wheat and, later, tobacco. The Tamworth region, specifically the Goonoo Goonoo estate owned by the Australian Agricultural Company, became known for wool (EJE Town Planning, 2001). The estate was fenced from the mid-1950s, which prevented the shepherding of sheep and was subsequently less cost effective (EJE Town Planning, 2001).

This ephemeral use of the land, and lack of legal claim, did not inspire these 'squatters' to make any improvements to the land, and thus no substantial buildings or structures were erected until after 1852 when minimal security was won by the squatters in the form of fourteen-year leases (EJE Town Planning, 2001).

The monopoly of the Australian Agricultural Company was brought to an end when the government resumed 99,519 acres under Closer Settlement legislation in 1909 (Jonathan Falk Planning Consultants Pty Ltd & Rodney Jensen and Associates Pty Ltd, 1988).

3.4 Nineteenth & Twentieth Centuries in Tamworth (Taminda)

The Tamworth region was one of the few large towns established outside of the metropolitan dominance of the regions of Sydney, Newcastle and Wollongong. Jonathan Falk Planning Consultants Pty Ltd and Rodney Jensen and Associates Pty Ltd (1988) attribute the success of Tamworth to the facilities provided to the region and the population.

The majority of the Tamworth region has historically been used for low intensity farming, involving sheep and cattle grazing on the plains. As mentioned in Section 3.3, the trial and success of more high intensity agricultural processes involving the planting of crops such as wheat, and later tobacco on the alluvial plains surrounding the Peel River in the nineteenth and twentieth centuries led to the expansion of farming in the area.

From the 1850s, Tamworth was a base for government services – initially land administration, police and the judiciary. With the extension of the railway line into West Tamworth in 1878 and East Tamworth in 1882, the city became a regional centre. Buildings such as the ANZ Bank, the Post Office and the Lands Department are considered by Jonathan Falk Planning Consultants Pty Ltd and Rodney Jensen and Associates Pty Ltd (1988) to be among the most outstanding built heritage items within the region.

In 1888, Tamworth became the first town in the colony to be lit by electricity (Jonathan Falk Planning Consultants Pty Ltd & Rodney Jensen and Associates Pty Ltd, 1988).

Between 1900-1902, the Tamworth region went into drought. The Australian Agricultural Company, by this point the Peel River Land and Mineral Company, suffered as a result. In 1908, the Wade government in New South Wales imposed a Compulsory Purchase Order on the company for 40,352 hectares in the vicinity of Tamworth (Including the current Subject Area). A further 32,805 acres were sold between 1925 and 1935, and a further 9,720 acres were compulsorily resumed for War Service Land Settlement in 1953. The remaining 4853ha was sold in auction in 1985, bringing the Company's monopoly in the region to a complete close (Jonathan Falk Planning Consultants Pty Ltd & Rodney Jensen and Associates Pty Ltd, 1988).

In 1908, domestic and industrial requirements for light and power led to the establishment of the local gas works, and a new power house was built in the town in 1922, providing power to the surrounding rural area – including Taminda (Jonathan Falk Planning Consultants Pty Ltd & Rodney Jensen and Associates Pty Ltd, 1988).

The Subject Area was part of the land grant to the Australian Agricultural Company (refer to Figure 4), that was included in a parcel of land that was subdivided and sold after the government resumed the land in 1909. The land remained zoned for farming.

Historic maps and land records show that in In June1909, Joseph Henry Starr purchased Lot 26 (Settlement Purchase No 1909/30), which corresponds to the eastern portion of the current Subject Area. In 1947, the Subject Area was outside of the bounds of the city of Tamworth; however, by 1964 the bounds of the city had changed and now encompassed the Subject Area (refer to Figure 5).

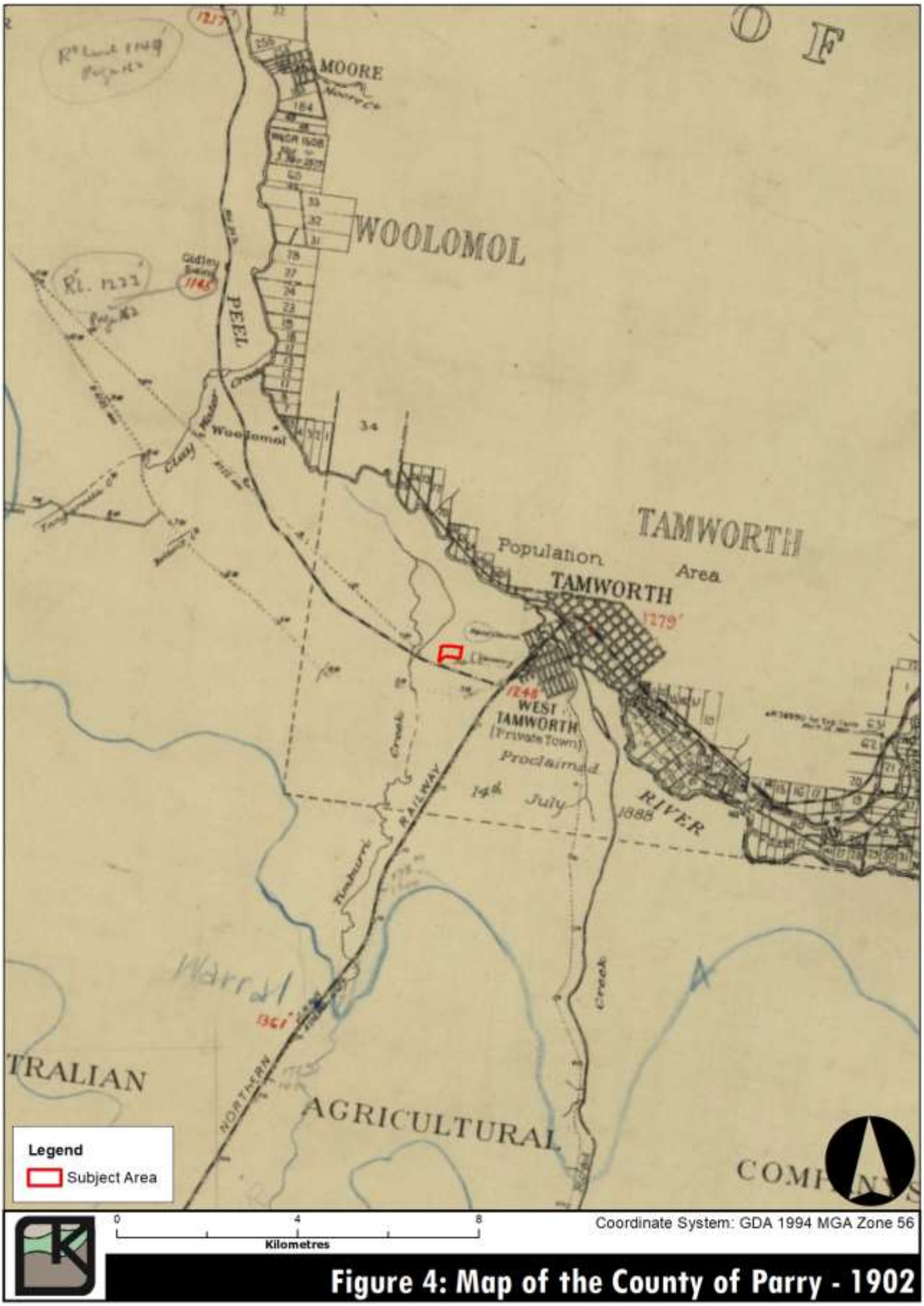


Figure 4: Map of the County of Parry - 1902

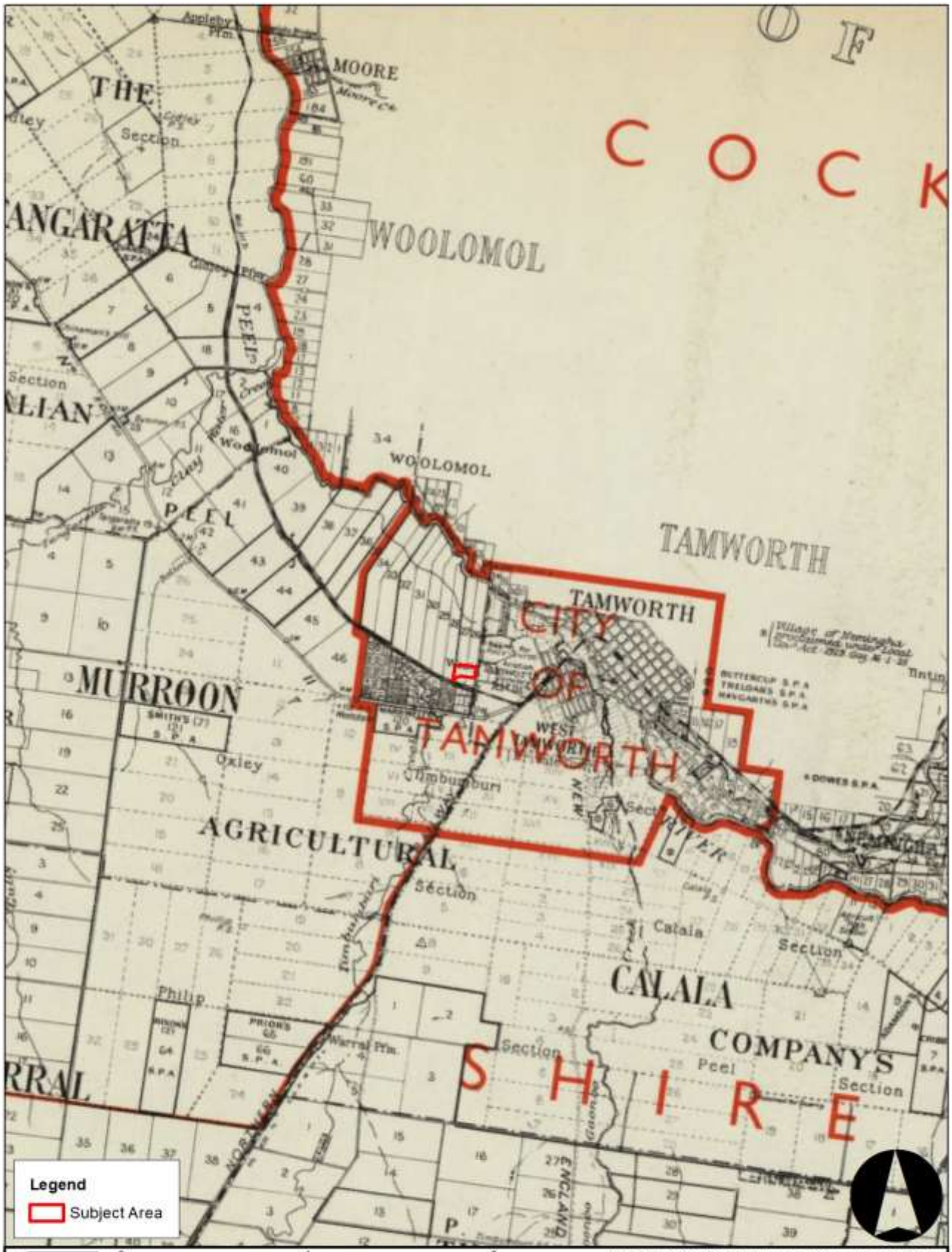


Figure 5: Map of the County of Parry - 1964

4 SIGNIFICANCE ASSESSMENT

4.1 Significance Criteria

An assessment of heritage significance encompasses a range of heritage criteria and values. The heritage values of a site or place are broadly defined as the 'aesthetic, historic, scientific or social values for past, present or future generations' (NSW Heritage Office, 2001). This means a place can have different levels of heritage value and significance to different groups of people.

The archaeological significance of a site is commonly assessed in terms of historical and scientific values, particularly by what a site can tell us about past lifestyles and people. There is an accepted procedure for determining the level of significance of an archaeological site.

A detailed set of criteria for assessing the State's cultural heritage was published by the (then) NSW Heritage Office. These criteria are divided into two categories: nature of significance, and comparative significance. Heritage assessment criteria in NSW fall broadly within the four significance values outlined in the Burra Charter. The Burra Charter has been adopted by State and Commonwealth heritage agencies as the recognised document for guiding best practice for heritage practitioners in Australia. The four significance values are:

- Historic significance. Concerned with the aesthetical, scientific and social qualities of an item; identifying significance between an item, cultural significance and change. Item is significant due to its association with or position in the evolving pattern of our cultural history
- Aesthetic significance. Concerned with the scenic and architectural values of an item and/or the creative achievement that it evidences. To fulfil this criterion an item has visual or sensory appeal, landmark qualities or shows creative or technical excellence.
- Technical/research significance. Concerned with the evaluation of an item in technical and research terms, which takes into consideration the archaeological, educational, industrial or research potential of a site. Items have significance in terms of their ability to make a contribution to a better understanding of cultural history, or their ability to present information to a wider community.
- Social significance. Concerned with the contemporary community's appreciation of the cultural record. Classification relies upon the social, spiritual or cultural relationship of an item and the community.

The NSW Heritage Office issued a more detailed set of assessment criteria to provide consistency with heritage agencies in other States and to avoid ambiguity and misinterpretation. These criteria are based on The Burra Charter. The following SHR criteria were gazetted following amendments to the Heritage Act that came into effect in April 1999:

- Criterion (a) - an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).
- Criterion (b) - an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).
- Criterion (c) - an item is important in demonstrating the aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).
- Criterion (d) - an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.

- Criterion (e) - an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).
- Criterion (f) - an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).
- Criterion (g) - an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments; or a class of the local area's cultural or natural places; or cultural or natural environment.

4.2 Assessment of Significance

The following assessment of significance is made using the Heritage Office manual's criteria (NSW Heritage Office, 1996).

CRITERION A - An item is important in the course, pattern, of NSW's cultural or natural history (or the cultural or natural history of a local area).

There is no known association between the Subject Area with importance to NSW's cultural or natural history (or the cultural or natural history of a local area).

The Subject Area **does not** satisfy this criterion.

CRITERION B - An item has strong and special association associated with the life and work of a person or groups of persons of importance to NSW's cultural or natural history (or the cultural or natural history of a local area).

There is no known association between the Subject Area with the life and work of a person or groups of persons of importance to NSW's cultural or natural history (or the cultural or natural history of a local area). Historical Evidence suggests use of the land upon which the Subject Area is situated would have been ephemeral in the early European settlement of the region.

The Subject Area **does not** satisfy this criterion.

CRITERION C - An item is important in demonstrating aesthetic characteristics and or/ a high degree of creative or technical achievement in NSW (or a local area).

No items demonstrating aesthetic characteristics and or/a high degree of creative or technical achievement were identified within the Subject Area.

The Subject Area **does not** satisfy this criterion.

CRITERION D - An item has strong or special associations with a particular community or cultural group in NSW (or local area).

No items associated with any particular community or cultural group were identified within the Subject Area.

The Subject Area **does not** satisfy this criterion.

CRITERION E - An item has the potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of a local area).

No items with the potential to yield information contributing to an understanding of NSW's cultural or natural history were identified within the Subject Area.

The Subject Area **does not** satisfy this criterion.

CRITERION F - An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of a local area).

No items possessing uncommon, rare of endangered aspects of NSWs cultural or natural history were identified within the Subject Area.

The Subject Area **does not** satisfy this criterion.

CRITERION G - An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.

No items important in demonstrating the principal characteristics or a class of NSWs cultural or natural places or environments were identified within the Subject Area.

The Subject Area **does not** satisfy this criterion.

4.3 Statement of Significance

The Subject Area comprises a rural landscape that has been utilised for agricultural purposes, primarily grazing and crop farming, throughout its history. The history of the Subject Area does not indicate any built structures, given the suggestion that use of the land south of the Peel River was used by squatters in a temporary nature; as the Subject Area was outside the limits of settlement (Jonathan Falk Planning Consultants Pty Ltd & Rodney Jensen and Associates Pty Ltd, 1988).

This assessment has concluded that the Subject Area does not hold any significance at either a local or state level.

5 HERITAGE IMPACT STATEMENT

The discussion of impacts to heritage can be centred upon a series of questions which must be answered as part of a SoHI which frame the nature of impact to a heritage item. The Heritage Manual Guideline (NSW Heritage Office, 1996) Statements of Heritage Impact includes a series of questions to indicate the criterion which must be answered. These are:

- How is the proposed curtilage allowed around the heritage item appropriate?
- Could future development that results from this development compromise the significance of the heritage item? How has this been minimised?
    - Could future development that results from this development affect views to, and from, the heritage item?
- What has been done to minimise negative affects?

Based upon the discussion of Impacts to heritage items, impact to these items can be quantified under three main categories: direct impacts, indirect impacts and no impact. These kinds of impacts are dependent on the proposed impacts, nature of the heritage item and its associated curtilage.

Direct impacts

Direct impacts are where the completion of the proposed development will result in a physical loss or alteration to a heritage item which will impact the heritage value or significance of the place. Direct impacts can be divided into whole or partial impacts. Whole impacts essentially will result in the removal of a heritage item as a result of the development where as partial impacts normally constitute impacts to a curtilage or partial removal of heritage values. For the purposes of this assessment direct impacts to heritage items have been placed into the following categories:

- Physical impact - whole: where the development will have a whole impact on a heritage item resulting in the complete physical loss of significance attributed to the item.
- Physical impact - partial: where the project will have a partial impact on an item which could result in the loss or reduction in heritage significance. The degree of impact through partial impacts is dependent on the nature and setting of a heritage item. Typically, these impacts are minor impacts to a small proportion of a curtilage of an item or works occurring within the curtilage of a heritage item which may impact on its setting (i.e. gardens and plantings).

Indirect impacts

Indirect impacts to a heritage item relate to alterations to the environment or setting of a heritage item which will result in a loss of heritage value. This may include permanent or temporary visual, noise or vibration impacts caused during construction and after the completion of the development. Indirect impacts diminish the significance of an item through altering its relationship to its surroundings; this in turn impacts its ability to be appreciated for its historical, functional or aesthetic values. For the purposes of this assessment impacts to heritage items have been placed into the following categories:

- Visual impact;
- Noise impact; and,
- Vibration impact.

Cumulative impacts

Cumulative impacts relate to minimal or gradual impacts from a single or multiple development upon heritage values. A cumulative impact would constitute a minimal impact being caused by the proposed development which over time may result in the partial or total loss of heritage value to the Subject Area or associated heritage item. Cumulative impacts may need to be managed carefully over the prolonged period of time.

No impact

This is where the project does not constitute a measurable direct or indirect impact to the heritage item. The industrial rezoning and solar farm installation at the Subject Area will not result in any impacts, either direct or indirect, to any items of heritage significance or value.

5.1 Heritage Impact Statement

The proposed rezoning of 55 Dampier Street, Taminda will not result in any impacts, either direct or indirect, to any items of heritage significance or value.

6 OBLIGATIONS AND RECOMMENDATIONS

The following management principles and recommendations are based on:

- The legal requirements of the *Heritage Act 1977*, whereby it is illegal to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit;
- The findings presented within this Statement of Heritage Impact; and,
- Recognition of the extended period of which development activities will occur within the Subject Area.

6.1 Obligations

1. Any development likely to impact the heritage significance of a State Significant Heritage Item will require a permit under Section 60 of the *Heritage Act 1977* prior to works being undertaken.
2. An Excavation Permit Exception under Section 134(4) of the *Heritage Act 1977* is necessary to authorise any disturbance or excavation of land known to or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed.
3. In accordance with Clause 5.10 of the Tamworth LEP 2010, Development Applications for heritage items, heritage conservation areas and in the vicinity of either will require a heritage management document to be prepared which assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned.

6.2 Recommendations

KAS recommends the following:

1. No further assessment of the historic heritage within the Subject Area is required prior to the commencement of the proposed works (refer to Section 1.2). Should the design and/or extent of the proposed development be altered, further archaeological assessment may be required;
2. Prior to the commencement of works, all relevant staff and contractors should be made aware of their statutory obligations for heritage under the *Heritage Act 1977*, which may be implemented as a heritage induction;
3. If unrecorded Aboriginal object or objects are identified in the Subject Area during works, then all works in the immediate area must cease and the area should be cordoned off. OEH must be notified by ringing the Enviroline 131 555 so that the site can be adequately assessed and managed;
4. In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, OEH must be contacted by ringing the Enviroline 131 555. An OEH officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the relevant Aboriginal stakeholders before works recommence; and,

5. If, during the course of development works, suspected historic cultural heritage material is uncovered, work should cease in that area immediately. The Heritage Branch, Office of Environment & Heritage (Enviroline 131 555) should be notified and works only recommence when an approved management strategy has been developed.

7 REFERENCES

Boileau, J. (2007). *Thematic History of Nundle, Manilla and Barraba: Tamworth Regional Council Community Based Heritage Study*. Report for Tamworth Regional Council.

Carey, J. (2006). *Tamworth and Districts: Early History*. Report for Tamworth Regional Council: Tamworth.

EJE Town Planning. (2001). *Parry Shire community based heritage study : draft report*. Newcastle.

HO & DUAP. (2002). *Statements of Heritage Impact Guidelines*. report for Heritage Office and Department of Urban Affairs and Planning.

ICOMOS. (1999). *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter)*. Canberra: Australia ICOMOS.

Jonathan Falk Planning Consultants Pty Ltd, & Rodney Jensen and Associates Pty Ltd. (1988). *Tamworth Heritage Study: Final Report.* (Vol. 1: Heritage Study). Prepared for Tamworth City Council and Department of Environment and Planning

NSW Heritage Office. (1996). *NSW Heritage Manual*. Sydney: Department of Urban Affairs & Planning and NSW Heritage Office.

NSW Heritage Office. (2001). Assessing Heritage Significance. In *NSW Heritage Office*.

Tindale, N. B. (1974). *Aboriginal Tribes of Australia - Their Terrain, Environmental Controls, Distribution, Limits and Proper Names*. Canberra: Australian National University Press.

Wilson, J., & McAdam, L. (2000). *The Tamworth Aboriginal/Archaeological Site Study*. Prepared for Tamworth City Council.

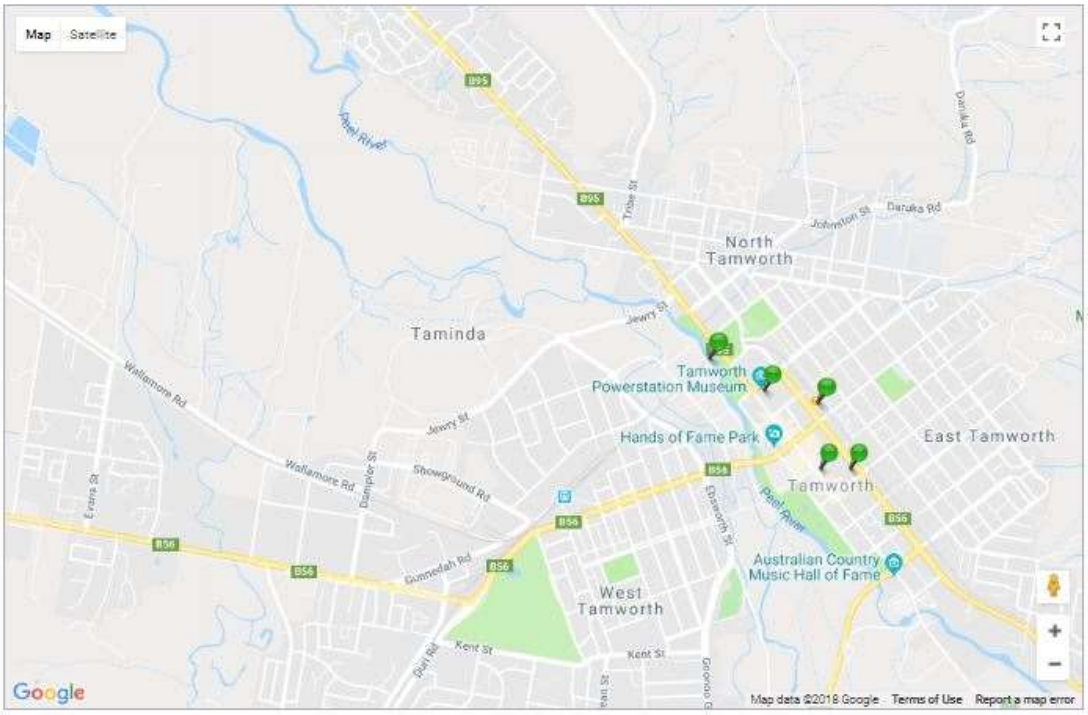
APPENDIX I. State Heritage Register Search Results

Location information for some Aboriginal Places (e.g. burial grounds and sacred sites) have been generalised because of their cultural sensitivity. Location information for restricted Aboriginal Places is not shown at all. If an activity or development is proposed that may potentially impact on or harm (i.e., damage, deface or destroy) an Aboriginal Place, then proponents must undertake a search for the exact boundaries of Aboriginal Places through **AHIMS Web Services**.

Downloading of State Heritage Register spatial datasets and associated metadata into a Geographical Information System (GIS) software package is available through **Data NSW**

Listing Type:	◉ All ○ Aboriginal Places ○ State Heritage Register
Local government area:	Please Choose...
Item name/Database ID:	
SHR number:	
Location:	tamworth
Local Aboriginal Land Council (LALC):	Please Choose...
State theme:	Please Choose...
Item type:	Please Choose...
Item Group:	Please Choose...
Item category:	Please Choose...

Search Reset



Appendix II. State Heritage Inventory Search – Tamworth

government agencies.

Section 1. Aboriginal Places listed under the National Parks and Wildlife Act.

Your search returned 1 record.

Aboriginal place name	Local government area	Local Aboriginal Land Council	Latitude	Longitude	Gazettal date and page numbers	Comments
Inglebah	Walcha	Tamworth	-31.1702086667	151.451583542	12/21/2007 p. 10680	

Section 2. Items listed under the NSW Heritage Act.

Your search returned 6 records.

Item name	Address	Suburb	LGA	SHR
Dominican Roman Catholic Convent	Marius Street	Tamworth (East)	Tamworth Regional	00122
King George V Avenue of Memorial English Oaks	King George V Memorial Avenue	Tamworth (East)	Tamworth Regional	01922
Tamworth Peel Barracks	Peel Street (cnr)	Tamworth	Tamworth Regional	00550
Tamworth Post Office	Fitzroy Street	Tamworth	Tamworth Regional	01421
Tamworth rail bridge over Peel River	Main Northern railway 454.125 km	Tamworth	Tamworth Regional	01058
Tamworth Railway Station, yard group and movable relics	Main Northern railway	Tamworth	Tamworth Regional	01260

Section 3. Items listed by Local Government and State Agencies.

Your search returned 249 records.

Item name ▲	Address	Suburb	LGA	Information source
ANZ Bank Building	429 Peel Street	Tamworth	Tamworth Regional	LGOV
Anzac Park Gates	Brisbane Street	Tamworth	Tamworth Regional	LGOV
Anzac Park Gazebo	Brisbane Street	Tamworth	Tamworth Regional	LGOV
Australian Winter Cereal Collection	Calala Lane	Tamworth	Tamworth Regional	SGOV
Baptist Church	86 Carthage Street	Tamworth	Tamworth Regional	LGOV
Calrosey School	140 Brisbane Street	Tamworth	Tamworth Regional	LGOV
Central Hotel	330-334 Peel Street	Tamworth	Tamworth Regional	LGOV
Chaffey Dam	Peel River	Tamworth	Tamworth Regional	SGOV
Commercial Building	30-32 Darling Street	Tamworth	Tamworth Regional	LGOV
Commercial Building	226 Peel Street	Tamworth	Tamworth Regional	LGOV
Commonwealth Bank Building	404 Peel Street	Tamworth	Tamworth Regional	LGOV
Community Centre	Darling Street	Tamworth	Tamworth Regional	LGOV
Cottage	46 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	47 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	48 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	51 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	37 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	39 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	41 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	44 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	54 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Cottage	56 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
Courthouse Hotel	232 Peel Street	Tamworth	Tamworth Regional	LGOV

Durham	Calala Lane	Tamworth	Tamworth Regional	SGOV
East Tamworth Station Pedestrian Bridge	Bourke Street	Tamworth	Tamworth Regional	LGOV
Eastern Railway Viaduct	Peel Street	Tamworth	Tamworth Regional	LGOV
Electrical Showroom	Peel Street	Tamworth	Tamworth Regional	LGOV
Goonoo Goonoo Station - Group of Buildings	Goonoo Goonoo New England Highway	Tamworth	Tamworth Regional	LGOV
Grandstand (at race track)	Britten Road	Tamworth	Tamworth Regional	LGOV
Group of shops	164 Peel Street	Tamworth	Tamworth Regional	LGOV
Group of Shops	235-237 Peel Street	Tamworth	Tamworth Regional	LGOV
Group of Shops	239 Peel Street	Tamworth	Tamworth Regional	LGOV
Herbarium	Calala Lane	Tamworth	Tamworth Regional	SGOV
Hospital - Allamble	100 Marius Street	North Tamworth	Tamworth Regional	LGOV
Hotel - Joe Maguires Pub	146-148 Peel Street	Tamworth	Tamworth Regional	LGOV
Hotel & Shops	395-401 Peel Street	Tamworth	Tamworth Regional	LGOV
House	29 Napier Street	Tamworth	Tamworth Regional	LGOV
House	31 Napier Street	Tamworth	Tamworth Regional	LGOV
House	29 Parry Street	West Tamworth	Tamworth Regional	LGOV
House	48-50 Peel Street	Tamworth	Tamworth Regional	LGOV
House	64 Raglan Street	Tamworth	Tamworth Regional	LGOV
House	10 Rawson Avenue	Tamworth	Tamworth Regional	LGOV
House	14 Rawson Avenue	Tamworth	Tamworth Regional	LGOV
House	19 Rawson Avenue	Tamworth	Tamworth Regional	LGOV
House	65 Roderick Street	Tamworth	Tamworth Regional	LGOV
House	79 Roderick Street	Tamworth	Tamworth Regional	LGOV
House	24 Upper Street	Tamworth	Tamworth Regional	LGOV
House	46 White Street	Tamworth	Tamworth Regional	LGOV
House	74-96 King George Avenue	Tamworth	Tamworth Regional	LGOV

House	34 White Street	Tamworth	Tamworth Regional	LGOV
House	55 Upper Street	Tamworth	Tamworth Regional	LGOV
House	57 Upper Street	Tamworth	Tamworth Regional	LGOV
House	59 Upper Street	Tamworth	Tamworth Regional	LGOV
House	100 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	142 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	26 Darling Street	Tamworth	Tamworth Regional	LGOV
House	79 Church Street	West Tamworth	Tamworth Regional	LGOV
House	95 Crown Street	West Tamworth	Tamworth Regional	LGOV
House	97 Crown Street	West Tamworth	Tamworth Regional	LGOV
House	150 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	153 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	170 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	61 Darling Street	Tamworth	Tamworth Regional	LGOV
House	63 Darling Street	Tamworth	Tamworth Regional	LGOV
House	89 Denison Street	West Tamworth	Tamworth Regional	LGOV
House	91 Denison Street	West Tamworth	Tamworth Regional	LGOV
House	99 Denison Street	West Tamworth	Tamworth Regional	LGOV
House	100-102 Bourke Street	North Tamworth	Tamworth Regional	LGOV
House	123 Brisbane Street	Tamworth	Tamworth Regional	LGOV
House	129 Brisbane Street	Tamworth	Tamworth Regional	LGOV
House	64 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	75 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	77 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	79 Carthage Street	Tamworth	Tamworth Regional	LGOV

House	94-96 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	95 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	59 Fitzroy Street	Tamworth	Tamworth Regional	LGOV
House	86 Marius Street	Tamworth	Tamworth Regional	LGOV
House	144 Marius Street	Tamworth	Tamworth Regional	LGOV
House	50 White Street	Tamworth	Tamworth Regional	LGOV
House	123 Marius Street	Tamworth	Tamworth Regional	LGOV
House	150 Marius Street	Tamworth	Tamworth Regional	LGOV
House	26 Gipps Street	West Tamworth	Tamworth Regional	LGOV
House	68 Griffin Avenue	East Tamworth	Tamworth Regional	LGOV
House	94 Griffin Avenue	Tamworth	Tamworth Regional	LGOV
House	65 Hill Street	Tamworth	Tamworth Regional	LGOV
House	14 Gipps Street	West Tamworth	Tamworth Regional	LGOV
House	15 Gipps Street	Tamworth	Tamworth Regional	LGOV
House	17 Gipps Street	Tamworth	Tamworth Regional	LGOV
House	56 White Street	Tamworth	Tamworth Regional	LGOV
House	77 White Street	Tamworth	Tamworth Regional	LGOV
House	38 Upper Street	Tamworth	Tamworth Regional	LGOV
House	40 Upper Street	Tamworth	Tamworth Regional	LGOV
House	44 Upper Street	Tamworth	Tamworth Regional	LGOV
House	83 Upper Street	Tamworth	Tamworth Regional	LGOV
House	89 Upper Street	Tamworth	Tamworth Regional	LGOV
House	204-208 Marius Street	Tamworth	Tamworth Regional	LGOV
House	98 Griffin Avenue	Tamworth	Tamworth Regional	LGOV
House	33 Hill Street	Tamworth	Tamworth Regional	LGOV

House	43 Hill Street	Tamworth	Tamworth Regional	LGOV
House	2-24 King George Avenue	Tamworth	Tamworth Regional	LGOV
House	16 Macquarie Street	North Tamworth	Tamworth Regional	LGOV
House	18 Macquarie Street	Tamworth	Tamworth Regional	LGOV
House	76 Fitzroy Street	Tamworth	Tamworth Regional	LGOV
House	96 Fitzroy Street	Tamworth	Tamworth Regional	LGOV
House	98 Fitzroy Street	Tamworth	Tamworth Regional	LGOV
House	122 Fitzroy Street	Tamworth	Tamworth Regional	LGOV
House	46 White Street	Tamworth	Tamworth Regional	LGOV
House	19 Gipps Street	West Tamworth	Tamworth Regional	LGOV
House	79 White Street	Tamworth	Tamworth Regional	LGOV
House	141A-141B Brisbane Street	Tamworth	Tamworth Regional	LGOV
House	102 Brisbane Street	Tamworth	Tamworth Regional	LGOV
House	34 Bourke Street	North Tamworth	Tamworth Regional	LGOV
House	36 Bourke Street	North Tamworth	Tamworth Regional	LGOV
House	149 Brisbane Street	Tamworth	Tamworth Regional	LGOV
House	43 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	45 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	47 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	81 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	89 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	134 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	136 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	140 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	8 Darling Street	Tamworth	Tamworth Regional	LGOV
House	10 Darling Street	Tamworth	Tamworth Regional	LGOV

House	16 Darling Street	Tamworth	Tamworth Regional	LGOV
House	178 Carthage Street	Tamworth	Tamworth Regional	LGOV
House	15 Church Street	West Tamworth	Tamworth Regional	LGOV
House	65 Church Street	West Tamworth	Tamworth Regional	LGOV
House	75 Church Street	West Tamworth	Tamworth Regional	LGOV
House	77 Church Street	West Tamworth	Tamworth Regional	LGOV
House	65 Darling Street	Tamworth	Tamworth Regional	LGOV
House	67 Darling Street	Tamworth	Tamworth Regional	LGOV
House	69 Darling Street	Tamworth	Tamworth Regional	LGOV
House	67 Denison Street	West Tamworth	Tamworth Regional	LGOV
House	93 Denne Street	West Tamworth	Tamworth Regional	LGOV
House	95 Denne Street	West Tamworth	Tamworth Regional	LGOV
House	115 Denne Street	West Tamworth	Tamworth Regional	LGOV
House	96-98 Evans Street	Tamworth	Tamworth Regional	LGOV
House	21 Gipps Street	West Tamworth	Tamworth Regional	LGOV
House	22 Gipps Street	West Tamworth	Tamworth Regional	LGOV
House	52 White Street	Tamworth	Tamworth Regional	LGOV
House	46A White Street	Tamworth	Tamworth Regional	LGOV
House	47 White Street	Tamworth	Tamworth Regional	LGOV
House	66A Napier Street	Tamworth	Tamworth Regional	LGOV
House	King George Avenue	Tamworth	Tamworth Regional	LGOV
House	116 North Street	Tamworth	Tamworth Regional	LGOV
House	130 North Street	Tamworth	Tamworth Regional	LGOV
House	132 North Street	Tamworth	Tamworth Regional	LGOV
House	28 Piper Street	North Tamworth	Tamworth Regional	LGOV
House	42 Raglan Street	Tamworth	Tamworth Regional	LGOV

House	21 Rawson Avenue	Tamworth	Tamworth Regional	LGOV
House	23 Rawson Avenue	Tamworth	Tamworth Regional	LGOV
House	62 Rawson Avenue	Tamworth	Tamworth Regional	LGOV
House	35 Roderick Street	Tamworth	Tamworth Regional	LGOV
House	117 Upper Street	Tamworth	Tamworth Regional	LGOV
House	119 Upper Street	Tamworth	Tamworth Regional	LGOV
House	121 Upper Street	Tamworth	Tamworth Regional	LGOV
House - Avondale	66 Napier Street	Tamworth	Tamworth Regional	LGOV
House - Broma-grove	72 White Street	East Tamworth	Tamworth Regional	LGOV
House - Calala	138-144 Denison Street	West Tamworth	Tamworth Regional	LGOV
House - Carrick	120 Denison Street	West Tamworth	Tamworth Regional	LGOV
House - Girrawilla	62 Napier Street	Tamworth	Tamworth Regional	LGOV
House - Glen Evilly	53-55 White Street	Tamworth	Tamworth Regional	LGOV
House - Glen Moor	106 Brisbane Street	Tamworth	Tamworth Regional	LGOV
House - Glenbrook	Nundle Road	Tamworth	Tamworth Regional	LGOV
House - Marius Cottage	112 Marius Street	Tamworth	Tamworth Regional	LGOV
House - Minna-murra	69 White Street	Tamworth	Tamworth Regional	LGOV
House - Salona	90 Carthage Street	Tamworth	Tamworth Regional	LGOV
House - St Austel	130 Marius Street	Tamworth	Tamworth Regional	LGOV
House - Strathmore	11 Gipps Street	West Tamworth	Tamworth Regional	LGOV
House - The Cottage	141 Marius Street	Tamworth	Tamworth Regional	LGOV
House - The Pines	26 Hill Street	Tamworth	Tamworth Regional	LGOV
House (Square Man Hotel)	185-189 Peel Street	Tamworth	Tamworth Regional	LGOV
House beside Retreat Theatre	63 Bridge Street	West Tamworth	Tamworth Regional	LGOV
House - Shield Hill	32 Upper Street	Tamworth	Tamworth Regional	LGOV
Houses	51 & 53 Upper Street	Tamworth	Tamworth	LGOV

Houses	51 & 53 Upper Street	Tamworth	Tamworth Regional	LGOV
Imperial Hotel	181-195 Marius Street	Tamworth	Tamworth Regional	LGOV
Industrial Building	134 Peel Street	Tamworth	Tamworth Regional	LGOV
Insect and Associates Collection	Calala Lane	Tamworth	Tamworth Regional	SGOV
Lands Office	25 Fitzroy Street	Tamworth	Tamworth Regional	LGOV
Local Lights	Endeavour Drive	Tamworth	Tamworth Regional	LGOV
Main Block	Dean Street	Tamworth	Tamworth Regional	SGOV
Main Group of Hospital Buildings	Johnston Street	Tamworth	Tamworth Regional	LGOV
Marius Cottage	112 Marius Street	Tamworth	Tamworth Regional	SGOV
Masonic Temple	462-464 Peel Street	Tamworth	Tamworth Regional	LGOV
Monument	Tribe Street	Tamworth	Tamworth Regional	LGOV
Monuments at the Tamworth Cemetery	Showground Road	Tamworth	Tamworth Regional	LGOV
National Australia Bank-Building	400-401 Peel Street	Tamworth	Tamworth Regional	LGOV
Office Building	260-264 Peel Street	Tamworth	Tamworth Regional	LGOV
OFT Movable Heritage - Weights & Measures	Bradfield Road	West Lindfield	Willoughby	SGOV
OFT Movable Heritage - Weights & Measures		Newcastle	Newcastle	SGOV
OFT Movable Heritage - Weights & Measures		Grafton	Clarence Valley	SGOV
OFT Movable Heritage - Weights & Measures		Coffs Harbour	Coffs Harbour	SGOV
OFT Movable Heritage - Weights & Measures		Tamworth	Tamworth Regional	SGOV
Old Convent Building	223-227 Marius Street	Tamworth	Tamworth Regional	LGOV
Old Courthouse Building	2 Darling Street	Tamworth	Tamworth Regional	LGOV
Old Flour Mill	175-179 Peel Street	Tamworth	Tamworth Regional	LGOV
Old Hotel Building	143-145 Marius Street	Tamworth	Tamworth Regional	LGOV
Post Office	402A Peel Street	Tamworth	Tamworth Regional	LGOV
Power House Monument	Armidale Road	Tamworth	Tamworth Regional	LGOV
Power House Motel	248 Marius Street	Tamworth	Tamworth Regional	LGOV

Public State Building (Mechanics Institute)	87 Brisbane Street	Tamworth	Tamworth Regional	LGOV
Railway Bridge	Peel Street	Tamworth	Tamworth Regional	LGOV
Regent Cinema	3-5 Brisbane Street	Tamworth	Tamworth Regional	LGOV
Retreat Theatre	Bridge Street	West Tamworth	Tamworth Regional	LGOV
School Residence	126 Brisbane Street	Tamworth	Tamworth Regional	LGOV
Shop	265-267 Peel Street	Tamworth	Tamworth Regional	LGOV
Shop	277 Peel Street	Tamworth	Tamworth Regional	LGOV
Shopfront Glass	76-80 Brisbane Street	Tamworth	Tamworth Regional	LGOV
Shops	465-469 Peel Street	Tamworth	Tamworth Regional	LGOV
Slab Hut near Calala	138-144 Denison Street	Tamworth	Tamworth Regional	LGOV
St Andrews Church	152-154 Marius Street	Tamworth	Tamworth Regional	LGOV
St. John's Church	102 Carthage Street	Tamworth	Tamworth Regional	LGOV
St. Nicholas Church	18 White Street	Tamworth	Tamworth Regional	LGOV
St. Paul's Church	63 Bridge Street	West Tamworth	Tamworth Regional	LGOV
Tamworth Centre for Crop Improvement	Calala Lane	Tamworth	Tamworth Regional	SGOV
Tamworth Correctional Centre	Johnston Street	Tamworth	Tamworth Regional	LGOV
Tamworth Correctional Centre	Dean Street, corner 154 Johnston Street	Tamworth	Tamworth Regional	SGOV
Tamworth Correctional Centre - Administration	Dean Street, corner 154 Johnston Street	Tamworth	Tamworth Regional	SGOV
Tamworth Correctional Centre - Cell Block	Dean Street, corner 154 Johnston Street	Tamworth	Tamworth Regional	SGOV
Tamworth Correctional Centre - Dry Cell	Dean Street, corner 154 Johnston Street	Tamworth	Tamworth Regional	SGOV
Tamworth Correctional Centre - Gatehouse & Visitors	Dean Street, corner 154 Johnston Street	Tamworth	Tamworth Regional	SGOV
Tamworth Correctional Centre - Internal Administration Buildings	Dean Street, corner 154 Johnston Street	Tamworth	Tamworth Regional	SGOV
Tamworth Correctional Centre - Walls & Towers	Dean Street, corner 154 Johnston Street	Tamworth	Tamworth Regional	SGOV
Tamworth Court House	Marius and Fitzroy Street	Tamworth	Tamworth Regional	SGOV
Tamworth East Zone Substation	Cockburn Street	Tamworth	Tamworth Regional	SGOV
Tamworth Gatekeeper's residence	20 Darling Street	Tamworth	Tamworth Regional	SGOV

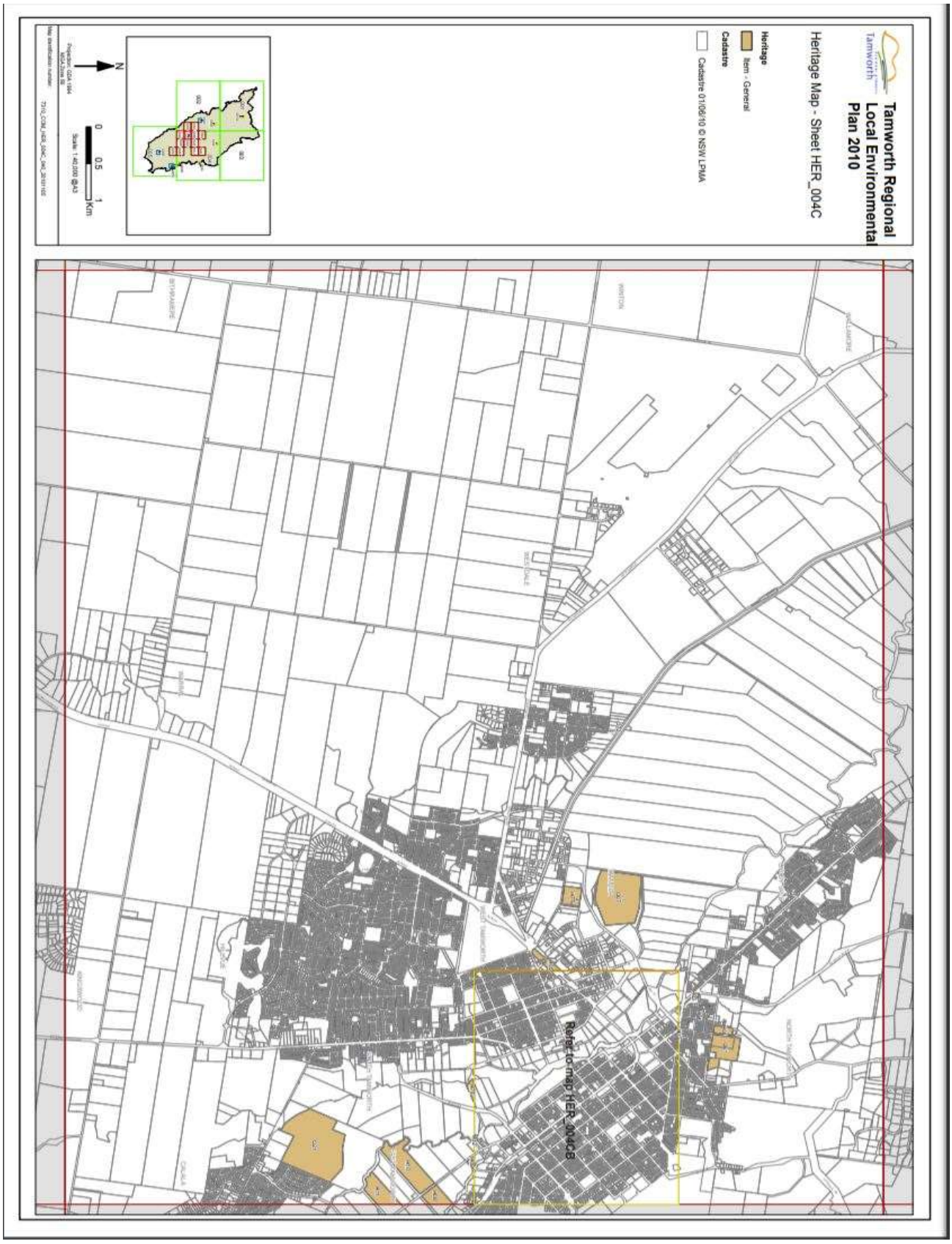
Tamworth Hotel	147 Marius Street	Tamworth	Tamworth Regional	LGOV
Tamworth Primary School	Upper Street	Tamworth	Tamworth Regional	LGOV
Tamworth Railway Footbridge	456.040km Northern Railway Line, Bourke Street	Tamworth	Tamworth Regional	SGOV
Tamworth Railway Station	Marius Street	Tamworth	Tamworth Regional	SGOV
Tamworth Railway Station	Marius Street	Tamworth	Tamworth Regional	LGOV
Tamworth, Former Station Master's Residence	34 Bourke Street	Tamworth	Tamworth Regional	SGOV
Tamworth, Peel River Underbridge	454.125km Northern Railway Line	Tamworth	Tamworth Regional	SGOV
Tamworth, Peel Street Underbridge	454.187km Northern Line, Peel Street	Tamworth	Tamworth Regional	SGOV
Tobacco Kiln	119-139 King George Avenue	Tamworth	Tamworth Regional	LGOV
Tobacco Kiln	Scott Road	Tamworth	Tamworth Regional	LGOV
Tobacco Kiln	73-95 King George Avenue	Tamworth	Tamworth Regional	LGOV
Town Hall	26-30 Fitzroy Street	Tamworth	Tamworth Regional	LGOV
War Memorial	Gipps Street	Tamworth	Tamworth Regional	LGOV
Wells	Scott Road	Tamworth	Tamworth Regional	LGOV
Wells adjacent to Peel River	Scott Road	Tamworth	Tamworth Regional	LGOV
Wesleyan Church	144 Marius Street	Tamworth	Tamworth Regional	LGOV
West Tamworth Railway Station	In Street	West Tamworth	Tamworth Regional	SGOV
West Tamworth Railway Station	In and Outs Streets	West Tamworth	Tamworth Regional	LGOV
Western Railway Viaduct	Peel Street	Tamworth	Tamworth Regional	LGOV
Yellow Box Stand	Calala Lane	Tamworth	Tamworth Regional	SGOV

There was a total of 256 records matching your search criteria.

APPENDIX III. Register of the National Estate Search Results



Appendix IV. Tamworth Regional Council Local Environment Plan 2010



9.8 Flood impact and riparian assessment report

TAMINDA TAMWORTH PLANNING PROPOSAL

PROPOSED REZONING TO INDUSTRIAL LAND

FLOOD IMPACT AND RIPARIAN LAND ASSESSMENT

July 2020

Prepared by

Mark Tooker

Director

Tooker and Associates

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FIGURES

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Figure 2	Site Plan
Figure 3	Existing 100 yr ARI Flood Extent
Figure 4	Proposed Development
Figure 5	Proposed Fill Levels or Levee Crest Levels
Figure 6	Proposed Regrading Levels and Depths in New Flood Flow Path
Figure 7	Impact on 100 yr ARI flood Levels
Figure 8	Impact on 20 year ARI flood levels
Figure 9	100 year ARI flood velocities
Figure 10	20 year ARI flood velocities
Figure 11	1:25,000 Topographic Map

1. Introduction

It is proposed to rezone Lots 2 and 3 DP 1234850 in the Racecourse West Development site to employment land (refer Figure 1). The Planning Proposal for this rezoning is being prepared by Elton Consulting on behalf of Chan Abbey Holdings. This report has been prepared to support the Planning Proposal and deals with the potential impacts on the flooding behaviour and impacts on waterfront land as defined by the Water Management Act 2000.

This report was prepared by Mark Tooker from Tooker and Associates who has over 35 years experience in flood impact assessments and management of riparian land under the Water Management Act 2000.

2. Site Description

The proposed rezoning site is located in the western area of the Tamworth urban area (refer Figure 1) and consists of part of the Racecourse West Development site (30ha) on 2 and 3 DP 1234850 (refer Figure 2) over an area of approximately 9 ha. The lot immediately to the west is known as Somerset Farm (Lot 60 DP 1227482). Chan Abbey Holdings own both the Racecourse West Development site and Somerset Farm. While Somerset Farm will not be rezoned, it will be partially regraded as part of the flood mitigation works to ensure that the development on the rezoning lots do not adversely impact the flooding behaviour on adjacent properties.

The Racecourse West Development site has a common boundary on the eastern side with the Tamworth Racecourse and the existing Taminda industrial area on the southern side. The overall width of the two lots is approximately 465m (in an east west direction) and its length over the proposed rezoning area is approximately 245m. The land is very flat and falls to the Peel River in the north at a grade of approximately 0.3%.

The Somerset Farm site is approximately 250m wide and its southern boundary fronts onto Wallamore Road. The farmhouse and sheds are located on land approximately 300m from Wallamore Road on a higher parcel of land which appears to have been filled in the past to be at or just above the 100 yr ARI flood level. Otherwise the land would generally slope down towards the north at the same grade as for the Racecourse West Development site.

The lots containing the Somerset Farm and Racecourse West Development area extend further north across the Peel River and its anabranches. As such, the proposed development resulting from the rezoning may impact on the waterfront land as defined in the Water Management Act 2000. Waterfront land is defined as land within 40m of the top of bank of a river. Development within waterfront land requires a Controlled Activity Approval (CAA) from the Department of Primary Industry Water division.

Tamworth Council propose to construct, when funding is available, an extension of Jewry Street heading west along the boundary of the proposed rezoning land on Lots 2 and 3 DP 123485. This proposed bypass road would then head south through the Somerset Farm site

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to connect at grade with Wallamore Road at the western and southern boundaries of the Somerset Farm site. This road is known as the bypass road. Council has created a lot for this road which could be incorporated into any future development on the Racecourse West Development and Somerset Farm sites.

There is a narrow lot (Lot 1 DP 44224) between the Racecourse West Development site and the Tamworth Racecourse which acts as a drainage corridor to accommodate flows down to the Peel River anabranch from the basin located between Jewry Street and the racecourse system. This overland flow path will need to be retained in any development on the Racecourse West Development site.

3. Flood Behaviour

The site is affected by local flood flows down the Timbumburi Creek and their interaction with the regional flooding in the Peel River (refer Figure 3). The flood flows in Timbumburi Creek from the south are dammed behind the railway embankment causing a wide flood area upstream of the railway line. At the eastern extent of this flood area is a drainage culvert under the rail line located at the western boundary of the Somerset Farm site and Wallamore Road. Floodwaters discharge from the culvert and over Wallamore Road in a 100 yr ARI flood event and are deflected to the east around the high landform at the Somerset farmhouse and shed area. It then flows north along the Racecourse West Development site before joining with the Peel River flood flows at the northern end of the racecourse.

The 100 yr ARI flood levels have a gradient of about 2m varying from approximately RL 374.2m AHD at Wallamore Road to RL 372.2m AHD at the northern end of the racecourse.

The peak flood velocities across the site are low in the 100 year ARI flood compared to the higher velocities in the Peel River anabranches and the railway culvert (larger arrows mean higher velocities).

There is an existing low flow channel extending from opposite the railway culvert in the south and heading around the higher ground of the homestead on Somerset Farm and heading north along the western boundary of the Racecourse West Development site towards the Peel River anabranch system.

4. Proposed Development

The proposed development is to form a 9 ha industrial area on Lots 2 and 3 DP 123485. The Council's proposed bypass road bounds the site on the northern boundary as shown on Figure 4. The proposed industrial development area would either be filled to the Flood Planning Level (FPL) (100yr ARI flood level plus 0.5m freeboard) or it would be ringed by a levee with a crest level 1m above the 100 year ARI flood level. The required levee crest levels and existing ground levels are depicted on Figure 5.

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Potential flood impacts are limited to those on the flood behaviour of the Timbumburi Creek which can be mitigated with the proposed regrading of Somerset Farm ground levels.

The depth of fill required over Lots 2 and 3 to achieve the FPL would range between 0.3m to 1.1m and the spoil required for the fill could be sourced from the regrading required on Somerset Farm. Fill levels would also require consideration of any earthworks required as part of works for services such as the sewer and drainage systems.

If the levee option was chosen, then the levee height would vary between 0.8m and 1.6m above existing ground levels. The levee would have a floodgate located in the northern wall and within the development there would be sufficient detention storages/basins to accommodate the 100 year ARI rainfall falling on the site during a 100 year ARI regional flood. The site runoff would be temporarily stored on site until it could be released after the regional floodwaters receded. The employment development within the levee would have minimum floor levels of 300mm above the storage level within the site for the 100 year ARI rainfall on the 9 ha development area.

The existing Timbumburi Creek flood flows presently on the site are diverted to the east around the high landform containing the farm homestead and sheds on Somerset Farm in a less efficient flow path which causes higher flood levels locally. The proposal therefore is to provide a more efficient flood flow path by removing what was probably an artificial high point at the Somerset Farm building pad and allow flood flows to run directly northward on the Somerset Farm site from the railway culvert towards the Peel River along the full 250m width of the Somerset Farm site. This new flood flow path would be formed by removing the high point by regrading Somerset Farm as shown on Figure 6. The regrading depths would be up to 1.2m at the homestead highpoint reducing to depths of generally 0.2m further to the north

A low flow flood channel would be provided generally along its present path along the eastern boundary of Somerset Farm and would suit the regrading and with varying widths to provide appropriate flow velocities. There is up to 250m width available on the site to sculpt this low flow flood channel.

An earth swale (2m wide) and bund approximately 350mm high would be formed along the western boundary of the Somerset Farm site to ensure that runoff from the land to the west would be drained towards the Peel River to the north and any small increases in flood levels on Somerset Farm were not transferred onto the adjacent property to the west.

5. Flood Impact Assessment

Lyall and Associates have formulated a flood model for Tamworth Council for the Peel River incorporating the flood flows along the Timbumburi Creek. It is appreciated that Council agreed to allow use of their flood model in the interest of designing a development concept on the subject site that would not adversely impact on the flood behaviour in adjacent

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properties. The use of their model also ensures a baseline level of consistency in terms of impact assessment.

Lyall and Associates revised the flood model to incorporate the maximum development on the Racecourse West Development site and the mitigation measure of regrading ground levels on Somerset Farm which could be accommodated without significant adverse impacts on the existing flood behaviour. The northern extent of this modelled development was approximately 415m north of the northern boundary of Lots 2 and 3. If this extent of development did not adversely impact the flood behaviour, then the proposed development of Lots 2 and 3 would have far less flood impact and be acceptable. Both the 20yr and 100yr ARI floods were modelled for this maximum development and plots of flood level changes and post development flood velocities are presented on Figures 7 to 10.

The regrading of Somerset Farm to remove the high point, provides a more efficient flood flow path over a 250m width thereby offsetting any major increases in flood levels on adjacent properties. In fact, there are reductions in flood levels on properties to the west of Somerset Farm.

For the 20yr and 100yr ARI floods, any increases in flood levels are restricted to Somerset Farm or the Racecourse West Development site (refer Figures 7 and 8).

The 100yr ARI flood peak velocities along the Somerset Farm flow path generally range from 0.6 m/s to 1 m/s whereas in the 20yr ARI flood, the peak velocities generally vary from 0.4 m/s to 0.8m/s (refer Figures 9 and 10). These velocities are appropriate for grassed pasture areas and are similar to existing flood velocities.

The low flow channel width and cross section will be considered in further detail to optimise flow and velocities in the regraded area of the Somerset Farm site and minimise any impacts on the existing sewer pipe across this area. The proposed low flow channel would join with the existing low flow channel at the northern end of the site.

For a levee option, a detention basin would be incorporated in the development to temporarily store local runoff from the future industrial development area to ensure peak flows are controlled to existing rates and that in regional floods, runoff can be temporarily stored while the flood gates are closed and allow release of the local runoff after the regional flood peak has receded.

6. EPA Act Section 9.1 Ministerial Directions

Section 4.3 entitled Flood Prone Land of the Ministerial Directions under Section 9.1 (2) of the EPA Act 1979 apply to planning proposals lodged with the DPIE. This section demonstrates that the proposed planning proposal development complies with directions in Section 4.3 Flood Prone Land.

The proposed development complies with the NSW Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005 including the Guideline on Development Controls on Low Flood Risk Areas. The manner in which it complies is that it

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proposes that development will occur on filled land with a minimum level at the Flood Planning Level (FPL – 100 yr flood level plus 500mm freeboard) and above and it has no significant adverse impact on the flooding behaviour on adjacent sites. It also is not being developed in a floodway. This ensures that the land has a low flood risk and the potential for flood damages and risk to life in floods complies with government flood guidelines (see clauses 1, 4 and 6a and b of the Direction).

There will be no substantial increased requirement for government spending on flood mitigation measures, infrastructure or services (Clause 6d of the Direction) because the development complies with all the government flood prone land guidelines.

Clauses 5 and 6c do not allow rezoning of rural land to industrial uses in the flood planning areas nor a significant increase in the development of the subject land. However, Clause 9 of the Direction allows the inconsistency with Clauses 5 and 6c given that the development complies with the governments flood prone land guidelines and as such, will be of minor significance in terms of the flood impacts of the development.

7. Riparian Land Assessment

Development on waterfront land requires a Controlled Activity Approval (CAA) under the Water Management Act 2000. Waterfront land is defined as the land 40m from the top of bank of a river. The Department of Primary Industries Office of Water has issued a policy to assist in identification of waterfront land.

This policy uses the blue lines on the NSW 1:25000 topographic maps to show the extent of rivers and hence waterfront land is categorised as land located within 40m from the top of bank of these rivers. Typically, these blue lines extend beyond what might be visually and physically identifiable as rivers because there do not have any banks to define the river. Nonetheless, they are a readily identifiable starting point for assessment of the possible location of waterfront land.

The policy also adopts the Strahler System for classifying the status of rivers from minor (1st order) to major (4th or 5th order) streams.

The 1:25,000 topographic plan for the subject site is presented on Figure 11. It indicates two 1st order streams approximately 400m north of the location of the proposed levees or fill for the proposed development on Lots 2 and 3. On this basis, the proposed development would not impact on waterfront land and does not require an approval under the Water Management Act 2000.

8. Conclusions

The proposed development on Somerset Farm and on Lots 2 and 3 DP 123485 has been formulated to ensure that the development complies with government flood prone land guidelines and has no significant adverse impacts on the flooding behaviour on adjacent

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properties. This has been tested using Tamworth Council's flood model which has confirmed no significant adverse flood impacts. This also satisfies the Ministerial Directions Section 4.3 Flood Prone Land in that the inconsistency with Clauses 5 and 6c is allowable given the minor significance the development will have in terms of the adverse flood impacts on flood behaviour. This supports the rezoning of the proposed 9 ha development area for employment landuses subject to the implementation of the measures outlined in Section 4.

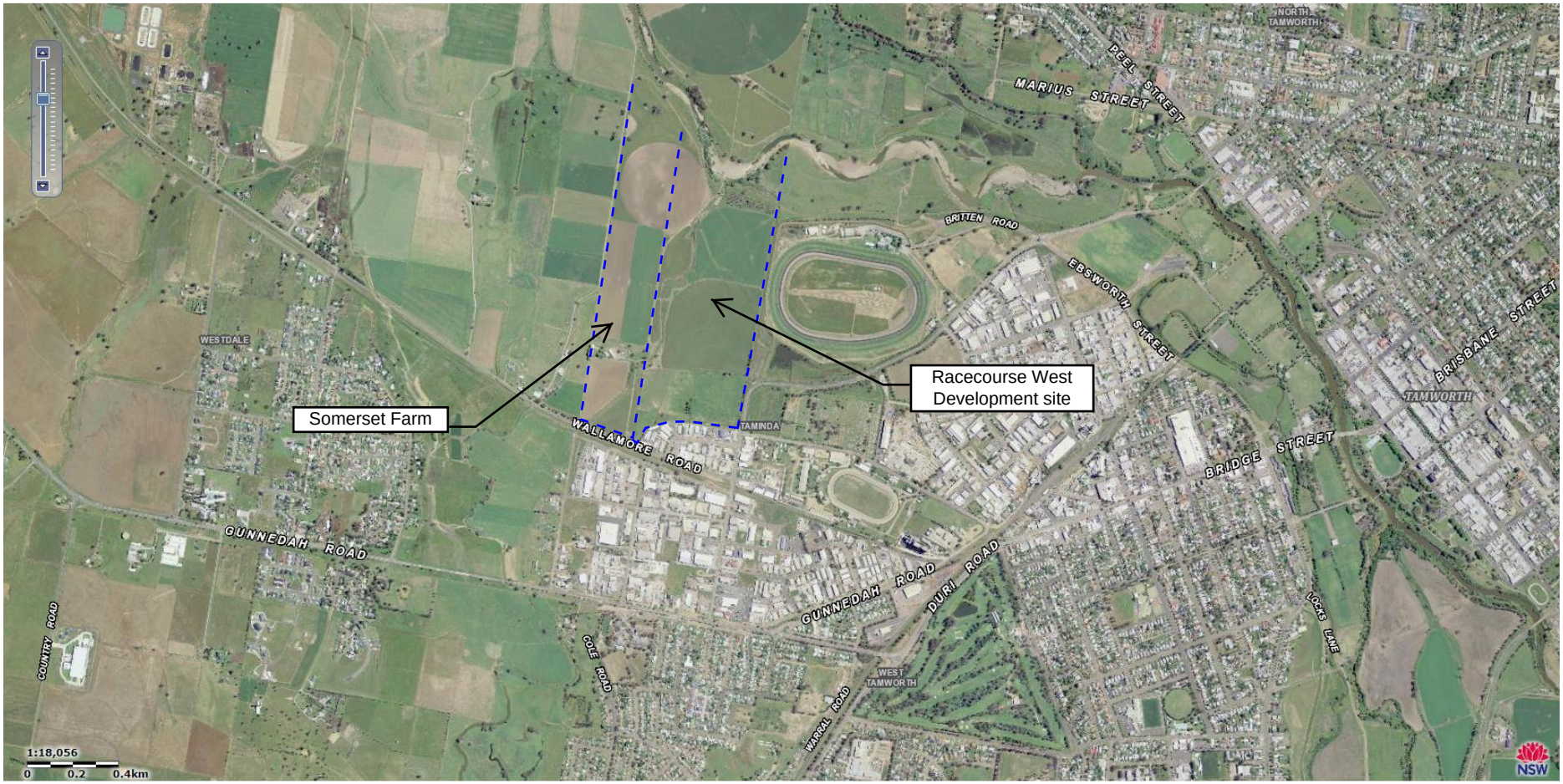
The future development on the rezoned site will not require approval under the Water Management Act 2000 because the development will not be located within 40m of the top of a river bank.

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FIGURES

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FIGURE 1



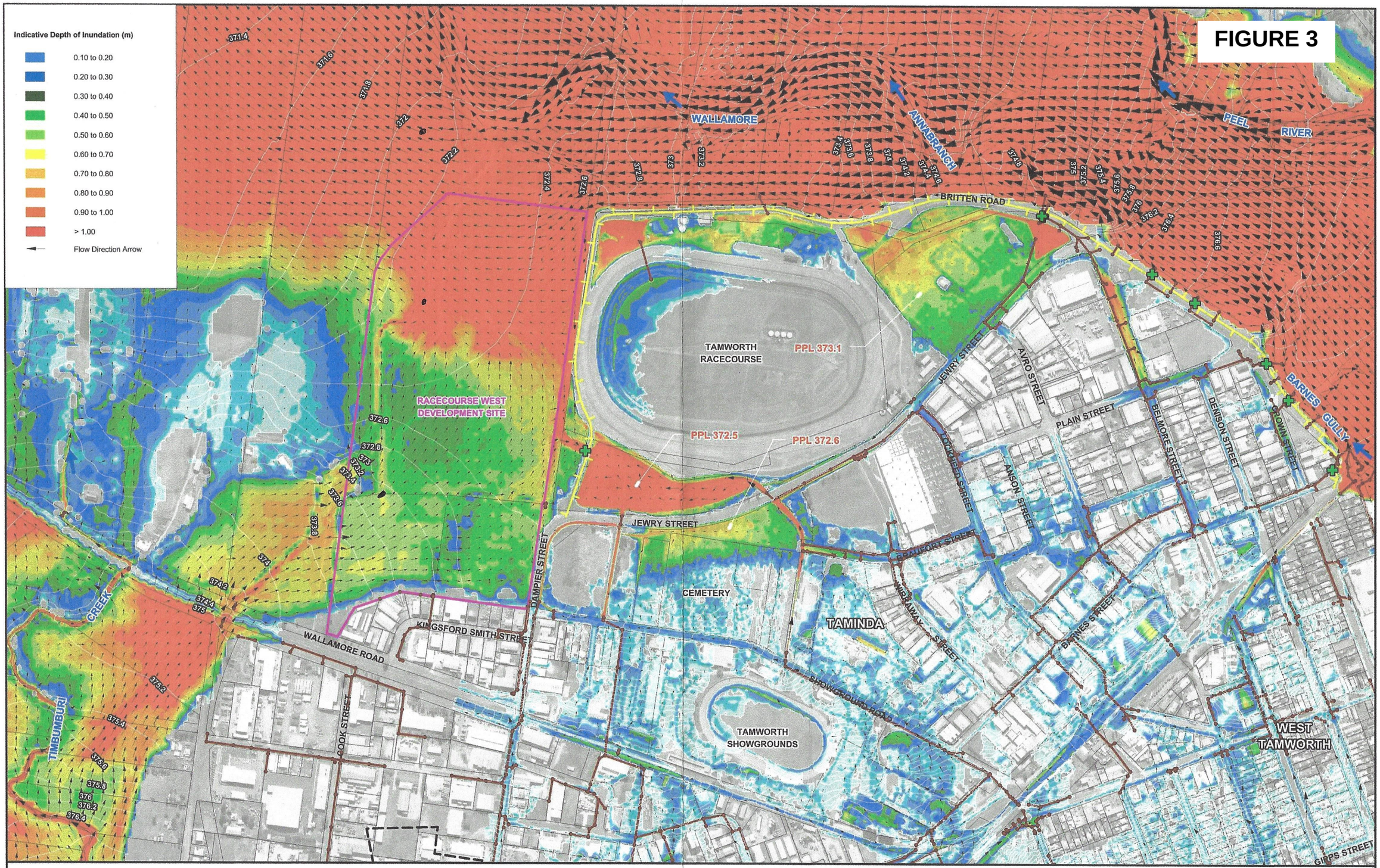
LOCALITY PLAN

FIGURE 2



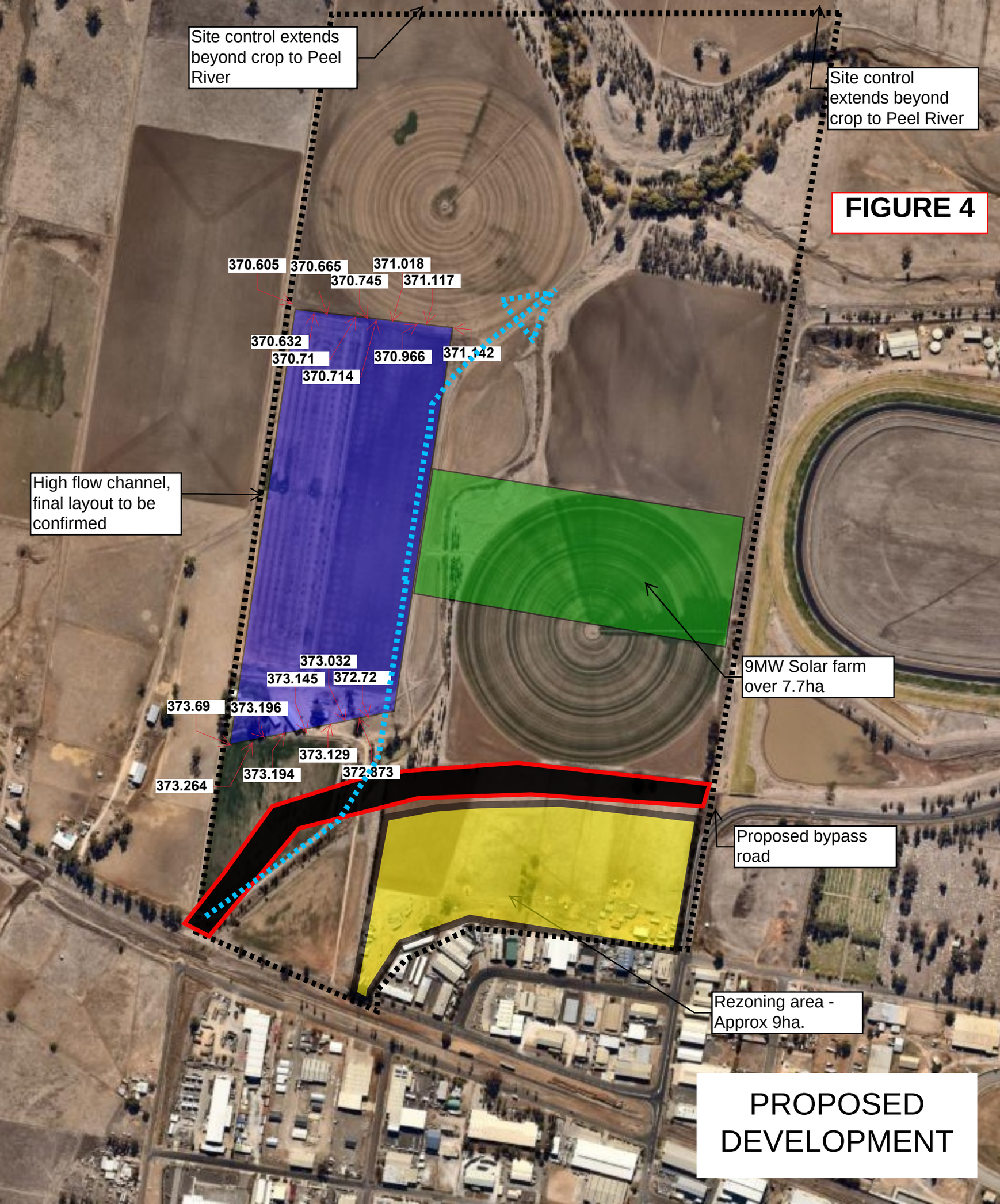
SITE PLAN

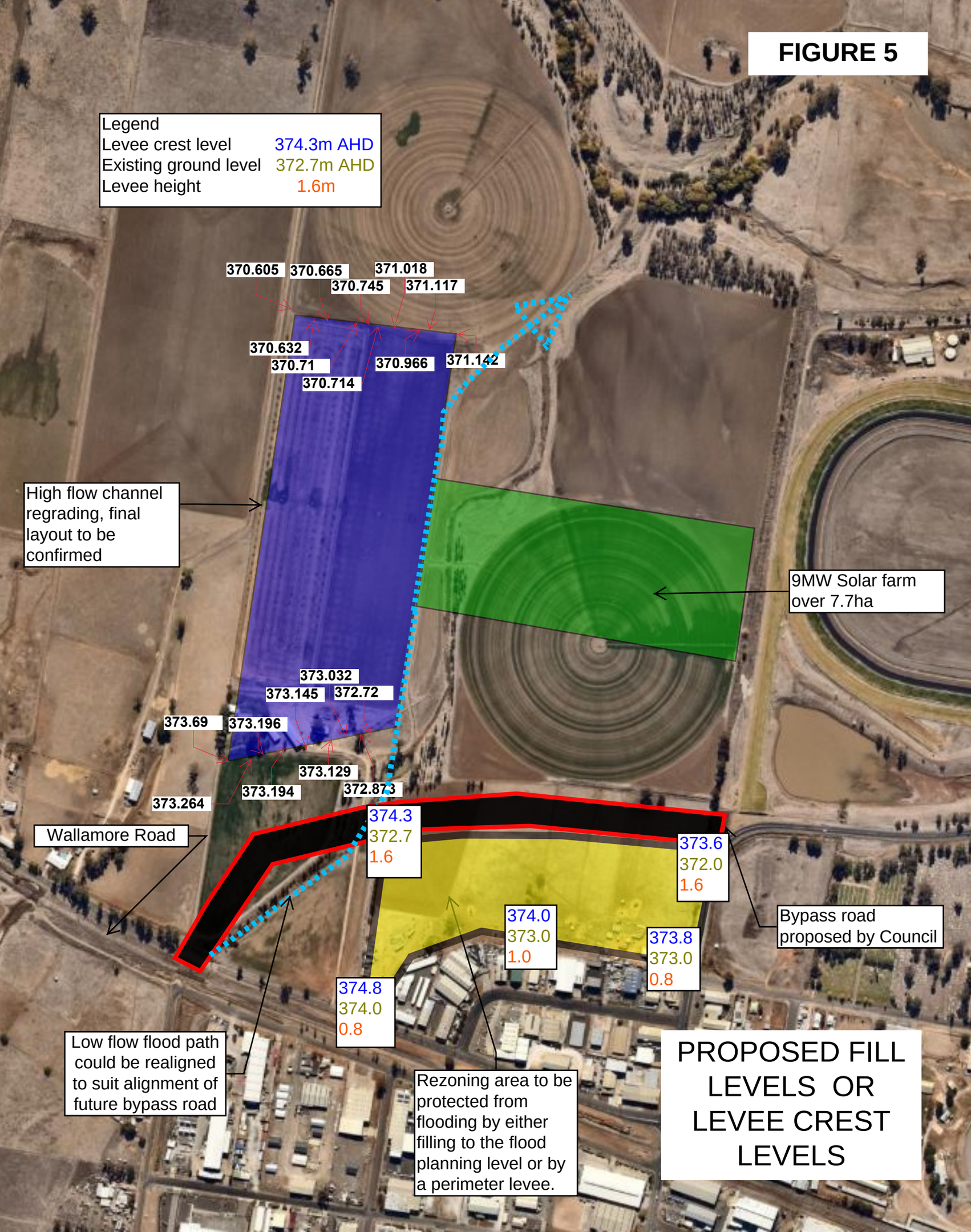
FIGURE 3



Lyall & Associates

PRESENT DAY (FLOOD GATES FULLY CLOSED) CONDITIONS
100 YEAR ARI FLOOD ENVELOPE


Site control extends beyond crop to Peel River
Site control extends beyond crop to Peel River
FIGURE 4
370.605
370.665
371.018
370.745
371.117
370.632
370.71
370.966
371.142
370.714
High flow channel, final layout to be confirmed
373.032
373.145
372.72
373.69
373.196
373.129
373.194
372.873
373.264
9MW Solar farm over 7.7ha
Proposed bypass road
Rezoning area - Approx 9ha.
PROPOSED DEVELOPMENT


FIGURE 5
Legend
Levee crest level 374.3m AHD
Existing ground level 372.7m AHD
Levee height 1.6m
370.605
370.665
371.018
370.745
371.117
370.632
370.71
370.966
371.142
370.714
High flow channel regrading, final layout to be confirmed
9MW Solar farm over 7.7ha
373.032
373.145
372.72
373.69
373.196
373.129
373.194
372.873
373.264
Wallamore Road
374.3
372.7
1.6
373.6
372.0
1.6
Bypass road proposed by Council
374.0
373.0
1.0
373.8
373.0
0.8
374.8
374.0
0.8
Low flow flood path could be realigned to suit alignment of future bypass road
Rezoning area to be protected from flooding by either filling to the flood planning level or by a perimeter levee.
PROPOSED FILL LEVELS OR LEVEE CREST LEVELS

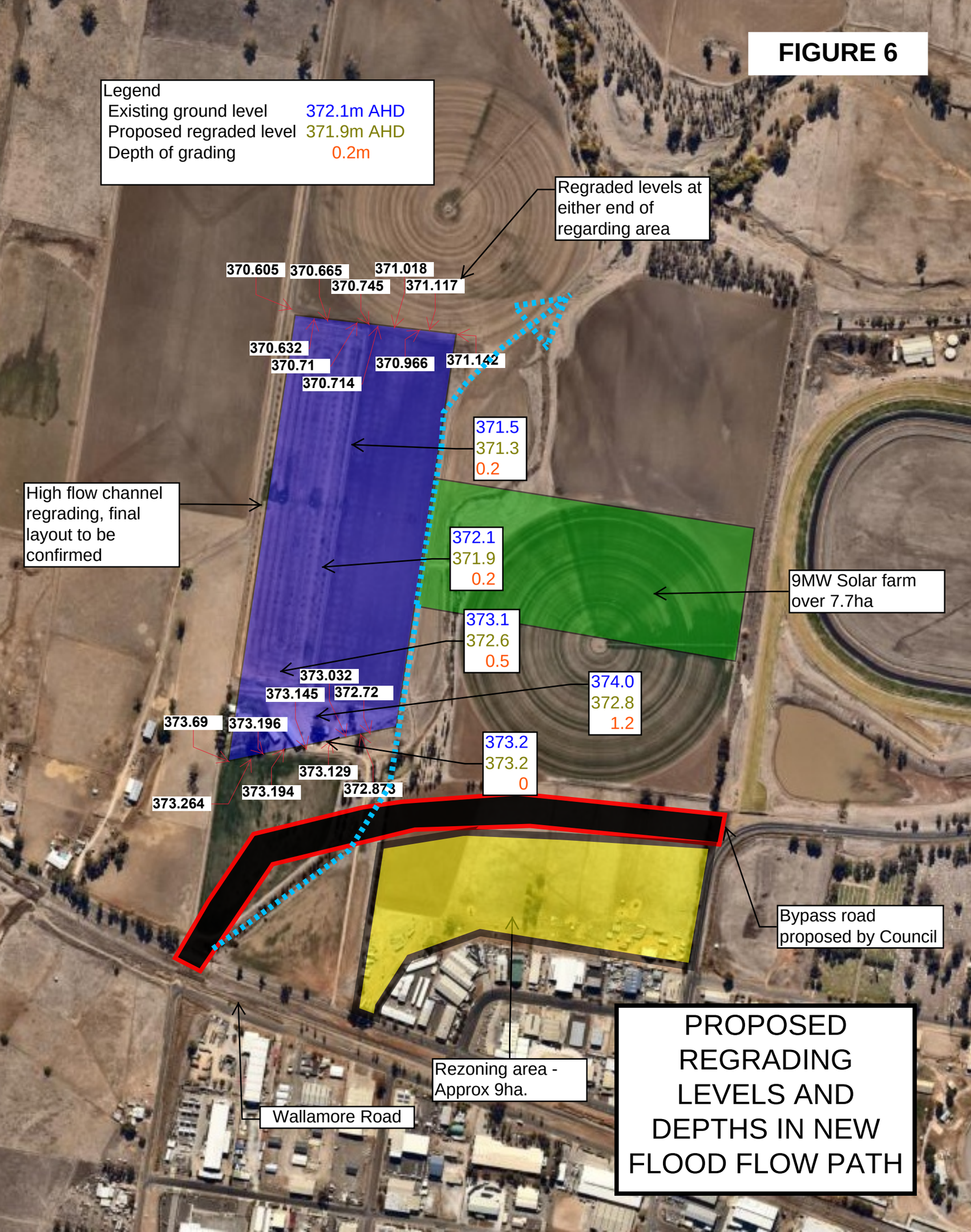
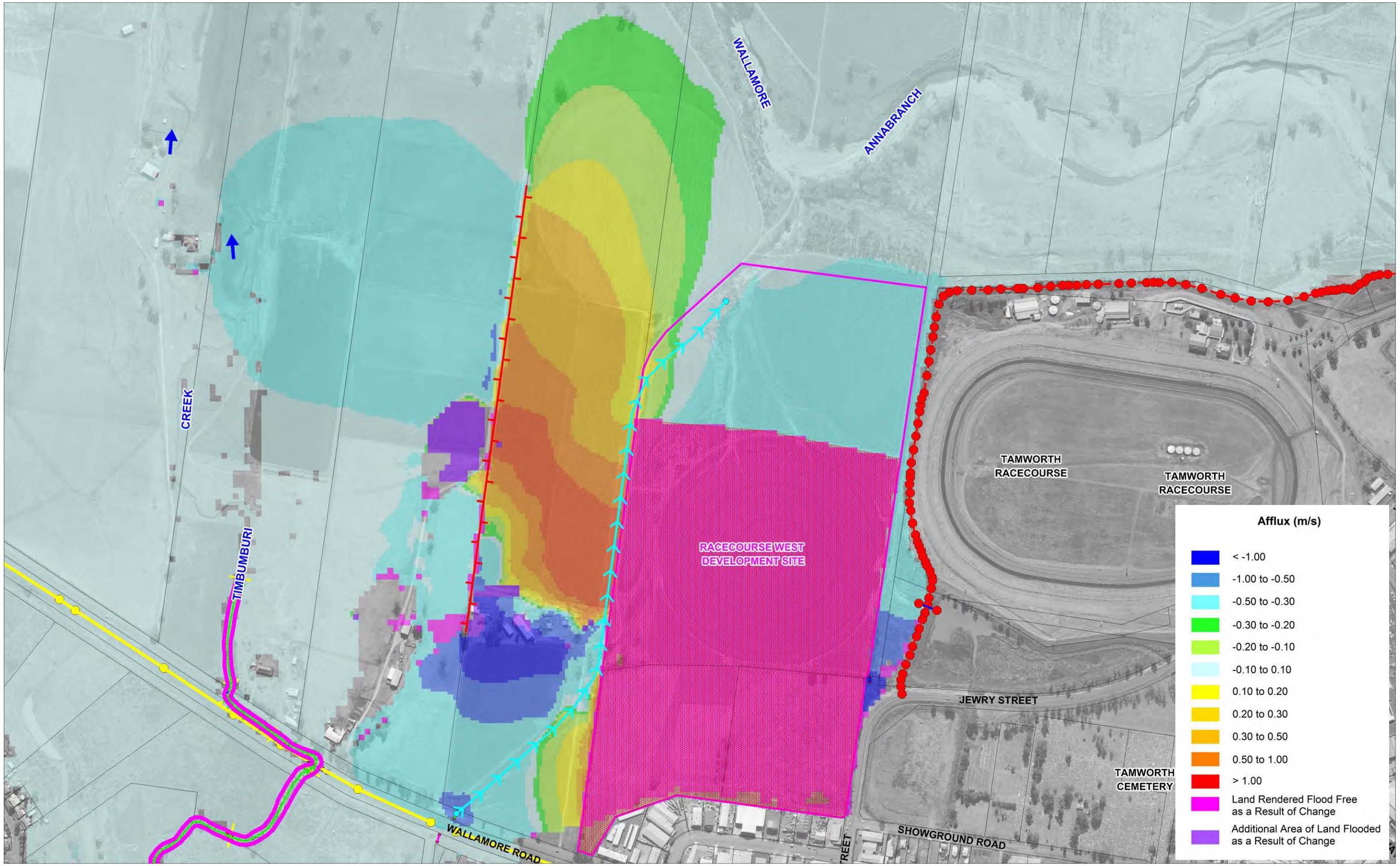
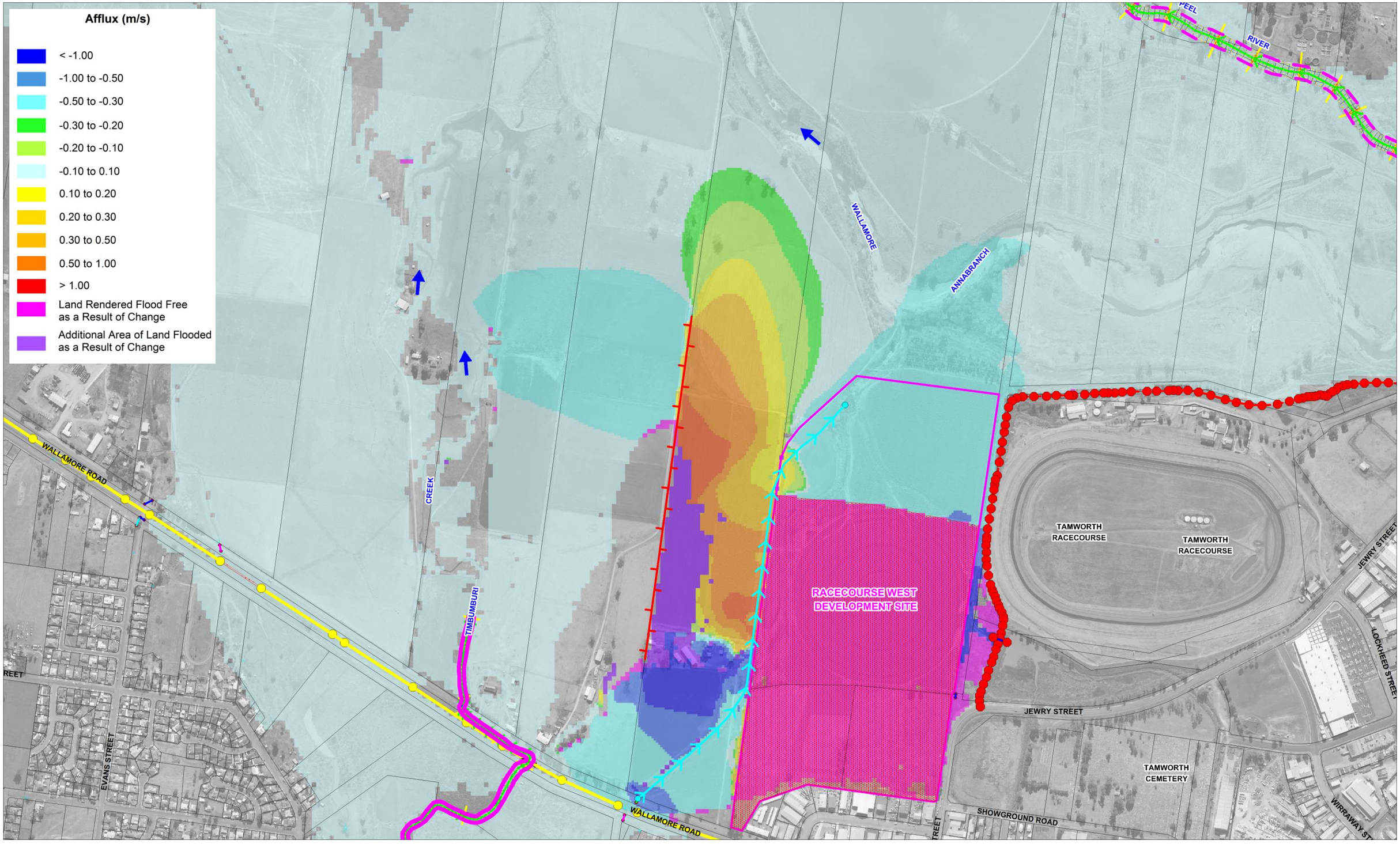

FIGURE 6
Legend
Existing ground level 372.1m AHD
Proposed regraded level 371.9m AHD
Depth of grading 0.2m
Regraded levels at either end of regarding area
370.605
370.665
370.745
371.018
371.117
370.632
370.71
370.714
370.966
371.142
371.5
371.3
0.2
High flow channel regrading, final layout to be confirmed
372.1
371.9
0.2
9MW Solar farm over 7.7ha
373.1
372.6
0.5
373.032
373.145
372.72
374.0
372.8
1.2
373.69
373.196
373.2
373.2
0
373.129
373.194
372.873
373.264
Bypass road proposed by Council
Rezoning area - Approx 9ha.
Wallamore Road
PROPOSED REGRADING LEVELS AND DEPTHS IN NEW FLOOD FLOW PATH

FIGURE 7



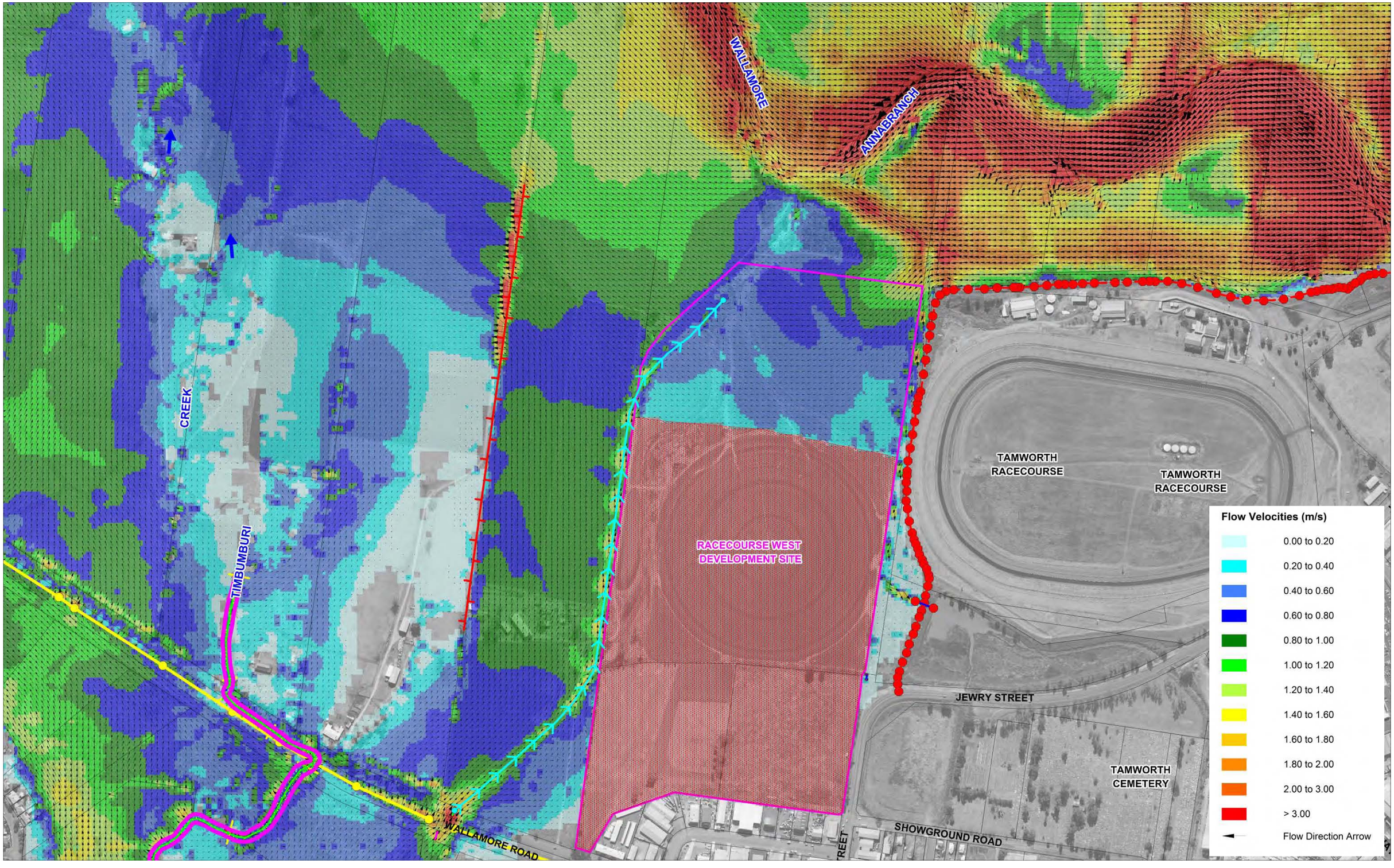
IMPACT ON 100 YR ARI FLOOD LEVELS

FIGURE 8



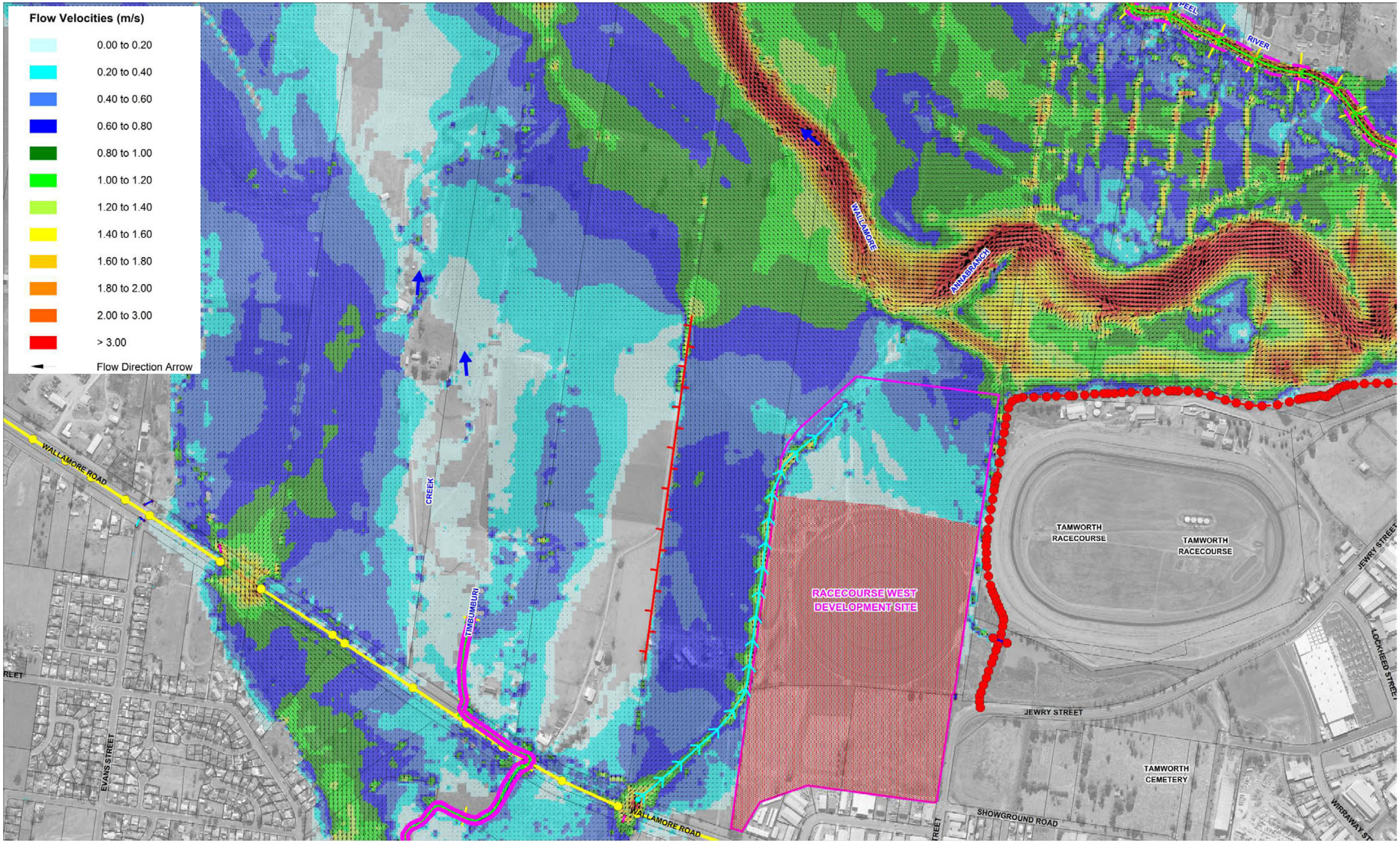
IMPACT ON 20 YR ARI FLOOD LEVELS

FIGURE 9



POST DEVELOPMENT 100 YR ARI PEAK FLOOD VELOCITIES

FIGURE 10



POST DEVELOPMENT 20 YR ARI PEAK FLOOD VELOCITIES

FIGURE 11



1:25,000 TOPOGRAPHIC PLAN

9.9 Preliminary Site investigation (Environmental)

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Contamination | Remediation | Geotechnical

CHAN ABBEY HOLDINGS



Preliminary Site Investigation

55 Dampier Street and 21 & 72 Wallamore Street, Taminda, NSW

Report E24043.E01_Rev3
25 September 2019

REPORT DISTRIBUTION

Preliminary Site Investigation
55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW

EI Report No.: E24043.E01_Rev3
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Author:	Technical Reviewer:
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Revision	Details	Date	Amended By
0	Original	17 December 2018	-
1	Change in land area	19 February 2019	AB
2	Response to Council Comments	12 August 2019	AB/MD
3	Addition of information	25 September 2019	AB/TG

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EXECUTIVE SUMMARY

Background and Objectives

Chan Abbey Holdings ("the Client") at the request of Elton Consulting engaged EI Australia (EI) to conduct a Preliminary Site Investigation (PSI) for the property located at address 55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW ('the site'). This PSI was completed as part of a Planning Proposal (PP) to Tamworth Regional Council for the development of Employment lands which has frontages to Dampier Street in the east and Wallamore Road in the South.

The main objective of this preliminary investigation was to characterise the environmental conditions of the site on the basis of historical land uses, supplemented by anecdotal and documentary evidence of possible pollutant sources.

Key Findings

- Historical records indicated that the southern half of the site was most likely to be primarily of agricultural land use since 1970's until the early 2000's. Following this, the land use changed to agricultural/commercial which has remained as the land use to date. In comparison, the northern half of the site to date has primarily being used for agricultural purposes.

- The site inspection revealed that isolated dumping has occurred at the southern third of the site. Some of the waste material observed included weathered steel beams, rusted metal drums, metal roofing sheets, and soil stockpiles;

- Onsite storage of pesticides (bipyridilium), herbicides (Group I, L, and M) and fuel oil was observed during site the site inspection that was completed on the 29 November 2018;

- Based on the information outlined in previous reports completed for the site by Sanko Excavation Environmental & Civil Services Pty Ltd (Sanko) and Regional EnviroScience Hazardous Materials Laboratory and Consultancy (EnviroScience); it is noted that action was taken into clearing any asbestos containing material that might have been brought to site as a result of inadequate soil management practices;

- The information provided in previous investigations completed by Sanko (2015, 2016a and 2016b) and EnviroScience (2015) was useful as an additional line of evidence to support the site observations where asbestos was not observed at surface;

- Council records dating back to 2004 held by Tamworth Regional Council indicated that the site has not been used for residential purposes and that the commercial/industrial use of the land has only being predominantly an isolated use to the south eastern side of the site;

- A search of SafeWork NSW Dangerous Goods Records revealed there are no records pertaining to the above premises;

- The site and surrounding properties (within 500m) were not reported as being of Aboriginal Heritage under the National Park and Wildlife Act;

- The site and surrounding properties were not reported as being subject to regulation in relation to environmental impacts, as documented in the NSW EPA databases; with the exception of one site within 500m of the site, which held a license for concrete batching. The license is no longer in force;

- A military use record search was completed on the site and lands in close proximity of the site. Overall, the available information indicated Tamworth was used for military purposes such as air training and Unexploded Ordnance. However, it is inferred that these usages were localised in

areas across or downgradient from the site and it is therefore considered that there is a low risk of the site being contaminated from these usages in the surrounding lands;

- The CSM identified the potential for contamination resulting from the use of pesticides, herbicides and some fertilisers across the Site; and possible oil spill and leaching of weathered building materials in the south eastern area of the Site which makes up approx. 30%of the Site area.
- The nearest sensitive receptors to the site were Wallamore Anabranch to the north of the site, and Timbumburi Creek and the agricultural/residential land uses to the west of the Site;
- The site and all examined (drilled / sampled) soils displayed no visual or olfactory evidence of contamination.
- The sub-surface layers were comprised of anthropogenic, silty clay / gravelly clay, fill mix or silty clay topsoil to a depth of 0.4m BGL, overlying natural clays.
- Laboratory analytical results for the representative soil samples were all found to apply with the adopted SILs applicable to the proposed sensitive (commercial/industrial) land use.
- Groundwater was not encountered during this investigation.

Conclusion

Based on the above findings and those outlined in the body of the report, as well as being subject to the Statement of Limitations (**Section 12**), EI concluded that widespread contamination was not present on the site. The site is regarded as suitable for the proposed rezoning of the site to a less sensitive land use (Employment Lands), in accordance with Clause 7 of *State Environmental Planning Policy No. 55 - Remediation of Land*, provided the recommendations detailed in **Section 11** are implemented.

Recommendations

EI hereby makes the following recommendations in relation to the proposed site development:

- All waste materials designated for off-site disposal (including any virgin excavated natural material (VENM)) must be classified in accordance the EPA (2014) *Waste Classification Guidelines*. They are to be transported to EPA-licensed waste facilities by licensed waste contractors.
- Any soil material to be imported to the site (i.e. for backfilling and/or landscaping purposes) must be confirmed by documentary evidence as suitable for the proposed land use. In the absence of such validation, the material will require assessment through sampling and laboratory analysis as being free of contamination and suitable for the intended land use, in accordance with NSW EPA guidelines.

EI note that these recommendations can be addressed through the DA approval process and incorporated into the conditions of development consent.

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE

Chan Abbey Holdings (CAH) ("the Client") at the request of Elton Consulting engaged EI Australia (EI) to conduct a Preliminary Site Investigation (PSI) for the property located at 55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW ('the Site'). Taminda is a suburb west of the main city of Tamworth.

The site is located within the Local Government Area of Tamworth Regional Council (see **Figure 1**). The land parcel is also identified as the southern section Lot 1 in DP 1234850, and Lot 2, 3 in DP 1234850, covering a total area of approximately 30 ha, as depicted in the site plan presented as **Figure 2**.

This environmental assessment was completed as part of the Planning Proposal to Tamworth Regional Council for the partial redevelopment of the site into Employment lands comprising of the rezoning and subdivision of 30 ha as shown in **Table 1-1** and illustrated in **Figure 3**.

Table 1-1 Development breakdown

Area Identification	Proposed Land Use	Approximate area
Whole site		30 hectares
A	Area to be retained	18.7 hectares
B	Rezoning for employment lands development	11.3 hectares

EI understand that this investigation was required to appraise the environmental condition of the site as part of a Planning Proposal for the proposed development outlined in **Section 1.2**.

The investigation also provides information on the potential environmental issues that will need to be addressed during later development phases.

1.2 PROPOSED DEVELOPMENT

Based on the information provided by Chan Abbey Holdings c/- Elton Holdings, the southern section of the site (Area B) has been designated for Employment lands development.

It is understood that the redevelopment in Area B will include the construction of a bypass road which connects Jewry Street from the east to Wallamore Road located to the south of the site.

Area A is subject to a separate assessment also undertaken by EI.

1.3 REGULATORY FRAMEWORK

The following regulatory framework and guidelines were considered during the preparation of this report:

- *Contaminated Land Management Act 1997*;
- DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*, Dept. of Environment and Conservation, New South Wales, DEC 2007/144;

- EPA (2017) *Guidelines for the NSW Site Auditor Scheme* (3rd Edition), NSW EPA;
- NEPC (2013) *National Environmental Protection (Assessment of Site Contamination) Measure 1999,* Amendment 2013, National Environmental Protection Council;
- NEPC (2013) Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater;
- NEPC (2013) Schedule B(2) Guideline on Site Characterisation;
- Tamworth Regional Council Local Environmental Plan 2010;
- Tamworth Regional Council Local Environmental Plan 2010;
- *State Environmental Planning Policy No 55—Remediation of Land* made under the *Environmental Planning and Assessment Act (1979)*; and
- OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*, NSW Office of Environment and Heritage (OEH).

1.4 PROJECT OBJECTIVES

The primary objectives of this investigation were to:

- Evaluate the potential for site contamination on the basis of historical land uses and anecdotal and documentary evidence of possible pollutant sources;
- Develop an appreciation of the influence of site-specific, geologic and hydrogeological conditions on the potential fate and transport of any impacts that may be identified;
- Target potentially impacted areas identified during the preliminary stages of the investigation for intrusive assessment;
- Investigate the degree of any potential contamination by means of intrusive sampling and laboratory analysis for relevant contaminants of potential concern (Limited Sampling);
- Conduct a screening assessment of potential risks that identified impacts may pose to human health and the environment; and
- Where site contamination is identified, provide data to assist in the selection and design of appropriate remedial (management) options.

1.5 SCOPE OF WORKS

In accordance with EI fee proposal P16758.1 (dated 24 August 2018) and subsequent email agreements (dated 9 September 2019), the above objectives are to be achieved with the following scope of works:

1.5.1 Desktop Study

- A review of relevant mapping for the project area;
- Search of historical aerial photographs archived at NSW Land and Property Information in order to review previous site use and the historical sequence of land development in the neighbouring area;
- A land titles search, also conducted through NSW Land and Property Information for information relating to site ownership;

- Search of Tamworth Regional Council records for information relating to operational site history and/or relevant environmental incidents;
- Search of SafeWork (NSW) records for information relating to possible underground tank approvals and locations;
- A search through the NSW EPA / OEH Land Information records to confirm that there are no statutory notices current on the site under the *Contaminated Land Management Act 1997* or *Protection of the Environment Operations Act 1997*;
- A review of existing underground services in the vicinity of the site;
- Review of available environmental reports, and;
- An inspection of the site and surrounding lands.

1.5.2 Fieldwork & Laboratory Analysis (completed by Sanko Engineering)

- Construction of test pits at 12 locations, distributed across accessible and targeted parts of the site;
- Multiple level soil sampling within fill and natural soil layers at each of the test pits; and
- Laboratory analysis of selected soil samples for relevant analytical parameters.

1.5.3 Data Analysis and Reporting

Following the desktop assessment and Site inspection, this PSI report was prepared generally in accordance with the OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites. This report documents the contaminated land assessment, field observation, soil sampling methodologies implemented by Sanko Engineering and discusses the findings, with respect to potential risks to human health, the environment and the aesthetic enjoyment of the land. The report concludes with a clear statement regarding the environmental status of the site, with recommendations for further management of contaminated groundwater, if warranted.

2. SITE DESCRIPTION

2.1 PROPERTY IDENTIFICATION, LOCATION AND PHYSICAL SETTING

The site identification details and associated information are presented in **Table 2-1**, while the site locality is shown in **Figure 1**.

Table 2-1 Site Identification, Location and Zoning

Attribute	Description
Street Address	55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW
Location Description	Taminda is located west of the City of Tamworth. The site is bound by: North – undeveloped land followed, Wallamore Anabranch and Peel River; East – Drainage line, Tamworth Jockey Club, Jewry Street followed by Tamworth lawn cemetery, and commercial and industrial properties; South – Commercial properties, Kingsford Smith Street, Wallamore Road, railway tracks; and West – Drainage line, land use for agriculture followed by Timbumburi Creek and commercial properties to the south east.
GPS Coordinates for north east corner of the site	GDA94-MGA56 Easting: 299665.576; Northing: 6559324.452. (Source: https://maps.six.nsw.gov.au/)
Site Area of Investigation	Approx. 30ha
Lot & Deposited Plan (DP)	Southern section of Lot 1 in DP 1234850, and Lot 2, 3 in DP 1234850
State Survey Marks	Four State Survey (SS) marks were situated in close proximity (<150 m) to the site: • PM30522 (east of the site) on corner of Showground road and Dampier Street; • PM49762D (south of the site) on Wallamore Road; • PM31463 (south of the site) on corner of Goonan Street and Cook Street; and, • PM188271 (south) on Middleton Avenue. (Source: https://maps.six.nsw.gov.au/)
Local Government Authority	Tamworth Regional Council
Parish	Murroon
County	Parry
Current Zoning	RU4– Primary Production Small Lots (Sheet LZN_004C; Tamworth Regional Local Environment Plan, 2010)

2.3 LOCAL LAND USE

The site is situated within an area of mixed uses on surrounding land, with local sensitive receptors within close proximity (<500m) to the site, as described in **Table 2-2**.

Table 2-2 Local Land Use

Direction	Land Use Description	Sensitive Receptors (& approx. Distance from Site)
North	Vacant land	Wallamore Anabranch (approx. 500 m)
East	Commercial use	Tributaries and drainage lines draining to the Anabranch (<20m)
South	Commercial	-
West	Agriculture and residential	Crops and residential properties (<10 m) Timbumburi Creek (<460m)

2.4 REGIONAL SETTING

The regional setting is summarised in terms of local topography, geology, soil landscape and hydrogeological information in **Table 2-3**.

Table 2-3 Regional setting details

Attribute	Description
Topography	The site is relatively flat with a RL between 370 – 380 mAHD with an overall gentle slope to the Anabranch to the north. The northern topography comprises of gently undulating floodplains with local relief <9m and slopes <1% - <2%; and occasional low levees and swamps. It is noted that the topography has been modified by the agricultural practices that occur at the site.
Site Drainage	Surface water flow is likely to be north, towards Wallamore Anabranch, located approximately 5000 m to the north of the site; which then connects to Peel River, located approximately <1km to the north of the site. EI note that on the east and west of the site there appears to be drainage lines which drain to Wallamore Anabranch. The drainage line observed to the west of the site intersects the site in the north western area.
Regional Geology	Information on regional sub-surface conditions, referenced from the New South Wales Department of Mines Geological Map Tamworth 1:250,000 Geological Series Sheet 56-13 (DMR 1971) indicates the site is underlain by Alluvium: clay, silt, sand and gravel.
Soil Landscapes	The Soil Conservation Service of NSW Soil Landscapes of the Tamworth 1:100,000 Sheet (Banks, Robert G, 2001) indicates that the site overlies three different soil landscapes, Peel (pe), Goonoo Goonoo (gn) and Duri (du). The soil landscapes are divided throughout the site as follow: - Peel soil landscape makes up the vast majority of the site. It is concentrated in northern part of the site. The soils that comprise this soil landscape are individually extensive but random in distribution. Soil types include moderately to well drained black dermosols; very deep, imperfectly drained calcareous black earths; black earths; and moderately deep, moderately well drained red-brown earths. - Goonoo Goonoo soil landscape makes up the south central section of the site.

Attribute	Description
	Goonoo Goonoo soil types are diverse but individually locally extensive. These include, very deep to giant, imperfectly drained solodic soils, and black earths; very deep and poorly drained grey clays; shallow, moderately well drained calcareous alluvial soils; and deep to giant, imperfectly drained brown clays. - Duri soil landscape occupies a small section on the southern part of the site, near the site boundary. These soils are generally dominate by duplex soils such as moderately deep, moderately well-drained red and brown earths and non-calcic brown soils; with minor occurrences of shallow, very well drained lithosols around rock outcrops. Deep, imperfectly drained red clays and deep to very deep, imperfectly drained non-calcic brown soils and possibly solodic soils occur along drainage lines and on sodic bedrock. In general, the Duri soil landscape is extremely complex due to rapid changes in underlying lithology.
Likelihood & Depth of Filling as indicated in Sanko (2019) report	Fill and/or Top soil was only encountered at all test pits (TP1 to TP12) extending to depths ranging between 0.1m and 0.4m.
Typical Soil Profile as indicated in Sanko (2019) report	Based on observations made during the field works completed by Sanko (2019), the typical soil profile comprised of: Fill –clayey SAND fine grained, pale yellow, low plasticity; and Sandy GRAVEL fine grained, orange, fine to medium sand, moist (0.3m maximum thickness); and/or Topsoil – Silty CLAY; low plasticity, dark grey, low plasticity fines, moist (0.4m maximum thickness); overlying Residual – CLAY; medium to high plasticity, dark grey/brown, trace of fine sand, moist (0.6m maximum thickness); overlying CLAY; medium to high plasticity, orange/brown, wet (1.1m maximum thickness)
Nearest Surface Water Feature	Wallamore Anabranch, located approximately 500 m to the north of the site.
Anticipated Groundwater Flow Direction	North/ north west, towards Wallamore Anabranch (inferred from local topography).

2.5 GROUNDWATER BORE RECORDS AND LOCAL GROUNDWATER USE

An online search of registered groundwater bores was conducted by EI on 22 November 2018 through the Water NSW database (Ref. https://realtimedata.waternsw.com.au/water.stm). There are seven registered bores within a 500 m radius of the site and these have been summarised in **Table 2-4**. The groundwater bore map downloaded from Water NSW is attached in **Appendix A**.

Table 2-4 Summary of Registered Water Bores within 500 m of the site

Bore No.	Date Drilled	Drilled Depth (m)	SWL*/Salinity/Yield	Bore Purpose	License Status
GW966758	-	-	-/ - / -	Stock, domestic	Converted
GW024241	-	12.20	-/ - / -	Not known	-
GW037910	01/09/1973	12.20	-/ - / -	Irrigation	-
GW966772	19/06/2000	16.70	-/ - / -	Stock, domestic, recreation	Converted
GW53585	01/11/1982	9.80	-/ - / -	Irrigation	-

GW052646	-	3.20	-/ - / -	Not known	-
GW961332	-	-	-/ - / -	-	-

Notes: No data was available for bore no. GW961332.
- Data not recorded;
* SWL – Standing water level measured in m BGL,
Salinity – units unspecified,
Yield – measured in L/s.

2.6 SITE WALKOVER INSPECTION

A site walkover inspection was conducted on 29 November 2018. The 30 hectares rural property is generally slightly-undulating and sloping towards the north. For ease of reference the site has been inspected as three separate lots – Lot 1, 2 and 3 of DP 1234850 as indicated in **Figure 2**. The broader area (Lot 1), was used for agricultural purposes; Lot 2 was predominantly used for stock grazing and a number of feed areas and water troughs were located across the Lot; and Lot 3 was used for commercial/industrial purposes on the south and agricultural on the north. A summary of the observations made for each lot is presented in **Table 2-5** below and Site photographs taken during the inspection are present in **Appendix B**.

Table 2-5 Site Observations

Lot Number (approx. area)	Activity	Potential Contaminant Sources	Photographs
1 (19 ha)	Agricultural	Possible use of pesticides, herbicides and fertilisers	Photographs 1 to 3
2 (5.6 ha)	Agricultural, cattle grazing, storage.	Possible use of pesticides, herbicides and fertilisers	Photographs 4, 5
	Cattle's grazing was observed to the north western and the south eastern side of the site. Soil disturbance due to cattle grazing activities was particularly noticeable in the south central section of the site.		Photographs 7 to 9
	North eastern section appears to be vacant and may potentially be also used for grazing.		Photograph 10

Lot Number (approx. area)	**Activity**	**Potential Contaminant Sources**	**Photographs**
	South western area of the site appears to be used for storage. Nine silos were observed, along with hay roll stacks, metal drums and other waste materials. Approximate locations are illustrated in **Figure 4**.	Leaching from waste materials stored on the site. These include steel frames, metal drums, old farm machinery, and tyres. Machinery spills and leaks.	Photographs 4, 10, 11
3 (5.4 ha)	Mixed use – commercial/industrial and vacant/agricultural	Leaks from onsite storage of pesticides (bipyridilium), herbicides (Group I - glyphosate, L - paraquat and M - glyphosate), and transmission oil (torque fluid 464). Leaching from waste materials such as metal drums (drum labels that were still legible indicated the drums were used to store natural products), steel beams, soil stockpiles, stockpiles of wood material, concrete piping, pvc piping, and bricks. Shipping containers, site offices, skip bins and workshop area was observed onsite. Filling observed near the south side of western boundary. Refer to **Figure 4** for approx. locations of some of the storage tanks, waste materials, shipping containers and stockpiles.	Photographs 12 to 17 Photographs 18 to 24 Photographs 25, 26

Other general Site observations included:

- Grasses and other vegetation was generally healthy and maintained for agricultural purposes except at the areas that showed some commercial activities (Photographs 2 and 4) and or were dry due to the drought conditions in New South Wales;
- One (1) large storage feed/grain containers were observed on Lot 2 (Ref. to **Figure 4** and Photograph 8);

- Septic tanks and sewerage tanks/vent were observed throughout the site as specified in **Figure 4** (Photographs 27 and 28);
- No suspicious odours were observed in any part of the site;
- No evidence of cattle or sheep tick dip sites were observed;
- No market garden orchards were observed;
- No evidence indicative of underground petroleum storage systems (UPSS) or aboveground storage tanks (AST) was observed on any parts of the site; and
- No evidence of groundwater monitoring wells was noted across the Site.

3. PREVIOUS INVESTIGATIONS

3.1 AVAILABLE DOCUMENTS

Further information was provided to EI on the 2 August 2019 including reports:

- Material Assessment (Suspected Asbestos) Letter Report Ref. E15-063-A DSConTWorth ASBES.Ltr, dated 12 October 2015 (Sanko, 2015);
- Partial Visual Asbestos Removal Clearance Report Ref. CLR5256R01, dated 18 November 2015 (EnviroScience, 2015);
- Asbestos Contaminated Brick Stockpile Removal – Validation Assessment Letter Report Ref. E15-063-B DSConTWorth ASBES VALID, dated 18 May 2016 (Sanko, 2016a), and;
- Onsite Fill Material Assessment Letter Report Ref. E16-043-B DSConTaminda.ENV, dated 15 September 2016 (Sanko, 2016b).

3.2 WORK SCOPE & FINDINGS

Information provided in the reports is summarised in **Table 3-1**.

Table 3-1 Report Scope and Findings

Report	Scope and Findings
Sanko, 2015	An investigation was completed in 2015 on an onsite brick stockpile with an approximate volume of 50m^3 located at Dampier Street, Tamworth. The stockpile had been imported to the site without the correct NSW EPA Recovered Aggregate Exemption (2010 or 2014) assessment. The stockpile material was tested for asbestos only, and the results indicated that stockpile was asbestos contaminated material. Sanko recommended that the material be removed from site as per relevant legislation and WorkCover (now SafeWork NSW) codes.
Enviroscience 2015	An asbestos clearance inspection completed by EnviroScience following the removal in November 2015 of asbestos contaminated building debris and soil from the property identified as 55 Dampier Street, Tamworth NSW. The area visually inspected by the Enviroscience clearance report was 15 m long by 6 m wide area (approx. 90m^2); and found that the surface was free of asbestos containing materials. Enviroscience concluded that the area could be safely accessed.
Sanko, 2016a	An asbestos clearance inspection completed by Sanko following the removal of the brick stockpile identified with suspected asbestos (Sanko, 2015). The clearance report concluded that based on the visual inspection and laboratory results from the surface samples taken within the stockpile footprint; there was no asbestos present within the stockpile footprint.

Report	Scope and Findings
Sanko, 2016b	A material assessment investigation completed by Sanko on sandy clay gravel material which had been stockpiled at 55 Dampier Street, Tamworth, NSW and was later spread out over approximately 3,000m^2 of the site in a 100 mm thick layer. During the investigation 9 soil samples and one soil duplicate sample were collected and they were tested for: - Heavy metals; - total recoverable hydrocarbons (TRH); - the monocyclic aromatic hydrocarbon compounds *benzene, toluene, ethyl-benzene* and *xylenes* (BTEX); and - polycyclic aromatic hydrocarbons (PAH). Three of the collected samples were further tested for asbestos. The analytical data indicated that for the selected analytes the soil concentrations were below the laboratory practical qualitative limits and/or below the NEPM (2013) Health Investigation Levels for Commercial sites. No asbestos was detected in any of the tested samples. As a result of this, the material was deemed suitable by Sanko for the intended use as a gravel working layer.

3.3 OVERVIEW OF PREVIOUS INVESTIGATIONS

Based on the reports available indicate that various fill material had been stockpiled on the site. Further building debris potentially containing asbestos was remove from the land. One stockpile of brick material was removed after potentially containing asbestos and a clearance issued. Subsequently suitable fill was spread across approximately 3,000 m^2 of the property.

The information provided indicated that potential asbestos was detected at the site but was cleared by the respective reports providing an additional line of evidence to support the EI observations that no asbestos was observed on the surface of the site.

4. SITE HISTORY AND SEARCHES

4.1 HISTORICAL LAND TITLES & AERIAL PHOTOGRAPH REVIEW

A historical land titles search was conducted through InfoTrack. Copies of relevant documents resulting from this search are presented in **Appendix C**. A summary of all the previous and current registered proprietors along with information obtained from the available historical aerial photographs, in relation to past potential land uses are presented in **Table 4-1**.

The historical aerial photographs reviewed as part of this PSI included:

- 1976: 1976, B/W, NSW 2385_01_130 – Department of Finance, Services & Innovation.
- 1989: 1989, NSW 3667_03_133 – Department of Finance, Services & Innovation.
- 1998: 1998, NSW 4442_03_116 – Department of Finance, Services & Innovation.
- 2002: 2002, NSW 4743_03_028– Department of Lands.
- 2012: 13 November 2012, Google Maps Imagery.
- 2018: 28 August 2018, Google Maps Imagery.

EI note that historical aerial photographs prior to 1976 were not available via the Department of Finance, Services & Innovation.

Table 4-1 Summary of Owners and Historical Aerial Photography

Date of Acquisition and term held	Registered Proprietor(s) & Occupations (where documented)	Site description based on historical aerial photographs	Inferred site uses
As regards Lot 1 D.P. 1234850			
As regards the part numbered (1) on the attached cadastre			
09.10.1936 (1936 to 1964)	Joseph Henry Starr	Nil	Most likely used for agricultural purposes
16.06.1964 (1964 to 1965)	Enid Agnes Kennedy (Married woman) Ainslie Jean Denton (Widow) (Section 94 Application not investigated)	Nil	Most likely used for agricultural purposes
13.08.1965 (1965 to 1969)	Rupert Alfred Wentworth Vickers (Farmer & Grazier)	Nil	Most likely used for agricultural purposes
09.05.1969 (1969 to 1980)	Barry Maynes McKinnon (Agent)	**1976:** land parcels are clearly marked. Land appears vacant and most likely is in the process of being set up for agricultural purposes.	Agricultural

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations (where documented)**	**Site description based on historical aerial photographs**	**Inferred site uses**
15.09.1980 (1980 to 1989)	John Baden Chaffey (Representative) Gladys Chaffey (Married Woman)	**1989:** Predominantly unchanged from previous aerial. Agricultural activity has been established. A house like structure is observed to the south east corner of the site. The crops on the Southern half of the site are laid out in horizontal rows; and the Northern half of the site appears to be cleared and ready for new crops. Drainage channels are observed in the northern half of the site. These lead/connect to a creek located to the north of the site.	Agricultural

Leases, excluding building premises: -

- 15.04.1952 to East-West Airlines Limited of part of the land in Volume 4795 Folio 165 – expired 15.06.1964

As regards the part numbered (2) on the attached cadastre			
16.04.1929 (1929 to 1945)	Henry Jonathan Cluff (Farmer)	Nil	Most likely used for agricultural purposes
06.02.1945 (1945 to 1976)	Clarence Hardwick Wythes (Farmer) Elsie Rose Wythes (Married Woman)	Nil	Most likely used for agricultural purposes
03.06.1976 (1976 to 1981)	Robert Norman Nicolle (Grazier) Ivy Jean Nicolle (Married Woman)	**1976:** land parcels are clearly marked. Land appears vacant and most likely is in the process of being set up for agricultural purposes.	Agricultural
13.02.1981 (1981 to 1981)	Ivy Jean Nicolle (Widow)	Nil	Agricultural
25.05.1981 (1981 to 1983)	Marau Pty Limited	Nil	Agricultural

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations (where documented)**	**Site description based on historical aerial photographs**	**Inferred site uses**
10.05.1983 (1983 to 1989)	John Baden Chaffey (Representative) Gladys Chaffey (Married Woman)	**1989:** Predominantly unchanged from previous aerial. Agricultural activity has been established. The crops on the Southern half of the site are laid out in horizontal rows. Drainage channels are observed to run in the northern half of the site and along western site boundary. These channels lead/connect to a creek located to the north of the site.	Agricultural
<u>Continued as regards the whole of Lot 1 D.P. 1234850</u>			
16.02.1989 (1989 to 1997)	John Baden Chaffey (Representative)	**1989:** Agricultural activity has been established. A house like structure is observed to the south east corner of the site. The crops on the Southern half of the site are laid out in horizontal rows; and the Northern half of the site appears to be cleared and ready for new crops. Drainage channels are observed to run in the northern half of the site and along western site boundary. These channels lead/connect to a creek located to the north of the site. **1998:** Predominantly unchanged from 1989 aerial. Agricultural activity appears to remain in place. Drainage channels are less pronounced than previous aerial, but still remain. The house like structure noted in the 1989 aerial has been demolished and is no longer observed. The southern half of the site appears to be cleared and ready for new crops.	Agricultural
12.06.1997 (1997 to 2002)	Arnold Neil Bailey	**2002:** Predominantly unchanged from 1998 aerial. Agricultural activity appears to remain in place.	Agricultural

Date of Acquisition and term held	Registered Proprietor(s) & Occupations (where documented)	Site description based on historical aerial photographs	Inferred site uses
04.12.2002 (2002 to 2013)	Novine Pty Ltd	**2012:** Agricultural activity appears to remain in place. Circular pattern in crops (centre pivot irrigation) is observed in the southern half of the site. Crops in the northern half of the site are laid out in vertical rows.	Agricultural
16.09.2013 (2013 to 2017)	Tamworth Regional Council	Nil	Agricultural
27.12.2017 (2017 to date)	# Harry David Stearman	**2018:** Site remains unchanged from 2002 aerial.	Agricultural

Leases continued: - NIL

Easements: -

- 4.01.1980 (R 157473) Easement to Drain Sewage 6 metres wide
- 13.12.1984 (V 391742) Easement for Electricity Transmission Line 20 metres wide
- 26.09.1995 (D.P. 265817) Easement to Drain Water 2 metres wide
- 25.01.2001 (7262811) Easement to Drain Sewage 5 metres wide
- 29.03.2017 (AM 108223) Easement to Drain Water 6 metres wide

As regards Lot 2 D.P. 1234850			
16.04.1929 (1929 to 1945)	Henry Jonathan Cluff (Farmer)	-	Vacant – agricultural use (probable)
06.02.1945 (1945 to 1976)	Clarence Hardwick Wythes (Farmer) Elsie Rose Wythes (Married Woman)	-	Vacant – agricultural use (probable)
03.06.1976 (1976 to 1981)	Robert Norman Nicolle (Grazier) Ivy Jean Nicolle (Married Woman)	**1976:** land parcel is clearly marked. Land appears vacant and a house like structure is noted on the south west of the site.	Vacant – agricultural use (probable)
13.02.1981 (1981 to 1981)	Ivy Jean Nicolle (Widow)	-	Vacant – agricultural use (probable)
25.05.1981 (1981 to 1989)	Marau Pty Limited	**1989:** land parcel is clearly marked. Land appears vacant.	Vacant – agricultural use (probable)
19.01.1989 (1989 to 1994)	John Douglas Collett	-	Vacant – agricultural use (probable)

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations (where documented)**	**Site description based on historical aerial photographs**	**Inferred site uses**
28.01.1994 (1994 to 2017)	Peel Technology High School Parents and Citizens Association	**1998:** Predominantly unchanged from 1989 aerial. Soils are observed to be healthy and green in colour. Bare patch of soil is observed on the western side of the site. **2002, 2012:** Predominantly unchanged from 1998 aerial. Soils appear dry as they are noted to be brown in colour. In 2012 aerial, land parcel is been subdivided into three distinct areas – southern area, east and west area.	Agricultural / commercial
27.12.2017 (2017 to date)	# Chan Abbey Holdings Pty Limited	**2018:** The southern area is noted to have a dirt road in the south western part of the site. In the northern half of the site soils are observed to be very brown, with no grass. Some hay stacks (?), amongst other equipment (drums?) is observed towards the western side of the site, and silos are noted along the south eastern boundary. The eastern area comprises of brown soils, and some bush plants in the south eastern section.	Agricultural / commercial
Leases: - NIL **Easements: -** • 4.01.1980 (R 157473) Easement to Drain Sewage 6 metres wide • 27.02.1985 (D.P. 711449) Easement to Drain Water 5 metres wide			
As regards Lot 3 D.P. 1234850			
09.10.1936 (1936 to 1964)	Joseph Henry Starr	-	Vacant
16.06.1964 (1964 to 1965)	Enid Agnes Kennedy (Married woman) Ainslie Jean Denton (Widow) (Section 94 Application not investigated)	-	Vacant

Date of Acquisition and term held	Registered Proprietor(s) & Occupations (where documented)	Site description based on historical aerial photographs	Inferred site uses
13.08.1965 (1965 to 1969)	Rupert Alfred Wentworth Vickers (Farmer & Grazier)	-	Vacant
09.05.1969 (1969 to 1981)	Barry Maynes McKinnon (Agent)	**1976:** land parcel is clearly marked. Land appears vacant.	Vacant
08.10.1981 (1981 to 2004)	Tim Kirkpatrick Anna Edith Kirkpatrick	**1989:** land parcel remains vacant. A house like structure is observed in the north eastern corner of the site. South boundary area appears to be used as a storage area for containers, equipment etc **1998:** land parcel appears to have been subdivided into two separate areas. House like structure has been demolished. The northern area of the site appears to have vertical rows of crops. Southern part of the land continues to be used as a storage area for what appears to be shipping containers, equipment and/or materials. The number of items stored has increased since previous 1989 aerial. **2002:** land has been cleared, no crops are observed. Southern area continues to be use a storage space.	Agricultural / commercial

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations (where documented)**	**Site description based on historical aerial photographs**	**Inferred site uses**
10.06.2004 (2004 to date)	# Kidman Group Pty Limited	**2012:** land parcel is vacant. Ground surface appears to be healthier, as the green colour indicated some form of vegetation has grown. A dirt road to the south of the site is observed. Dirt road extends from east to west. The amount of stored items along the southern boundary has decreased, with only a couple of items now observed. **2018:** land parcel is predominantly vacant. Ground surface appears dry, with little to no vegetation. Dirt track is no longer observed. Rubbish appears to be spread in the south western section of the site. Multiple shipping containers are observed in the south eastern section of the site. A structure with white convex roofing has been established.	Agricultural/ commercial

Note: # Denotes Current Registered Proprietor

In summary, review of land titles records and available historic aerial photography showed that the southern half of the site was most likely to be primarily of agricultural land use since 1970's until the early 2000's. Following this, the land use changed to agricultural/commercial which has remained as the land use to date.

In comparison, the northern half of the site to date has primarily being used for agricultural purposes.

Given that there was no available historic aerial photography prior to 1976, the land use prior to this date is uncertain. Nevertheless, when looking at the land titles in conjunction with council records (Tamworth Regional Council, 2006), Tamworth was renowned for agricultural/market activities since the 1860's. By the early to mid-20th century Tamworth developed into mixed of agricultural and industrial town.

4.2 MILITARY USE RECORD SEARCH

4.2.1 Unexploded Ordnance

A search of the Australian Department of Defence Unexploded Ordnance (UXO) Mapping Application (http://www.defence.gov.au/UXO/Where/Default.asp) was completed. The search indicated that the site was not identified as being potentially affected by UXO. The closest **land** identified as potential impacted by UXO was 17 Faringdon Street North Tamworth NSW 2340 (Lot 53 in DP1212930) located approx. 4.5km north of the site.

4.2.2 Airforce Training

Independent research into NSW Office of Environment & Heritage Website and other sources of information such as newspaper articles and Tourist information websites; indicate that during World War II (WWII), the Royal Australian Air Force (RAAF) No.20 Inland Aircraft Fuel Depot (IAFD), was established (1942) in Tamworth and was later closed on 14 June 1944. The RAAF flying school was also set up at the aerodrome (now Tamworth Regional Airport). It is noted that from approximately 1946 to 1961, the aerodrome was used for civil services and was operated by East West Airlines. Whilst the location of the fuel depot is not specified, based on the historical land titles and aerial photographs search, the SafeWork NSW record search and the site observations from the 29 November 2018 walkover inspection; it is unlikely that the Site was the location of the IAFD.

4.2.3 Risk of Contamination from Military Related Use

Overall, the available information indicates areas of Tamworth were used for military purposes such as air training at approximately 10km east of the Site; and Unexploded Ordnance at approximately 4.5km north of the Site. However, it is inferred that these usages were localised in areas across or downgradient from the site and it is therefore considered that there is a negligible risk of the site being contaminated from these prior military usages.

4.3 REVIEW OF SURROUNDING LAND USES

The review of historical aerial photographs was also used to assess changes to surrounding land uses. A summary of the pertinent information identified in relation to surrounding land parcels from the reviewed photographs is presented in **Table 4-2**.

Table 4-2 Summary of historical aerial photo review for surrounding land uses

Aerial photograph	Surrounding land uses based on historical aerial photographs
1976 – Department of Finance, Service & Innovation	River channels are noted to the north of the site. A road way followed by racecourse is observed to the east of the site. Beyond the racecourse urban development is noted. Some urban development is also noted to the south and south west of the site. Agricultural/vacant land is observed to the south west and west of the site, along with railway and roadways to the south.
1989 – Department of Finance, Service & Innovation	Surrounding land use remains predominantly unchanged from 1976 aerial photograph. However, industrial properties have been established on the neighbouring southern of the site. Residential and commercial/industrial use of surrounding lands to the east, south and south west has increase, and a new road way to the west, east and south east of the site has been constructed. New dwellings in the neighbouring lots to the west of the site have been established.
1998 – Department of Finance, Service & Innovation	Surrounding land use remains predominantly unchanged from 1989 aerial photograph. However, an increase is residential development is noted to the south west and far south of the site.
2002 – Department of Finance, Service & Innovation	Surrounding land use remains predominantly unchanged from 1998 aerial photograph.

Aerial photograph	Surrounding land uses based on historical aerial photographs
2012 Google Earth	Increase in residential development is noted to the south west of the site. Commercial/industrial properties in the neighbouring southern lot to the site have been constructed. An increase in commercial/industrial properties to the far south/east of the site is also observed. The neighbouring lot to the west of the site has adopted centre pivot irrigation in the northern section of the lot.
2018 Google Earth	Surrounding land use remains predominantly unchanged from 2012 aerial photograph. However, commercial/industrial development continues to increase to the east and south of the site. Similarly, the residential development to the south west of the site is denser.

4.4 COUNCIL INFORMATION

A search of site history records held by Tamworth Regional Council in relation to the site, were collected during this investigation. The records found dated back to 2004 and are presented in **Appendix D**. A summary of relevant documents reviewed (i.e. developments applications, letters of reference/complaints) is presented in **Table 4-3**.

Table 4-3 Summary of Historical records Archived at Tamworth Regional Council

Period / Year	Series (Council Ref)	Description
2004	7751/2004	Development application for an increase in the overall dimensions and the relocation of the garage-hayshed on Lot 3 in DP1234850 (previously known as Lot 23, DP260129). Approval was granted on 29 October 2004.
2011	DA0397/2011	Development application for the change of use (storage depot for skip bins) of Lot 3 in DP1234850. Approval was granted, and it became effective on 12 April 2011.
2015	DA0525/2015	Development application for the partial use of Lot 3 in DP1234850 for the storage of shipping containers and demountable buildings. Approval was granted, and it became effective on 07 August 2015.
2016	-	Statement of Environmental Effects report completed by Boresch Project Services in December 2016 (BPS, 2016). The report was completed for 55 Dampier St, Lot 23 DP260129. The report was used to obtain retrospective consent for the earthworks as executed and also obtain development consent for the erection of a workshop, installation of a site office and ablution block for the purpose of light industrial. The report concluded that retrospective consent on the earthworks as executed, along with the proposed development be approved by Council. Whilst the development application for these works was not available, the observations made during site inspection indicate that a workshop was constructed on an area of shallow filling.

In summary, historical council records dating back to 2004 for the south eastern part of the site indicate that the site was predominantly use for various commercial/ industrial purposes including, storage space. No residential use of the site was observed.

These findings are consistent with the aerial photography review and historical land titles information discussed in **Section 4.1**.

4.5 SAFEWORK NSW RECORD SEARCH

A search of SafeWork NSW Authority records relating to the property at 55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW was initiated on 29 October 2018 by EI, on behalf of the site owner. Correspondence dated 09 November 2018, from SafeWork NSW was received and there are no records held by SafeWork NSW pertaining to the above premises (Ref. **Appendix E**).

4.6 ABORIGINAL HERITAGE – RECORD OF ABORIGINAL PLACES UNDER THE NATIONAL PARKS AND WILDLIFE ACT

An on-line search of the NSW Environment & Heritage public record of Aboriginal Places declared by the Minister for the Environment under the National Park and Wildlife Act was conducted on 23 November 2018. The information obtained from this search is provided by the Heritage Division of the NSW Government Office of Environment & Heritage.

The search confirmed that the site known as 55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW and lands in its close proximity (within 500 m), are not Aboriginal Heritage.

4.7 CONTAMINATED LAND - RECORD OF NOTICES UNDER SECTION 58 OF CLM ACT (1997)

An on-line search of the contaminated land public record of EPA Notices was conducted on 23 November 2018.

The contaminated land public record is a searchable database of:

- Orders made under Part 3 of the *Contaminated Land Management Act 1997* (CLM Act);
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the Environment Protection Authority (EPA) has not been revoked;
- Site audit statements provided to the NSW EPA under section 53B of the CLM Act that relate to significantly contaminated land;
- Where practicable, copies of anything formerly required to be part of the public record; and
- Actions taken by NSW EPA under section 35 or 36 of the *Environmentally Hazardous Chemicals Act 1985* (EHC Act).

The search confirmed that the site known as 55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW and lands in its close proximity (within 500 m), are not subject to any regulatory notices issued by the NSW EPA.

4.7.1 List of NSW contaminated sites notified to EPA

A search through the List of NSW Contaminated Sites notified to the EPA under Section 60 of the CLM Act 2008 was conducted on 23 November 2018. This list is maintained by NSW EPA and includes properties on which contamination has been identified. Not all notified land is deemed to be impacted significantly enough to warrant regulation by the NSW EPA.

The search confirmed that the site known as 55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW and lands in its close proximity (within 500 m), are not subject to any regulatory notices issued by the NSW EPA.

EI note that four sites within a 1km radius were identified to be subject to regulatory notices issued by the NSW EPA. However, these sites are noted to be down hydraulic gradient or hydrologically cross gradient in relation to the site. A copy of the Public List of Notified Sites with the aforementioned sites highlighted in yellow has been provided in **Appendix C**.

4.7.2 POEO Public Register

A search of the Protection of the Environment Operations (POEO) Act public register was conducted on 23 November 2018. The public register contains records related to environmental protection licences, applications, notices, audits, pollution studies, and reduction programmes. The search identified that there is no records under the POEO public register for the site known as 55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW. However, the following land in its close proximity (within 500 m), has been identified under the POEO public register:

- *Boral Resources (Country) Pty Limited* – for concrete batching in a >13000 – 25000m^3 produced scale. License is no longer in force. A copy of the license has been provided in **Appendix C**.

Given that the license appears to not have been in force since its last review date, 16 February 2012; the activities completed at this site are not a cause for environmental concern.

5. CONCEPTUAL SITE MODEL

5.1 OVERVIEW

In accordance with NEPM (2013) *Schedule B2 – Guideline on Site Characterisation* and to aid in the assessment of data collection for the Site, EI developed a preliminary conceptual Site model (CSM) assessing plausible pollutant linkages between potential contamination sources, migration pathways and receptors. The CSM provides a framework for identifying data gaps in the existing Site characterisation and future Site assessments. Potential contamination sources, exposure pathways and receptors that were considered relevant for this assessment are summarised along with a qualitative assessment of the potential risks posed by complete exposure pathways[1].

5.2 SUBSURFACE CONDITIONS

The intrusive investigation carried out on 9 September 2019 by Sanko Engineering, revealed that the subsurface soils comprise of silty clay fill/top soil overlying natural clays. The natural soil layers correlated with the regional geology identified in **Section 2.3**.

5.3 POTENTIAL CONTAMINATION SOURCES

On the basis of the PSI findings potential contamination sources are as follows:

- Fill of unknown origin and quality placed at the Site;
- Weathering of exposed building fabrics, painted surfaces and metallic objects from the waste material found at the site and from the site structures;
- Hazardous materials derived from uncontrolled demolition or degradation of former Site structures and existing waste materials;
- Potential contamination associated with heavy machinery across large areas of the Site;
- Potential on-Site use of pesticides across the Site;
- Potential contamination from onsite chemical storages;
- Former agricultural use, and
- Contamination resulting from waste disposal and illegal dumping across the south eastern section of the Site, which makes up 30%of the Site; and unknown contamination sources (e.g. unknown burial pits or filled erosion gullies).

[1] A source, pathway, and receptor are all present and exposure to the contaminant is possible

5.4 CONTAMINANTS OF POTENTIAL CONCERN

Based on the findings of the PSI, the contaminants of potential concern (COPC) at the site are considered to be:

- Soil – heavy metals (HMs), total recoverable hydrocarbons (TRHs), the monocyclic aromatic hydrocarbon compounds *benzene, toluene, ethylbenzene and total xylenes* (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine and organophosphorus pesticides (OCPs / OPPs), herbicides, polychlorinated biphenyls (PCBs), asbestos, Cation Exchange (CEC), pH, and soil salinity.
- Water - heavy metals (HMs), total recoverable hydrocarbons (TRHs), the monocyclic aromatic hydrocarbon compounds *benzene, toluene, ethylbenzene and total xylenes* (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine and organophosphorus pesticides (OCPs / OPPs), total phenols, and volatile organic compounds (VOCs).

5.5 PER OR POLY-FLUOROALKYL SUBSTANCES (PFAS)

EPA (2017) requires that PFAS is considered in assessing contamination. EI use the following decision tree (**Table 5-1**) based on EnRisk (2016) for prioritising the potential for PFAS to be present on site and whether PFAS sampling of soil and water is required.

Table 5-1 PFAS Decision tree

Preliminary Screening	Likelihood of occurrence
Did fire training occur on-site?	**Low**
Did fire training occur, or is an airport or fire station up gradient of or adjacent to the site? [1]	**Low**[3]
Have "fuel" fires ever occurred on-site? (e.g. ignition of fuel (solvent, petrol, diesel, kerosene) tanks?)	**Low**
Have PFAS been used in manufacturing or stored on-site ?[2]	**Low**

Notes:
[1] Runoff from fire training areas may impact surface water, sediment and groundwater.
[2] PFAS is used wide range of industrial processes and consumer products, including in the manufacture of non-stick cookware, specialised garments and textiles, Scotchguard™ and similar products (used to protect fabric, furniture, leather and carpets from oils and stains), metal plating and in some types of fire-fighting foam (https://www.nicnas.gov.au/chemical-information/factsheets/chemical-name/perfluorinated-chemicals-pfas)
[3] A search of the NSW EPA PFAS investigation program register was completed and Tamworth Regional Airport has been identified as being impacted by PFAS. PFAS was also found in some surrounding properties. However, given the location of the Airport in relation to the site; which is approx. 4.5km to the west of the site (i.e. across gradient) the likelihood of the Airport activities being a source of site contamination is low. Furthermore, an additional search of the Australian Defence Force PFAS Investigation and Management Program register was completed and neither Tamworth Airport nor any other lands within the vicinity of the site were found on the PFAS investigation and management sites list.

5.6 EMERGING CHEMICALS

The NSW EPA uses Chemical Control Orders (CCOs) as a primary legislative tool under the EHC Act (1985) to selectively and specifically control particular chemicals of concern, and limit their potential impact on the environment. CCOs provide the EPA a rapid and flexible mechanism for responding to emerging chemical issues. As with PFAS compounds, EI has considered chemicals controlled by CCOs and other potential emerging chemicals in this assessment as outlined in **Table 5-2**.

Table 5-2 Emerging or controlled chemicals

Chemicals of Concern (CCO or emerging)	Decision
Were aluminium smelter wastes used or stored on site (CCO, 1986)?	**No**
Do dioxin contaminated wastes (CCO, 1986) have the potential to impact the site? [1]	**No**
Were organotin products (CCO,1989) used or stored on site ?[2]	**No**
Were polychlorinated biphenyls (PCBs) used or PCB wastes (CCO, 1997) stored on-site?[3]	**Low Risk**
Were scheduled chemical or wastes (CCO, 2004) used or stored[4]	**Yes** *Given that historically the site has been used for agricultural purposes, the likelihood of scheduled wastes being used onsite in the form of pesticides is medium.*
Are other emerging chemicals suspected?[5]	**No**
If Yes to any questions, has site sampling suite been optimised to include specific sampling for other chemicals of concern in soil, air and water	**Yes** *Identified COPC in Section 4.1.3*

Notes:
[1] From burning of certain chemicals, smelting or chemical manufacturing or fire on or near the site.
[2] From anti-fouling paints used or removed at boat & ship yards and marinas.
[3] From older transformer oils & electrical capacitors
[4] Twenty-four mostly organochlorine pesticides (such as aldrin, DDT, endrin, 2,4,5,T etc.)
[5] Other chemicals considered as emerging e.g. 1,4 dioxane (associated with some cVOCs),

5.7 POTENTIAL SOURCES, RECEPTORS AND EXPOSURE PATHWAYS

Potential contamination sources, exposure pathways and human and environmental receptors that were considered relevant for this assessment are summarised in **Table 5-3**.

Table 5-3 Preliminary Conceptual Site Model

Contaminated Media	Chemicals of Potential Concern	Transport Mechanism	Exposure Pathway	Potential Receptor
Impacted soils	HM, TRH, PAH, BTEXN, OCP, OPP, PCB, VOC, asbestos	Disturbance of surficial and subsurface soils during construction, future maintenance, and use of the site post redevelopment	• Ingestion and dermal contact; • inhalation of asbestos fibres and dust particulates; • volatile organic compounds during site redevelopment	• Construction and maintenance workers • End users of the site post redevelopment • Agricultural lands surrounding the site
		Atmospheric dispersion from soil to outdoor air spaces, or mobilisation of soil particles/ fibres during site works causing soil disturbance	• Inhalation of asbestos and dust fibres from impacted soil; • Inhalation of particles of contaminated soil	
	F1 and F2 TRH, BTEXN and VOCs	Volatilisation & diffusion from soil to indoor air spaces, particularly in areas where chlorinated solvents have been leaked or spilled	• Inhalation of vapours intruding into ground level office/industrial building spaces from VOC impacted soil, soil vapour or groundwater	
	HM, TRH, PAH, BTEXN, OCP	Plant uptake of contamination present in root zone	• Plant uptake	• Current ecological receptor of Wallamore Anabranch and Timbumburi Creek
Groundwater	HMs, TRH, BTEXN, total phenolsand VOCs	Migration of dissolved phase impacts in groundwater	• Contaminants arriving at receiving surface water bodies could lead to ingestion and dermal contact	• Aquatic ecosystems (Wallamore Anabranch and Timbumburi Creek) • Recreational water users
Building fabrics containing hazardous materials	Lead, PCB and asbestos	Release of hazardous materials during uncontrolled demolition of building fabrics	• Ingestion; • Dermal contact; • Inhalation of airborne contaminants	• Construction workers during site redevelopment; • Maintenance worker post-development; • End users of the site

5.8 DATA GAPS

Based on the information from the site history review and walkover inspection, EI considered a limited programme of intrusive investigation was warranted, by way of targeted / systematic sampling at available locations across the Site.

6. ASSESSMENT METHODOLOGY

6.1 SAMPLING RATIONALE

With reference to the CSM described in **Section 5**, the field investigation works were planned in accordance with the following rationale:

- Site characterisation in relation to soil would be based on intrusive soil investigations involving sampling and laboratory analysis of fill and natural soils from twelve test pits (TP1 to TP12). The test pits were located systematically across targeted and accessible parts of the site; and
- Laboratory analysis of representative soil samples for the COPC identified in **Section 5.4**.

6.2 ASSESSMENT CRITERIA

The assessment criteria proposed for this project are outlined in **Table 6-1**. The most conservative criteria has been chosen from available published guidelines that are endorsed by national or state regulatory authorities, with due consideration of the exposure scenario that is expected for the site, the likely exposure pathways and the identified potential receptors.

For the purposes of this investigation, the adopted soil assessment criteria are referred to as the Soil Investigation Levels (SILs). SILs are presented alongside the analytical results in the corresponding summary tables, which are discussed in **Section 9**.

Table 6-1 Adopted Investigation Levels for Soil

Environmental Media	Adopted Guidelines	Rationale
Soil	NEPC (2013) Soil HILs, EILs, HSLs, ESLs and Management Limits for TRHs	**Soil Health-based Investigation Levels (HILs)** Entirety of Area B: HIL- A residential with garden/access, including childcares. **Soil Health-based Screening Levels (HSLs) for Vapour Intrusion** Entirety of Area B: NEPM (2013) HSL-A & B for low to high density residential. NEPC (2013) HSL-A for recreational/open space sites. Asbestos HSLs: Presence or absence of asbestos (i.e. detection/non-detection) was adopted for preliminary screening purposes. **Ecological Investigation Levels (EILs) / Ecological Screening Levels (ESLs)** EILs / ESLs were considered relevant as a conservative measure. The derived EIL criteria presented by EI are based on the following: ▪ generic EILs for aged arsenic, fresh DDT and fresh Napthalene (NEPM Schedule B, Table 1B(5)); ▪ generic EIL for lead (NEPM Schedule B, Table 1B(4)); ▪ EIL derivation for Copper (total) is based on Copper (III); The adopted ESL criteria presented by EI are based on conservative coarse grained criteria. **Management Limits for Petroleum Hydrocarbons** Should the ESLs and HSLs be exceeded for petroleum

	hydrocarbons, soil samples will also assessed against the NEPM 2013 *Management Limits* for the TRH fractions F1 – F4 to assess propensity for phase-separated hydrocarbons (PSH), fire and explosive hazards & adverse effects on buried infrastructure.

6.3 SOIL INVESTIGATION

The soil investigation works conducted at the site are described in the Sanko Engineering report (Sanko, 2019). For ease of reference, this report has been provided under **Appendix F**. Test pit locations completed by Sanko are illustrated in **Figure 5**.

7. DATA QUALITY ASSESSMENT

The assessment of data quality is defined as the scientific and statistical evaluation of environmental results to determine if the data meet the objectives of the project (Ref. US EPA, 2006). Data quality assessment involves an evaluation of the compliance of the field sampling and laboratory analytical procedures and an assessment of the accuracy and precision of these data from the laboratory quality control measurements obtained.

The data quality assessment process for this PSI included a review of analytical procedures to confirm compliance with established laboratory protocols and an assessment of the accuracy and precision of analytical data from a range of quality control measurements. The QC measures generated from the field sampling and analytical program were as follows:

- Suitable records of fieldwork observations, including borehole logs;
- Relevant and appropriate sampling plan (density, type, and location);
- Use of approved and appropriate sampling methods;
- Preservation and storage of samples upon collection and during transport to the laboratory;
- Complete field and analytical laboratory sample COC procedures and documentation;
- Sample holding times within acceptable limits;
- Use of appropriate analytical procedures and NATA-accredited laboratories;
- Required LOR (to allow for comparison with adopted IL);
- Frequency of conducting quality control measurements;
- Laboratory blanks;
- Field duplicates;
- Laboratory duplicates;
- Matrix spike/matrix spike duplicates (MS/MSDs);
- Surrogates (or System Monitoring Compounds);
- Analytical results for replicated samples, including field and laboratory duplicates and inter-laboratory duplicates, expressed as Relative Percentage Difference (RPD); and
- Checking for the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

8. Results

8.1 Soil Investigation Results

8.1.1 Site Geology and Subsurface Conditions

The general site geology encountered during this investigation was a layer of fill or topsoil, overlying residual clays. The geological information obtained during the investigation is summarised in **Table 8-1** and test pit logs from these works are presented in **Appendix F**.

Table 8-1 Generalised Subsurface Profile

Layer	Description	Maximum Depth to Top & Bottom of Layer (mBGL)	
		Top	Bottom
Fill/Topsoil	Clayey SAND fine grained, pale yellow, low plasticity, moist/ Sandy GRAVEL fine grained, orange, fine to medium sand, moist.	0.0	0.3
	Silty CLAY; low plasticity, dark grey, low plasticity fines, moist.	0.0	0.4
Natural	CLAY; medium to high plasticity, dark grey/brown, trace of fine sand, moist. CLAY; medium to high plasticity, orange/brown, wet .	0.4	1.0

Note:
+ Termination depth of borehole

8.2 Laboratory Analytical Results

8.2.1 Soil Analytical Results (Contamination)

A summary of the laboratory results for the tested samples, with minimum / maximum analyte concentrations, is presented in **Table 8-2**. More detailed tabulation, showing individual sample concentrations alongside the adopted criteria, is presented in **Table T1** at the end of this report.

Table 8-2 Summary of Soil Analytical Results

No. of Primary Samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample Locations Exceeding Investigation Levels *
Priority Metals				
22	Arsenic	<4	<4	None
22	Cadmium	<0.4	<0.4	None
22	Chromium (Total)	13	37	None
22	Copper	20	40	None
22	Lead	6	11	None
22	Nickel	3.4	20	None
22	Zinc	45	46	None
22	Mercury	<0.1	<0.1	None
TRHs (including BTEX)				
22	TRH C_6-C_{10} minus BTEX (F1)	<25	<25	None

No. of Primary Samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample Locations Exceeding Investigation Levels *
22	TRH >C_{10}-C_{16} (F2) minus Naphthalene	<25	<25	None
22	TRH >C_{16}-C_{34} (F3)	<100	<100	None
22	TRH >C_{34}-C_{40} (F4)	<100	<100	None
22	Benzene	<0.1	<0.1	None
22	Toluene	<0.1	<0.1	None
22	Ethylbenzene	<0.1	<0.1	None
22	Total Xylenes	<0.3	<0.3	None
PAHs				
22	Benzo(α)pyrene	<0.05	<0.05	None
22	Carcinogenic PAHs	<0.5	<0.5	None
22	Naphthalene	<1	<1	None
22	Total PAHs	<0.05	<0.05	None
Asbestos				
7	Asbestos	No	No	None
OCPs				
22	OCPs	ND	ND	None
OPPs				
22	OPPs	ND	ND	None
PCBs				
22	PCBs	ND	ND	None

Note:
* Refer to **Section 7.3** for all investigation levels adopted.
ND – None Detect

Priority Metals

All priority metal concentrations were below the corresponding SILs (including EILs).

PAHs

All PAH concentrations were below the corresponding SILs.

TRHs and BTEX

All TRH and BTEX concentrations were below the laboratory practical quantitation limits (PQL) and subsequently below the corresponding SILs.

OCPs, OPPs and PCBs

The concentrations of all screened OCPs, OPPs and PCBs were below the corresponding SILs.

Asbestos

Asbestos was not detected in any of the tested fill soil samples.

9. Site Characterisation

9.1 Review of Conceptual Site Model & Data Gaps

The preliminary CSM discussed in **Section 5** was considered to appropriately identify contamination sources, migration mechanisms and exposure pathways, as well as potential onsite and offsite receptors.

Based on the available analytical data, widespread contamination was not identified on the site.

9.2 Soil Contamination Characterisation

All contaminant concentrations in the examined soils were found to comply with the adopted SILs (including EILs and ESLs) which is the most conservative criteria. Given that the proposed land use is for commercial/industrial purposes, which is a less sensitive land use; EI considered the potential for site contamination of significance as being low.

10. CONCLUSIONS

The property located at 55 Dampier Street and 21 & 72 Wallamore Road, Taminda, NSW was the subject of a Preliminary Site Investigation. The investigation was performed as part of a Planning Proposal to Tamworth Regional Council, for the development of Employment lands and construction of an associated bypass road which connects Jewry Street to Wallamore Road in the South. This Preliminary Site investigation (PSI) was undertaken by EI to evaluate the potential of any on-site contamination associated with current and former land uses.

The findings of this assessment were as follows:

- Historical records indicated that the southern half of the site was most likely to be primarily of agricultural land use since 1970's until the early 2000's. Following this, the land use changed to agricultural/commercial which has remained as the land use to date. In comparison, the northern half of the site to date has primarily being used for agricultural purposes.

- The site inspection revealed that isolated dumping has occurred at the southern third of the site. Some of the waste material observed included weathered steel beams, rusted metal drums, metal roofing sheets, and soil stockpiles;

- Onsite storage of pesticides (bipyridilium), herbicides (Group I, L, and M) and fuel oil was observed during site the site inspection that was completed on the 29 November 2018;

- Based on the information outlined in previous reports completed for the site by Sanko Excavation Environmental & Civil Services Pty Ltd (Sanko) and Regional EnviroScience Hazardous Materials Laboratory and Consultancy (EnviroScience); it is noted that action was taken into clearing any asbestos containing material that might have been brought to site as a result of inadequate soil management practices;

- The information provided in previous investigations completed by Sanko (2015, 2016a and 2016b) and EnviroScience (2015) was useful as an additional line of evidence to support the site observations where asbestos was not observed at surface;

- Council records dating back to 2004 held by Tamworth Regional Council indicated that the site has not been used for residential purposes and that the commercial/industrial use of the land has only being predominantly an isolated use to the south eastern side of the site;

- A search of SafeWork NSW Dangerous Goods Records revealed there are no records pertaining to the above premises;

- The site and surrounding properties (within 500m) were not reported as being of Aboriginal Heritage under the National Park and Wildlife Act;

- The site and surrounding properties were not reported as being subject to regulation in relation to environmental impacts, as documented in the NSW EPA databases; with the exception of one site within 500m of the site, which held a license for concrete batching. The license is no longer in force;

- A Military use record search was completed on the site and lands in close proximity of the site. Overall, the available information indicated Tamworth was used for military purposes such as air training and Unexploded Ordnance. However, it is inferred that these usages were localised in areas across or downgradient from the site and it is therefore considered that there is a low risk of the site being contaminated from these usages in the surrounding lands;

- The CSM identified the potential for contamination resulting from the use of pesticides, herbicides and some fertilisers across the Site; and possible oil spill and leaching of weathered building materials in the south eastern area of the Site which makes up approx. 30%of the Site area.
- The nearest sensitive receptors to the site were Wallamore Anabranch to the north of the site, and Timbumburi Creek and the agricultural/residential land uses to the west of the Site;
- The site and all examined (drilled / sampled) soils displayed no visual or olfactory evidence of contamination.
- The sub-surface layers were comprised of anthropogenic, silty clay / gravelly clay, fill mix or silty clay topsoil to a depth of 0.4m BGL, overlying natural clays.
- Laboratory analytical results for the representative soil samples were all found to apply with the adopted SILs applicable to the proposed sensitive (commercial/industrial) land use.
- Groundwater was not encountered during this investigation.

Based on the findings from this PSI, and with consideration of the Statement of Limitations (**Section 12**), EI concluded that wide spread contamination was not present on the site. The site is regarded as suitable for the proposed rezoning of the site to a less sensitive land use (Employment Lands), in accordance with Clause 7 of *State Environmental Planning Policy No. 55 - Remediation of Land*, provided the recommendations detailed in **Section 11** were implemented.

11. RECOMMENDATIONS

EI hereby makes the following recommendations in relation to the proposed site development:

- All waste materials designated for off-site disposal (including any virgin excavated natural material (VENM)) must be classified in accordance the EPA (2014) *Waste Classification Guidelines*. They are to be transported to EPA-licensed waste facilities by licensed waste contractors.

- Any soil material to be imported to the site (i.e. for backfilling and/or landscaping purposes) must be confirmed by documentary evidence as suitable for the proposed land use. In the absence of such validation, the material will require assessment through sampling and laboratory analysis as being free of contamination and suitable for the intended land use, in accordance with NSW EPA guidelines.

EI note that these recommendations can be addressed through the DA approval process and incorporated into the conditions of development consent.

12. STATEMENT OF LIMITATIONS

This report has been prepared for the exclusive use of Chan Abbey Holdings Pty Ltd c/- Elton Consulting, who is the only intended beneficiary of EI's work. The scope of the investigations carried out for the purpose of this report is limited to those agreed with Chan Abbey Holdings Pty Ltd on 5 October 2018 and subsequent emails dated 9 September 2019.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental industry in Australia as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section of this report must be read in conjunction with the whole of this report, including its appendices and attachments.

The conclusions presented in this report are based on a limited assessment of historical site use and current use of the site. Due to the preliminary nature of this assessment, findings are not based on actual samples collected or testing conducted. EI has relied upon information provided by the Client and other third parties to prepare this document, some of which could not be verified by EI due to the anecdotal or historical nature of the information.

EI's professional opinions are reasonable and based on its professional judgment, experience and training.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through the data searches that have been initiated with government authorities, but for which the requested information is still pending.

Technical opinions may also be amended in the light of further investigation, observations, or validation testing and analysis during remedial activities. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

REFERENCES

Banks, Robert G, 2001 *Soil Landscapes of Tamworth1:100 000 sheet*, Department of Land and Water Conservation, Sydney.

BPS (2016) *Statement of Environmental Effects, 55 Dampier Street, Lot 23 DP260129, Taminda NSW 2340, Earthworks as Executed, Installation of Site Office, Ablution Block and Workshop for Light Industrial Use*, December 2016.

DCP (2010) *Tamworth Regional Council Development Control Plan (DCP),* Tamworth Regional Council.

DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*, Dept. of Environment and Conservation, New South Wales, DEC 2007/144, June 2007.

DMR (1971) Tamworth 1:250,000 *Geological Series Sheet* Geological Series Sheet 56-13, Geological Survey of New South Wales, Department of Mineral Resources.

Enrisk (2016) *Proposed Decision Tree for Prioritising Sites Potentially Contaminated with PFASs*, Enrisk, February 2016.

EnviroScience (2015) *Partial Visual Asbestos Removal Clearance Report* Ref. CLR5256R01, dated 18 November 2015.

EPA (1995) *Sampling Design Guidelines*, Environment Protection Authority of New South Wales, Contaminated Sites Unit, EPA 95/59, September 1995.

EPA (2017) *Guidelines for the NSW Site Auditor Scheme* (3rd Edition), NSW EPA, Doc. EPA 2017P0269, October 2017.

He, Z. L., Yang, X. E., and Stoffella, P. J. (2005). Trace elements in agroecosystems and impacts on the environment. *Journal of Trace Elements in Medicine and Biology* **19**, 125 – 140.

LEP (2010) *Tamworth Regional Council Local Environmental Plan (LEP),* Tamworth Regional Council.

NEPC (2013) *National Environmental Protection (Assessment of Site Contamination) Measure 1999,* Amendment 2013, National Environmental Protection Council, 16 May 2013;

OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*, NSW Office of Environment and Heritage (OEH), OEH 2011/0650; and

Sanko (2015) *Material Assessment (Suspected Asbestos)* Letter Report Ref. E15-063-A DSConTWorth ASBES.Ltr, dated 12 October 2015.

Sanko (2016a) *Asbestos Contaminated Brick Stockpile Removal – Validation Assessment* Letter Report Ref. E15-063-B DSConTWorth ASBES VALID, dated 18 May 2016.

Sanko (2016b) *Onsite Fill Material Assessment Letter Report* Ref. E16-043-B DSConTaminda.ENV, dated 15 September 2016.

Sanko (2019) *Field Assessment And Data Collection For Preliminary Stage II Environmental Site Assessment* Ref. E19 026_A_DampierStTaminda_FW_PS2.Rpt, dated 19 September 2019.
SEPP 55 (1997) *State Environment Protection Policy 55*, Remediation of Land under the Environmental Planning and Assessment Act 1997.

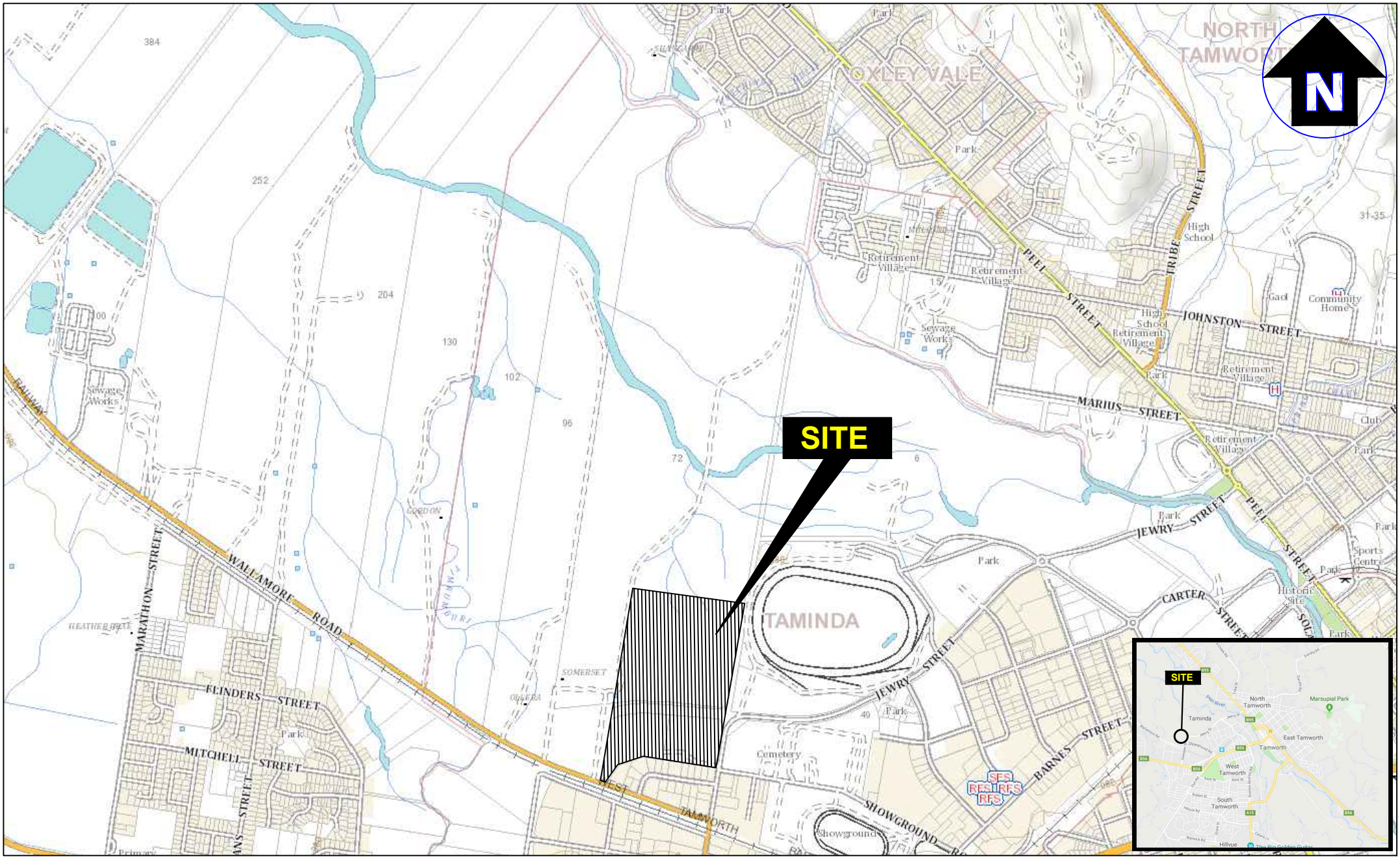
USEPA (2006) *Data Quality Assessment: A Reviewers Guide – EPA QA/G-9R*. USEPA Office of Environmental Information, EPA/240/B-06/002, February 2006.

WADOH (2009) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. Published by the Western Australian Department of Health, May 2009.

ABBREVIATIONS

ACM	Asbestos Containing Material
AHD	Australian Height Datum
AST	Aboveground Storage Tank
BTEX	Benzene, Toluene, Ethylbenzene, Total Xylenes
CSM	Conceptual Site Model
DA	Development Application
DEC	Department of Environment and Conservation, NSW
DECC	Department of Environment and Climate Change, NSW
DECCW	Department of Environment, Climate Change and Water, NSW
DP	Deposited Plan
DSI	Detailed Site Investigation
EI	EI Australia
EPA	Environment Protection Authority
ha	Hectares
IAFD	Inland Aircraft Fuel Depot
km	Kilometres
m	Metres
MAH	Monocyclic Aromatic Hydrocarbons
mAHD	Metres relative to Australian Height Datum
mBGL	Metres below ground level
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environment and Heritage, NSW (formerly DEC, DECC, DECCW)
OPP	Organophosphorus Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PP	Planning Proposal
PSI	Preliminary Site Investigation
RAAF	Royal Australian Air Force
SCID	Storage Chemical Information Database
SEPP	State Environmental Planning Policy
SSM	State Survey Mark
TRHs	Total Recoverable Hydrocarbons
UXO	Unexploded Ordnance
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

FIGURES & TABLE



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Drawn:	D.R./M.G.
Approved:	A.B.
Date:	12-08-18
Scale:	Not To Scale

Chan Abbey Holdings

Preliminary Site Investigation

55 Dampier Street and 72 Wallamore Road, Taminda NSW

Site Locality Plan

Figure: 1

Project: E24043.E01_Rev3



LEGEND

– — – Approximate site boundary

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Date:	12-08-18

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Preliminary Site Investigation
55 Dampier Street & 21, 72 Wallamore Road, Taminda NSW
Site Outline

Figure: 2

Project: E24043.E01_Rev3



LEGEND

- Approximate site boundary
- Approximate area to be retained (AREA A)
- Approximate outline of proposed industrial development area (AREA B)
- Approximate proposed bypass road outline

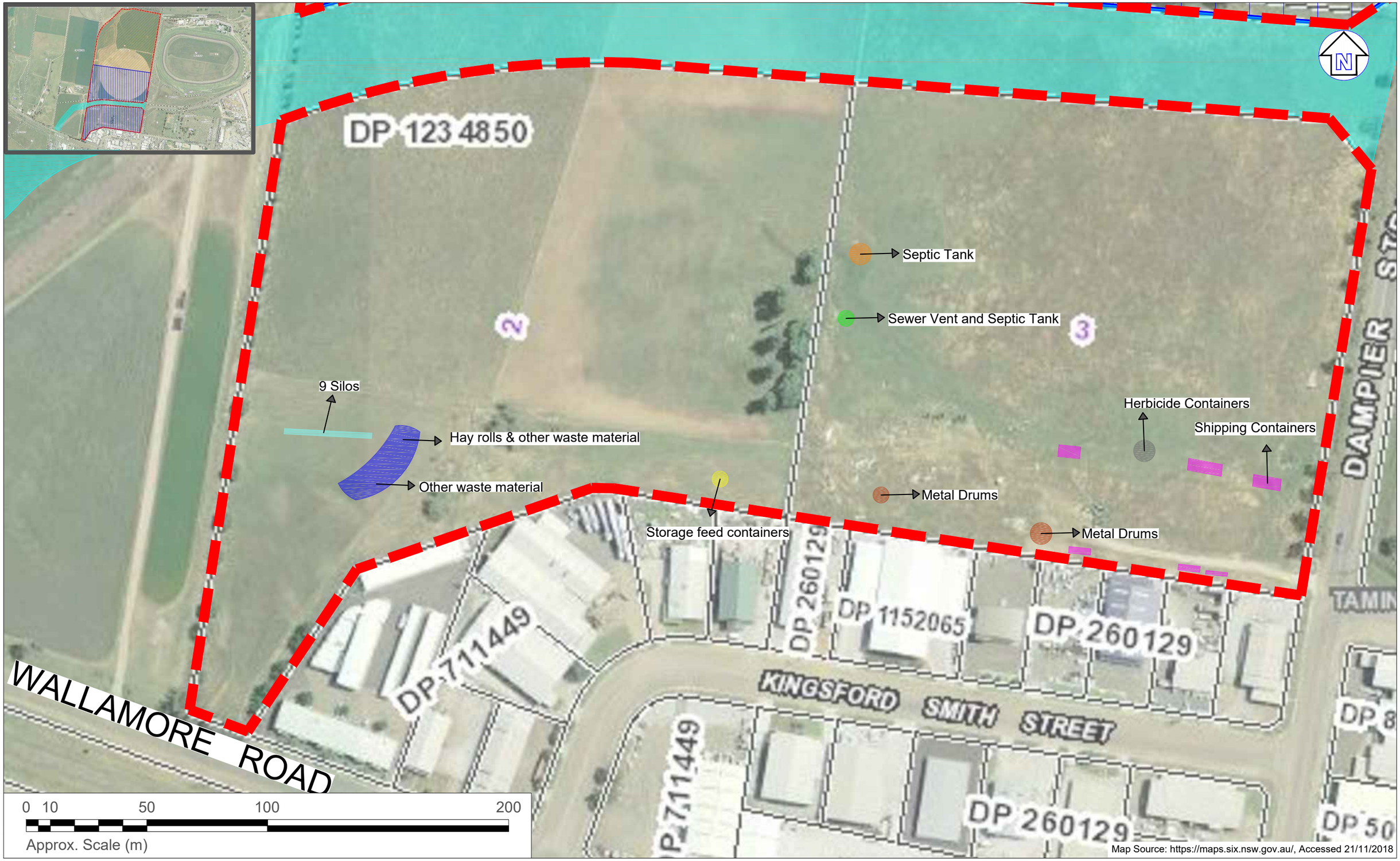
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Preliminary Site Investigation
55 Dampier Street & 21, 72 Wallamore Road, Taminda NSW
Proposed Outline of Industrial Development

Figure: 2

Project: E24043.E01_Rev3



LEGEND

- Approximate site boundary
- Approximate proposed bypass road outline

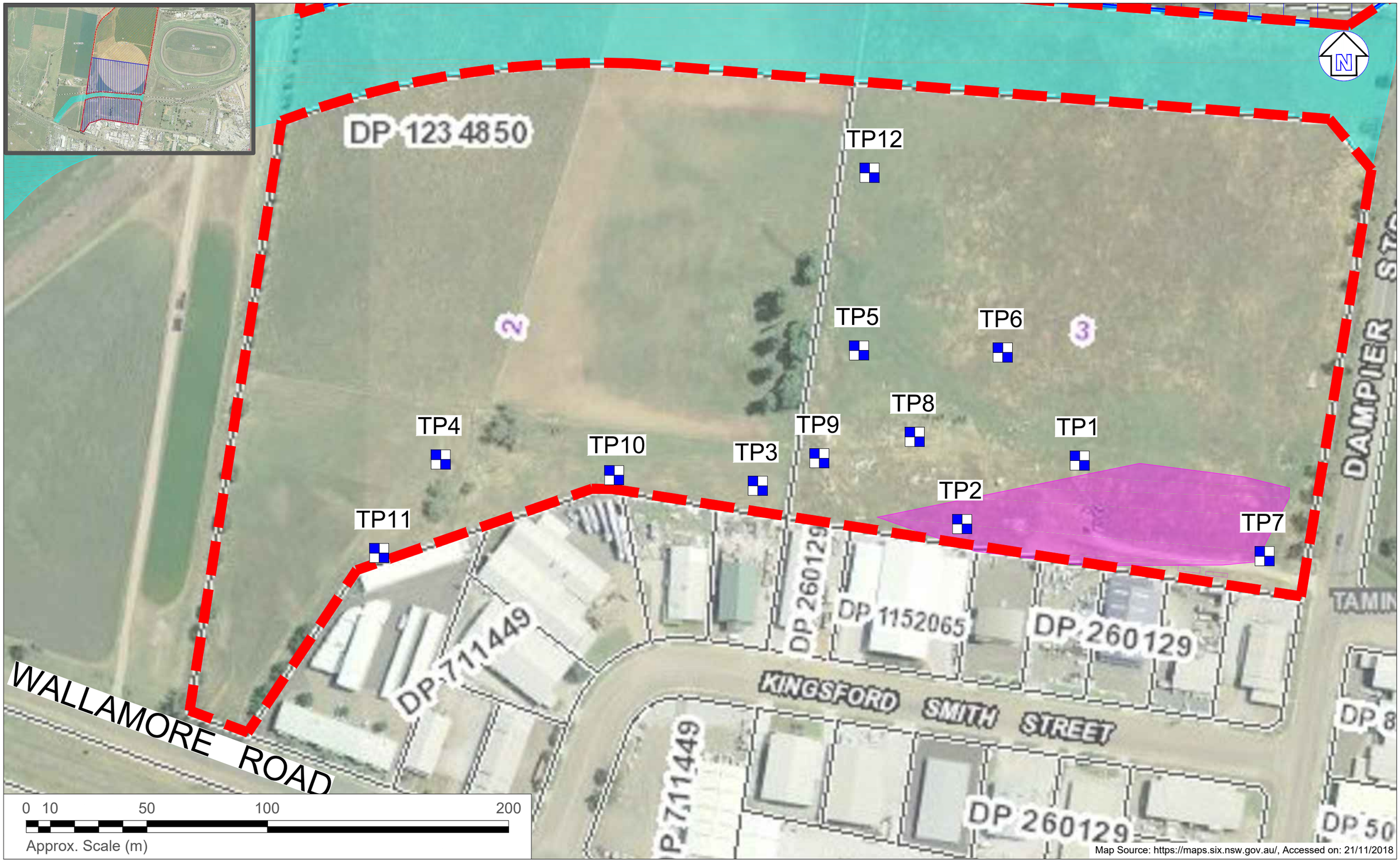
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Preliminary Site Investigation
55 Dampier Street & 21, 72 Wallamore Road, Taminda NSW
Site Observations Location Plan

Figure: 4

Project: E24043.E01_Rev3



LEGEND

- Approximate site boundary
- Approximate proposed bypass road outline
- Approximate extent of imported fill (Sanko, 2019)
- Approximate test pit location (Sanko, 2019)

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Chan Abbey Holdings
Preliminary Site Investigation
55 Dampier Street & 21, 72 Wallamore Road, Taminda NSW
Sanko (2019) Sampling Locations Plan

Figure: 5

Project: E24043.E01_Rev3

Table 1 - Summary of Soil Analytical Results (based on Sanko, 2019 data)

E24043.E01- Taminda

Batch Number	Sample Date	Sample ID	Sample Depth	Soil Description	Metals								PAHs				BTEX				TRH						Pesticides [2]		Total PCBs [6]	pH	CEC	EC	Asbestos
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Carcinogenic PAHs (as B(a)P TEQ)	Benzo(a)pyrene	Total PAH (NEPM/WHO16)	Naphthalene	Benzene	Toluene	Ethylbenzene	Total Xylenes	F1	F2	F3	F4	C_6-C_{10}	C_{10}-C_{36}	OCPs [5]	OPPs						Present/Absent
		TP1	0	Fill/Top Soil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
		TP1	0.2	Natural	<4	<0.4	14	27	8	<0.1	12	40	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.1	28	80	N.A.
		TP1	0.2	Natural	<4	<0.4	15	29	9	<0.1	12	45	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.1	29	79	N.A.
		TP1	1.2	Natural	<4	<0.4	24	37	8	<0.1	19	32	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.6	29	110	N.A.
		TP2	0	Fill/Top Soil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres
		TP2	0.2	Fill	<4	<0.4	37	22	11	<0.1	8	33	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.8	13	130	N.A.
		DUP1	-	Fill (TP2 0.2)	<4	<0.4	30	21	10	<0.1	8	29	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.9	13	170	N.A.
		TP2	0.9	Natural	<4	<0.4	27	39	9	<0.1	19	35	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.5	26	98	N.A.
		TP3	0.1	Fill/Top Soil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
		TP3	1	Natural	<4	<0.4	28	34	9	<0.1	17	29	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.5	19	56	N.A.
		TP4	0.3	Fill/Top Soil	<4	<0.4	13	28	9	<0.1	12	40	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.7	26	66	N.A.
		TP4	0.9	Natural	<4	<0.4	15	29	8	<0.1	13	44	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8	24	60	N.A.
		TP5	0	Fill/Top Soil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
		TP5	0.3	Fill/Top Soil	<4	<0.4	14	27	8	<0.1	12	42	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.4	24	48	N.A.
		DUP2	-	Fill/Top Soil (TP5)	<4	<0.4	25	20	11	<0.1	10	28	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.1	16	58	N.A.
		DUP2	-	Fill/Top Soil (TP5)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
		TP6	0.6	Natural	<4	<0.4	16	27	9	<0.1	12	46	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.5	25	39	N.A.
22618	10/9/2019	TP6	1.5	Natural	<4	<0.4	20	30	6	<0.1	16	25	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.4	22	58	N.A.
		TP7	0.1	Fill	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
		TP7	0.6	Natural	<4	<0.4	22	33	7	<0.1	17	28	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.7	26	110	N.A.
		TP7	0.6	Natural	<4	<0.4	24	37	7	<0.1	19	32	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	N.A.	N.A.	N.A.	N.A.
		TP8	0.2	Fill	<4	<0.4	14	27	8	<0.1	12	41	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.3	26	45	N.A.
		TP8	0.2	Fill	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	ND	ND	N.A.	8.2	25	46	N.A.
		TP8	0.6	Natural	<4	<0.4	14	27	8	<0.1	12	42	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8	27	63	N.A.
		TP9	0.1	Fill/Top Soil	<4	<0.4	15	25	8	<0.1	12	46	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.6	24	78	
		TP9	1.6	Natural	<4	<0.4	21	31	7	<0.1	16	26	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.4	19	56	N.A.
		TP10	0.1	Fill/Top Soil	<4	<0.4	13	25	8	<0.1	12	39	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.7	30	61	N.A.
		TP11	0	Fill/Top Soil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
		TP11	0.2	Natural	<4	<0.4	24	27	10	<0.1	13	35	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.7	30	92	N.A.
		TP11	0.7	Natural	<4	<0.4	18	25	8	<0.1	13	28	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.3	26	55	N.A.
		TP12	0	Fill/Top Soil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected
		TP12	0	Fill/Top Soil	<4	<0.4	17	27	8	<0.1	12	40	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	7.5	26	44	N.A.
		TP12	0	Fill/Top Soil	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	7.6	N.A.	45	N.A.
		TP12	1.2	Natural	<4	<0.4	27	40	8	<0.1	20	34	<0.5	<0.05	<0.05	<1	<0.2	<0.5	<1	<3	<25	<50	<100	<100	<25	<50	ND	ND	<0.1	8.8	27	120	N.A.
Maximum					0	0.0	37	40	11	0.00	20	46	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	30.0	170.0	N.C.
SILs																																	
HIL A - *Residential with accessible soils*					100	20	100 Cr(VI)	6,000	300	40	400	7,400	3		300												240		1				
HSL A & HSL B - Residential Soil texture classification –Sand 1					Source depths (0 m to <1 m. BGL)												3	0.5	160	55	40	45	110										
					Source depths (1 m to <2 m. BGL)												NL	0.5	220	NL	60	70	240										
					Source depths (2m to <4 m. BGL)												NL	0.5	310	NL	95	110	440										
					Source depths (4 m+)												NL	0.5	540	NL	170	200	NL										
EIL / ESL - Residential [1]					100		190	95	1,100		30	130		33*			170	50	85	70	105	180	120	300	2,800		180					
EIL / ESL - Residential [1] *(modified EIL/ESL values based on average pH and CEC values)*							410	230			320	920																				
Management Limits – *Residential, parkland and public open space* Coarse grained soil texture [1]																						700	1,000	2,500	10,000							
Asbestos contamination HSL – A Residential with soil access Bonded ACM (%w/w)																																0.01
Asbestos contamination HSL for Non Bonded / Friable Asbestos (%w/w)																																0.001

Notes: All results are recorded in mg/kg (unless otherwise stated)

1 Coarse Grained soil texture values were applied, being the most conservative of the material types.
2 Only detected pesticides will be reported.
HIL A NEPC 1999 Amendment 2013 'HIL A' Health Based Investigation Levels applicable for residential exposure settings with access to soil.
HSL A & B NEPC 1999 Amendment 2013 'HSL A&B' Health Based Screening Levels based on vapour intrusion values applicable for low-medium density residential sites.
EIL/ESL NEPC 1999 Amendment 2013 'EIL/ESL' Ecological Investigation Levels/Ecological Screening Levels.
NA No published criteria available
N.C. Not Calculated
NL 'Not Limiting' - The contaminant cannot exceed the maximum allowable vapour risk due to its specific chemical solubility limit.
F1 TRH C6-C10 less BTEX.
F2 TRH >C10-C16 less naphthalene.
F3 TRH >C16-C34.
F4 TRH >C34-C40.
* CRC CARE 2017, Risk-based management and remediation guidance for benzo(a)pyrene, CRC CARE Technical Report no. 39, CRC for Contamination Assessment and Remediation of the Environment, Newcastle, Australia.

eiaustralia
Contamination | Remediation | Geotechnical

APPENDIX A
Water NSW - Registered Groundwater Bore Search

State Overview
State Overview

Rivers and Streams
favourites · search · download sites · find a site
Real Time Data - Rivers And Streams

Daily River Reports
Daily River Reports

Dams
favourites · search · download sites · find a site
Real Time Data - Major Dams

Groundwater (Telemetered data)
favourites · search · download sites · find a site
Real Time Data - Bores

All Groundwater Site details
search · download sites · find a site
All Groundwater Map
North Coast Region
Hunter Region
Greater Sydney Region
South Coast Region
Northwest Region
Central West Region
Lachlan River Basin
Castlereagh River Basin
Macquarie River Basin
Southwest Region
Far West Region
Great Artesian Basin
Coal Basins

Meteorology
favourites · search · download sites · find a site
Real Time Data - Weather Stations

Hunter Integrated Telemetry System
Hunter Integrated Telemetry System

bandwidth ○ high ◉ low

glossary and metadata

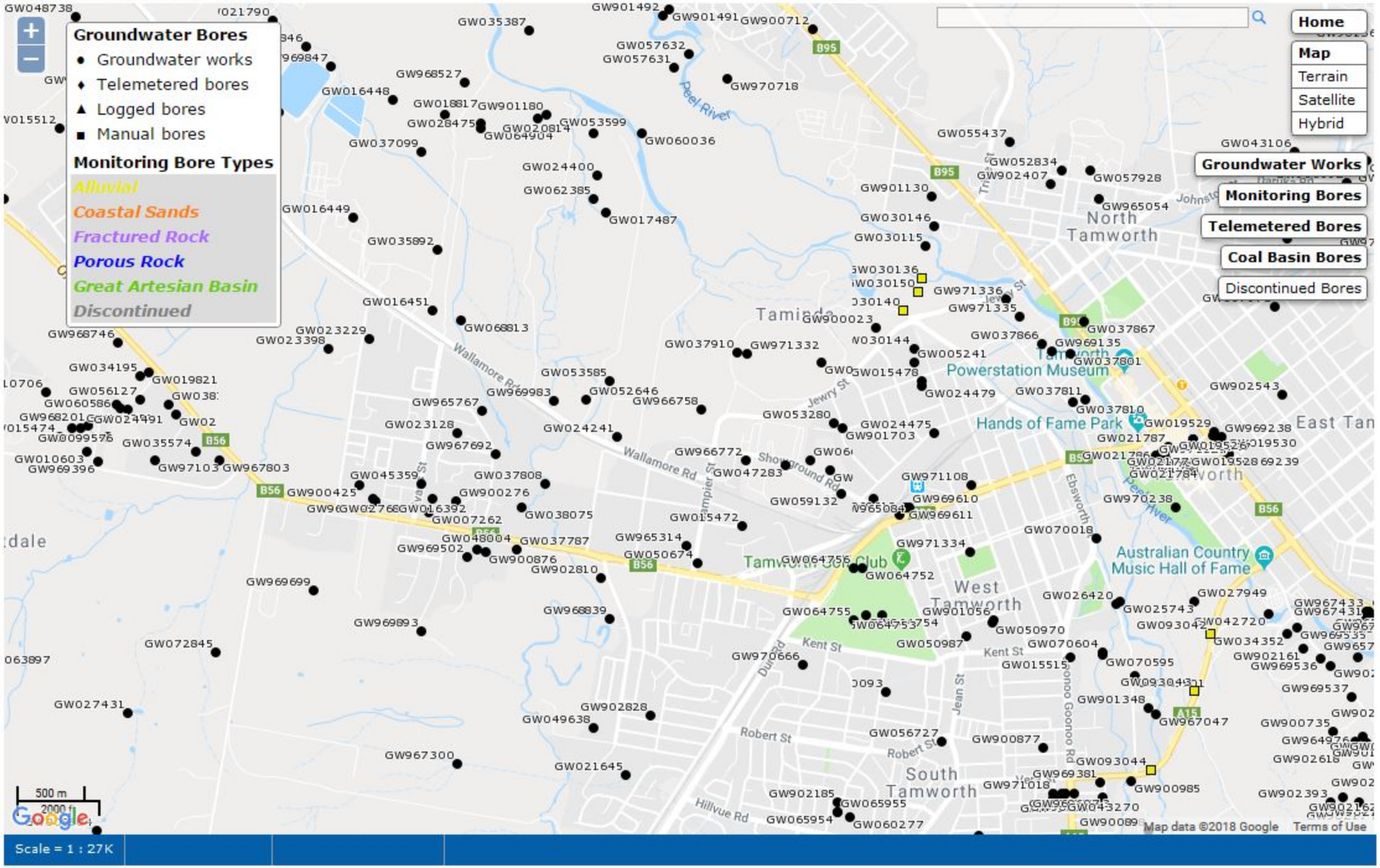
Northwest Region

bookmark this page

All data times are Eastern Standard Time

Map

current site: GW037910



WaterNSW
Work Summary

GW024241

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

Work Type: Well
Work Status:
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 01/01/1946
Final Depth: 12.20 m
Drilled Depth:

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	PARRY	MURROON	28
Licensed:			

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9035-1N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6558442.000
Easting: 298923.000
Latitude: 31°05'26.3"S
Longitude: 150°53'31.1"E

GS Map: -
MGA Zone: 56
Coordinate 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	Concrete Cylnder	0.00	0.00	1372			

***** End of GW024241 *****

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.

WaterNSW
Work Summary

GW037910

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): IRRIGATION
Work Type: Bore
Work Status:
Construct.Method: Cable Tool
Owner Type: Private
Commenced Date:
Completion Date: 01/09/1973
Final Depth: 12.10 m
Drilled Depth: 12.20 m
Contractor Name: (None)
Driller:
Assistant Driller:
Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	PARRY	CALALA	LOT 92 D P 259787
Licensed:			

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9035-1N
Grid Zone:
Scale:
Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6559012.000
Easting: 299701.000
Latitude: 31°05'08.3"S
Longitude: 150°54'00.8"E
GS Map: -
MGA Zone: 56
Coordinate Source: GPS - Global

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	Steel	-0.60	8.00	203			Suspended in Clamps
1	1	Opening	Screen	8.00	12.50	203		1	

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)
8.20	11.80	3.60	Unconsolidated	5.70		13.26			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.04	3.04	Soil Black Alluvial	Soil	
3.04	4.57	1.53	Clay Red	Clay	
4.57	8.22	3.65	Conglomerate	Conglomerate	
8.22	11.88	3.66	Sand Gravel Water Supply	Sand	

11.88	12.19	0.31	Clay	Clay	
4.57	8.22	3.65	Clay Sandy	Clay	

Remarks

04/02/1976: GALVANISED LOW CARBON STEEL
10/03/1981: TAMWORTH RACECOURSE
01/04/2015: Martin O'Rourke updated co-ordinates Old E 299892 N 6559076 new from GPS E299701 N 6559020

***** End of GW037910 *****

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.

WaterNSW
Work Summary

GW052646

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

Work Type: Well
Work Status: Supply Obtained
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date:
Final Depth: 3.20 m
Drilled Depth:

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	PARRY	MURROON	29
Licensed:			

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9035-1N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6558689.000
Easting: 298715.000
Latitude: 31°05'18.2"S
Longitude: 150°53'23.4"E

GS Map: -
MGA Zone: 56
Coordinate 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	Brick	0.00	0.00	305			

***** End of GW052646 *****

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.

WaterNSW
Work Summary

GW053585

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): IRRIGATION

Work Type: Well
Work Status:
Construct.Method: Hand Dug
Owner Type: Private

Commenced Date:
Completion Date: 01/11/1982
Final Depth: 9.80 m
Drilled Depth: 9.80 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	PARRY	MURROON	29
Licensed:			

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:
CMA Map: 9035-1N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6558810.000
Easting: 298863.000
Latitude: 31°05'14.3"S
Longitude: 150°53'29.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GD.,ACC.MAP

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	Concrete Cylnder	0.00	6.10	1200			
1	1	Casing	Timber	6.10	9.80				

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)
6.10	9.80	3.70	Unconsolidated	6.10		11.40			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Topsoil	Topsoil	
0.30	6.10	5.80	Clay	Clay	
6.10	9.75	3.65	Gravel Water Supply	Gravel	

***** End of GW053585 *****

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

GW966758

Licence: 90BL252157 **Licence Status:** CONVERTED

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

Work Type: Bore
Work Status:
Construct.Method: Hand Dug
Owner Type:

Commenced Date: **Final Depth:**
Completion Date: **Drilled Depth:**

Contractor Name:
Driller: Unknown Unknown
Assistant Driller:

Property: LOT 23 DP260129 LOT 23 DAMPIER STREET TAMWORTH 2340 **Standing Water Level:**
GWMA: - **Salinity:**
GW Zone: - **Yield:**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	PARRY	PARRY.17	LT23 DP260129
Licensed:	PARRY	MURROON	Whole Lot 23//260129

Region: 90 - Barwon **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6558635.0 **Latitude:** 31°05'20.4"S
Elevation Source: (Unknown) **Easting:** 299476.0 **Longitude:** 150°53'52.1"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

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

Remarks

***** End of GW966758 *****

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

GW966772

Licence: 90BL249837
Licence Status: CONVERTED

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

Work Type: Bore
Work Status:
Construct.Method: Rotary
Owner Type:

Commenced Date:
Completion Date: 19/06/2000
Final Depth: 16.70 m
Drilled Depth: 16.70 m

Contractor Name: MJ & LC MANNION
Driller: Leonard George Mannion
Assistant Driller:

Property: TAMWORTH SHOWGROUND WESTDALE RD TAMWORTH 2340
GWMA: 005 - PEEL VALLEY
GW Zone: 001 - PEEL ALLUVIUM
Standing Water Level: 9.000
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	PARRY	PARRY.5	LOT 4 DP 535457
Licensed:	PARRY	CALALA	Whole Lot 4//535457

Region: 90 - Barwon
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6558308.0
Easting: 299776.0
Latitude: 31°05'31.2"S
Longitude: 150°54'03.1"E

GS Map: -
MGA Zone: 0
Coordinate Source: GPS - Global Positioning System

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	16.70	203			Rotary
1	1	Casing	Steel	0.00	16.70	203			Welded

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	0.60	0.60	topsoil	Topsoil	
0.60	6.10	5.50	clay	Clay	
6.10	10.10	4.00	gravel and clay	Gravel	
10.10	10.13	0.03	water bearing gravel	Invalid Code	
10.13	12.23	2.10	clay	Clay	
12.23	15.83	3.60	gravel	Gravel	
15.83	16.70	0.87	shale	Shale	

Remarks

***** End of GW966772 *****

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.

APPENDIX B
Site Photographs



Photograph 1. View of Lot 1 from the north western side to the south eastern side of the site.



Photograph 2. View towards the south/south eastern side of Lot 1.



Photograph 3. View towards the southern/south east side of Lot 2.



Photograph 4. View from the south to the north of Lot 2.



Photograph 5. View of the southern entrance of Lot 2.



Photograph 6. Cattle grazing observed in the north western /western area of Lot 2.



Photograph 7. Soil disturbance noted to the south central part of Lot 2.



Photograph 8. View of feeding area in the south eastern section of Lot 2.



Photograph 9. View of north eastern section of Lot 2.



Photograph 10. View of hay rolls stacks and other waste material found in Lot 2.



Photograph 11. Label of one of the drums found in Lot 2.



Photograph 12. Chemical storage tanks found near the entrance of Lot 3.



Photograph 13. Group I herbicide stored onsite in Lot 3.



Photograph 14. Example of Group M herbicides stored onsite in Lot 3.



Photograph 15. Example of Group L herbicide stored onsite in Lot 3.



Photograph 16. Example of pesticide stored onsite in Lot 3.



Photograph 17. Example of transmission oil stored onsite in Lot 3.



Photograph 18. View of waste material found in Lot 3.



Photograph 19. Stockpile of waste material found in Lot 3.



Photograph 20. Rusted drums on bare soil patches found in Lot 3.



Photograph 21. View of waste material found on the southern side of Lot 3.



Photograph 22. View of soil stockpile and waste material found in Lot 3.



Photograph 23. Cement and brick block found in Lot 3.



Photograph 24. Soil stockpile and cement pipes found in Lot 3.



Photograph 25. View of workshop, shipping containers and drums found in Lot 3.



Photograph 26. View of shipping containers and skip bins found in Lot 3.



Photograph 27. Sewerage vent and tank found on the western boundary of Lot 3.



Photograph 28. Septic tank found in Lot 3.

APPENDIX C
Historical Property Titles Search & POEO License

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

LRS NSW **Sydney**

Re: - 55 Dampier Street and 72 Wallamore Road, Taminda

Description: - Lots 1, 2 & 3 D.P. 1234850

As regards Lot 1 D.P. 1234850

As regards the part numbered (1) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
09.10.1936 (1936 to 1964)	Joseph Henry Starr	Vol 4795 Fol 165
16.06.1964 (1964 to 1965)	Enid Agnes Kennedy (Married woman) Ainslie Jean Denton (Widow) (Section 94 Application not investigated)	Vol 4795 Fol 165
13.08.1965 (1965 to 1969)	Rupert Alfred Wentworth Vickers (Farmer & Grazier)	Vol 4795 Fol 165
09.05.1969 (1969 to 1980)	Barry Maynes McKinnon (Agent)	Vol 4795 Fol 165 Now Vol 14087 Fol 62
15.09.1980 (1980 to 1989)	John Baden Chaffey (Representative) Gladys Chaffey (Married Woman)	Vol 14087 Fol 62 Now 272/631977

Leases, excluding building premises: -

- 15.04.1952 to East-West Airlines Limited of part of the land in Volume 4795 Folio 165 – expired 15.06.1964

As regards the part numbered (2) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
16.04.1929 (1929 to 1945)	Henry Jonathan Cluff (Farmer)	Crown Tenure Settlement Purchase 1909/49 Tamworth (Book 1555 No. 723 Mortgage) Now Vol 5370 Fol 222
06.02.1945 (1945 to 1976)	Clarence Hardwick Wythes (Farmer) Elsie Rose Wythes (Married Woman)	Vol 5370 Fol 222 Now Vol 11332 Fol 157
03.06.1976 (1976 to 1981)	Robert Norman Nicolle (Grazier) Ivy Jean Nicolle (Married Woman)	Vol 11332 Fol 157
13.02.1981 (1981 to 1981)	Ivy Jean Nicolle (Widow)	Vol 11332 Fol 157
25.05.1981 (1981 to 1983)	Marau Pty Limited	Vol 11332 Fol 157
10.05.1983 (1983 to 1989)	John Baden Chaffey (Representative) Gladys Chaffey (Married Woman)	Vol 11332 Fol 157 Now 272/631977

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Continued as regards the whole of Lot 1 D.P. 1234850

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
16.02.1989 (1989 to 1997)	John Baden Chaffey (Representative)	272/631977
12.06.1997 (1997 to 2002)	Arnold Neil Bailey	272/631977
04.12.2002 (2002 to 2013)	Novine Pty Ltd	272/631977
16.09.2013 (2013 to 2017)	Tamworth Regional Council	272/631977 Now 1/1234850
27.12.2017 (2017 to date)	# Harry David Stearman	1/1234850

# Denotes current registered proprietor

Leases continued: - NIL

Easements: -

- 4.01.1980 (R 157473) Easement to Drain Sewage 6 metres wide
- 13.12.1984 (V 391742) Easement for Electricity Transmission Line 20 metres wide
- 26.09.1995 (D.P. 265817) Easement to Drain Water 2 metres wide
- 25.01.2001 (7262811) Easement to Drain Sewage 5 metres wide
- 29.03.2017 (AM 108223) Easement to Drain Water 6 metres wide

---

As regards Lot 2 D.P. 1234850

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
16.04.1929 (1929 to 1945)	Henry Jonathan Cluff (Farmer)	Crown Tenure Settlement Purchase 1909/49 Tamworth (Book 1555 No. 723 Mortgage) Now Vol 5370 Fol 222
06.02.1945 (1945 to 1976)	Clarence Hardwick Wythes (Farmer) Elsie Rose Wythes (Married Woman)	Vol 5370 Fol 222 Now Vol 11332 Fol 157
03.06.1976 (1976 to 1981)	Robert Norman Nicolle (Grazier) Ivy Jean Nicolle (Married Woman)	Vol 11332 Fol 157
13.02.1981 (1981 to 1981)	Ivy Jean Nicolle (Widow)	Vol 11332 Fol 157
25.05.1981 (1981 to 1989)	Marau Pty Limited	Vol 11332 Fol 157 Now 1/711449
19.01.1989 (1989 to 1994)	John Douglas Collett	1/711449
28.01.1994 (1994 to 2017)	Peel Technology High School Parents and Citizens Association	1/711449 Now 2/1234850

ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Continued as regards Lot 2 D.P. 1234850

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
27.12.2017 (2017 to date)	# Chan Abbey Holdings Pty Limited	2/1234850

# Denotes current registered proprietor

Leases: - NIL

Easements: -

- 4.01.1980 (R 157473) Easement to Drain Sewage 6 metres wide
- 27.02.1985 (D.P. 711449) Easement to Drain Water 5 metres wide

---

As regards Lot 3 D.P. 1234850

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
09.10.1936 (1936 to 1964)	Joseph Henry Starr	Vol 4795 Fol 165
16.06.1964 (1964 to 1965)	Enid Agnes Kennedy (Married woman) Ainslie Jean Denton (Widow) (Section 94 Application not investigated)	Vol 4795 Fol 165
13.08.1965 (1965 to 1969)	Rupert Alfred Wentworth Vickers (Farmer & Grazier)	Vol 4795 Fol 165
09.05.1969 (1969 to 1981)	Barry Maynes McKinnon (Agent)	Vol 4795 Fol 165 Now Vol 14087 Fol 61
08.10.1981 (1981 to 2004)	Tim Kirkpatrick Anna Edith Kirkpatrick	Vol 14087 Fol 61 Now 23/260129
10.06.2004 (2004 to date)	# Kidman Group Pty Limited	23/260129 Now 3/1234850

# Denotes current registered proprietor

Leases: - NIL

Easements: -

- 11.02.1980 (R 261250) Easement to Drain Sewage 6 metres wide
- 09.08.1984 (D.P. 636336) Easement to Drain Water

Yours Sincerely
Mark Groll
21 November 2018

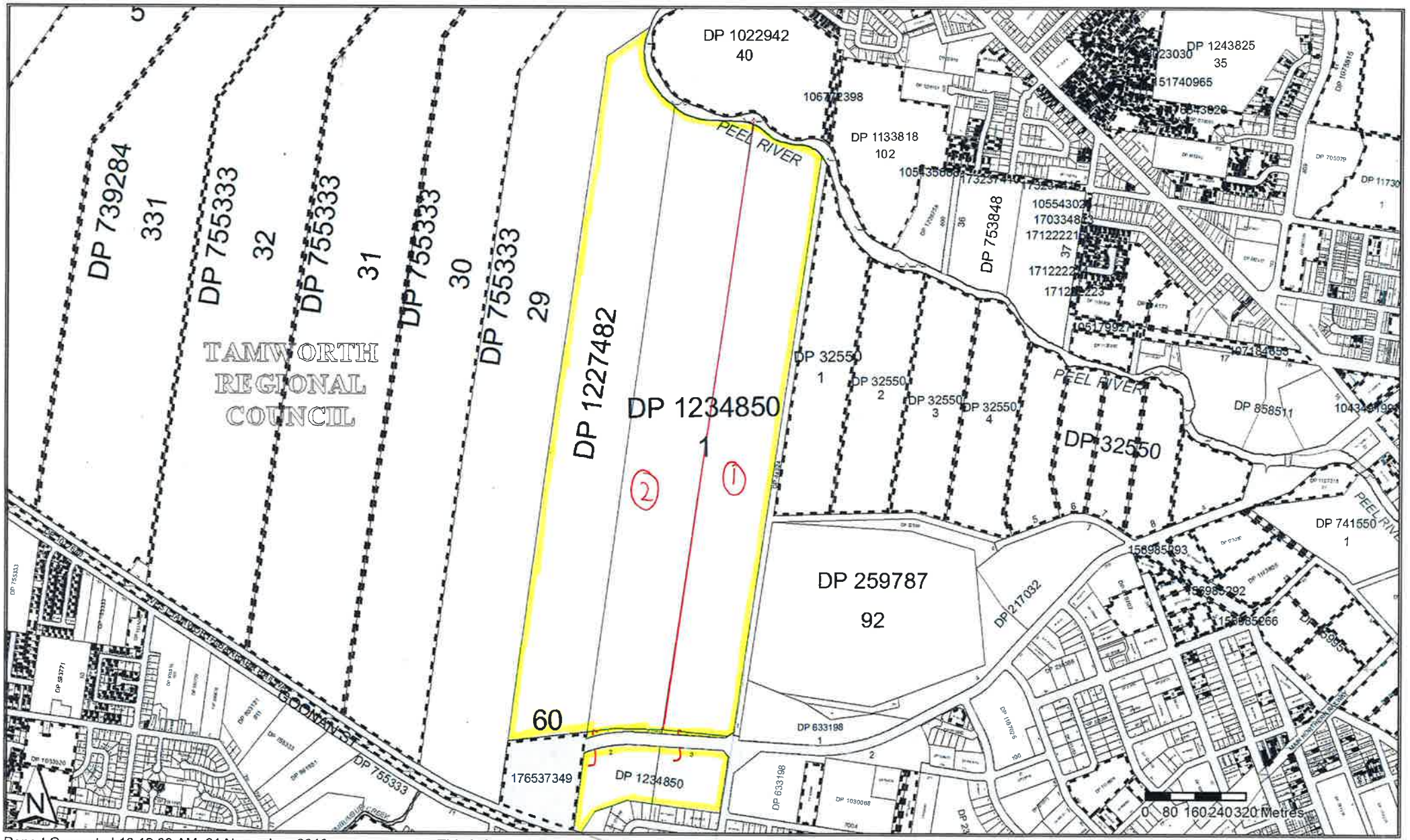
LAND REGISTRY SERVICES

Cadastral Records Enquiry Report : Lot 1 DP 1234850

Ref : CMapIT

Locality : TAMINDA
LGA : TAMWORTH REGIONAL

Parish : MURROON
County : PARRY



Report Generated 10:12:09 AM, 21 November, 2018

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This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

InfoTrack Your Searching Partner

InfoTrack

PLAN FORM 2 DP1227482 WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION LXML ePlan Sheet 1 of 1 Sheets

A EASEMENT FOR ABOVE GROUND WORKS 20 WIDE VIDE 9945037
B EASEMENT TO DRAIN SEWAGE 6 WIDE VIDE R249085 AND SHOWN ON DP601968
C EASEMENT FOR ELECTRICITY TRANSMISSION LINE 20 WIDE VIDE 391742 SHOWN ON DP635782
D EASEMENT TO DRAIN SEWAGE 5 WIDE VIDE 7262811 SHOWN ON DP1006026

SURVEYING AND SPATIAL INFORMATION REGULATION 2012

	MGA					
MARK	EAST	NORTH	ZONE	CLASS	ORDER	ORIGIN
PM31465	299 409.809	6 557 524.943	56	C	U	SCIMS
SS56939	299 497.995	6 557 991.168	56	A	1	SCIMS
PM30522	299 557.549	6 558 369.766	56	A	1	SCIMS
PM31463	299 132.025	6 558 232.426	56	C	U	SCIMS
PM49761	299 528.437	6 558 177.041	56	C	U	SCIMS
PM120932	298 825.282	6 558 424.132	56	U	U	RTK GPS
PM188270	298 861.810	6 558 617.560	56	U	U	RTK GPS
PM188271	299 113.176	6 558 648.624	56	U	U	RTK GPS

MGA CO-ORDINATES ADOPTED FROM SEARCH OBTAINED FROM LAND & PROPERTY INFORMATION AS AT 10-11-2016

COMBINED SCALE FACTOR : 1.000 032

60 63.35 Ha BY DEDN
59 6.483 Ha
WALLAMORE RAILWAY GOONAN ROAD
SMITH ST KINGSFORD (25 WIDE) COOK ST DAMPIER ST
CORRIDOR
SEE DIAG 1

DIAGRAM 2
RR 1:10,000

DIAGRAM 1
RR 1:3000

190° 42' 39" 474.477--G DENOTES MGA SCALED TO GROUND
190° 42' 55" 474.442 DENOTES MEASURED GROUND

AZIMUTH "A" – "Z"

Surveyor : Peter John Baxter
Date of Survey : 30-11-2016
Surveyor's Ref : 0857
QA Ref: 0857-161130

PLAN OF SUBDIVISION OF LOT 28 IN DEPOSITED PLAN 755333

LGA: Tamworth Regional
Locality : Taminda
Subdivision No: SUB2017/0025
Lengths are in metres. Reduction Ratio 1:10,000

Registered 30.1.2017

DP1227482

Req:R616112 /Doc:DP 1227482 P /Rev:31-Jan-2017 /Sts:SC.OK /Pgs:ALL /Prt:21-Nov-2018 12:18 /Seq:1 of 3
Ref:taminda /Src:M

DP1227482

PLAN FORM 6 (2013) **WARNING: Creasing or folding will lead to rejection** ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Office Use Only

Registered: 30.1.2017

Title System: TORRENS

Purpose: SUBDIVISION

Office Use Only

DP1227482

PLAN OF SUBDIVISION OF LOT 28 DP755333

LGA: TAMWORTH REGIONAL

Locality: Taminda

Parish: Murroon

County: Parry

~~Crown Lands NSW/Western Lands Office Approval~~

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

~~Signature: .....~~

~~Date: .....~~

~~File Number: .....~~

~~Office: .....~~

Subdivision Certificate

I, LUCY WALKER

Authorised Person/~~General Manager/*Accredited Certifier~~, certify that the provisions of s.109J of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.

Signature: Lwalker

Accreditation number: .....

Consent Authority: Tamworth Regional Council

Date of endorsement: 09/01/2017

Subdivision Certificate number: Sub2017/0025

File number: .....

*Strike through if inapplicable.

Survey Certificate

I, Peter John Baxter

of P.O. Box 1402 Tamworth NSW 2340

a surveyor registered under the *Surveying and Spatial Information Act 2002*, certify that:

*~~(a) The land shown in the plan was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on~~

*(b) The part of the land shown in the plan (being lot 59) was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on, 30 Nov 2016, the part not surveyed was compiled in accordance with that Regulation.

*~~(c) The land shown in this plan was compiled in accordance with the *Surveying and Spatial Information Regulation 2012*.~~

Signature: Dated: 30 Nov 2016

Surveyor ID: 443

Datum Line: "A" (PM31463) - "Z" (PM30522)

Type: *~~Urban~~/*Rural

The terrain is *Level-Undulating / *Steep-Mountainous.

*Strike through if inapplicable.

^Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.

Statements of intention to dedicate public roads create public reserves and drainage reserves, acquire/resume land.

IT IS INTENDED TO DEDICATE LOT 59 TO THE PUBLIC AS ROAD

Plans used in the preparation of survey/compilation.

2350-1761	DP601968	DP711449
DP44224	DP603348	DP739272
DP259787	DP631977	DP816023
DP260129	DP633198	DP1006026
DP265817	DP635782	DP1039053
DP539436	DP636336	DP1152065

If space is insufficient continue on PLAN FORM 6A

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

Surveyor's Reference: 0857

QA REF:0857-161130

PLAN FORM 6A (2012) WARNING: Creasing or folding will lead to rejection ePlan

DP1227482

DEPOSITED PLAN ADMINISTRATION SHEET

Office Use Only

Registered: 30.1.2017

Office Use Only

DP1227482

PLAN OF SUBDIVISION OF LOT 28 DP755333

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2012*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Subdivision Certificate number: Sub2017/0025

Date of Endorsement: 09/01/2017

Statements of intention to dedicate public roads create public reserves and drainage reserves, acquire/resume land.

Pursuant to Sec 88B of the Conveyancing Act 1919-64 it is intended to create

1. Positive Covenant

Lot	Street Number	Street Name	St Type	Locality
59	NA	Wallamore	Road	Taminda
60	72	Wallamore	Road	Taminda

Seal of Tamworth Regional Council
The common seal of Tamworth Regional Council was hereunto affixed in the presence of authorised officers of the Council who certify this to be correct for the purposes of the real Property Act 1900

TAMWORTH REGIONAL COUNCIL
The COMMON SEAL of the
ESTABLISHED 2004

Tamworth Regional Council authorised officer
General ~~Manger~~ COUNSEL
Name: ~~Paul Anthony Bennett~~ PETER THOMPSON
Signature:

Tamworth Regional Council authorised officer
Mayor
Name: Colin John Murray
Signature:

If space is insufficient use additional annexure sheet

Surveyor's Reference: 0857 QA Ref: 0857-161130

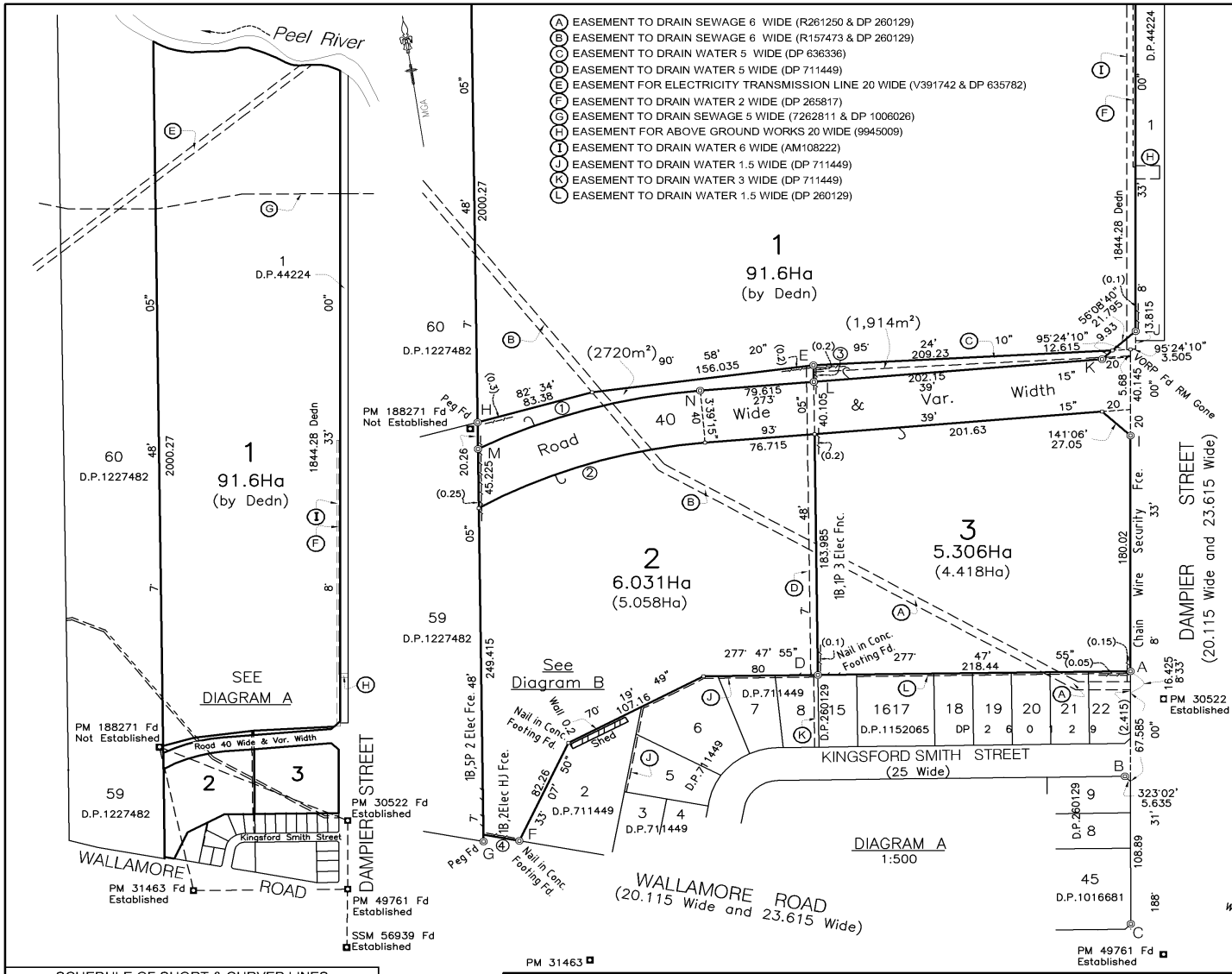
InfoTrack

PLAN FORM 2 (A2)

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

ePlan

Sheet 1 of 1 Sheets



SURVEYING & SPATIAL INFORMATION REGULATION 2012
CLAUSE 35(1)b & 61(2)

Mark	MGA Co-ordinates Easting	Northing	Class	Order	Origin
PM 30522	299,557.549	6,558,369.766	A	1	SCIMS
PM 31463	299,132.025	6,558,232.426	C	U	SCIMS
PM 49761	299,528.437	6,558,177.041	C	U	SCIMS
SSM 56939	299,497.995	6,557,991.168	A	1	SCIMS
PM 188271	299,113	6,558,649	U	U	TRAVERSE

Source: M.G.A. CO-ORDINATES ADOPTED FROM LAND & PROPERTY INFORMATION AS AT 25 OCTOBER 2017
COMBINED SCALE FACTOR 1.000031 ZONE 56
Datum: PM 49761 - PM 31463

CLAUSE 12 PM & SSM COMPARISONS & SURVEY CONTROL CONNECTIONS

From	To	Bearing	Distance	Remarks
PM 49761	PM 31463	277°57'13"	400.250	By Survey
		277°57'13"	400.250	By SCIMS (GND)
PM 49761	SSM 56939	189°17'50"	188.364	By Survey
		189°18'04"	188.343	By SCIMS (GND)
PM 49761	PM 30522	8°35'09"	194.902	By Survey
		8°35'23"	194.905	By SCIMS (GND)
PM 30522	PM 188271	302°06'17"	524.581	By Survey
PM 188271	PM 31463	177°24'39"	416.140	By Survey

SCHEDULE OF REFERENCE MARKS

Cor.	Bearing	Distance	From	Remarks
A	277°49'	0.5	R.M.G.I.Pipe Fd	DP. 260129
	321°25'20""	31.37	R.M. PM 30522	
B	187°49'	0.5	R.M.Conc. Block Fd	DP. 260129
C	278°31'	0.5	R.M.G.I.Pipe Fd	DP. 260129
D	97°49'	0.5	R.M.G.I.Pipe Fd	DP. 711449
E	94°28'	1.005	R.M.G.I.Pipe Fd	DP. 603487
F	33°09'	0.515	R.M.G.I.Pipe Fd	DP. 711449
G	261°56'	3.2	R.M.DH&W Fd	DP. 1227482
H	48°35'	2.405	R.M.PM 188270	DP. 1227482
I	277°01'	1.0	R.M.G.I.Pipe	
J	277°01'	1.0	R.M.G.I.Pipe	
K	353°39'	1.0	R.M.G.I.Pipe	
L	4°39'	1.01	R.M.G.I.Pipe	
M	8°57'	0.97	R.M.G.I.Pipe	
N	4°39'	1.01	R.M.G.I.Pipe	

SCHEDULE OF SHORT & CURVED LINES

No.	Bearing	Distance	Arc	Radius
1	82°33'28"	161.660	162.675	420
2	81°02'40"	165.910	167.257	380
3	7°48'05	12.465		
4	109°01'05"	25.592		

Table of mm

J:\2017\17020 Chan Abbey Holdings Pty Limited Plan of Subdivision Dampier Street\ACAD\DP\Issue 06\17020_DP_Issue 06.dwg

Surveyor : Mitchel Bernard Hanlon
Date of Survey : 31 July 2017
Surveyor's Ref : 17020

PLAN OF SUBDIVISION PLAN
LOT 23 DP 260129, LOT 1 DP 711449 AND LOT 272 DP 631977

LGA: TAMWORTH REGIONAL
Locality : TAMINDA
Subdivision No: SUB 2018-0013
Lengths are in metres. Reduction Ratio 1:7000

Registered
13.12.2017

DP1234850

Req:R616115 /Doc:DP 1234850 P /Rev:13-Dec-2017 /Sts:SC.OK /Pgs:ALL /Prt:21-Nov-2018 12:18 /Seq:1 of 5
Ref:taminda /Src:M

PLAN FORM 6 (2012) WARNING: Creasing or folding will lead to rejection **ePlan**

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 4 sheet(s)

*OFFICE USE ONLY

Registered: 13.12.2017

Title System: TORRENS

Purpose: SUBDIVISION

*OFFICE USE ONLY

DP1234850

PLAN OF SUBDIVISION PLAN
LOT 23 IN DP 260129, LOT 1 IN DP 711449
AND LOT 272 IN DP 631977

LGA: TAMWORTH REGIONAL
Locality: TAMINDA
Parish: MURROON
County: PARRY

Crown Lands NSW/Western Lands Office Approval

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

Signature: .....

Date: .....

File Number: .....

Office: .....

Survey Certificate

I, MITCHEL BERNARD HANLON

of PO BOX 1568, TAMWORTH, 2340

a surveyor registered under the Surveying & Spatial Information Act 2002, certify

*(a) ~~The land shown in the plan was surveyed in accordance with the~~ Surveying and Spatial Information ~~Regulation~~, 2012, is accurate ~~and the survey was was completed on:~~.....

(b) The part of the land shown on the plan (*being/~~*excluding ^~~ ..... LOT 1 in DP 71449, 23 in DP 260129 and 272 in DP 631977 .....) was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on , 31 July 2017 ..... the part not surveyed was compiled in accordance with that Regulation.

*(c) ~~The land shown in this plan was compiled in accordance with the Surveying and Spatial Information Regulation 2012.~~

Signature: ..... Dated: 31 July 2017

Surveyor ID: BOSSI No.1205

Datum Line: PM 49761 - PM31463

Type: *Urban/*Rural

The terrain is *Level-Undulating / ~~*Steep Mountainous.~~

* Strike through if applicable

^ Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.

Subdivision Certificate

I, LUCY WALKER

*Authorised Person/~~*General Manager/*Accredited Certifier~~, certify that the provisions of s.109J of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.

Signature: .....

Accreditation No: .....

Consent Authority: TAMWORTH REGIONAL COUNCIL

Date of Endorsement: 15/11/2017

Subdivision Certificate No: SUB2018-0013

File No: LF1015 / LF7866 / LF12151

* Strike through if applicable

STATEMENTS of intention to dedicate public roads, public reserves and drainage reserves

SUBJECT TO AN EXISTING EASEMENT TO DRAIN SEWAGE 6 WIDE (R157473), AN EASEMENT TO DRAIN WATER 5 WIDE (DP636336), AN EASEMENT TO DRAIN WATER 5 WIDE (DP711449) AND AN EASEMENT TO DRAIN WATER 6 WIDE (AM108222) IT IS INTENDED TO DEDICATE THE ROAD 40 WIDE & VARIABLE WIDTH TO THE PUBLIC AS ROAD.

Plans used in preparation of Survey/Compilation

DP 1227482
DP 44224
DP 711449
DP 265817
DP 603487
DP 631977
DP 636336
DP 635782
DP 260129
DP 601968
DP 1006026
DP 32550
DP 265817
CP 2349-1764
CP 9539-1603
CP 1150-3100

If space is insufficient continue on PLAN FORM 6A

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

SURVEYOR'S REFERENCE: 17020

PLAN FORM 6A (2012) **WARNING: Creasing or folding will lead to rejection** ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Office Use Only

Registered: 13.12.2017

Office Use Only

DP1234850

PLAN OF SUBDIVISION PLAN
LOT 23 IN DP 260129, LOT 1 IN DP 711449
AND LOT 272 IN DP 631977

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2012*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals - see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel on sheet 1 of the administration sheets.

Subdivision Certificate No.: Sub2018-0013

Date of Endorsement: 15/11/2017

SUBJECT TO AN EXISTING EASEMENT TO DRAIN WATER 3 WIDE AND AN EXISTING EASEMENT TO DRAIN SEWAGE 6 WIDE*

IT IS INTENDED TO DEDICATE THE ROAD 40 WIDE & VARIABLE WIDTH TO THE PUBLIC AS ROAD.

SCHEDULE OF ADDRESSES

Lot 1	72 Wallamore Road, Taminda, NSW, 2340
Lot 2	21 Wallamore Road, Taminda, NSW, 2340
Lot 3	55 Dampier Street, Taminda, NSW, 2340

The Common Seal of Tamworth Regional Council was hereunto affixed on 15/11/2017
Pursuant to a resolution of Council in the presence of

Paul Anthony Bennett
General Manager

C J Murray

Colin John Murray
Mayor

TAMWORTH REGIONAL COUNCIL
The COMMON SEAL of the
ESTABLISHED 2004

If space is insufficient use additional annexure sheet

Surveyor's Reference: 17020

PLAN FORM 6A (2012) **WARNING: Creasing or folding will lead to rejection** ePlan

DEPOSITED PLAN ADMINISTRATION SHEET Sheet 3 of 4 sheet(s)

Office Use Only

Registered: 13.12.2017

Office Use Only

DP1234850

PLAN OF SUBDIVISION PLAN
LOT 23 IN DP 260129, LOT 1 IN DP 711449
AND LOT 272 IN DP 631977

Subdivision Certificate No.: Sub 2018-0018

Date of Endorsement: 15/11/2017

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2012*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals - see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel on sheet 1 of the administration sheets.

Executed by
Kidman Group Pty Limited
ACN 107 347 740
in accordance with Section 127 of the
Corporations Act 2001

.....
Signature of Sole Director / Secretary:

HARRY DAVID STEARMAN
.....
Sole Director / Secretary:
(Block Letters)

HARRY DAVID STEARMAN.

If space is insufficient use additional annexure sheet

Surveyor's Reference: 17020

PLAN FORM 6A (2012) **WARNING: Creasing or folding will lead to rejection** ePlan

DEPOSITED PLAN ADMINISTRATION SHEET Sheet 4 of 4 sheet(s)

Office Use Only

Registered: 13.12.2017

Office Use Only

DP1234850

PLAN OF SUBDIVISION PLAN
LOT 23 IN DP 260129, LOT 1 IN DP 711449
AND LOT 272 IN DP 631977

Subdivision Certificate No.:.....

Date of Endorsement:.....

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2012*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals - see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel on sheet 1 of the administration sheets.

Executed by
Peel Technology High School Parents & Citizens Association Inc.

.....
Signature of authorised person:

PRESIDENT
.....
Position Held

ASHLEY JOHN CASTLES
.....
Name of authorised person
(Block Letters)

.....
Witness:

VICE PRESIDENT
.....
Full name of witness

CATHERINE ELIZABETH WEEKS.
.....
Address of witness
88 GUNNEDAH RD
TAMWORTH NSW 2340

If space is insufficient use additional annexure sheet

Surveyor's Reference: 17020

J:\2017\17020 Chan Abbey Holdings Pty Limited Plan of Subdivision Dampier Street\ACAD\DP\17020_DP_Issue 03.dwg

Req:R614264 /Doc:CT 12042-181 CT /Rev:17-Feb-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:17
Ref:taminda /Src:M

ICATE OF TITLE

PROPERTY ACT, 1900

12042181

NEW SOUTH WALES

Prior Title (Crown Grant)
Vol.4795 Fol.165

Vol. 12042 Fol. 181

Edition issued 5-2-1973

N60156 CANCELLED R

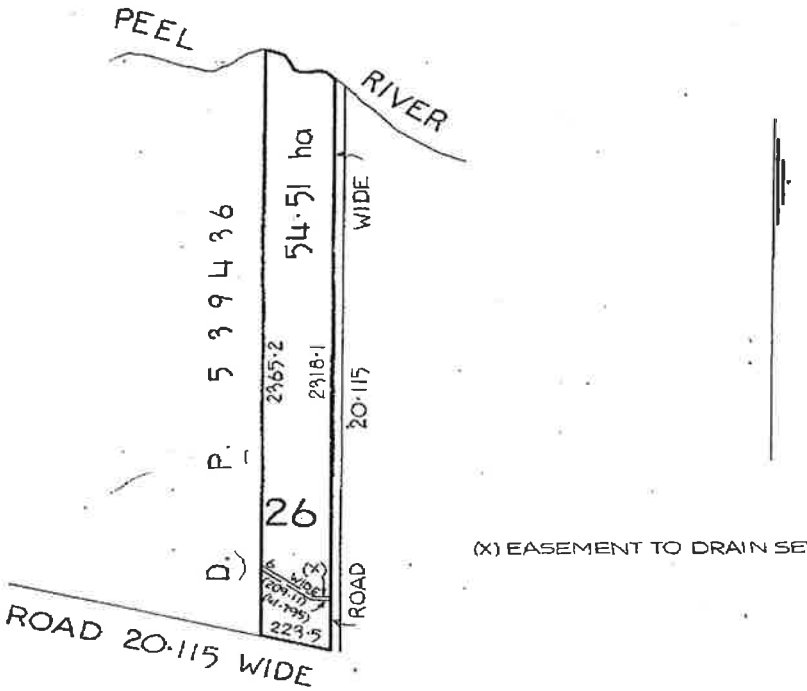
(Page 1) Vol. 12042 Fol. 181

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



(X) EASEMENT TO DRAIN SEWAGE - R261250

N60156

REDUCTION RATIO 1:20 000

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Portion 26 in the City of Tamworth Parish of Murroon and County of Parry. EXCEPTING THEREOUT the minerals reserved by the Crown Grant.

FIRST SCHEDULE

BARRY MAYNES McKINNON of Tamworth, Agent.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
~~2. Attention is directed to Section 31 of the Closer Settlement Act, 1904, relating to Transfer. (S.P. No.1909/30 Tamworth).~~ Cancelled R322427
~~3. Mortgage No.L460770 to Bank of New South Wales. Entered 17-6-1969.~~ Discharged N33555.

Registrar General

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

Vol. 12042 Fol. 181

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
This deed is cancelled as to whole ex road New Certificates of Title have issued on 20-3-1980 for lots in Deposited Plan No. 603487 as follows:- Lots 261 to 262 Vol. 14087 Fol. 61 to 62 respectively. The residue of land in this folio comprises road widening shown in D.P. 603487 REGISTRAR GENERAL REGISTRAR GENERAL NEW CERTIFICATE(S) OF TITLE ISSUING ON DP603487 NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO SURVEY DRAFTING BRANCH.					

R261250
DP603487
R322427

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS Attention is directed to section 8 of the Land Aggregation Tax Management Act, 1971.	ENTERED	Signature of Registrar General	CANCELLATION
Request	R322427			16-11-1979		
Transfer	R261250	—	Easement to drain storage affecting the land shown as [illegible] on the Plan hereon	11-2-1980		
	D.P. 603487		Interests of the Council of the City of TAMWORTH in the addition to existing road shown on D.P. 603487.	27.2.1980.		

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R614264 /Doc:CT 12042-181 CT /Rev:17-Feb-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:17
Ref:taminda /Src:M

Req:R614203 /Doc:CT 14087-062 CT /Rev:22-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:12
Ref:taminda /Src:M

[redacted]

CERTIFICATE OF TITLE

14087062

NEW SOUTH WALES

165

REAL PROPERTY ACT, 1900

Crown Grant Vol. 4795 Fol. 165

Prior Title Vol. 12042 Fol. 181

Vol. 14087 Fol. 62

CANCELLED

EDITION ISSUED 21 3 1980

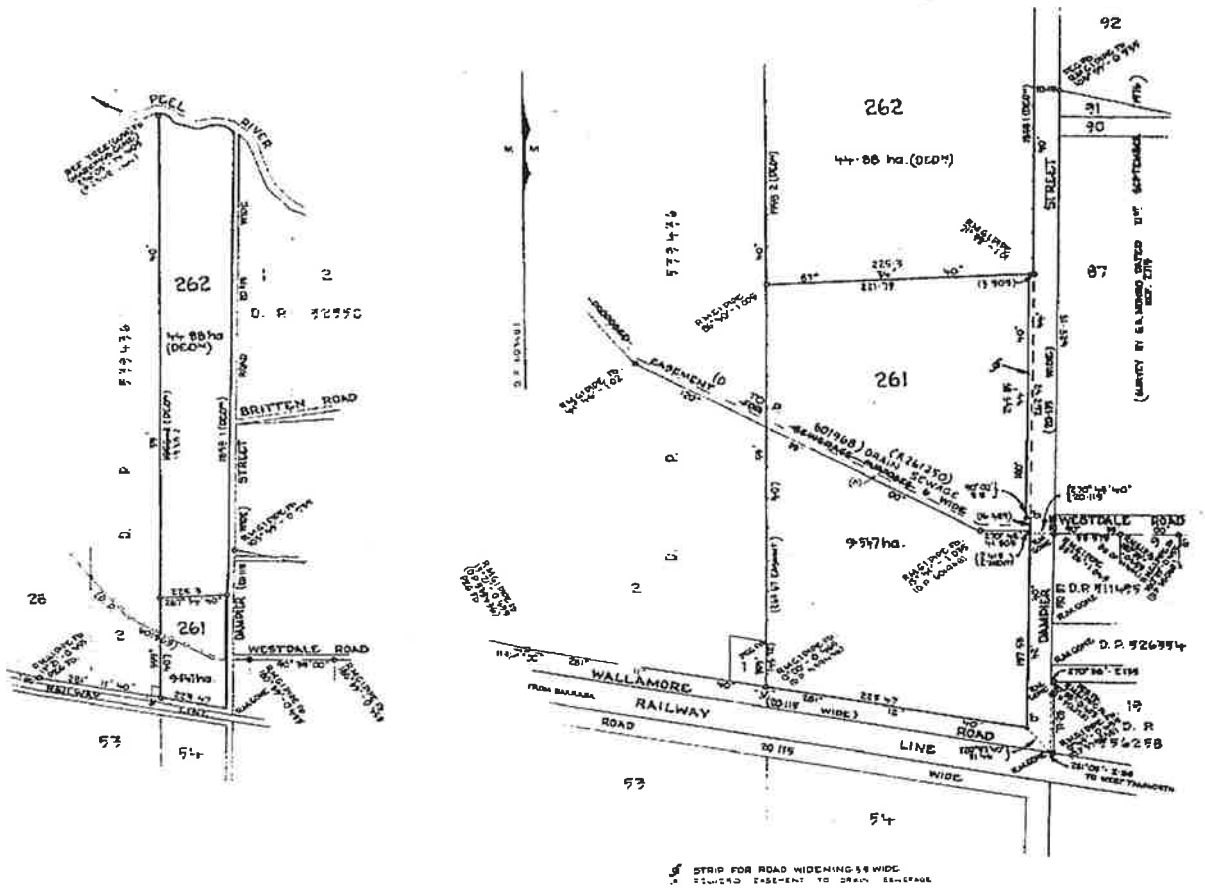
(Page 1) Vol. 14087 Fol. 62

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 262 in Deposited Plan 603487 at Taminda in the City of Tamworth Parish of Murroon and County of Parry. EXCEPTING THEREOUT the minerals reserved by the Crown Grant.

FIRST SCHEDULE

~~BARRY MAYNES McKINNON of Tamworth, Agent.~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. R322429 Attention is directed to section 8 Land Aggregation Tax Management Act, 1971.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

RG 2/62

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R614203 /Doc:CT 14087-062 CT /Rev:22-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:12
Ref:taminda /Src:M

Vol. 14087 Fol. 062

S42219 T. - 20 M. CT 25-3-83 DP 631977 Rpd 10-5-83

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
John Baden Chaffey of Tamworth, Representative and Gladys Chaffey, his wife as joint tenants	Transfer	S42219	15-9-1980	

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
Mortgage	S42220	to Australia and New Zealand Banking Group Limited	15-9-1980			

This deed is cancelled as to the whole
New certificates of title have issued on 19-5-1983
for lots in Deposited Plan No. 631977 as follows:
Lots 271 to 272 Vol. 15055 Fol. 116/117 respectively.

REGISTRAR GENERAL

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R614177 /Doc:CT 15055-117 CT /Rev:18-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:10
Ref:taminda /Src:M

15055117

[redacted]ICATE OF TITLE

NEW SOUTH WALES [redacted] PROPERTY ACT, 1900

Vol. 15055 Fol. 117

First Titles : Vol. 4795 Fol.165
Vol. 5370 Fol.222

Prior Titles : Vol.11332 Fol.157
Vol.14087 Fol. 62

EDITION ISSUED 23 5 1983

I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

CANCELLED

Registrar General.

SEE AUTO FOLIO

15055 117 Fol.

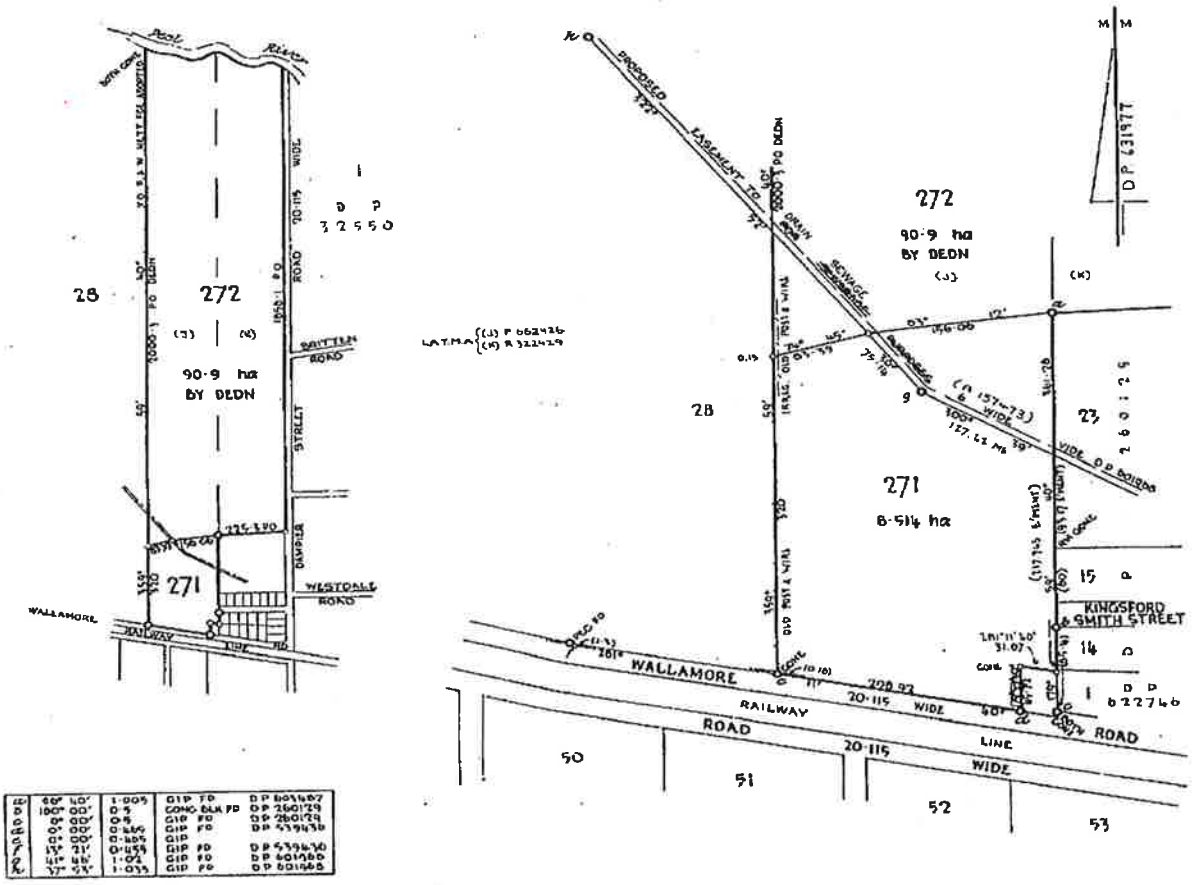
(Page 1) Vol.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



LAND REFERRED TO

Lot 272 in Deposited Plan 631977 at Taminda in the City of Tamworth Parish of Murroon and County of Parry.

FIRST SCHEDULE

JOHN BADEN CHAFFEY and GLADYS CHAFFEY as Joint Tenants.

SECOND SCHEDULE

1. Land excludes minerals and is subject to reservations and conditions in favour of the Crown - see Crown Grants.
2. P662426 P Attention is directed to Section 8 Land Aggregation Tax Management Act,1971 as regards the part so indicated in Deposited Plan 631977.
3. R157473 P Easement to drain sewage affecting the part of the land above described shown so burdened in Deposited Plan 631977.
4. R322429 P Attention is directed to Section 8 Land Aggregation Tax Management Act,1971 as regards the part so indicated in Deposited Plan 631977.
5. S42220 P Mortgage to Australia and New Zealand Banking Group Limited affecting the part formerly comprised in Certificate of Title Volume 14087 Folio 62.

GRM BA(SB) ES(SB) BA(SB) MY

Vol. 15055 Fol. 117

L.O. 1066 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR | Registrar General

CANCELLED

SEE AUTO. FOLIO

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
T715101 Mortgage to Australia and New Zealand Banking Group Limited. Registered 8-9-1983.		
V391742 Transfer. Easement for electricity transmission line affecting the part of the land within described shown as proposed easement for electricity transmission line 20 wide in DP635782. Registered 13-12-1984.		

NOTATIONS AND UNREGISTERED DEALINGS

Discharge of C.T. 715101 MK. Clearway

T 715101 MK
M 635782 R
03 OCT 1984
V391742 Transfer

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE M

Req:R614177 /Doc:CT 15055-117 CT /Rev:18-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:10 Ref:tamina /Src:M

Req:R614196 /Doc:CT 11332-157 CT /Rev:19-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:12
Ref:taminda /Src:M

NEW SOUTH WALES

CERTIFICATE OF TITLE

REAL PROPERTY ACT, 1900, as amended.

TORRENS TITLE
Register Book

Crown Grant Vol. 5370 Fol. 222

Prior Titles Vol.5492 Fols.56 and 57

Vol. 11332 Fol. 157

Edition issued 5-6-1970

CANCELLED

See new edition

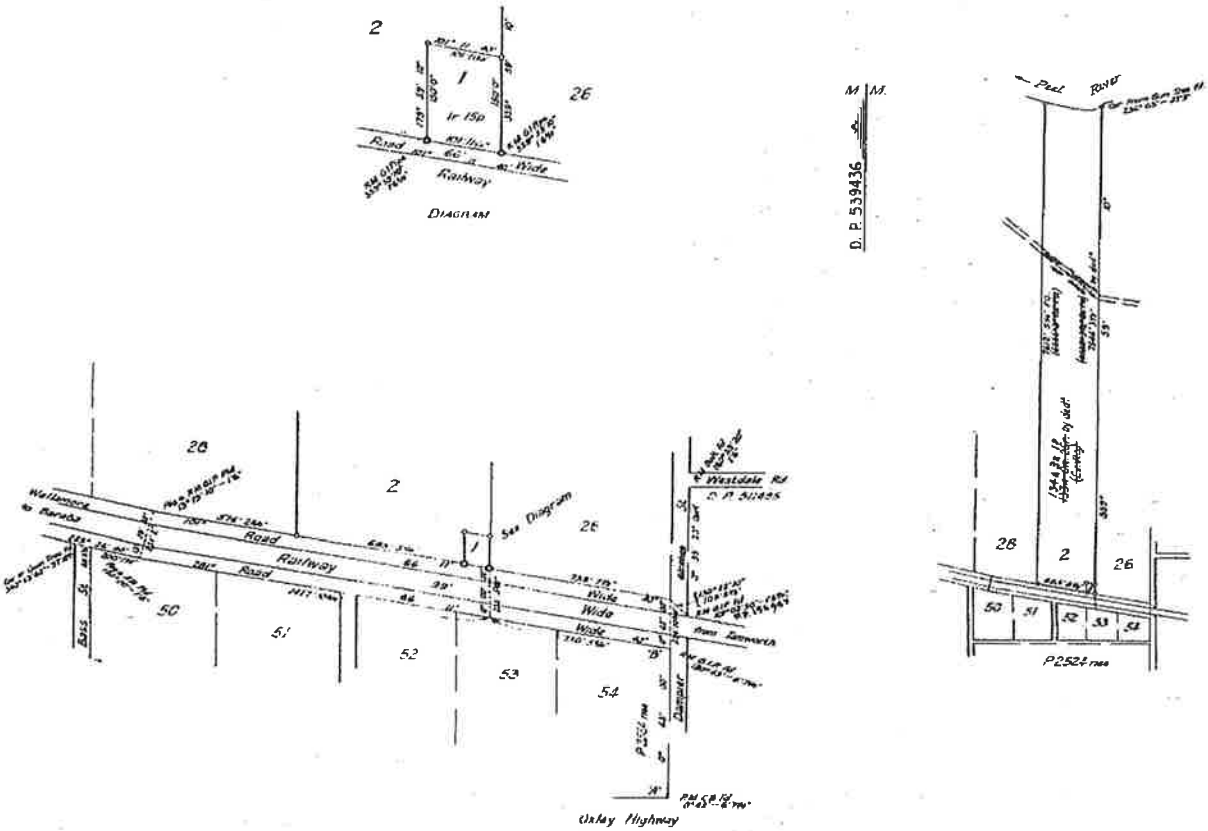
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness G Barnes

Registrar General.

(Page 1) Vol. 11332 Fol. 157

PLAN SHOWING LOCATION OF LAND



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 2 in Deposited Plan 539436 at Westdale in the City of Tamworth Parish of Murroon and County of Parry. EXCEPTING THEREOUT the minerals reserved by the Crown Grant.

FIRST SCHEDULE

~~CLARENCE HARDWICK WYTHES, of West Tamworth, Farmer and ELSIE ROSE WYTHES, his wife, as Tenants in Common in equal shares.~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. ~~Attention is directed to Section(s) of the Closer Settlement Act, 1904.~~ Cancelled. P662426.
3. ~~Mortgage No.D361927 to Rural Bank of New South Wales. Entered 10-5-1945.~~ Discharged P745412

Registrar General.

RG 2/62

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

Req:R614196 /Doc:CT 11332-157 CT /Rev:19-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:12
Ref:taminda /Src:M

Vol. 11332 Fol 157

V. C. N. BLIGHT, GOVERNMENT PRINTER

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar-General
Robert Norman Nicolle, of Bingara, Grazier and Ivy Jean Nicolle, his wife, as joint tenants.	Transfer	P745413	------	3-6-1976	

CANCELLED

See new edition issued 7-3-1980
Vide R157473

REGISTRAR GENERAL

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION
Request	P662426	—	Attention is directed to Section 8, Land Aggregation for Management Act, 1971	1-4-1976		
Transfer	R157473	—	Easement to drain sewage affecting the land shown as "proposed easement for sewerage purposes 6 metres wide on D.P. 601968.	9-1-1980.		

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

Pt Lot 12 DP 43
CT 5/24
R157473
DP 601968
Easement purposes

Req:R614196 /Doc:CT 11332-157 CT /Rev:19-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:12
Ref:taminda /Src:M

NEW SOUTH WALES

CERTIFICATE OF TITLE

PROPERTY ACT, 1900

11332157

Vol. 11332 Fol. 157

(Page 1) Vol. 11332 Fol. 157

Crown Grant Vol. 5370 Fol. 222

Prior Titles Vol. 5492 Fols. 56 and 57

EDITION ISSUED

10 3 1980

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

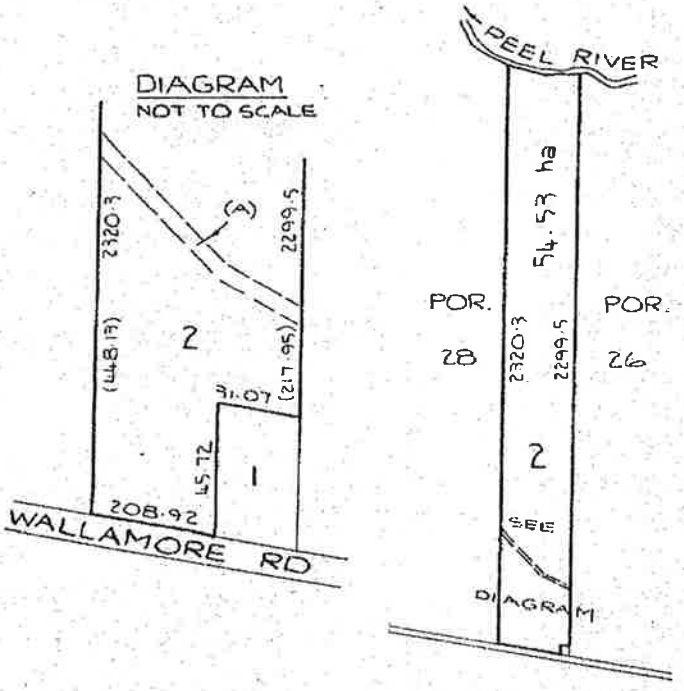
Registrar General.

CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES

DIAGRAM
NOT TO SCALE



(A) EASEMENT TO DRAIN SEWAGE 6 WIDE - R157473

R157473 M.X.

REDUCTION RATIO 1:20000

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 2 in Deposited Plan 539436 at Westdale in the City of Tamworth Parish of Murroon County of Parry. EXCEPTING THEREOUT the minerals reserved by the Crown grant.

FIRST SCHEDULE

~~ROBERT NORMAN NICOLLE of Bingara, Grazier and IVY JEAN NICOLLE his wife, as Joint Tenants~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown grant above referred to.
2. P662426 Attention is directed to section 8 Land Aggregation Tax Management Act, 1971.
3. R157473 Easement to drain sewage affecting the land shown so burdened in the plan hereon.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

RG 2/64

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Vol. 11332 Fol. 157

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
~~Ivy Jean Nicolle of Bingara, Widow.~~	Notice of Death	S300863	~~13-2-1981~~	
~~Marau Pty. Limited by Transfer S465576. Registered 25-5-1981~~				
John Baden Chaffey and Gladys Chaffey as joint tenants as to part of Lot 272 in DP631977 [comprised] within and Marau Pty Limited as to the residue by Transfer T515224. Registered 10-5-1983.				

C.T. 11332-157
S300863 NB.
S465576 Te
—7 m/k
T 410880
T515224 as to part of Lot 272 in D.P. 631977
Regd 10.5.83

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
S465577		Mortgage to Rural Bank of New South Wales. Registered 25-5-1981			Discharged	T410880

This deed is cancelled as to whole
New certificates of Title have issued on 19-5-1983
for lots in Deposited Plan 631977 as follows:
Lots 271 & 272 ISOSS 116/117 respectively.

REGISTRAR GENERAL

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R614196 /Doc:CT 11332-157 CT /Rev:19-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:12
Ref:taminda /Src:M

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
6/11/2018 10:25AM

FOLIO: 272/631977

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 15055 FOL 117

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
22/9/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
16/2/1989	Y180172	NOTICE OF DEATH	EDITION 1
26/9/1995	DP265817	DEPOSITED PLAN	EDITION 2
12/6/1997	3137905	DISCHARGE OF MORTGAGE	
12/6/1997	3137906	TRANSFER	EDITION 3
25/3/1999	5704999	MORTGAGE	EDITION 4
13/9/1999	DP1006026	DEPOSITED PLAN	
27/9/2000	7112170	CAVEAT	
25/1/2001	7262810	WITHDRAWAL OF CAVEAT	
25/1/2001	7262811	TRANSFER GRANTING EASEMENT	EDITION 5
8/5/2002	8576687	DISCHARGE OF MORTGAGE	
8/5/2002	8576689	MORTGAGE	EDITION 6
4/12/2002	9189029	DISCHARGE OF MORTGAGE	
4/12/2002	9189030	TRANSFER	EDITION 7
2/10/2003	9945009	TRANSFER GRANTING EASEMENT	EDITION 8
16/9/2013	AI21612	TRANSFER	EDITION 9
29/3/2017	AM108222	TRANSFER GRANTING EASEMENT	
29/3/2017	AM108223	POSITIVE COVENANT	EDITION 10
13/12/2017	DP1234850	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

taminda PRINTED ON 6/11/2018

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Received: 06/11/2018 10:25:36

Req:R614844 /Doc:DL 3137906 /Rev:21-Jun-1997 /Sts:NO.OK /Pgs:ALL /Prt:21-Nov-2018 10:57 /Seq:1 of 1
Ref:taminda /Src:M

TRANSFER

Real Property Act, 1900

3137906 G

Offi

10/06/1997 $2.00 994002939 15
6052 272/631977 (2) TFR
CHAFFEY JB BAILEY AN
$560000.00 $0.00 076333 718

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

FOLIO IDENTIFIER 272/631977
FOLIO IDENTIFIER 28/755333

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
28A	HOLMAN [illegible] BROADWAY & CO. DX 295 SYDNEY Phone: 235-1011 L.T.O BOX 684T Fax: 232-6[illegible] L.T.O. Delivery 28A

REFERENCE (max. 15 characters): Holman Bailey

(C) **TRANSFEROR** JOHN BADEN CHAFFEY

(D) acknowledges receipt of the consideration of FIVE HUNDRED AND SIXTY THOUSAND DOLLARS ($560,000.00)
and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T / TS (s713 LGA) / TW (Sheriff)	ARNOLD NEIL BAILEY

(G) **TENANCY:** 5

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATED** 9th May 1997
Signed in my presence by the Transferor who is personally known to me.

Signature of Witness

B.J. THOMPSON
Name of Witness (BLOCK LETTERS)

SOLICITOR
Address of Witness
TAMWORTH.

Signature of Transferor

Signed in my presence by the Transferee who is personally known to me.

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

P B Duffy
Solicitor for the ~~Signature of~~ Transferee

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only)

AUSDOC Office Pty. Ltd.

Req:R614845 /Doc:DL 9189030 /Rev:05-Dec-2002 /Sts:NO.OK /Pgs:ALL /Prt:21-Nov-2018 10:57 /Seq:1 of 1
Ref:taminda /Src:M

Form: 01T
Licence: 01-08-067
Licensee: Midware Systems
Lyons Barnett Kennedy

TRANSFER

New South Wales
Real Property Act 1900

9189030F

PRIVACY NOTE: this information is legally required and will beco

STAMP DUTY Office of State Revenue use only

NEW SOUTH WALES DUTY
29-11-2002 0001200693-001
SECTION 18(2)
DUTY $ **********2.00

(A) **TORRENS TITLE** If appropriate, specify the part transferred
Folio Identifier 272/631977 & 28/755333

(B) **LODGED BY**

Delivery Box	Name, Address or DX and Telephone	CODE
28A	[illegible] DX 849, SYDNEY L.T.O. Delivery 28A Reference (optional): LYTAM – NOVINE	T TW (Sheriff)

(C) **TRANSFEROR** ARNOLD NEIL BAILEY

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $ 1,300,000.00 and as regards

(E) **ESTATE** the land specified above transfers to the transferee an estate in fee simple.

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** NOVINE PTY LTD ACN 002 518 407

(I) **TENANCY:**

(J) **DATE** 28 / 11 / 2002

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: J. L. Bailey

Address of witness: 'Somerset'
Wallamore Rd
Tamworth
2340.

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor:

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name: BRIAN JAMES THOMPSON
Signatory's capacity: Solicitor for the transferee

BRIAN JAMES THOMPSON
Solicitor
Tamworth

All handwriting must be in block capitals.

Number additional pages sequentially

Req:R614846 /Doc:DL AI021612 /Rev:19-Sep-2013 /Sts:NO.OK /Pgs:ALL /Prt:21-Nov-2018 10:57 /Seq:1 of 2
Ref:taminda /Src:M

Form: 01T
Licence: 05-11-638
Licensee: Softdocs

TRANSFER

New South Wales
Real Property Act 1900

1/2

AI21612W

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Reg by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

NEW SOUTH WALES DUTY
21-08-2013 0007238244-001
SECTION 277-TRANSFER
NO DUTY PAYABLE

(A) **TORRENS TITLE** 272/631977 and 28/755333

(B) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any	CODES
28A	LLPN: 124247U SAI GLOBAL Property DX 885 SYDNEY 02 9210 0700 Reference (optional): 33466694-Everingham	T TW

(C) **TRANSFEROR** NOVINE PTY LIMITED ACN 002 518 407

Rejection Alteration NOTED

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $ 2,000,000.00 and as regards the land and WALS referred to in WAL-Transfer of even date

(E) **ESTATE** specified above transfers to the transferee an estate in fee simple.

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** TAMWORTH REGIONAL COUNCIL ABN 52 631 074 450

(I) **TENANCY:**

DATE 10/09/2013

(J) Certified correct for the purposes of the Real Property Act 1900 and executed on behalf of the company named below by the authorised person(s) whose signature(s) appear(s) below pursuant to the authority specified.
Company: NOVINE PTY LIMITED ACN 002 518 407
Authority: Section 127(1) of the Corporations Act 2001

Signature of authorised person:
Name of authorised person: MICHAEL JOHN FAULKNER
Office held: DIRECTOR

Signature of authorised person:
Name of authorised person: SHEILA MARGARET FAULKNER
Office held: DIRECTOR

The seal of TAMWORTH REGIONAL COUNCIL ABN 52 631 074 450 was hereunto affixed in the presence of authorised officers of the Council who certify this dealing to be correct for the purposes of the Real Property Act 1900.

Signature of authorised officer:

Name of authorised officer:

Position of authorised officer:

Council's seal: For execution by the Transferee see Annexure 'A'

Signature of authorised officer:

Name of authorised officer:

Position of authorised officer:

(K) The transferee's solicitor certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. 486928 Full Name: Jacqueline Louise Sorenson Signature:

** s117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.*

Annexure A to TRANSFER

Parties: From NOVINE PTY LIMITED ACN 002 518 407 to TAMWORTH REGIONAL COUNCIL ABN 52 631 074 450

Dated: 10/09/2013

The seal of TAMWORTH REGIONAL COUNCIL ABN 52 631 074 450
was hereunto affixed in the presence of authorised officers of the Council who certify this dealing to be correct for the purposes of the Real Property Act 1900.

Council's seal:

TAMWORTH REGIONAL COUNCIL
The COMMON SEAL of the
ESTABLISHED 2004

Signature of authorised officer: C.J. Murray

Name of authorised officer: COLIN JOHN MURRAY

Position of authorised officer: MAYOR

Signature of authorised officer:

Name of authorised officer: PAUL ANTHONY BENNETT

Position of authorised officer: GENERAL MANAGER

* *s117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.*

LAND REGISTRY SERVICES

Historical Title

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
6/11/2018 10:25AM

FOLIO: 1/1234850

First Title(s): VOL 4795 FOL 165 VOL 5370 FOL 222
Prior Title(s): 272/631977

Recorded	Number	Type of Instrument	C.T. Issue
13/12/2017	DP1234850	DEPOSITED PLAN	FOLIO CREATED EDITION 1
27/12/2017	AN4331	TRANSFER	EDITION 2
22/1/2018	AN56645	CAVEAT	

*** END OF SEARCH ***

taminda PRINTED ON 6/11/2018

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Received: 06/11/2018 10:25:36

LAND REGISTRY SERVICES Title Search

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/1234850

SEARCH DATE	TIME	EDITION NO	DATE
21/11/2018	11:00 AM	2	27/12/2017

LAND

LOT 1 IN DEPOSITED PLAN 1234850
AT TAMINDA
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF MURROON COUNTY OF PARRY
TITLE DIAGRAM DP1234850

FIRST SCHEDULE

HARRY DAVID STEARMAN (T AN4331)

SECOND SCHEDULE (9 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 R157473 EASEMENT TO DRAIN SEWAGE 6 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
3 V391742 EASEMENT FOR ELECTRICITY TRANSMISSION LINE 20 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 DP265817 EASEMENT TO DRAIN WATER 2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 7262811 EASEMENT TO DRAIN SEWAGE 5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
6 9945009 EASEMENT FOR ABOVE GROUND WORKS 20 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED AFFECTING THE SITE SHOWN AS"PROPOSED EASEMENT FOR ABOVE GROUND WORKS OVER CENTRELINE OF POLES" IN THE PLAN WITH 9945009
7 AM108222 EASEMENT TO DRAIN WATER 6 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
8 AM108223 POSITIVE COVENANT
* 9 AN56645 CAVEAT BY A & GS CLIFT PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

taminda PRINTED ON 21/11/2018

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 21/11/2018 11:00:56

Req:R614178 /Doc:CT 15055-116 CT /Rev:23-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:10
Ref:taminda /Src:M

15055 116

[redacted]FICATE OF TITLE

NEW SOUTH WALES — [redacted]L PROPERTY ACT, 1900

Vol. 15055 Fol. 116

First Title : Vol. 5370 Fol.222

Prior Title : Vol.11332 Fol.157

EDITION 23 ISSUED 5 1983

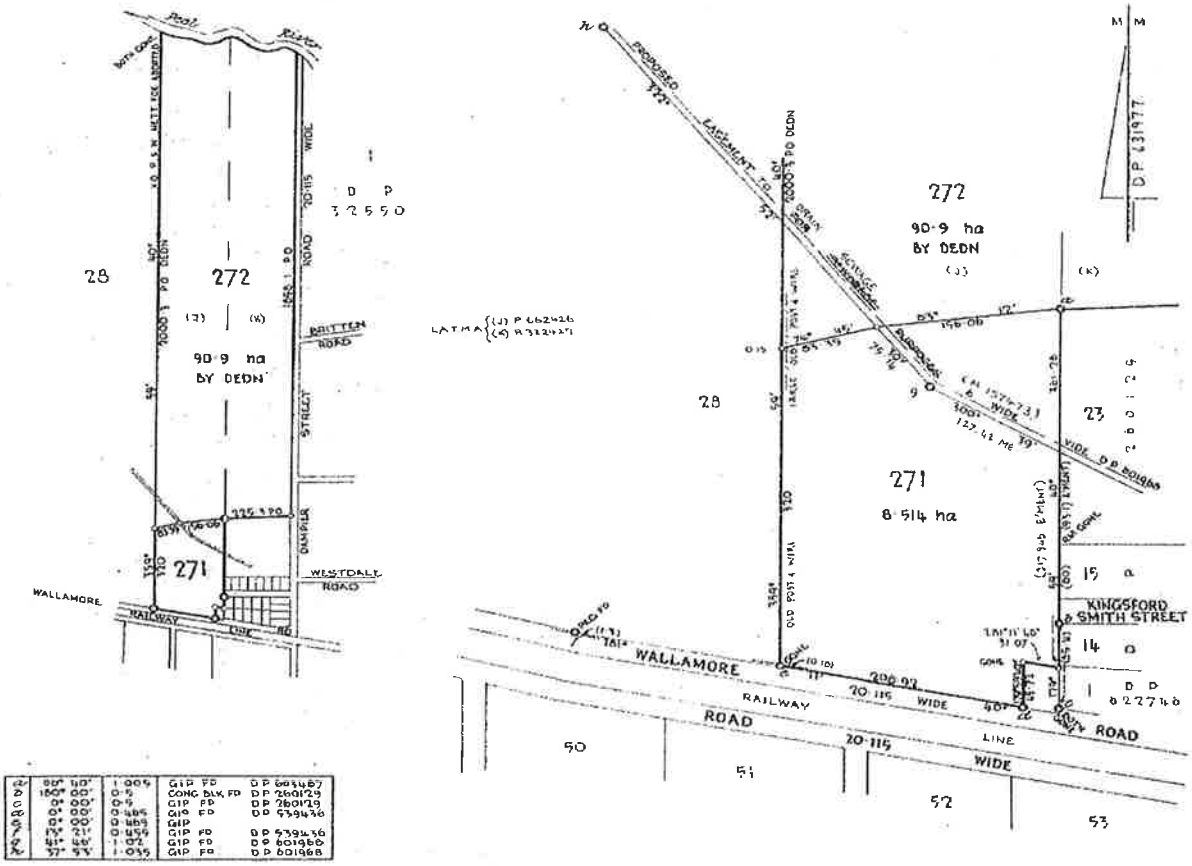
I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

Registrar General.

CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



LAND REFERRED TO

Lot 271 in Deposited Plan 631977 at Taminda in the City of Tamworth Parish of Murroon and County of Parry.

FIRST SCHEDULE

MARAU PTY. LIMITED.

SECOND SCHEDULE

1. Land excludes minerals and is subject to reservations and conditions in favour of the Crown - see Crown Grant.
2. P662426 Attention is directed to Section 8 Land Aggregation Tax Management Act,1971.
3. R157473 Easement to drain sewage affecting the part of the land above described shown so burdened in Deposited Plan 631977.

(Page 1) Vol. 15055 Fol. 116

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Vol. 15055 Fol. 116

L.O. 1066 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR | Registrar General

DP/SP 711449 Registered 25-1-1985
The folio is cancelled as to whole/~~part~~ upon creation of computer folios for lots 1 to 9 inclusive abovementioned plan.

SECOND SCHEDULE (continued)

PARTICULARS | Registrar General | CANCELLATION

T643092 Mortgage to State Bank of New South Wales. Registered 20-7-1983
DP636336 Easement to drain water appurtenant to the land within described.

The interest of the Council of the Local Government Area in the public road dedicated in DP 711449

~~Registered~~ 25/2/1985

~~Interest~~ created pursuant to Section 88B Conveyancing Act, 1919, by the registration of DP 711449

Registered 25/2/1985

NOTATIONS AND UNREGISTERED DEALINGS

T643092 mtg
CT 8-5-84
DP636336
Easement 9/8/84
08 JAN 1985

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE

Req:R614178 /Doc:CT 15055-116 CT /Rev:23-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:10
Ref:tamtnda /Src:M

LAND REGISTRY SERVICES

Historical Title

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
6/11/2018 10:26AM

FOLIO: 1/711449

First Title(s): VOL 5370 FOL 222
Prior Title(s): VOL 15055 FOL 116

Recorded	Number	Type of Instrument	C.T. Issue
27/2/1985	DP711449	DEPOSITED PLAN	FOLIO CREATED EDITION 1
9/6/1987	W923501	TRANSFER OF MORTGAGE	EDITION 2
19/1/1989	Y109174	DISCHARGE OF MORTGAGE	
19/1/1989	Y109175	TRANSFER	EDITION 3
28/1/1994	I980756	TRANSFER	EDITION 4
2/4/2007	AD23587	DEPARTMENTAL DEALING	
13/12/2017	DP1234850	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

taminda PRINTED ON 6/11/2018

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Received: 06/11/2018 10:26:35

Req:R615566 /Doc:DL Y109175 /Rev:31-Aug-2010 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 11:37 /S
Ref:taminda /Src:M

RP 13
1905

STAMP DUTY

[redacted]

$1-00

Y109175

TRANSFER

REAL PROPERTY ACT, 1900

T

3 2 of 2 X

$ 1

R2/2

DESCRIPTION OF LAND Note (a)	Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
	Folio Identifier 1/711449	WHOLE	TAMWORTH

TRANSFEROR
Note (b)

MARAU PTY LIMITED

ESTATE
Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ 16,000.00
and transfers an estate in fee simple
in the land above described to the TRANSFEREE

TRANSFEREE
Note (d)

JOHN DOUGLAS COLLETT

of 40 Ridge Street, Tamworth

OFFICE USE ONLY

S

TENANCY
Note (e)

as joint tenants/tenants in common

PRIOR ENCUMBRANCES
Note (f)

subject to the following PRIOR ENCUMBRANCES 1. .....

2. ..... 3. .....

DATE 23rd December 1988

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION
Note (g)

Signed in my presence by the transferor who is personally known to me

THE COMMON SEAL of MARAU PTY. LIMITED
Signature of Witness

was hereunto affixed by authority
Name of Witness (BLOCK LETTERS)

of the Directors in the presence of:
Address and occupation of Witness

MARAU PTY. LIMITED Common Seal

Director

Director/Secretary

Signature of Transferor

Note (g)

Signed in my presence by the transferee who is personally known to me

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address and occupation of Witness

Signature of Transferee

Kenneth John SORRENSON.

TO BE COMPLETED BY LODGING PARTY
Notes (h) and (i) Lodged Stamp Office by GALLOWAY & CO. LAW STATIONERS
OFFICE USE ONLY
PH. 233 1011
DX 340
SYDNEY

LODGED BY

GALLOWAY & CO.

Phone: 233-1011 Fax: 233-3851
DX 340 L.T.O. Delivery DUA
Delivery Box Number

LOCATION OF DOCUMENTS		
CT	OTHER	
1		Herewith.
		In L.T.O. with
		Produced by

Checked EAH	Passed	REGISTERED - -19	Secondary Directions		
Signed	Extra Fee	19 JAN 1989	Delivery Directions	CT	28A

Issued

Req:R615567 /Doc:DL I980756 /Rev:07-Apr-2010 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 11:37 /Seq:1 of 1
Ref:taminda /Src:M

RP13

TRANSFER

Real Property Act, 1900

I 980756 T

Office of State Revenue use only

OFFICE OF STATE REVENUE P9
STAMP DUTY 1992/93
DUTY $ 10-00 1ST REC Nº 15987 62

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

FOLIO IDENTIFIER 1/711449

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
28A	GALLOWAY & CO. Phone: 233-1011 Fax: 232-649 DX 340, L.T.O. Delivery 28A REFERENCE (max. 15 characters): eversol-collett

(C) **TRANSFEROR** JOHN DOUGLAS COLLETT

(D) acknowledges receipt of the consideration of $1.00

and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE** T TECHNOLOGY
PEEL ~~TECHNICAL~~ HIGH SCHOOL PARENTS & CITIZENS ASSOCIATION INC

(G) **TENANCY:**

OFFICE OF STATE REVENUE N.S.W. TREASURY 1992/93 ALTERATION NOTED 325

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATED** 30th November 1993

Signed in my presence by the Transferor who is personally known to me.

K A Mark
Signature of Witness

KELLIE-ANNE MARIN
Name of Witness (BLOCK LETTERS)

42A PEEL STREET, TAMWORTH.
Address of Witness

J. D. Collett
Signature of Transferor

Signed in my presence by the Transferee who is personally known to

THE COMMON SEAL of PEEL TECHNOLOGY HIGH SCHOOL PARENTS & CITIZENS ASSOCIATION INC) was hereunto ~~Signature of Witness~~ affixed in the presence of:)

~~Name of Witness (BLOCK LETTERS)~~

Pam McKinnon
PUBLIC OFFICER ~~Address of Witness~~

PEEL TECHNOLOGY HIGH SCHOOL PARENT & CITIZEN'S ASSN. INC. Common Seal

N J Dean
~~Signature of Transferee~~

SIGNATURE OF A MEMBER OF THE COMMITTEE

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only) 378

Ausdoc Commercial and Law Stationers 1991

LAND REGISTRY SERVICES — Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
6/11/2018 10:26AM

FOLIO: 2/1234850

First Title(s): VOL 5370 FOL 222
Prior Title(s): 1/711449

Recorded	Number	Type of Instrument	C.T. Issue
13/12/2017	DP1234850	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED EDITION 1
13/12/2017	AM921387	TRANSFER	
22/1/2018	AN56644	CAVEAT	

*** END OF SEARCH ***

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Received: 06/11/2018 10:26:35

LAND REGISTRY SERVICES Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/1234850

SEARCH DATE	TIME	EDITION NO	DATE
21/11/2018	11:40 AM	1	13/12/2017

LAND

LOT 2 IN DEPOSITED PLAN 1234850
AT TAMINDA
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF MURROON COUNTY OF PARRY
TITLE DIAGRAM DP1234850

FIRST SCHEDULE

CHAN ABBEY HOLDINGS PTY LIMITED (T AM921387)

SECOND SCHEDULE (5 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

2 R157473 EASEMENT TO DRAIN SEWAGE 6 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

3 DP636336 EASEMENT TO DRAIN WATER 5 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED

4 DP711449 EASEMENT TO DRAIN WATER 5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

* 5 AN56644 CAVEAT BY A & GS CLIFT PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Received: 21/11/2018 11:40:39

Req:R615655 /Doc:CT 14087-061 CT /Rev:22-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 11:44
Ref:taminda /Src:M

[redacted]

CERTIFICATE OF TITLE

NEW SOUTH WALES — L PROPERTY ACT, 1900

14087061

165

Crown Grant Vol. 4795 Fol. 165

Prior Title Vol. 12042 Fol. 181

Vol. 14087 Fol. 61

CANCELLED

EDITION ISSUED 21 3 1980

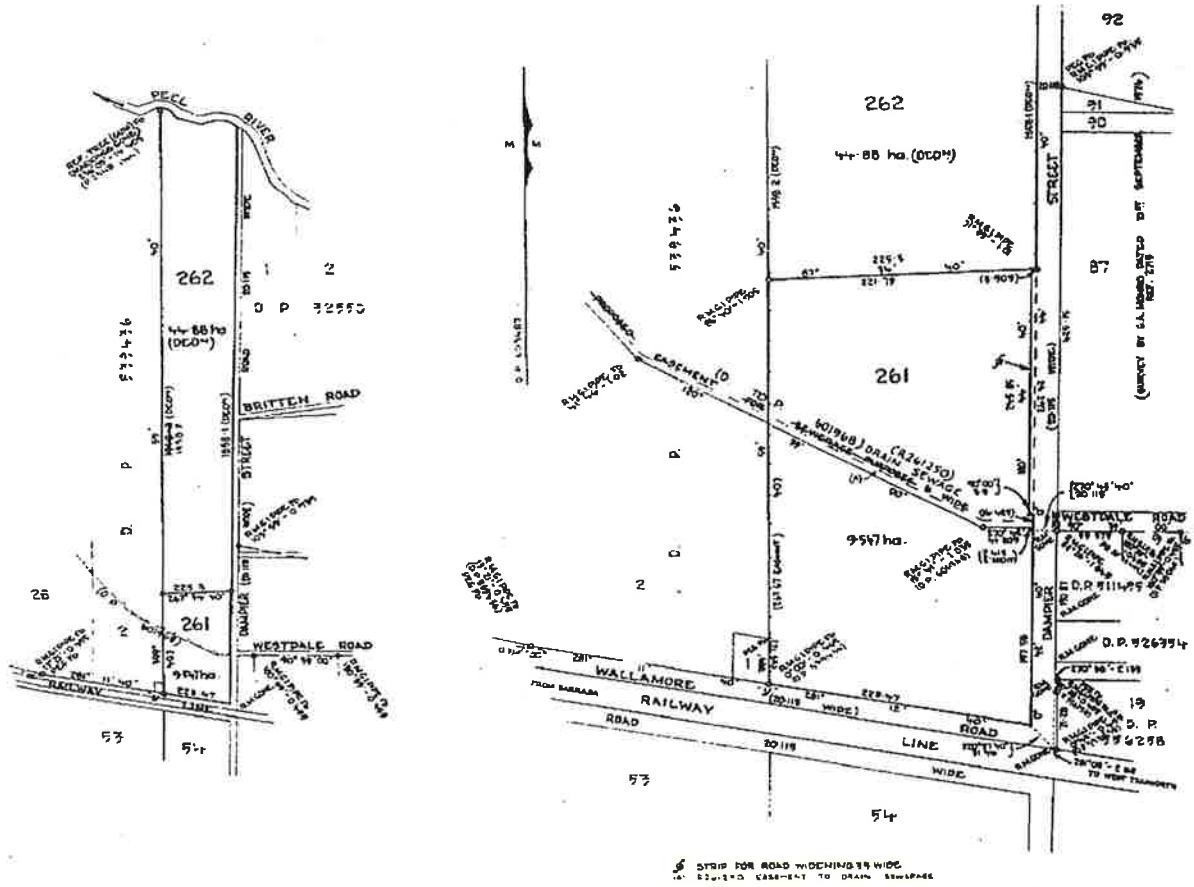
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

(Page 1) Vol. 14087 Fol. 61

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 261 in Deposited Plan 603487 at Tamunda in the City of Tamworth Parish of Murroon and County of Parry. EXCEPTING THEREOUT the minerals reserved by the Crown Grant.

FIRST SCHEDULE

BARRY MAYNES McKINNON of Tamworth, Agent.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. R322429 Attention is directed to section 8 Land Aggregation Tax Management Act, 1971.
3. R261250 Easement to Drain Sewerage affecting the land shown so burdened in Deposited Plan 603487.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R615655 /Doc:CT 14087-061 CT /Rev:22-Dec-2010 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 11:44
Ref:taminda /Src:M

DP260129
9/12/80

Vol. 14087 Fol. 61

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General

NEW CERTIFICATE(S) OF TITLE ISSUING ON DP260129
NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO SURVEY

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
	DP260129	The interest of the Council of the City of Tamworth in the new road and addition to existing road shown on D.P. 260129	12.6.1980			
	DP260129	Interests created pursuant to Section 88B Conveyancing Act 1919, by the registration of Deposited Plan 260129	12.6.1980			
		This deed is cancelled as to Whole Ex Road New certificates of title have issued on 25-7-1980 for lots in Deposited Plan No 260129 as follows: Lots 1 to 23 Vol 10171 Fols 199 to 216 respectively				
	PTS DP260129	Production of Certificate of Title Vol 14087 Fol 61 has been dispensed with : Vide DP260129.	25-7-1980			

The residue of land in this folio comprises road shown in D P260129

REGISTRAR GENERAL

REGISTRAR GENERAL

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R614179 /Doc:CT 14171-216 CT /Rev:07-Mar-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:10
Ref:taminda /Src:M

14171216

[redacted]TIFICATE OF TITLE

NEW SOUTH WALES

REAL PROPERTY ACT, 1900

Register

Vol. 14171 Fol. 216

Crown Grant Vol. 4795 Fol.165

Prior Title Vol.14087 Fol. 61

EDITION ISSUED

28 7 [illegible]

14171 Fol. 216

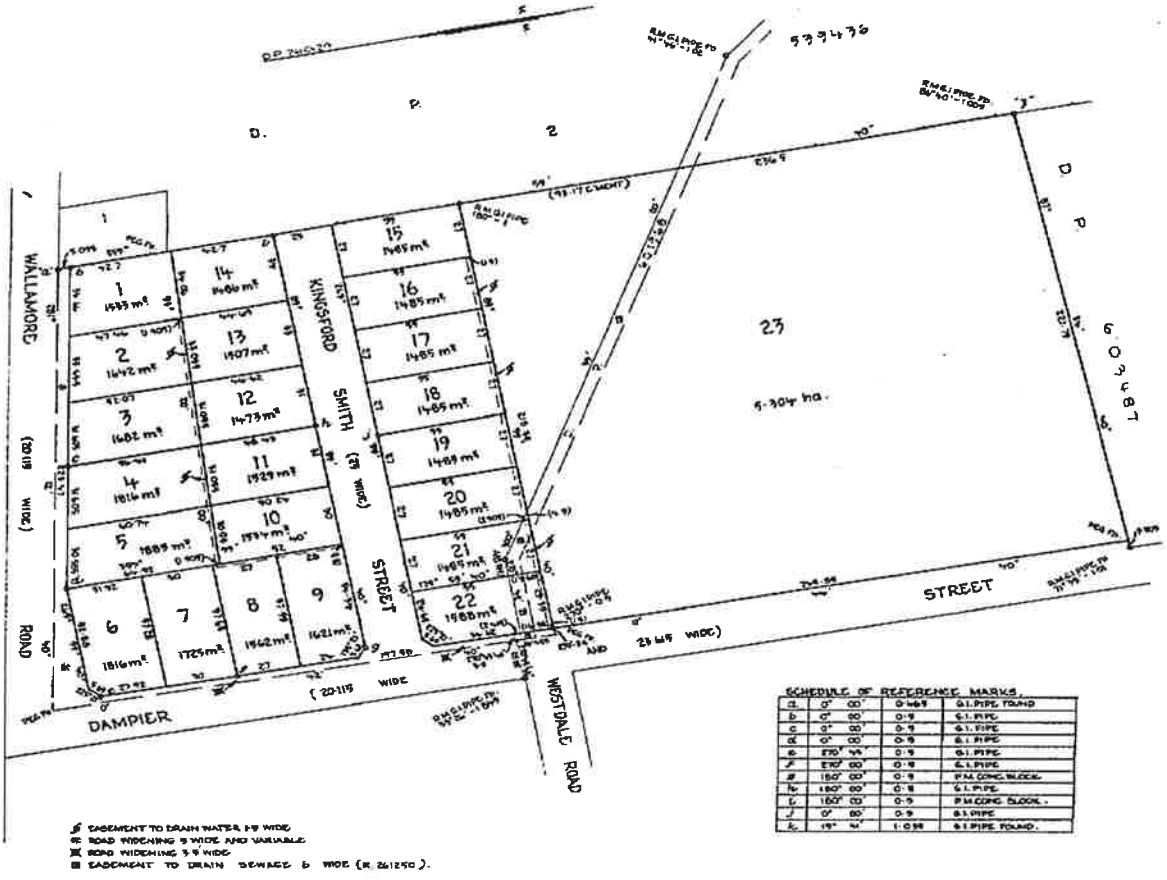
(Page 1) Vol.

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 23 in Deposited Plan 260129 at Taminda in the City of Tamworth Parish of Murroon and County of Parry. EXCEPTING THEREOUT the minerals reserved by the Crown Grant.

FIRST SCHEDULE

~~BARRY MAYNES McKINNON of Tamworth, Agent.~~

SECOND SCHEDULE

GRM BA EA/SB

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. R322429 Attention is directed to section 8 Land Aggregation Tax Management Act,1971.
3. R261250 Easement to drain sewerage affecting the part of the land above described shown so burdened in Deposited Plan 260129.

RG 2/64

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

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WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

Vol. 14171 Fol. 216

S721678T
DP636336
V862097M

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
Tim Kirkpatrick and Anne Edith Kirkpatrick as joint tenants by Transfer S721678. Registered 8-10-1981.				

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
EW	DP.636336	EASEMENT TO DRAIN WATER AFFECTING THE PART OF THE LAND WITHIN				
		DESCRIBED SHOWN SO BURDENED IN DP.636336.	9-8-1984			
M V862097 Mortgage to Westpac Banking Corporation. Registered 13.8.1985.						

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R614179 /Doc:CT 14171-216 CT /Rev:07-Mar-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:10
Ref:taminda /Src:M

LAND REGISTRY SERVICES

Historical Title

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
6/11/2018 10:27AM

FOLIO: 23/260129

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 14171 FOL 216

Recorded	Number	Type of Instrument	C.T. Issue
5/6/1987		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
15/9/1987		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
10/6/2004	AA712747	DISCHARGE OF MORTGAGE	
10/6/2004	AA712748	TRANSFER	EDITION 1
8/12/2017	AM952616	DEPARTMENTAL DEALING	
13/12/2017	DP1234850	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

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LAND REGISTRY SERVICES

Historical Title

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NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
6/11/2018 10:27AM

FOLIO: 3/1234850

First Title(s): VOL 4795 FOL 165
Prior Title(s): 23/260129

Recorded	Number	Type of Instrument	C.T. Issue
13/12/2017	DP1234850	DEPOSITED PLAN	FOLIO CREATED EDITION 1

*** END OF SEARCH ***

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LAND REGISTRY SERVICES Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 3/1234850

SEARCH DATE	TIME	EDITION NO	DATE
21/11/2018	11:48 AM	1	13/12/2017

LAND

LOT 3 IN DEPOSITED PLAN 1234850
AT TAMINDA
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF MURROON COUNTY OF PARRY
TITLE DIAGRAM DP1234850

FIRST SCHEDULE

KIDMAN GROUP PTY LIMITED

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 R261250 EASEMENT TO DRAIN SEWAGE 6 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
3 DP636336 EASEMENT TO DRAIN WATER 5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Req:R614183 /Doc:CT 14046-059 CT /Rev:14-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:10
Ref:taminda /Src:M

14046059

NEW SOUTH WALES

ICATE OF TITLE

PROPERTY ACT, 1900

Vol. 14046 Fol. 59

Prior Title (Crown Grant)

Vol. 6731 Fol. 47

CANCELLED

EDITION ISSUED

11 2 1980

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

SEE AUTO FOLIO

Registrar General.

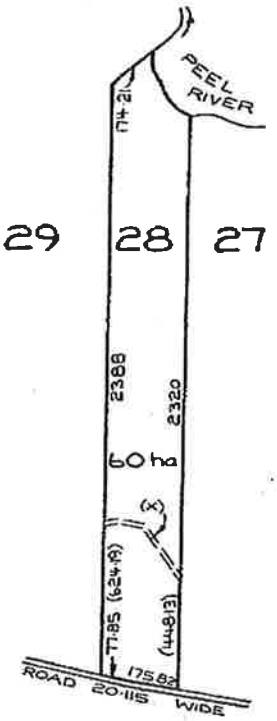
(Page 1) Vol. 14046 Fol. 59

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WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



(X) - EASEMENT TO DRAIN SEWAGE - 6 WIDE R249085.

R249085

REDUCTION RATIO 1:20000

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Portion 28 in the City of Tamworth Parish of Murroon County of Parry. EXCEPTING THEREOUT the minerals reserved by the Crown grant.

FIRST SCHEDULE

JOHN BADEN CHAFFEY of Tamworth, Farmer and GLADYS CHAFFEY his wife, as Tenants in Common in equal shares.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown grant above referred to.
2. Restrictions on dealings see section 31 Closer Settlement Act, 1904 (SP1909/119 Tamworth).
3. ~~K577254 Caveat by Rural Bank of New South Wales.~~ Withdrawn T410879
4. M484809 Mortgage to Australia and New Zealand Savings Bank Limited.
5. R249085 Easement to drain sewage affecting the land shown so burdened in the plan hereon.

RG 2/64

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Vol. 14046 Fol. 59

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General

DP635782 R
CT 03 OCT 19
V391742TGf

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
CA V391742		Transfer. Easement for electricity transmission line affecting the part of the land within described shown as proposed easement for electricity transmission line 20 wide in DP635782. Registered 13-12-1984.				

CANCELLED

SEE AUTO FOLIO

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R614183 /Doc:CT 14046-059 CT /Rev:14-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:21-Nov-2018 10:10
Ref:taminda /Src:M

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
6/11/2018 10:27AM

FOLIO: 28/755333

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 14046 FOL 59

Recorded	Number	Type of Instrument	C.T. Issue
12/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
19/4/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
15/4/1991		AMENDMENT: TITLE DIAGRAM	
29/11/1996	2652743	TRANSMISSION APPLICATION	EDITION 1
12/6/1997	3137903	APPLICATION FOR REMOVAL OF RESTRICTIONS	
12/6/1997	3137904	DISCHARGE OF MORTGAGE	
12/6/1997	3137906	TRANSFER	EDITION 2
25/3/1999	5704999	MORTGAGE	EDITION 3
13/9/1999	DP1006026	DEPOSITED PLAN	
27/9/2000	7112170	CAVEAT	
25/1/2001	7262810	WITHDRAWAL OF CAVEAT	
25/1/2001	7262811	TRANSFER GRANTING EASEMENT	EDITION 4
8/5/2002	8576687	DISCHARGE OF MORTGAGE	
8/5/2002	8576689	MORTGAGE	EDITION 5
4/12/2002	9189029	DISCHARGE OF MORTGAGE	
4/12/2002	9189030	TRANSFER	EDITION 6
2/10/2003	9945037	TRANSFER GRANTING EASEMENT	EDITION 7
16/9/2013	AI21612	TRANSFER	EDITION 8
30/1/2017	DP1227482	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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LAND REGISTRY SERVICES

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
6/11/2018 10:27AM

FOLIO: 60/1227482

First Title(s): VOL 6731 FOL 47
Prior Title(s): 28/755333

Recorded	Number	Type of Instrument	C.T. Issue
30/1/2017	DP1227482	DEPOSITED PLAN	FOLIO CREATED EDITION 1
27/12/2017	AN4331	TRANSFER	EDITION 2
22/1/2018	AN56645	CAVEAT	

*** END OF SEARCH ***

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LAND REGISTRY SERVICES Title Search

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 60/1227482

SEARCH DATE	TIME	EDITION NO	DATE
21/11/2018	12:06 PM	2	27/12/2017

LAND

LOT 60 IN DEPOSITED PLAN 1227482
AT TAMINDA
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF MURROON COUNTY OF PARRY
TITLE DIAGRAM DP1227482

FIRST SCHEDULE

HARRY DAVID STEARMAN (T AN4331)

SECOND SCHEDULE (7 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

2 R249085 EASEMENT TO DRAIN SEWAGE 6 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

3 V391742 EASEMENT FOR ELECTRICITY TRANSMISSION LINE 20 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

4 7262811 EASEMENT TO DRAIN SEWAGE 5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

5 9945037 EASEMENT TO DRAIN WATER EASEMENT FOR ABOVE GROUND WORKS 20 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED AFFECTING THE SITE SHOWN AS "PROPOSED EASEMENT FOR ABOVE GROUND WORKS OVER CENTRELINE OF POLES" IN THE PLAN WITH 9945037

6 DP1227482 POSITIVE COVENANT

* 7 AN56645 CAVEAT BY A & GS CLIFT PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Received: 21/11/2018 12:06:41

List of NSW Contaminated Sites Notified to EPA as of 9 November 2018

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that contamination is significant enough to warrant regulation having regard to the matters in section 12 of the CLM Act, the EPA may apply the regulatory provisions of the CLM Act to have the appropriate person (for example, the responsible polluter and/or landowner) investigate and remediate the site.

Where the EPA reasonably suspects that a pollution incident is occurring (or has occurred) at a premise, the EPA, as the appropriate regulatory authority, may choose to regulate the incident and any resulting contamination under the POEO Act by ordering the occupier or the owner to carry out certain actions.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2014.
- The contamination is being managed under a specifically tailored program operated by another agency (for example t
- he Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon, particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being	The EPA has completed an assessment of the contamination and decided

finalised	that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	Contamination is currently regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA as *the appropriate regulatory authority* reasonably suspects that a pollution incident is occurring/ has occurred and that it requires regulation under the POEO Act. The EPA may use environment protection notices, such as clean up notices, to require clean up action to be taken. Such regulatory notices are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the

(EP&A Act)	*Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Suburb	Site Name	Address	Contamination Activity Type	Management Class	Latitude	Longitude
SYDNEY OLYMPIC PARK	Aquatic Centre Carpark Landfill	Shane Gould AVENUE	Landfill	Ongoing maintenance required to manage residual contamination	-33.85093439	151.0656713
SYDNEY OLYMPIC PARK	Blaxland Common Landfill	Jamieson STREET	Landfill	Ongoing maintenance required to manage residual contamination	-33.82638382	151.05972
SYLVANIA	Caltex Service Station - Sylvania Heights	414-416 Princes HIGHWAY	Service Station	Contamination currently regulated under CLM Act	-34.02361051	151.0895394
SYLVANIA	Caltex Service Station	61 Port Hacking ROAD	Service Station	Regulation under CLM Act not required	-34.0140089	151.104212
TALBINGO	Old Town Landfill	Bridle STREET	Landfill	Regulation under CLM Act not required	-35.59018237	148.3041771
TALBINGO	T3 Spoil dump and adjoining river sediments	Off Snowy Mountains HIGHWAY	Landfill	Contamination formerly regulated under the CLM Act	-35.6177268	148.2926158
TALBINGO	Former grit blasting site	Old Damsite ROAD	Other Industry	Regulation under CLM Act not required	-35.60894551	148.3030165
TAMINDA	Mobil Depot	9 Hinkler ROAD	Other Petroleum	Regulation under CLM Act not required	-31.09584286	150.9040493
TAMWORTH	Caltex Tamworth Service Station	109 Gunnedah ROAD	Service Station	Regulation under CLM Act not required	-31.09723226	150.8955299
TAMWORTH	Curlew Crescent	19-29 Curlew CRESCENT	Metal Industry	Regulation under CLM Act not required	-31.06963607	150.9069306
TAMWORTH	Coles Express Tamworth	251 - 253 Goonoo Goonoo ROAD	Service Station	Contamination currently regulated under CLM Act	-31.11058167	150.9236721
TAMWORTH	Former Service Station, Fitzpatrick Super Fund, Tamworth	210 Goonoo Goonoo ROAD	Service Station	Regulation under CLM Act not required	-31.10613594	150.9234143
TAMWORTH	Gunnedah Road Site	49 GUNNEDAH ROAD	Other Industry	Contamination formerly regulated under the CLM Act	-31.09574904	150.9021583
TAMWORTH	Elovera Former Sheep Dip	730 Ascot Calala ROAD	Cattle Dip	Regulation under CLM Act not required	-31.1801846	150.962897
TAMWORTH	Housing NSW	29 -33 White STREET	Other Petroleum	Regulation under CLM Act not required	-31.0915651	150.9357811
TAMWORTH	BP Tamworth Service Station and Depot	27-29 Gunnedah ROAD	Service Station	Under assessment	-31.09642128	150.9058193
TAMWORTH	Former Mobil Service Station	373-375 Armidale ROAD	Service Station	Regulation under CLM Act not required	-31.10122679	150.9441341
TAMWORTH	Kensell's Mitsubishi	11-14 Kable AVENUE	Other Petroleum	Regulation under CLM Act not required	-31.08921565	150.9273063
TAMWORTH	Caltex Star Tamworth	21 White STREET	Service Station	Regulation under CLM Act not required	-31.09255137	150.9341709
TAMWORTH	Former Service Station Tamworth	(Cnr Scott Rd) 254-256 Goonoo Goonoo ROAD	Service Station	Regulation under CLM Act not required	-31.1118945	150.9228523
TARCUTTA	Mobil Service Station	(Hume Highway) 32 Sydney STREET	Service Station	Contamination formerly regulated under the CLM Act	-35.2772942	147.73574
TAREE	Caltex Taree	12 Pitt STREET	Service Station	Regulation under CLM Act not required	-31.90551738	152.4783334
TAREE	Former Caltex Depot	44 Stevenson STREET	Other Petroleum	Regulation under CLM Act not required	-31.90563595	152.4640848
TAREE	Former BP Service Station (Reliance Petroleum)	150 Manning River DRIVE	Service Station	Regulation under CLM Act not required	-31.93842026	152.4682056
TAREE	Former Shell Depot	53-55 Stevenson STREET	Other Petroleum	Regulation under CLM Act not required	-31.90514622	152.4649706

Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 12655

Department of **Environment & Climate Change** NSW

Licence Details	
Number:	12655
Anniversary Date:	16-February
Review Due Date:	16-Feb-2012

Licensee

BORAL RESOURCES (COUNTRY) PTY LIMITED
PO BOX 42
WENTWORTHVILLE NSW 2145

Licence Type

Premises

Premises

Boral Concrete Plant Taminda Industrial Estate
15-17 Cook Street
TAMWORTH NSW 2340

Scheduled Activity

Cement Works - A/C/G

Fee Based Activity	**Scale**
Concrete Batching (30)	> 13000 - 25000 m3 produced

Region

North West - Armidale
Level 1, NSW Govt Offices, 85 Faulkner Street
ARMIDALE NSW 2350
Phone: 02 6773 7000
Fax: 02 6772 2336

PO Box 494 ARMIDALE
NSW 2350

Environment Protection Licence

Licence - 12655

Department of **Environment & Climate Change** NSW



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Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act); and
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees.

The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

BORAL RESOURCES (COUNTRY) PTY LIMITED
PO BOX 42
WENTWORTHVILLE NSW 2145

subject to the conditions which follow.

1 Administrative conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled development work listed below at the premises listed in A2.
Civil construction work will be conducted in the construction of the concrete batching plant. The scope will encompass excavation, drainage and services installation.

A1.2 This licence authorises the carrying out of the scheduled activities listed below at the premises

specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity
Cement Works - A/C/G

Fee Based Activity	Scale
Concrete Batching (30)	> 13000 - 25000 m3 produced

A1.3 The licensee must not carry on any scheduled activities until the scheduled development works are completed, except as elsewhere provided in this licence.

A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
Boral Concrete Plant Taminda Industrial Estate
15-17 Cook Street
TAMWORTH
NSW
2340
LOT 1 DP 394486 AND LOT 15 DP 1078071

A3 Other activities

A3.1 Not applicable.

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
(a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
(b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to air and water and applications to land

P1 Location of monitoring/discharge points and areas

P1.1 Not applicable.

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

P1.3 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

Water and land

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
1	Wet Weather Discharge, Discharge Quality Monitoring	Wet Weather Discharge, Discharge Quality Monitoring	Overflow pipe inlet within location labelled as "Clean Water Holding Pit" on drawing titled "Tamworth Concrete Plant, 13-17 Cook St, Taminda - General Arrangement (Drawing No. TAM-G02)" dated 8-1-07 and on file 251466A1

Note: A discharge and monitoring point for the premises will be included in the licence in accordance with the EPAs general terms of approval prior to commencement of operations at the premises.

3 Limit conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Load limits

L2.1 Not applicable.

L2.2 Not applicable.

L3 Concentration limits

L3.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L3.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L3.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

Water and Land

POINT 1

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5 - 8.5
Total suspended solids	milligrams per litre				50

Note: Limit conditions for the discharge point for the premises will be included in the licence in accordance with the EPAs general terms of approval prior to commencement of operations at the premises.

L4 Volume and mass limits

L4.1 Not applicable.

L5 Waste

L5.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

L5.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.

L6 Noise Limits

L6.1 Noise from the premises must not exceed:
(a) 50dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm) Monday to Saturday and 8am to 6pm Sunday;; and
(b) 44dB(A) $L_{Aeq(15\ minute)}$ during the evening (6pm to 10pm) Monday to Sunday; and
(c) 42dB(A) $L_{Aeq(15\ minute)}$ during the early morning shoulder period of 6am to 7am Monday to Saturday; and
(d) at all other times 40dB(A) $L_{Aeq\ (15\ minute)}$, except as expressly provided by this licence.

Where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L6.2 Noise from the premises is to be measured at the nearest affected residential receiver that is not situated in an area zoned as industrial to determine compliance with condition L6.1.

Note: Noise measurement

For the purpose of noise measures required for this condition, the L_{Aeq} noise level must be measured or computed at the point defined in condition L6.2 over a period of 15 minutes using "FAST" response on the sound level meter.

For the purpose of the noise criteria for this condition, 5dBA must be added to the measured level if the noise is substantially tonal or impulsive in character. The location or point of impact can be different for each development, for example, at the closest residential receiver or at the closest boundary of the development. Measurement locations can be:
a) 1 metre from the facade of the residence for night time assessment;
b) at the residential boundary;
c) 30 metres from the residence (rural situations) where boundary is more than 30 metres from residence.

L6.3 The noise emission limits identified in this licence apply under all meteorological conditions except:

(a) during rain and wind speeds (at 10m height) greater than 3m/s; and
(b) under "non-significant weather conditions".

Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.

4 Operating conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:
(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.

O3 Dust Control

O3.1 The plant must be maintained in a condition which minimises or prevents the emission of dust from the plant.

O3.2 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

5 Monitoring and recording conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
(a) in a legible form, or in a form that can readily be reduced to a legible form;
(b) kept for at least 4 years after the monitoring or event to which they relate took place; and
(c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
(a) the date(s) on which the sample was taken;
(b) the time(s) at which the sample was collected;
(c) the point at which the sample was taken; and
(d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

Water and Land

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	milligrams per litre	Each overflow event	Representative sample
Total suspended solids	milligrams per litre	Each overflow event	Representative sample
pH	pH	Each overflow event	Representative sample

M3 Testing methods - concentration limits

M3.1 Not applicable.

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;

(e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 Conditions M5.1 and M5.2 do not apply until 3 months after:
(a) the date of the issue of this licence or
(b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

M6 Requirement to monitor volume or mass

M6.1 Not applicable.

Note: Discharge monitoring requirements will be included in the licence in accordance with the EPA's general terms of approval prior to commencement of operations at the premises.

6 Reporting conditions

R1 Annual return documents

What documents must an Annual Return contain?

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
(a) a Statement of Compliance; and
(b) a Monitoring and Complaints Summary.
A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
(a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
(b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
(a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
(b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

Deadline for Annual Return

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

R1.6 Not applicable.

Licensee must retain copy of Annual Return

R1.7 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary

R1.8 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
(a) the licence holder; or
(b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.9 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

R2 Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
(a) where this licence applies to premises, an event has occurred at the premises; or
(b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
(a) the cause, time and duration of the event;
(b) the type, volume and concentration of every pollutant discharged as a result of the event;
(c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
(d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
(e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
(f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
(g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

General conditions

G1 Copy of licence kept at the premises

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

Pollution studies and reduction programs

Special conditions

Dictionary

General Dictionary

In this licence, unless the contrary is indicated, the terms below have the following meanings:

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
assessable	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998

pollutants	
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 1998.
flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
industrial waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
inert waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.

plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
reprocessing of waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
treatment of waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste code	Means the waste codes listed in Appendix 5 of the EPA document A Guide to Licensing Part B.
waste type	Means Group A, Group B, Group C, inert, solid, industrial or hazardous waste

Mr Robert O'Hern

Environment Protection Authority

Environment Protection Licence

Licence - 12655

(By Delegation)

Date of this edition - 30-Oct-2007

End Notes

1	Licence varied by notice 1079571, issued on 30-Oct-2007, which came into effect on 30-Oct-2007.

APPENDIX D
Council Records

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place

51567/2011

Tamworth Skip-Eze
PO Box 42
KOOTINGAL NSW 2352

Dear Sir/Madam

Environmental Planning and Assessment Act 1979
NOTICE TO APPLICANT OF DETERMINATION OF A DEVELOPMENT APPLICATION

Pursuant to Section 81(1)(a) of the Act, notice is hereby given of the determination by Council of the following development application.

Development Application No.	DA0397/2011
Subject Land:	Lot 23, DP 260129, Dampier Street, TAMINDA
Description:	Change of Use (Storage depot for skip bins)

In the determination of this application Council considered all matters listed under Section 79C of the Act. The development application has been determined by the **granting of consent subject to the conditions** listed below.

General

1) All proposed building, site works or property improvement indicated on the submitted plans or otherwise required under the terms of this consent shall be completed prior to occupation of the premises to ensure compliance with the provisions of the Environmental Planning and Assessment Act, 1979.

2) To confirm and clarify the terms of Council's approval, and as provided for by Section 95 of the Environmental Planning and Assessment Act, 1979, the Storage Depot may be operated for the period 12 April 2011 to 12 April 2013.

Continued Operations

3) Skip Bins are to be emptied prior to return to the site. In the rare event that the return time is outside Landfill operating hours, the Bin shall be covered to prevent spillage or disturbance and shall be emptied at the earliest opportunity.

4) In the event of inundation of the site by floodwaters, skip bins shall be removed from the site, where time is available to do so.

The conditions have been imposed in accordance with the Environmental Planning and Assessment Act and Council's adopted policies.

This approval became effective on 12 April 2011 (Section 83 of the Act) and will lapse unless the proposed development is commenced within five (5) years of the approval date (Section 95 of the Act).

Under the provisions of Section 97AA of the Act you may (within six (6) months from the date of this development consent) appeal to the Land and Environment Court against conditions imposed should you feel they are unreasonable.

All conditions imposed by Council shall be observed as non-compliance is an offence under the Act.

Yours faithfully

Catherine Pyne
Team Leader Development Assessment

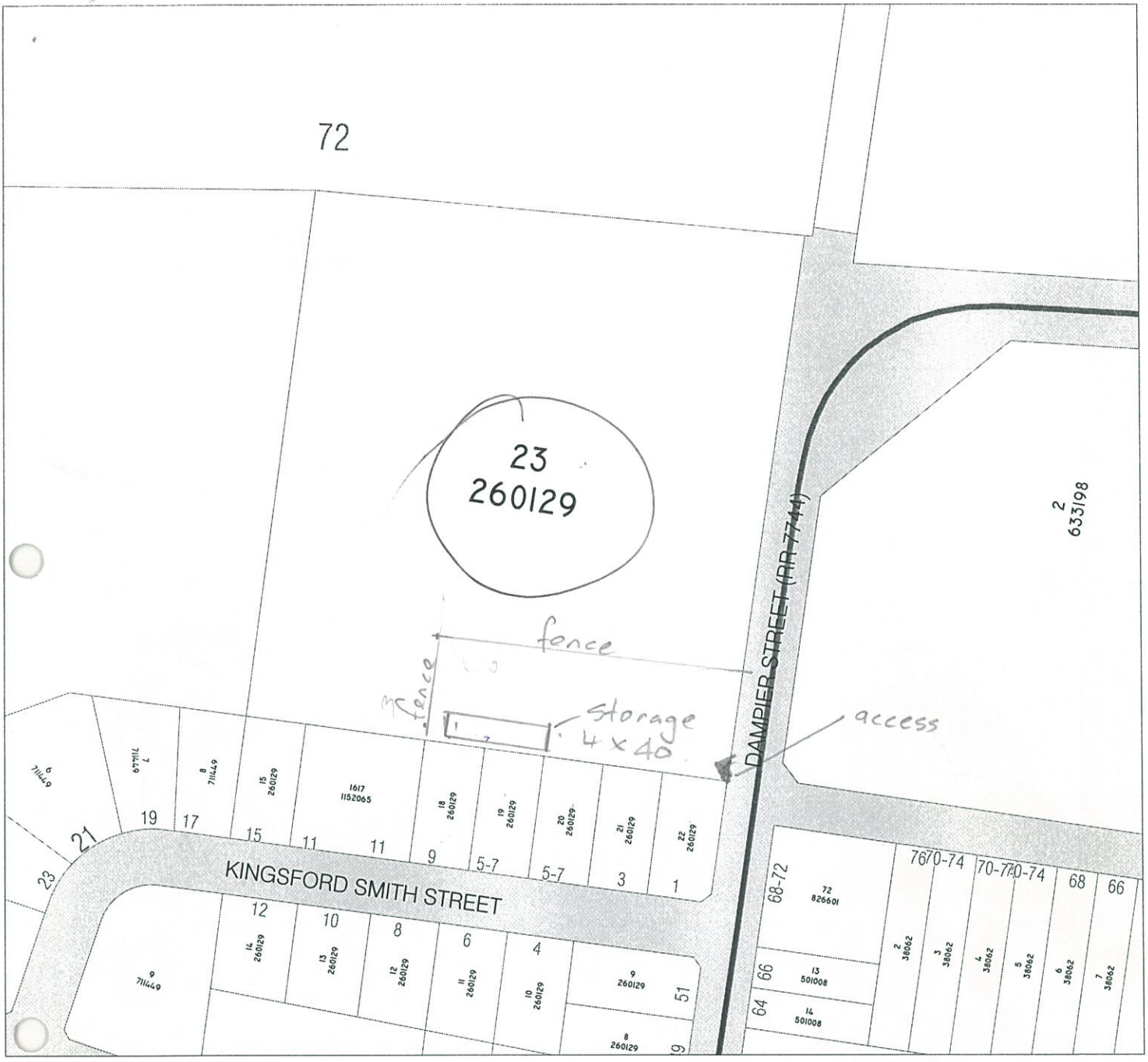
Contact: (02) 6767 5488

Reference: CP/DA0397/2011

12 April 2011

Determination issued in accordance with "Delegation of Functions" issued on: 1.12.2008

Tamworth Regional Council



SCALE 1 : 2,640

20 0 20 40 60

METERS

N

All maps on this site have been produced by the Geographic Information Section of Tamworth RegionalCouncil using information captured by Tamworth Regional Council. Tamworth Regional Council accepts no responsibility both in contract or tort (and particularly in negligence) for any errors omissions or inaccuracies whatsoever contained within or arising from these maps. All maps cannot be reproduced without the prior written consent of Tamworth Regional Council.

REGIONAL COUNCIL Tamworth

Tuesday, 29 March 2011 12:32 PM

Tamworth Regional Council



SCALE 1 : 2,629

20 0 20 40 60

METERS

N

All maps on this site have been produced by the Geographic Information Section of Tamworth RegionalCouncil using information captured by Tamworth Regional Council. Tamworth Regional Council accepts no responsibility both in contract or tort (and particularly in negligence) for any errors omissions or inaccuracies whatsoever contained within or arising from these maps. All maps cannot be reproduced without the prior written consent of Tamworth Regional Council.

REGIONAL COUNCIL Tamworth

Tuesday, 29 March 2011 12:29 PM

Tamworth Regional Council

437 Peel Street, Tamworth NSW 2340
Telephone:- (02) 6755 4555
Facsimile:- (02) 6755 4499
Email:- trc@tamworth.nsw.gov.au
ABN 52 631 074 450

29 October 2004

7754/2004

FILE COPY

Kidman Trust P/L
41 North Street
EAST TAMWORTH NSW 2340

Dear Sir/Madam

DEVELOPMENT APPLICATION NO. MOD0024/2005 FOR GARAGE- HAYSHED ON LOT 23 DP 260129.

I refer to the subject development application and advise that Council has completed its assessment of the application to modify the development in the following manner:-

An increase in the overall dimensions and the site location of the shed

Pursuant to Section 96 of the Environmental Planning and Assessment Act 1979, Council has approved the amended consent. In this regard, conditions of the development consent remain unchanged from the original determination (copy attached).

Please note that this approval remains effective from the original date of consent, .

Section 96 confers on an applicant who is dissatisfied with this determination a right of appeal to the Land and Environment Court. This appeal provision is pursuant to Pt. 15 Rule 3 of the Land and Environment Court Rules and is exercisable within sixty (60) days of the receipt of this notice.

Yours faithfully

Stuart Stevens
For and on behalf of
David Lewis
Development and Approvals Manager

For further information please contact:-

Stuart Stevens
Telephone:- (02) 6755 4539
Email:- s.stevens@tamworth.nsw.gov.au

Please address all correspondence to:-

The Acting General Manager
Tamworth Regional Council
PO Box 555, Tamworth NSW 2340
OR DX 6125

Please Quote:- MOD0024/2005

Correspondence issued in accordance with "Delegation of Functions" issued on: 11.08.04

NEW SOUTH WALES

CERTIFICATE OF TITLE

REAL PROPERTY ACT, 1900

TORRENS TITLE
Register

Vol. 14171 Fol. 21

EDITION 2

28 7

Crown Grant Vol. 4795 Fol.165

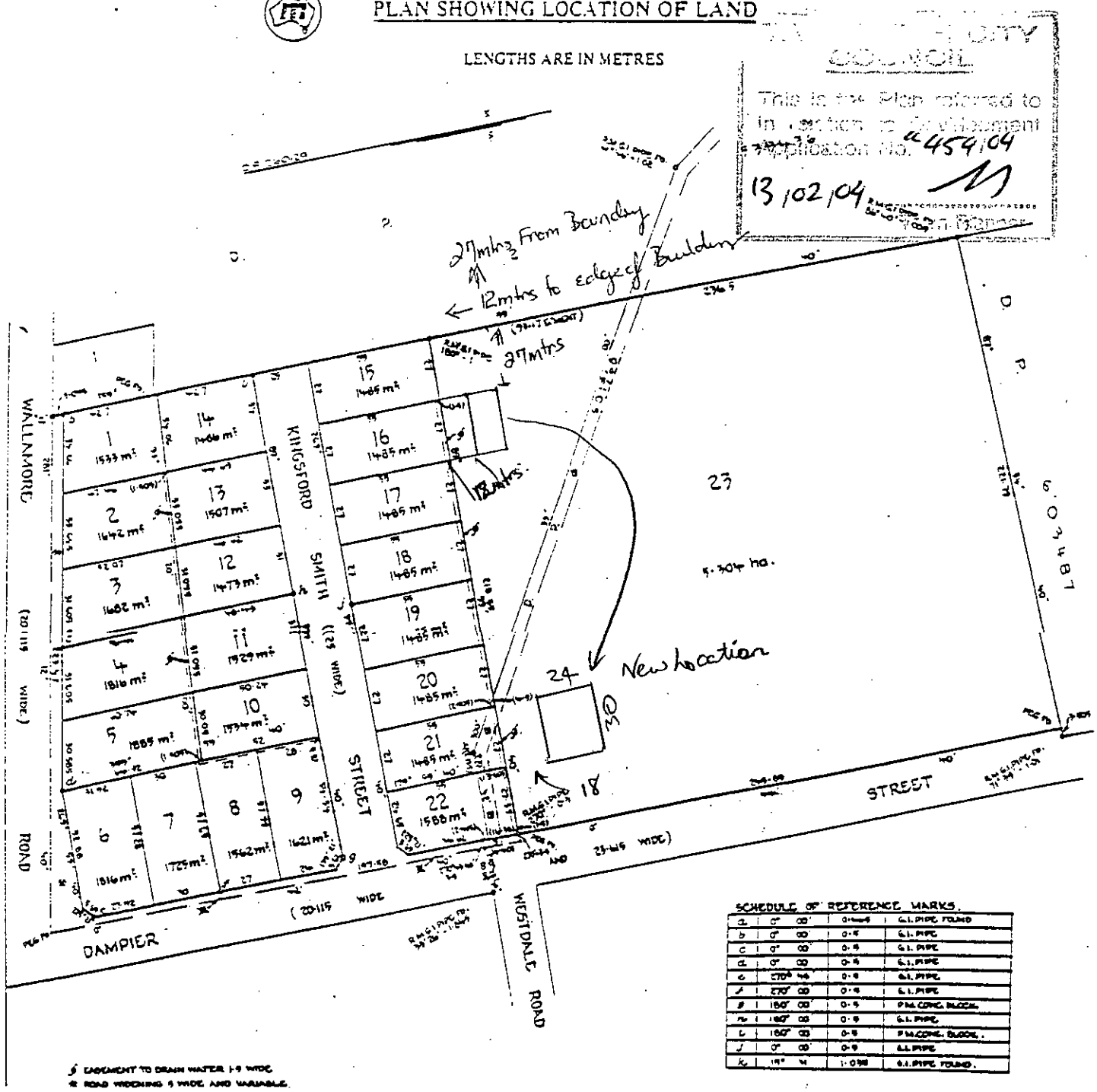
Prior Title Vol.14087 Fol. 61

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within descr
nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

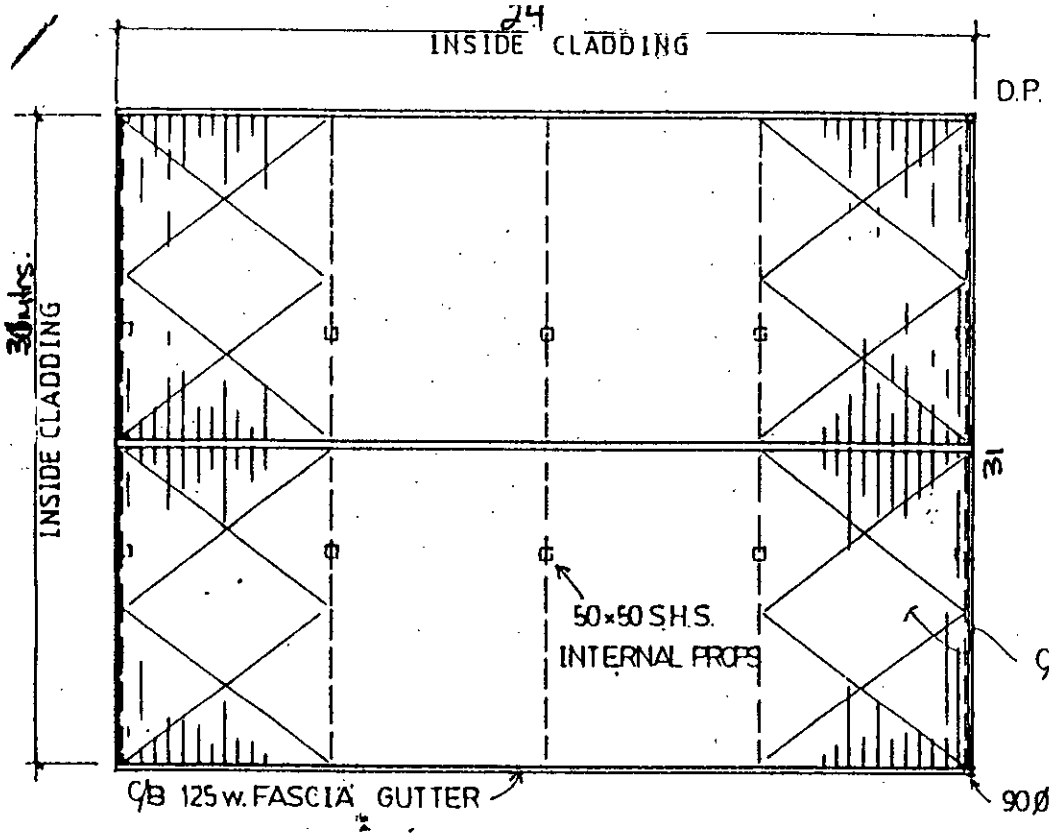
PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES

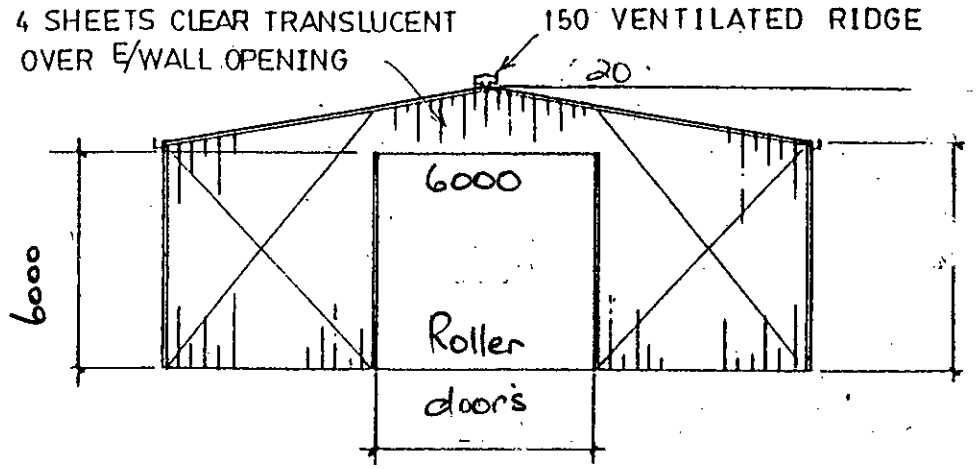


g EASEMENT TO DRAIN WATER 1·9 WIDE
* ROAD WIDENING 9 WIDE AND VARIABLE
X ROAD WIDENING 3·6 WIDE
S EASEMENT TO DRAIN SEWAGE 6 WIDE (R. 261250).

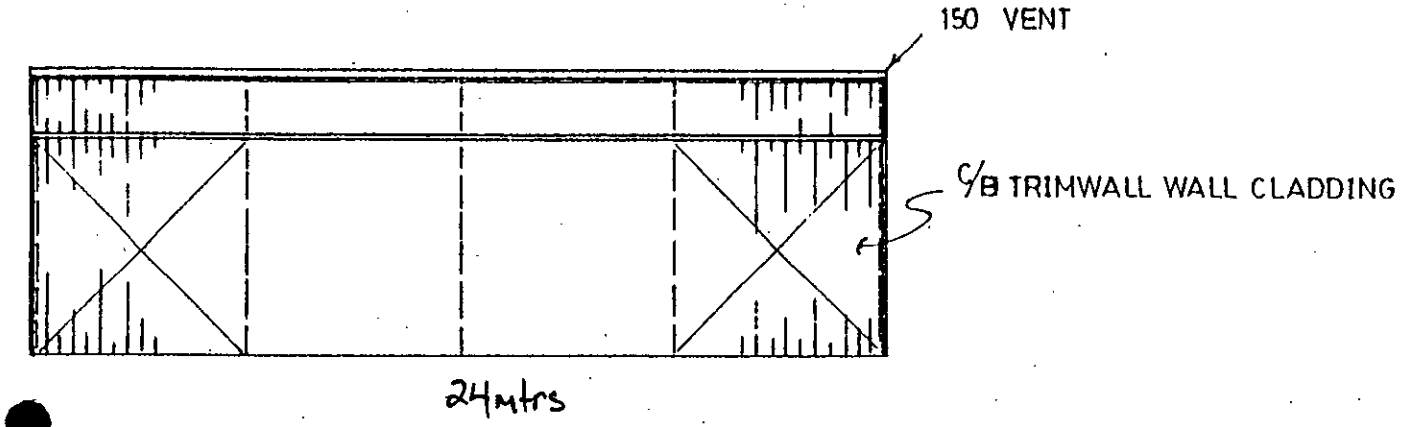
ESTATE AND LAND REFERRED TO



ROOF PLAN



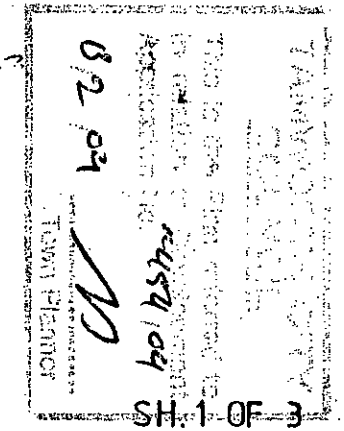
TYP. END WALL ELEVATION



TYP. SIDE WALL ELEVA JN

PROPOSED BUILDING FOR

LOT 23 DAMPIER STREET.
TAMWORTH.
A/C KIPMAN TRUST



SH. 1 OF 3

NEW SOUTH WALES

CERTIFICATE OF TITLE

REAL PROPERTY ACT, 1900

TORRENS TITLE
Register

Vol. 14171 Fol. 21

EDITION 2

28 7

Crown Grant Vol. 4795 Fol.165

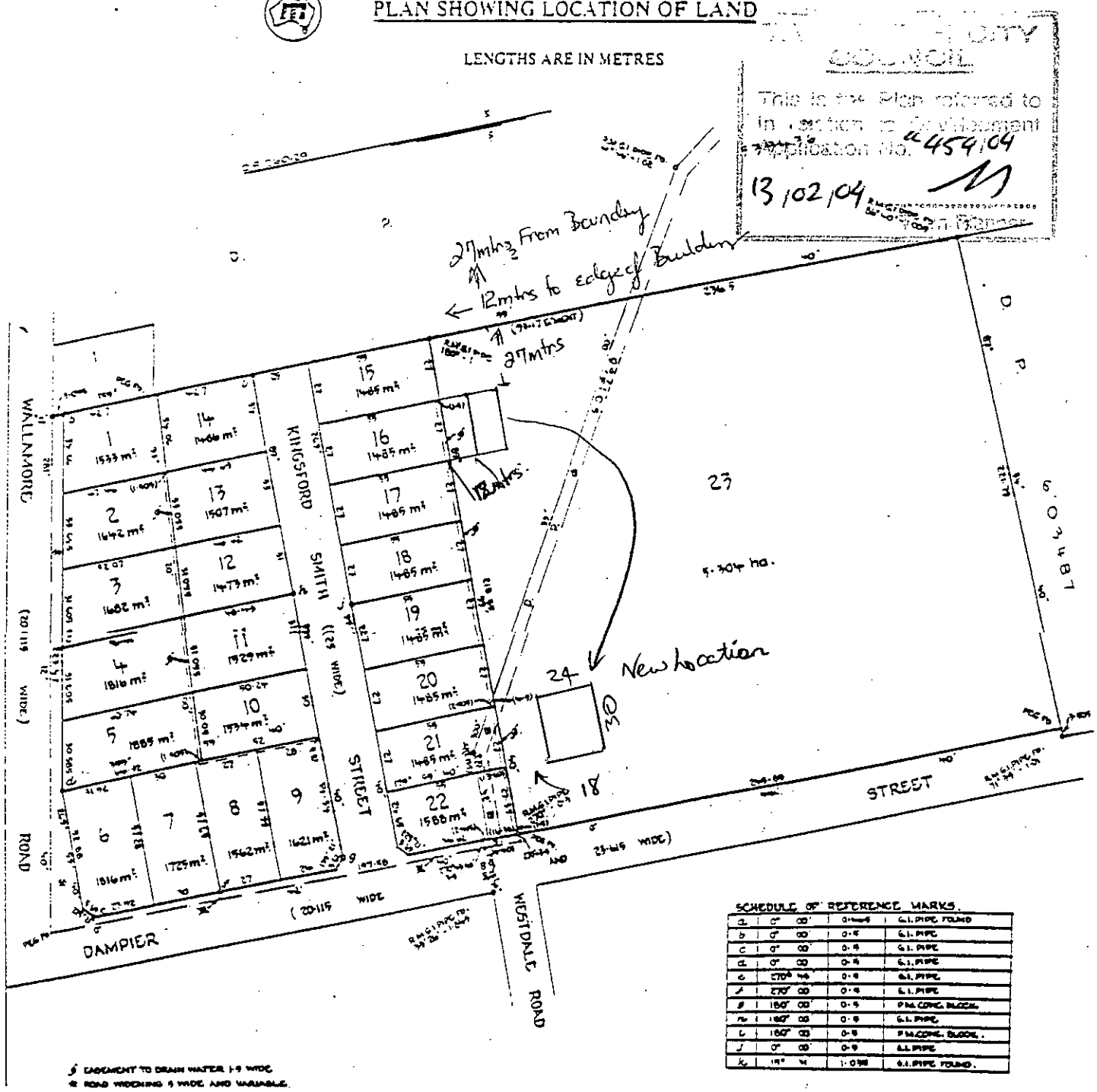
Prior Title Vol.14087 Fol. 61

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within descr
nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



g EASEMENT TO DRAIN WATER 1·9 WIDE
* ROAD WIDENING 9 WIDE AND VARIABLE
X ROAD WIDENING 3·6 WIDE
S EASEMENT TO DRAIN SEWAGE 6 WIDE (R. 261250).

ESTATE AND LAND REFERRED TO

Construction Certificate

FORM 11

issued under the Environmental Planning and Assessment Act 1979
Section 109c(1)(c) & 109H

ABN 93 752 522 800

Construction Certificate No. CC0454/2004
Development Consent No. DA 0530/2004
Officer Responsible: Stuart Stevens

FILE COPY

Applicant's Details

Name: Kidman Trust P/L
41 North Street
EAST TAMWORTH NSW 2340

FREP
DOC 8/9/2004
FOLIO
GIS

Reference: n/a

Property Identification

Legal Description Lot 23 DP 260129

Property Address Dampier Street TAMINDA NSW 2340

Classification & Description of Development

Description: Garage- hayshed

Class: 10a,

Determination

This application has been determined by granting approval on: 13 February 2004
This construction certificate will expire at the same time as the development consent relied on.

Attachments

- Schedule of essential fire safety measures (if applicable)
- Conditions required to be attached by the Regulations

Approved Plans and Specifications Relied on

- Plans and specifications by Barnson P/L

Certificate

The Tamworth City Council certifies that the work:, if completed in accordance with these plans and specifications, will comply with the requirements of s81A(5) of the *Environmental Planning & Assessment Act 1979.*

..... 13/2/04.

Stuart Stevens **Date**
Graduate Development & Building Officer

Note: Prior to commencement of any work, you must appoint a Principal Certifying Authority (PCA). The PCA may be either an Accredited Certifier or Council. The PCA will issue Compliance Certificates in respect of inspections, processes and products required by the Development Consent and if required, an Occupation Certificate (or interim Occupation Certificate). You must advise Council of the appointment of a PCA by submitting a FORM 7 application a minimum of 2 days before work commences.

"Authority to sign" 26/8/03

Tamworth City Council

437 PEEL STREET
TAMWORTH NSW 2340

TELEPHONE: (02) 67554555

P O BOX 555 TAMWORTH 2340
DX 6125 FAX (02) 67554464
Email envserv@tamworth.nsw.gov.au

ABN 93 752 522 800

In reply please quote:
DA0530/2004

If telephoning ask for:
Development Services

Please address all correspondence to the General Manager

09 February 2004

Kidman Trust P/L
41 North Street
EAST TAMWORTH NSW 2340

FILE COPY
PREP
DOC 7804/2004
FOLIO
PROP
C/R

Dear Sir/Madam

Environmental Planning and Assessment Act 1979
NOTICE TO APPLICANT OF DETERMINATION OF A DEVELOPMENT APPLICATION

Pursuant to Section 81(1)(a) of the Act, notice is hereby given of the determination by Council of the following development application.

Development Application No. DA0530/2004

Subject Land: Lot 23 DP 260129, Dampier Street TAMINDA NSW 2340

Building Classification: 10a

Description: Hayshed

In the determination of this application Council considered all matters listed under Section 79C of the Act. The development application has been determined by the **granting of consent subject to the conditions** listed below.

Prior to Work Commencing

1) Appropriate measures are to be implemented in relation to erosion and sediment control prior to work commencing. Such measures are to be maintained during the construction of the development.

2) A sign is to be erected in a prominent position on any work site on which work involved in the erection or demolition of a building is being carried out stating that unauthorised entry to the work site is prohibited and showing the name of the person in charge of the work site and a telephone number at which that person may be contacted outside working hours. The sign is to be removed when the work has been completed. This condition does not apply to building work carried on inside an existing building, or building work carried out on premises that are to be occupied continuously (both during and outside working hours) while the work is carried out.

3) Toilet facilities are to be provided, prior to the commencement of work, at or in the vicinity of the work site on which work involved in the erection or demolition of a building is being carried out. Facilities are to be provided at the rate of one toilet for every 20 persons or part of 20 persons employed at the site. Each toilet provided must be a standard flushing toilet, and must be connected to a public sewer. If connection to a public sewer is not practicable, then the toilet is to be connected to an accredited sewage management facility approved by the council. If connection to a public sewer or an accredited sewage management facility is not practicable, then connection to some other sewage management facility approved by the council is required.

General

4) All building work must be carried out in accordance with the provisions of the Building Code of Australia.

5) All proposed building, site works or property improvement indicated on the submitted plans or otherwise required under the terms of this consent shall be completed prior to occupation of the premises to ensure compliance with the provisions of the Environmental Planning and Assessment Act, 1979.

6) Work on the project shall be limited to the following hours to prevent unreasonable disturbance to the amenity of the area:- ***Monday to Friday - 7.00am to 5.00pm; Saturday - 8.00am to 1.00pm if audible on other residential premises, otherwise 7.00am to 5.00pm; No work to be carried out on Sunday or Public Holidays if it is audible on other residential premises.*** The builder shall be responsible to instruct and control his sub-contractors regarding the hours of work. Council will exercise its powers under the Protection of the Environment Operations Act, 1997, in the event that the building operations cause noise to emanate from the property on Sundays or Public Holidays or otherwise than between the hours detailed above.

Inspections

7) ***Inspection*** - When building works have reached the following stages an inspection is to be arranged by contacting Council's Customer Service Centre by phoning 67554 555 (or by Facsimile 6755 4499) by 4:00pm the day before the inspection is required.
Please advise Council if the work will not be ready at the appointed time. Failure to do so may incur an additional inspection fee of $50.

(i) Formwork for concrete slabs with reinforcement in position, prior to concrete being poured;
(ii) Final inspection of the development (prior to occupation, where applicable);

During Construction

8) The footpath and/or road reserve are not to be used for construction purposes or placing of building materials (without Council's prior consent) to ensure safe and unobstructed access for

pedestrians. Where necessary, application may be made by contacting Council's Development & Approvals Division.

9) Roofwaters are to be disposed of by piping to the street gutter to control the flow of roofwaters so as to prevent damage to the building's footings and to restrict the likelihood of stormwater nuisance to adjoining landholders.

The conditions have been imposed in accordance with the Environmental Planning and Assessment Act and Council's adopted policies.

This approval became effective on 09 February 2004 (Section 83 of the Act) and will lapse unless the proposed development is commenced within five (5) years of the approval date (Section 95 of the Act).

Under the provisions of Section 97 of the Act you may (within twelve [12] months of receipt of this notice) appeal to the Land and Environment Court against conditions imposed should you feel they are unreasonable.

All conditions imposed by Council shall be observed as non-compliance is an offence under the Act.

Please address any enquiries concerning this consent to Stuart Stevens of Council's Development & Approvals Division on (02) 6755 4537.

Yours faithfully

Stuart Stevens
Graduate Development & Building Officer

Determination issued in accordance with "Delegation of Functions" issued on: _____

REGIONAL COUNCIL
Tamworth

ABN: 52 631 074 450

More than just a city. More than just one place.

134581/2015

Boresch Project Services
PO Box 1561
TAMWORTH NSW 2340

FILE COPY

Dear Madam

Environmental Planning and Assessment Act 1979
NOTICE TO APPLICANT OF DETERMINATION OF A DEVELOPMENT APPLICATION

Pursuant to Section 81(1)(a) of the Act, notice is hereby given of the determination by Council of the following development application.

Development Application No.	DA0525/2015
Subject Land:	Lot 23 DP 260129, 55 Dampier Street, TAMINDA
Description:	Use of Part of the Land for the Storage of Shipping Containers and Demountable Buildings
Applicant's Reference:	2015-042

In the determination of this application Council considered all matters listed under Section 79C of the Act. The development application has been determined by the **granting of consent subject to the conditions** listed below.

General

1) The development must be carried out in accordance with the Development Application and accompanying plans, drawings and other documents as amended by conditions of this consent. Any amendment to the development or to these conditions will require the consent of the Council.

2) To confirm and clarify Council's terms of approval, this consent provides **only** for the storage of shipping containers and demountable buildings on the land. It does not allow for activities such as the:

   a) Retail sale of shipping containers, demountable buildings or other structures;
   b) Inspection of shipping containers or demountable buildings stored onsite by customers;
   c) Display of shipping containers or demountable buildings for sale;
   d) Manufacture of structures or products made from shipping containers or demountable buildings;
   e) Alterations to shipping containers or demountable buildings; and
   f) Washing of shipping containers or demountable buildings stored onsite.

3) The storage of shipping containers and a demountable building is restricted to the area of land defined as Lease Area 1 (2226m^2) and Lease Area 2 (900m^2) as illustrated on the stamped approved plans.

4) The access handle outlined with red pen on the stamped approved plans is not permitted to be used for the storage of shipping containers and/or demountable buildings.

5) No temporary or permanent structures are permitted to be constructed onsite including a site office, amenities, workshop or other associated building. In this regard, all enquiries shall be taken, and all sales made off- site.

6) To protect the integrity of the sewer main traversing the site, no shipping containers or demountable buildings shall be stored within:

   a) The 6 metre wide sewer easement; and

   b) A distance of less than 6 metres from the existing sewer manhole.

7) This consent provides for the installation of a one (1) business identification sign displayed on the fence. A business identification sign is defined by the Tamworth Regional Local Environmental Plan 2010 as follows:

   *"**building identification sign** means a sign that identifies or names a building and that may include the name of a building, the street name and number of a building, and a logo or other symbol but does not include general advertising of products, goods or services."*

8) Any external lighting must be designed to comply with Australian Standard AS4282 Control of Offensive Effects of Outdoor Lighting

Ongoing Requirements

9) Vehicles shall be loaded or unloaded standing wholly within the allotment to ensure that the proposed development does not give rise to street loading or unloading operations with consequent accident potential and reduction in road efficiency. Under no circumstances are vehicles to be loaded or unloaded at the kerb side, or across the public footpath.

10) All vehicular movement to and from the site shall be in a forward direction to ensure that the proposed development does not give rise to vehicle reversing movements on or off the Public Road with consequent traffic accident potential and reduction in road efficiency.

11) Dust control measures shall be in place to prevent dust from vehicles using the unsealed access affecting the amenity of the immediate area. The landowner is responsible for monitoring the dust and implementing controls as needed.

The conditions have been imposed in accordance with the Environmental Planning and Assessment Act and Council's adopted policies.

This approval became effective on Friday, 7 August 2015 (Section 83 of the Act) and will lapse unless the proposed development is commenced within five (5) years of the approval date (Section 95 of the Act).

Under the provisions of Section 97 of the Act you may (within six (6) months from the date of this development consent) appeal to the Land and Environment Court against conditions imposed should you feel they are unreasonable.

All conditions imposed by Council shall be observed as non-compliance is an offence under the Act.

Council is committed to a process of continual improvement. You are invited to arrange a post lodgement meeting with the Manager Development Approvals should you wish to discuss your experience with this development application. Alternately, you may send written correspondence to Council by post or email. Contact details are provided on the front page of this approval.

Yours faithfully

David Lewis
Manger, Development Approvals

Contact: Mitch Gillogly (02) 6767 5462 or m.gillogly@tamworth.nsw.gov.au

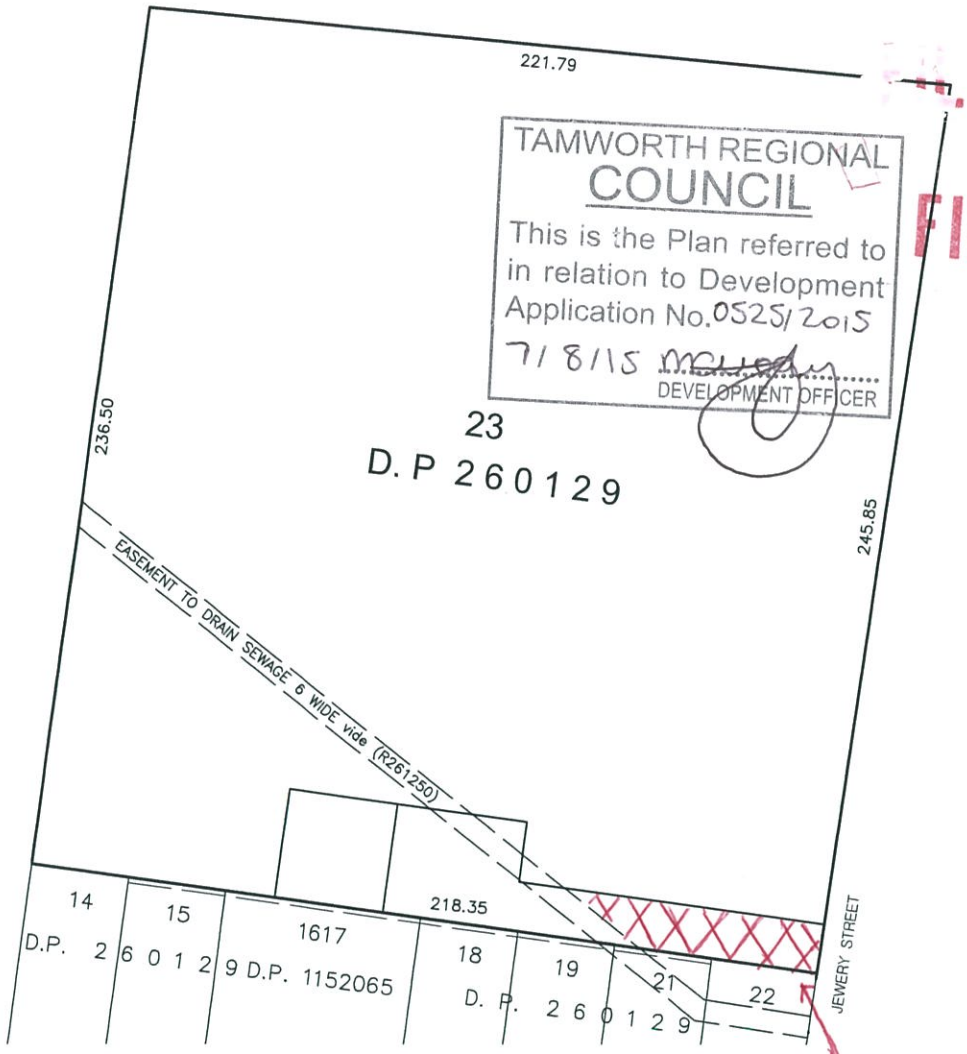
Reference: LW/mg/DA0525/2015

7 August 2015

PLAN FOR ANNEXURE TO LEASE

ANNEXURE "A"

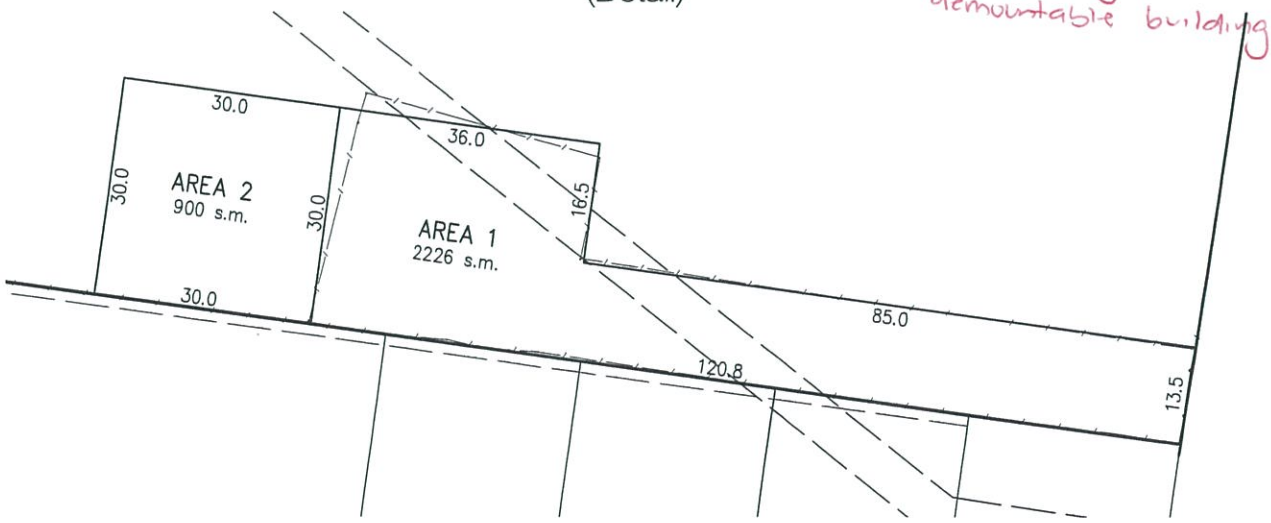
SITE PLAN



FILE COPY

Restriction on the placement of shipping containers & demountable buildings.

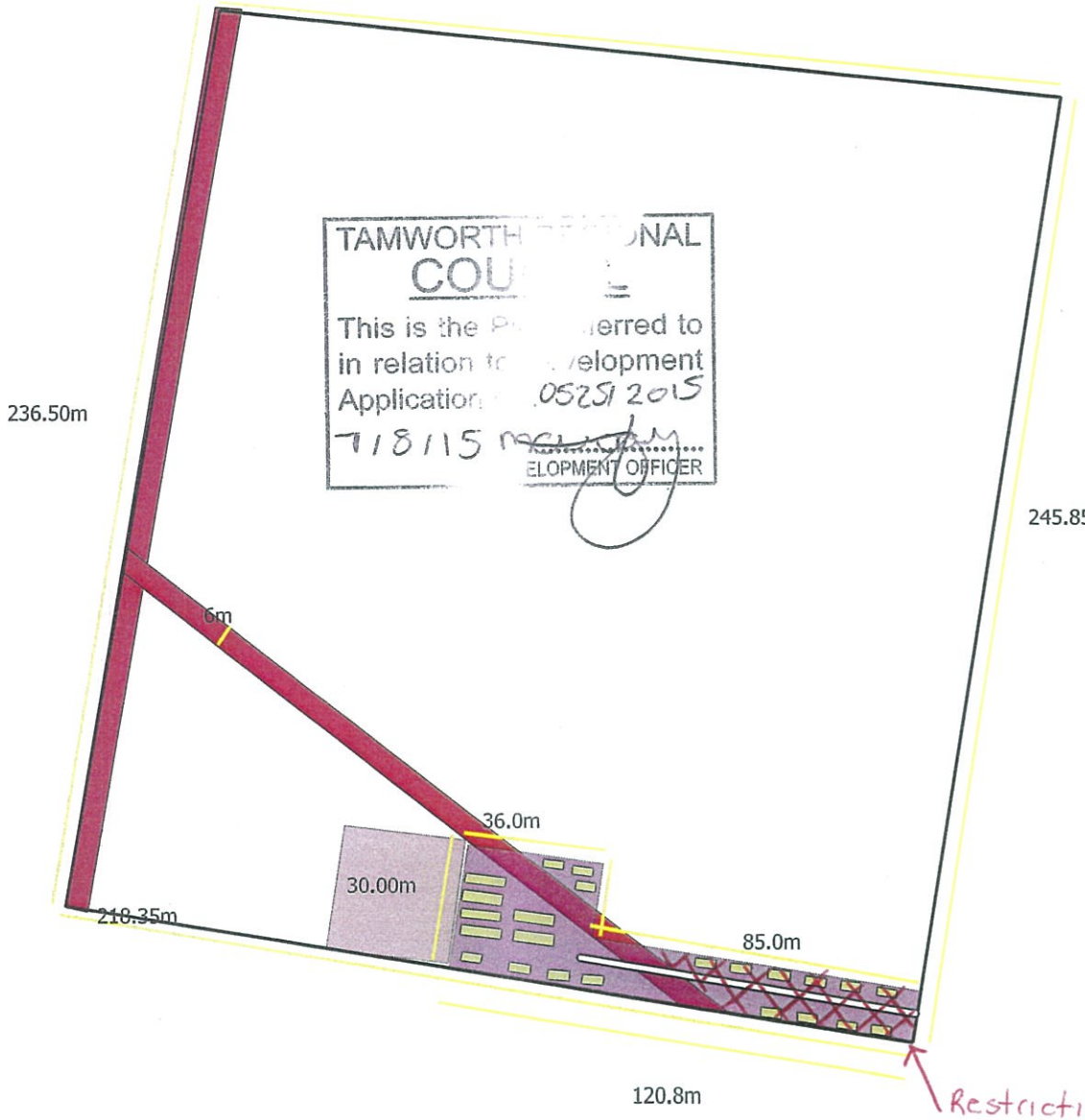
LEASE AREAS
(Detail)



Revised Site Plan

55 Dampier Street

Lot 23 DP 260129



Legend

- Access
- GeoSearch
- Boundary
- Shiping Containers/Demountables
- Dimensions
- Lease Area 1
- Easements
- Lease Area 2

Google Hybrid

N

0 50 100 m

Prepared By: Rebecca Boresch
Date: 05 August 2015
File Ref: 2015-042

boresch PROJECT SERVICES

APPENDIX E
SafeWork NSW Records

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D18/220123

9 November 2018

EI Australia
David Rizkalla
Suite 6.01
55 Miller St
Pyrmont NSW 2009

Dear Mr Rizkalla

RE SITE: 55 Dampier and 72 Wallamore Rd, Taminda NSW 2340

I refer to your site search request received by SafeWork NSW on 1 November 2018 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

APPENDIX F
Sanko (2019) Investigation Report



Sanko
Excavation Environmental & Civil Services P/L • Environmental and Geotechnical Engineering

Ph: 0407 434 604
A.B.N: 65 113 418 223 A.C.N. 113 418 223
Email: seecservices@hotmail.com

FIELD ASSESSMENT AND DATA COLLECTION FOR PRELIMINARY STAGE II ENVIRONMENTAL SITE ASSESSMENT

PROPOSED REZONING

55 DAMPIER ST AND 21 & 72 WALLAMORE RD TAMINDA, NSW

Lots 2 & 3 DP 1234850

19/09/2019



Sanko
Excavation Environmental & Civil Services P/L • Environmental and Geotechnical Engineering

Ph: 0407 434 604
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Email: seecservices@hotmail.com



19/09/2019

Document - E19 026_A_DampierStTaminda_FW_PS2.Rpt

**FIELD ASSESSMENT FOR PRELIMINARY
STAGE II ENVIRONMENTAL SITE ASSESSMENT
PROPOSED RE-ZONING**

**55 DAMPIER ST AND
21 & 72 WALLAMORE RD
TAMINDA, NSW
Lots 2 & 3 DP 1234850**

1 Introduction

This document presents the Field Assessment Findings and Data Summary for a Preliminary Stage II Environmental Site Assessment (S2ESA) at the above-mentioned site.

Refer to the Preliminary (Stage I) Environmental Site Assessment (S1ESA) completed by EI Australia for detailed site information and data that dictates the sampling numbers. It was proposed for Sanko to collect the Field Data and EI Australia to compile the final report in line with the S1ESA.

1.1 Field Observations

The following field observations were made on the day of sample collection:

- The northern portion of the site comprised vacant farmland that was being used for cattle agistment at the time of assessment;
- The south eastern portion of the site was covered by clean fill (as previously assessed) and was being used for storage purposes;
- The southern portion of the site contained some minor areas of imported fill;
- The south western portion of the site was being used for agricultural purposes and some storage of equipment such as cattle feeders and grain silos;

- Visual or olfactory evidence of hydrocarbons, hydrogen sulphide odours, ash, slag, fibrous cement material or anthropogenic material was NOT observed at the time of assessment.

1.2 Soil Sampling Methodology

Test pit locations were selected prior to commencement of excavation based on information obtained from the referenced S1ESA and stipulated by EI Australia. All test pit locations are shown on the attached Figure 1.

All test pits were excavated using a 1.2t excavator equipped with a toothed bucket to termination depths ranging from 1.0m to 1.8m.

Soil samples were taken from various depths in TP1 to TP12. The depth at which the soil samples were taken and tested was dictated by changes in soil characteristics and profiles and other such factors as odour and colour.

Collected samples were submitted for testing as per Table 1 below and the attached Chain of Custody.

All sampling was undertaken in accordance with all relevant Australian Standards, including *AS 1726 – 1993 – Geotechnical Site Investigations*, *NSW EPA Sample Design Guidelines* with reference to the CLM Act, NEPM (2013) Schedules and associated guidelines as detailed in the reference list. All laboratories used were NATA Certified.

1.3 QA/QC

New neoprene gloves were worn during sampling and replaced prior to collection of each sample directly from the excavator's bucket. All collected samples were placed in laboratory supplied glass with Teflon coated lids. Decontamination of sampling equipment was carried out with Decon 90 and clean water. Samples were then placed on ice and transported to a fridge at our premises prior to dispatch to the laboratory.

Field screening involved visual observation to determine if the material was imported uncontrolled fill or natural soil material.

A Chain of Custody form was prepared and accompanied samples to the laboratory. Laboratory QA/QC procedures are detailed in the attached laboratory testing results.

All Laboratory QA/QC documentation is supplied by the laboratory in Envirolabs Laboratory Test Results. Field Assessment QA/QC comprised the collection of 2X Duplicate Samples and 1X Field Wash Blank.

1.4 Sample Register

The following table, Table 1 detail the collected soil samples and the samples submitted to the laboratory for analysis.

TABLE 1 –SAMPLE REGISTER

Location	Depth (m b.g.l)	Material	Testing Requested
TP1	0.0	Topsoil	Presence of Asbestos
TP2	0.0	Topsoil	Presence of Asbestos
TP3	0.1	Topsoil	Presence of Asbestos
TP5	0.0	Topsoil	Presence of Asbestos
TP7	0.1	Topsoil	Presence of Asbestos
TP11	0.0	Topsoil	Presence of Asbestos
TP12	0.0	Topsoil	Presence of Asbestos
TP1	0.2	Topsoil	9 Combo Suite
TP1	1.2	Alluvium	9 Combo Suite
TP2 + DUP1	0.2	Fill	9 Combo Suite
TP2	0.9	Alluvium	9 Combo Suite
TP3	0.3	Topsoil	-
TP3	1.0	Alluvium	9 Combo Suite
TP4	0.3	Topsoil	9 Combo Suite
TP4	0.9	Alluvium	9 Combo Suite
TP5 + DUP2	0.3	Topsoil	9 Combo Suite
TP5	0.8	Alluvium	-
TP6	0.6	Topsoil	9 Combo Suite
TP6	1.5	Alluvium	9 Combo Suite
TP7	0.6	Topsoil	9 Combo Suite
TP7	1.3	Alluvium	-
TP8	0.2	Topsoil	9 Combo Suite
TP8	0.6	Alluvium	9 Combo Suite
TP8	1.0	Alluvium	-
TP9	0.1	Topsoil	9 Combo Suite
TP9	0.6	Alluvium	-
TP9	1.6	Alluvium	9 Combo Suite
TP10	0.1	Topsoil	-
TP10	0.4	Alluvium	9 Combo Suite
TP11	0.2	Topsoil	9 Combo Suite
TP11	0.7	Alluvium	9 Combo Suite
TP12	0.0	Topsoil	9 Combo Suite
TP12	0.7	Alluvium	-
TP12	1.2	Alluvium	9 Combo Suite
WASH BLANK	-	-	9 Combo Suite

9 Combo Suite Comprises the following analytical suite:

TRH / BTEX / PAH / OC/OP / PCB / HM8 / pH / CEC / Salinity

2 Summary of Soil Investigation Methodology

Activity/Item	Details
Fieldwork	The field work was conducted on **09 September 2019**. All test pits **(TP1 to TP12)** were completed to natural soil.
Drilling Method and Investigation Depth	Test pits were completed using a **1.2t excavator equipped with toothed bucked.** Final test pits depths ranged between **[1.0 to 1.8] m BGL.**
Soil Logging	Soils were classified in the field with respect to lithological characteristics and evaluated on a qualitative basis for odour and visual signs of contamination. Soil classifications and descriptions were based on the Unified Soil Classification System (USCS) and Australian Standard (AS) 4482.1-2005.
Field Observations (including visual and olfactory signs of potential contamination)	**The following olfactory evidence was NOT noted;** • **petroleum hydrocarbons** • **acid sulfate soils (hydrogen sulfide odour)** **The following visual evidence was NOT noted;** • **ash, slag or FCS; or** • **anthropogenic inclusions in soils**
Soil Sampling	Soil samples were collected by dry grab method (using unused, dedicated nitrile gloves) and placed into laboratory-supplied, acid-washed, solvent-rinsed glass jars; Blind / split field QC duplicates were separated from the primary samples and placed into glass jars; **7X Surface and Topsoil samples (up to 150g) was placed in a separate zip-lock bag for asbestos presence/absence analysis.** **1X Wash Blank Sample was collected**
Soil Vapour Screening	**PID Screening was NOT completed at the time of assessment due to the deemed low rick of hydrocarbon contamination**
Decontamination Procedures	Test Pit Equipment – The excavator bucket used was decontaminated between sampling locations until bucket was free of all residual material. Sampling Equipment – Nitrile gloves were dedicated to each sample (i.e. used gloves were discarded before collecting each new sample).
Sample Preservation	Samples were stored in a chilled chest (with frozen ice packs), whilst on-site and in transit to the laboratory. All samples were submitted and analysed within the required holding period.
Management of Soil Cuttings	**Soil excavation spoil used as backfill for completed test pits.**
Quality Control and Laboratory Analysis	The soil samples were submitted to **ENVIROLAB SYDNEY** for analysis of the previously-identified COPC. QA/QC testing comprised intra-laboratory ('blind field') duplicates tested by **ENVIROLAB** samples were transported under strict COC conditions

3 ASSUMPTIONS AND LIMITATIONS

It is the nature of contaminated site investigations that the degree of variability in site conditions cannot be known completely and no sampling and analysis program can eliminate all uncertainty concerning the condition of the site. Professional judgement must be exercised in the collection and interpretation of the data.

In preparing this assessment, current guidelines for assessment and management of contaminated land were followed. This work has been conducted in good faith in accordance with Sanko's understanding of the client's brief and general accepted practice for environmental consulting.

This assessment was prepared with the objective of providing guidance on the remediation and validation activities to be undertaken IF REQUIRED. No warranty, expressed or implied, is made as to the information and professional advice included in this report. Anyone using this document does so at their own risk and should satisfy themselves concerning the applicability of its application and where necessary should seek expert advice in relation to the particular situation.

If you have any further questions about this report, please contact the undersigned.

For and on behalf of
Sanko Excavation Environmental and Civil Services P/L



Damien Sankowsky *BE(Env)*
Principal Environmental Engineer
Australian Geomechanics Society (AGS) Member – EA ID 5879317

Attachments:

- *Report Limitations*
- *Site Photographs 1 – 8*
- *Figure 1 – Existing Site and Test pit Location Plan*
- *Log Explanation Sheets*
- *Engineering Test Pit Logs TP1 to TP12*
- *Chain of Custody Form*

References:

- *NEPC National Environmental Protection Measures NEPM (2013)*
- *Guidelines for Consultants Reporting on Contaminated Sites (OEH 2011)*
- *NSW EPA Sampling Design Guidelines (1995)*
- *NSW EPA Waste Classification Guideline, Part 1: Classifying Waste*
- *NSW EPA Guidelines for the NSW Site Auditor Scheme (2nd edition)*
- *Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A - The excavated natural material exemption 2012*
- *Guidelines for the Assessment and Management of Groundwater Contamination (DECC 2007)*
- *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (DECC 2009)*
- *Site Validation Reporting (DECCW 2010b)*
- *The Requirements of the Guidelines for the NSW Site Auditor Scheme (DEC 2006)*
- *AS4629;2004 "Method for the Qualitative Identification of Asbestos in Bulk Samples"*
- *EI Australia – Preliminary Site Assessment – E24043 E01-Rev2 dated 19 August 2019*
- *Envirolab Laboratory Testing Results – Report Number 226180*

Excavation Environmental & Civil Services P/L • Environmental and Geotechnical Engineering

REPORT LIMITATIONS

Sanko Excavation Environmental and Civil Service Pty Ltd have undertaken a site assessment in accordance with current industry and professional standards. The scope of works were limited to that as set out in the proposal as refered to in this investigation. This report is based upon limited site investigation and subsurface sampling and laboratory testing of samples as set out in the forementioned proposal. Report findings are based upon site conditions at the time of investigation and as such can not be relied upon for unqualified warranties or assume liablity for site conditions not observed and/or accessable during or at the time of investigation. The works are restricted to the site detailed in the report with no offsite investigations conducted. Despite all resaonable care and dilligance taken ground conditions encountered and contaminant concentrations may not represent conditions between sample locations. Site characteristics may also change subsequent to this investigation due to natural processes, chemical reactions, spilling or leaking of contaminants, change in water levels or dumping of fill. All observations and interpretation is made from a limited number of observation points assuming geological and chemical conditions are representative across the site. No other warranties are made or intended. Third parties should seek their own independent advice regarding report contents. This report has been prepared exclusively for the client as detailed on the report and remains the property of this company and the client and can not be reproduced without the written consent of the client as detailed on the report and can then only be reproduced in its entirety.



PHOTOGRAPH 1 – Excavator used for sample collection



PHOTOGRAPH 2 – Areas in southern portion of the site showing fill mounds

FIELD ASSESSMENT AND DATA COLLECTION

55 DAMPIER ST, TAMINDA **SEPT 2019**





PHOTOGRAPH 3 AND 4 – Material encountered in southern portion

FIELD ASSESSMENT AND DATA COLLECTION

55 DAMPIER ST, TAMINDA **SEPT 2019**





PHOTOGRAPH 5 AND 6 – Natural alluvial clays

FIELD ASSESSMENT AND DATA COLLECTION

55 DAMPIER ST, TAMINDA **SEPT 2019**



PHOTOGRAPH 7 – Typical natural soil profile



PHOTOGRAPH 8 – South eastern portion of the site with clean imported fill

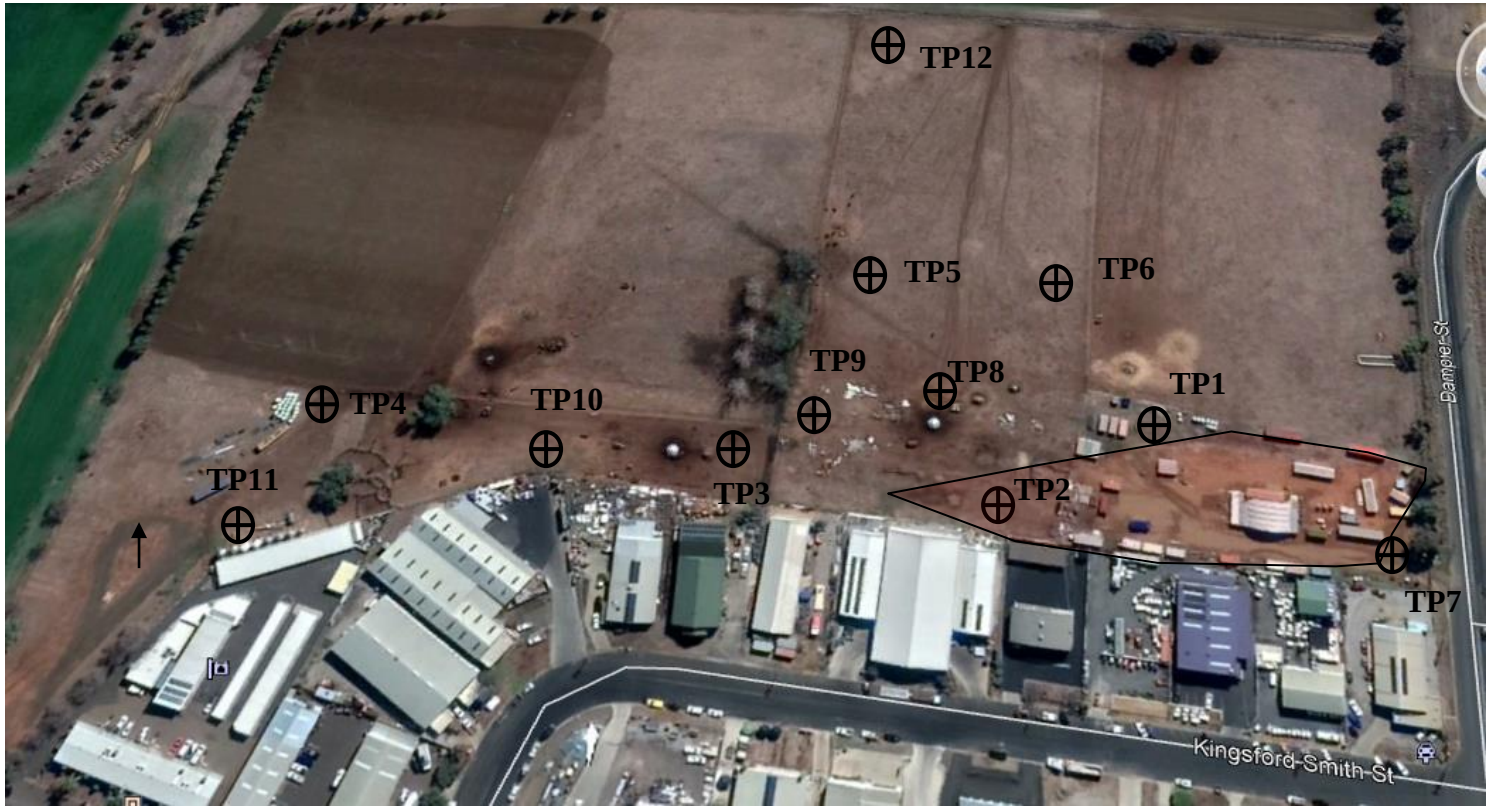


FIGURE 1 – TEST PIT LOCATION PLAN

Approx. Extent of Imported Fill

FIELD ASSESSMENT AND DATA COLLECTION

55 DAMPIER ST, TAMINDA **SEPT 2019** **N**

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 µm to 2.36 mm
	medium	200 µm to 600 µm
	fine	75 µm to 200 µm

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH s_u (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	–	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN

WEATHERED IN PLACE SOILS

Extremely weathered material	Structure and fabric of parent rock visible.
Residual soil	Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil	Deposited by wind.
Alluvial soil	Deposited by streams and rivers.
Colluvial soil	Deposited on slopes (transported downslope by gravity).
Fill	Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.
Lacustrine soil	Deposited by lakes.
Marine soil	Deposited in ocean basins, bays, beaches and estuaries.

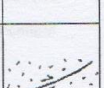
SOIL DESCRIPTION EXPLANATION SHEET 1/2

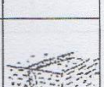
SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)						USC	PRIMARY NAME
COARSE GRAINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	(A 0.075 mm particle is about the smallest particle visible to the naked eye)	GRAVELS More than half of coarse fraction is larger than 2.0 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.		GW	GRAVEL
				Predominantly one size or a range of sizes with more intermediate sizes missing.		GP	GRAVEL
			GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below)		GM	SILTY GRAVEL
				Plastic fines (for identification procedures see CL below)		GC	CLAYEY GRAVEL
		SANDS More than half of coarse fraction is smaller than 2.0 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes missing		SW	SAND
				Predominantly one size or a range of sizes with some intermediate sizes missing.		SP	SAND
			SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).		SM	SILTY SAND
				Plastic fines (for identification procedures see CL below).		SC	CLAYEY SAND
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm			IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm.				
				DRY STRENGTH	DILATANCY	TOUGHNESS	
		SILTS & CLAYS Liquid limit less than 50		None to Low	Quick to slow	None	ML SILT
				Medium to High	None	Medium	CL CLAY
				Low to medium	Slow to very slow	Low	OL ORGANIC SILT
		SILTS & CLAYS Liquid limit greater than 50		Low to medium	Slow to very slow	Low to medium	MH SILT
				High	None	High	CH CLAY
				Medium to High	None	Low to medium	OH ORGANIC CLAY
HIGHLY ORGANIC SOILS			Readily identified by colour, odour, spongy feel and frequently by fibrous texture.			Pt	PEAT

• Low plasticity – Liquid Limit W_L less than 35%. • Modium plasticity – W_L between 35% and 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.	
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.	

TERM	DEFINITION	DIAGRAM
SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	
TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	
TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

72810 / 07-06

SOIL DESCRIPTION EXPLANATION SHEET 2/2

Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP1**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
			CL	**Silty CLAY:** low plasticity	<Wp	VSt	TOPSOIL
	0.1			dark grey, low plas fines			
			CH	**CLAY:** medium to high			ALLUVIUM
	0.2			plasticity, dark grey / brown,			
				trace of fine sand			
	0.3						
	0.4						
	0.5						
	0.6						
				CLAY: medium to high	>Wp	St	
	0.7			plasticity, orange / brown,			
	0.8						
	0.9						
	1.0						
	1.1						
	1.2						
	1.3						
				TERMINATED @ 1.3m			
	1.4						
	1.5						
	1.6						
	1.7						
	1.8						
	1.9						
	2.0						
	2.1						
	2.2						

Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP2**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
	0.1		SC	**Clayey SAND:** fine grained, pale yellow, low plasticity fines	D	VD	FILL
DUP 1	0.2						
	0.3						
	0.4		CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand	<Wp	VSt	ALLUVIUM
	0.5						
	0.6						
	0.7						
	0.8						
	0.9			**CLAY:** medium to high plasticity, orange / brown,	>Wp	St	
	1.0						
	1.1						
	1.2						
	1.3						
	1.4			TERMINATED @ 1.3m			
	1.5						
	1.6						
	1.7						
	1.8						
	1.9						
	2.0						
	2.1						
	2.2						

Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP3**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
	0.1		CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.8		CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	1.2			**CLAY:** medium to high plasticity, orange / brown,	>Wp	St	
	2.2			TERMINATED @ 1.2m			

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Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP4**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
	0.1		CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.3						
	0.4		CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.8						
	0.9			**CLAY:** medium to high plasticity, orange / brown,	>Wp	St	
	1.2						
	1.3			TERMINATED @ 1.2m			
	1.4						
	1.5						
	1.6						
	1.7						
	1.8						
	1.9						
	2.0						
	2.1						
	2.2						

Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP5**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
			CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.1						
	0.2						
DUP 2	0.3						
	0.4						
			CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.5						
	0.6						
	0.7						
				CLAY: medium to high plasticity, orange / brown,	>Wp	St	
	0.8						
	0.9						
	1.0						
				TERMINATED @ 1.0m			
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
	1.6						
	1.7						
	1.8						
	1.9						
	2.0						
	2.1						
	2.2						

Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP6**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
	0.1		CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.3						
	0.4		CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.6						
	0.7						
	0.8			**CLAY:** medium to high plasticity, orange / brown,	>Wp	St	
	1.0						
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
	1.6						
	1.7						
	1.8			TERMINATED @ 1.8m			
	1.9						
	2.0						
	2.1						
	2.2						

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Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP7**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
	0.1			Sandy GRAVEL; fine grained, orange, fine to med sand	D	VD	FILL
	0.2		CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.3						
	0.4		CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.5						
	0.6						
	0.7						
	0.8						
	0.9						
	1.0			**CLAY:** medium to high plasticity, orange / brown,	>Wp	St	
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
	1.6						
	1.7						
	1.8			TERMINATED @ 1.8m			
	1.9						
	2.0						
	2.1						
	2.2						

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Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP8**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
	0.1		CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.2						
	0.3						
	0.4						
	0.5		CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.6						
	0.7						
	0.8						
	0.9			**CLAY:** medium to high plasticity, orange / brown,	>Wp	St	
	1.0						
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
	1.6			TERMINATED @ 1.5m			
	1.7						
	1.8						
	1.9						
	2.0						
	2.1						
	2.2						

Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP9**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
			CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.1						
	0.2						
	0.3						
			CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.4						
	0.5						
	0.6						
	0.7						
	0.8						
	0.9						
	1.0						
				CLAY: medium to high plasticity, orange / brown,	>Wp	St	
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
	1.6						
	1.7						
	1.8						
				TERMINATED @ 1.8m			
	1.9						
	2.0						
	2.1						
	2.2						

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Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP10**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
			CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.1						
	0.2						
	0.3						
			CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.4						
	0.5						
	0.6						
	0.7						
	0.8						
	0.9						
				CLAY: medium to high plasticity, orange / brown,	>Wp	St	
	1.0						
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
	1.6						
	1.7						
	1.8						
				TERMINATED @ 1.8m			
	1.9						
	2.0						
	2.1						
	2.2						

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Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP11**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
			CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.1						
			CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.2						
	0.3						
	0.4						
	0.5						
	0.6						
	0.7						
	0.8						
	0.9						
	1.0						
				CLAY: medium to high plasticity, orange / brown,	>Wp	St	
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
				TERMINATED @ 1.5m			
	1.6						
	1.7						
	1.8						
	1.9						
	2.0						
	2.1						
	2.2						

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Location: 55 Dampier St and 21 & 72 Wallamore Rd TAMINDA Date: 9/09/2019 **TP12**

Method: Excavator Logger: DS

Samples	Depth	Graphic	Class	Material	Moisture	Cons/Dens	Obs
			CL	**Silty CLAY:** low plasticity dark grey, low plas fines	<Wp	VSt	TOPSOIL
	0.1						
	0.2						
			CH	**CLAY:** medium to high plasticity, dark grey / brown, trace of fine sand			ALLUVIUM
	0.3						
	0.4						
	0.5						
	0.6						
	0.7						
	0.8						
				CLAY: medium to high plasticity, orange / brown,	>Wp	St	
	0.9						
	1.0						
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
				TERMINATED @ 1.5m			
	1.6						
	1.7						
	1.8						
	1.9						
	2.0						
	2.1						
	2.2						

Sanko

Excavation Environmental & Civil Services P/L • Environmental and Geotechnical Engineering

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: Sanko Excavaton Environmental & Civil Services P/L	Client Project Name / Number / Site etc (ie report title): E19 026 - OAMPIEN ST TAMWORTH
Contact Person: Damien Sankowsky	PO No.:
Project Mgr:	Envirolab Quote No. : 17SY108C3
Sampler:	Date results required:
Address: 76 Wollombi Rd, Millfield	Or choose: standard / same day / 1 day / 2 day / (3 day)
0407 434 604	*Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: Mob:	Additional report format: esdat / equis /
Email: seecservices@hotmail.com	Lab Comments:

Sample Information

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample
1	TP1	0.2	10/9	SOIL JAR
2	TP1	1.2		
3	TP2	0.2		
4	TP2	0.9		
5	TP3	1.0		
6	TP4	0.3		
7	TP4	0.9		
8	TP5	0.3		
9	TP6	0.6		
10	TP6	1.5		
11	TP7	0.6		
12	TP8	0.2		
13	TP8	0.6		

Tests Required

COMBO 6	CEC, pH + SALINITY	Comments
/	/	Provide as much information about the sample as you can

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 226180

Date Received: 16/09/19
Time Received: 11:40
Received by: SB
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (Company): SANKO	Received by (Company): ES&Syd.
Print Name: DAMIEN SANKOWSKY	Print Name: S. Bolton
Date & Time: 10-9-19	Date & Time: 16/09/19 1140
Signature:	Signature:

Lab use only:
Samples Received: (Cool) or Ambient (circle one)
Temperature Received at: 21.0 (If applicable)
Transported by: Hand delivered / (courier)

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Client: Sanko Excavaton Environmental & Civil Services P/L	Client Project Name / Number / Site etc (ie report title): E19 026 - DAMPIER ST, MINMINDA
Contact Person: Damien Sankowsky	PO No.:
Project Mgr:	Envirolab Quote No.: 17SY108C3
Sampler:	Date results required:
Address: 76 Wollombi Rd, Millfield	Or choose: standard / same day / 1 day / 2 day / (3 day)
0407 434 604	*Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: Mob:	Additional report format: esdat / equis /
Email: seecservices@hotmail.com	Lab Comments:

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph: 03 9763 2500 / melbourne@envirolab.com.au

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Brisbane Office - Envirolab Services
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Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Tests Required: COMBO 6	EC, pH SALINITY	ASBESTOS ID	Comments
14	TP9	1.6	10.9	SOIL JAR	/	/		Provide as much information about the sample as you can
15	TP10	0.1			/	/		
16	TP11	0.2			/	/		
17	TP11	0.7			/	/		
18	TP12	0.0			/	/		
19	TP12	1.2			/	/		
20	DUP1				/	/		
21	DUP2				/	/		
22	WASHBLANK			WATER JAR	/			
23	TP1	0.0		SOIL BAG			/	
24	TP2	0.0					/	
25	TP3	0.1					/	
26	TP5	0.0					/	

Relinquished by (Company): SANKO	Received by (Company): GLS Syd
Print Name: DAMIEN SANKOWSKY	Print Name: S. Bolton
Date & Time: 10-9-19	Date & Time: 16/09/19 1140
Signature:	Signature:

Lab use only:
Samples Received: (Cool) or Ambient (circle one)
Temperature Received at: 21 °C (if applicable)
Transported by: Hand delivered / courier

226180

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
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Perth Lab - MPL Laboratories
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Ph: 08 9317 2505 / lab@mpl.com.au

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Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: Sanko Excavaton Environmental & Civil Services P/L	Client Project Name / Number / Site etc (ie report title): E9026 - DAMPIER ST, TAMINDA
Contact Person: Damien Sankowsky	PO No.:
Project Mgr:	Envirolab Quote No. : 17SY108C3
Sampler:	Date results required:
Address: 76 Wollombi Rd, Millfield	Or choose: standard / same day / 1 day / 2 day / (3 day)
0407 434 604	*Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: Mob:	Additional report format: esdat / equis /
Email: seecservices@hotmail.com	Lab Comments:

Sample Information					Tests Required	Comments
Envirolab Sample ID	Client Sample ID or Information	Depth	Date sampled	Type of sample	ASBESTOS ID	Provide as much information about the sample as you can
27	TP7	0.1	10-9	SOIL BAG	/	
28	TP11	0.0	↓	↓	/	
30029	TP12	0.0	↓	↓	/	
30	TP9	0.1		Soil Jar	extra sample rec'd.	

Relinquished by (Company): SANKO	Received by (Company): ES Syd.	*Lab use only:*
Print Name: DAMION SANKOWSKY	Print Name: S. Bolton	Samples Received: (Cool) or Ambient (circle one)
Date & Time: 10-9-19	Date & Time: 16/09/19 11:40	Temperature Received at: 21.0 (if applicable)
Signature:	Signature:	Transported by: Hand delivered / courier

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Sanko excavation Environmental & Civil Services
Attention	Damien Sankowsky

Sample Login Details

Your reference	E19 026 - Dampier St Taminda
Envirolab Reference	226180
Date Sample Received	16/09/2019
Date Instructions Received	19/09/2019
Date Results Expected to be Reported	23/09/2019

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	30 Soil
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	21.0
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

pH/Salinity - out of recommended holding time
water sample - Incorrect container

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	CEC	Texture and Salinity*	Asbestos ID - soils	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	OCP in water	OP Pesticides in water	PCBs in Water	Metals in Water - Dissolved
TP1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP1-1.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP2-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP2-0.9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP3-1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP4-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP4-0.9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP5-0.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP6-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP6-1.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP7-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP8-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP8-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP9-1.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP10-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP11-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP11-0.7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP12-0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
TP12-1.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
DUP1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
DUP2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								
WASHBLANK												✓	✓	✓	✓	✓	✓	✓
TP1-0											✓							
TP2-0											✓							
TP3-0.1											✓							
TP5-0											✓							
TP7-0.1											✓							
TP11-0											✓							
TP12-0											✓							
TP9-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 226180

Client Details

Client	Sanko excavation Environmental & Civil Services
Attention	Damien Sankowsky
Address	76 Wollombi Rd, Millfield, NSW, 2325

Sample Details

Your Reference	**E19 026 - Dampier St Taminda**
Number of Samples	30 Soil
Date samples received	16/09/2019
Date completed instructions received	19/09/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	23/09/2019
Date of Issue	23/09/2019

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Aida Marner
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Jaimie Loa-Kum-Cheung, Metals Supervisor
Josh Williams, Chemist
Lucy Zhu, Senior Asbestos Analyst
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	96	94	98	95	93

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	96	97	96	95	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	99	87	91	91	93

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	96	93	95	92	90

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date extracted	-	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<3	<3
Surrogate aaa-Trifluorotoluene	%	95	95

svTRH (C10-C40) in Soil						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	89	92	90	90	89

svTRH (C10-C40) in Soil						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	91	90	89	92	92

svTRH (C10-C40) in Soil						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	93	90	91	90	87

svTRH (C10-C40) in Soil						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	89	87	90	89

svTRH (C10-C40) in Soil			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date extracted	-	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	88	89

PAHs in Soil						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	97	97	99	102	98

PAHs in Soil						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	97	99	101	98	96

PAHs in Soil						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	100	97	100	98	96

PAHs in Soil						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	98	98	96	98	99

PAHs in Soil			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date extracted	-	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	99	98

Organochlorine Pesticides in soil						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	106	103	104	103

Organochlorine Pesticides in soil						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	105	104	103	105

Organochlorine Pesticides in soil						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	104	104	104	103

Organochlorine Pesticides in soil						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	102	104	103	102	104

Organochlorine Pesticides in soil			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date extracted	-	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	101	103

Organophosphorus Pesticides						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	106	103	104	103

Organophosphorus Pesticides						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	105	104	103	105

Organophosphorus Pesticides						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	104	104	104	103

Organophosphorus Pesticides						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	102	104	103	102	104

Organophosphorus Pesticides			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date extracted	-	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	101	103

PCBs in Soil						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	106	103	104	103

PCBs in Soil						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	103	105	104	103	105

PCBs in Soil						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	104	104	104	103

PCBs in Soil						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019	21/09/2019	21/09/2019	21/09/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	102	104	103	102	104

PCBs in Soil			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date extracted	-	20/09/2019	20/09/2019
Date analysed	-	21/09/2019	21/09/2019
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	101	103

Acid Extractable metals in soil						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	24	37	27	28
Copper	mg/kg	27	37	22	39	34
Lead	mg/kg	8	8	11	9	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	19	8	19	17
Zinc	mg/kg	40	32	33	35	29

Acid Extractable metals in soil						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	15	14	16	20
Copper	mg/kg	28	29	27	27	30
Lead	mg/kg	9	8	8	9	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	13	12	12	16
Zinc	mg/kg	40	44	42	46	25

Acid Extractable metals in soil						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	22	14	14	21	13
Copper	mg/kg	33	27	27	31	25
Lead	mg/kg	7	8	8	7	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	17	12	12	16	12
Zinc	mg/kg	28	41	42	26	39

Acid Extractable metals in soil						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	24	18	17	27	30
Copper	mg/kg	27	25	27	40	21
Lead	mg/kg	10	8	8	8	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	13	13	12	20	8
Zinc	mg/kg	35	28	40	34	29

Acid Extractable metals in soil			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date prepared	-	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	25	15
Copper	mg/kg	20	25
Lead	mg/kg	11	8
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	10	12
Zinc	mg/kg	28	46

Moisture						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	23/09/2019	23/09/2019	23/09/2019	23/09/2019	23/09/2019
Moisture	%	8.4	17	3.9	16	14

Moisture						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	23/09/2019	23/09/2019	23/09/2019	23/09/2019	23/09/2019
Moisture	%	9.2	9.8	8.1	13	14

Moisture						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	23/09/2019	23/09/2019	23/09/2019	23/09/2019	23/09/2019
Moisture	%	18	9.0	10	15	9.8

Moisture						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	23/09/2019	23/09/2019	23/09/2019	23/09/2019	23/09/2019
Moisture	%	12	9.9	16	17	4.8

Moisture			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date prepared	-	20/09/2019	20/09/2019
Date analysed	-	23/09/2019	23/09/2019
Moisture	%	12	11

Misc Inorg - Soil						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
pH 1:5 soil:water	pH Units	7.1	8.6	7.8	8.5	8.5

Misc Inorg - Soil						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
pH 1:5 soil:water	pH Units	7.7	8.0	7.4	7.5	8.4

Misc Inorg - Soil						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
pH 1:5 soil:water	pH Units	8.7	8.3	8.0	8.4	7.7

Misc Inorg - Soil						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
pH 1:5 soil:water	pH Units	7.7	7.3	7.5	8.8	7.9

Misc Inorg - Soil			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date prepared	-	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019
pH 1:5 soil:water	pH Units	8.1	7.6

CEC						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Exchangeable Ca	meq/100g	19	12	9.5	11	9.4
Exchangeable K	meq/100g	0.6	0.5	0.8	0.4	0.2
Exchangeable Mg	meq/100g	7.7	14	2.6	12	8.2
Exchangeable Na	meq/100g	0.37	3.0	0.13	2.2	1.4
Cation Exchange Capacity	meq/100g	28	29	13	26	19

CEC						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Exchangeable Ca	meq/100g	17	16	16	17	11
Exchangeable K	meq/100g	0.4	0.4	0.5	0.4	0.3
Exchangeable Mg	meq/100g	7.4	6.8	7.0	7.4	9.5
Exchangeable Na	meq/100g	1.1	0.92	0.33	0.25	1.7
Cation Exchange Capacity	meq/100g	26	24	24	25	22

CEC						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Exchangeable Ca	meq/100g	11	17	17	9.5	20
Exchangeable K	meq/100g	0.4	0.2	0.5	0.2	0.4
Exchangeable Mg	meq/100g	12	7.5	8.0	8.2	8.4
Exchangeable Na	meq/100g	2.8	1.3	1.2	1.4	0.58
Cation Exchange Capacity	meq/100g	26	26	27	19	30

CEC						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Exchangeable Ca	meq/100g	20	18	18	11	9.3
Exchangeable K	meq/100g	0.5	0.6	0.6	0.4	0.8
Exchangeable Mg	meq/100g	8.5	7.4	7.8	13	2.7
Exchangeable Na	meq/100g	1.3	0.39	0.23	2.9	0.15
Cation Exchange Capacity	meq/100g	30	26	26	27	13

CEC			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date prepared	-	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019
Exchangeable Ca	meq/100g	11	17
Exchangeable K	meq/100g	0.3	0.6
Exchangeable Mg	meq/100g	5.0	6.7
Exchangeable Na	meq/100g	0.38	0.28
Cation Exchange Capacity	meq/100g	16	24

Texture and Salinity*						
Our Reference		226180-1	226180-2	226180-3	226180-4	226180-5
Your Reference	UNITS	TP1	TP1	TP2	TP2	TP3
Depth		0.2	1.2	0.2	0.9	1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Electrical Conductivity 1:5 soil:water	µS/cm	80	110	130	98	56
Texture Value	-	7.0	8.0	7.0	8.0	8.0
Texture		MEDIUM CLAY	LIGHT MEDIUM CLAY	MEDIUM CLAY	LIGHT MEDIUM CLAY	LIGHT MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class		NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		226180-6	226180-7	226180-8	226180-9	226180-10
Your Reference	UNITS	TP4	TP4	TP5	TP6	TP6
Depth		0.3	0.9	0.3	0.6	1.5
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Electrical Conductivity 1:5 soil:water	µS/cm	66	60	48	39	58
Texture Value	-	9.0	9.0	7.0	7.0	8.0
Texture		CLAY LOAM	CLAY LOAM	MEDIUM CLAY	MEDIUM CLAY	LIGHT MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class		NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		226180-11	226180-12	226180-13	226180-14	226180-15
Your Reference	UNITS	TP7	TP8	TP8	TP9	TP10
Depth		0.6	0.2	0.6	1.6	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Electrical Conductivity 1:5 soil:water	µS/cm	110	45	63	56	61
Texture Value	-	8.0	9.0	9.0	8.0	7.0
Texture		LIGHT MEDIUM CLAY	CLAY LOAM	CLAY LOAM	LIGHT MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class		NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		226180-16	226180-17	226180-18	226180-19	226180-20
Your Reference	UNITS	TP11	TP11	TP12	TP12	DUP1
Depth		0.2	0.7	0	1.2	-
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Electrical Conductivity 1:5 soil:water	µS/cm	92	55	44	120	170
Texture Value	-	9.0	7.0	8.0	8.0	7.0
Texture		CLAY LOAM	MEDIUM CLAY	LIGHT MEDIUM CLAY	LIGHT MEDIUM CLAY	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	<2	<2
Class		NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*			
Our Reference		226180-21	226180-30
Your Reference	UNITS	DUP2	TP9
Depth		-	0.1
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date prepared	-	20/09/2019	20/09/2019
Date analysed	-	20/09/2019	20/09/2019
Electrical Conductivity 1:5 soil:water	µS/cm	58	78
Texture Value	-	9.0	7.0
Texture		CLAY LOAM	MEDIUM CLAY
ECe	dS/m	<2	<2
Class		NON SALINE	NON SALINE

Asbestos ID - soils						
Our Reference		226180-23	226180-24	226180-25	226180-26	226180-27
Your Reference	UNITS	TP1	TP2	TP3	TP5	TP7
Depth		0	0	0.1	0	0.1
Date Sampled		10/09/2019	10/09/2019	10/09/2019	10/09/2019	10/09/2019
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/09/2019	20/09/2019	20/09/2019	20/09/2019	20/09/2019
Sample mass tested	g	Approx. 50g	Approx. 45g	Approx. 50g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils			
Our Reference		226180-28	226180-29
Your Reference	UNITS	TP11	TP12
Depth		0	0
Date Sampled		10/09/2019	10/09/2019
Type of sample		Soil	Soil
Date analysed	-	20/09/2019	20/09/2019
Sample mass tested	g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected

vTRH(C6-C10)/BTEXN in Water		
Our Reference		226180-22
Your Reference	UNITS	WASHBLANK
Depth		-
Date Sampled		10/09/2019
Type of sample		Soil
Date extracted	-	20/09/2019
Date analysed	-	22/09/2019
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	100
Surrogate toluene-d8	%	97
Surrogate 4-BFB	%	85

svTRH (C10-C40) in Water		
Our Reference		226180-22
Your Reference	UNITS	WASHBLANK
Depth		-
Date Sampled		10/09/2019
Type of sample		Soil
Date extracted	-	18/09/2019
Date analysed	-	19/09/2019
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	77

PAHs in Water		
Our Reference		226180-22
Your Reference	UNITS	WASHBLANK
Depth		-
Date Sampled		10/09/2019
Type of sample		Soil
Date extracted	-	18/09/2019
Date analysed	-	19/09/2019
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	90

OCP in water		
Our Reference		226180-22
Your Reference	UNITS	WASHBLANK
Depth		-
Date Sampled		10/09/2019
Type of sample		Soil
Date extracted	-	18/09/2019
Date analysed	-	18/09/2019
HCB	µg/L	<0.2
alpha-BHC	µg/L	<0.2
gamma-BHC	µg/L	<0.2
beta-BHC	µg/L	<0.2
Heptachlor	µg/L	<0.2
delta-BHC	µg/L	<0.2
Aldrin	µg/L	<0.2
Heptachlor Epoxide	µg/L	<0.2
gamma-Chlordane	µg/L	<0.2
alpha-Chlordane	µg/L	<0.2
Endosulfan I	µg/L	<0.2
pp-DDE	µg/L	<0.2
Dieldrin	µg/L	<0.2
Endrin	µg/L	<0.2
pp-DDD	µg/L	<0.2
Endosulfan II	µg/L	<0.2
pp-DDT	µg/L	<0.2
Endrin Aldehyde	µg/L	<0.2
Endosulfan Sulphate	µg/L	<0.2
Methoxychlor	µg/L	<0.2
Surrogate TCMX	%	99

OP Pesticides in water		
Our Reference		226180-22
Your Reference	UNITS	WASHBLANK
Depth		-
Date Sampled		10/09/2019
Type of sample		Soil
Date extracted	-	18/09/2019
Date analysed	-	18/09/2019
Azinphos-methyl (Guthion)	µg/L	<0.2
Bromophos ethyl	µg/L	<0.2
Chlorpyriphos	µg/L	<0.2
Chlorpyriphos-methyl	µg/L	<0.2
Diazinon	µg/L	<0.2
Dichlorvos	µg/L	<0.2
Dimethoate	µg/L	<0.2
Ethion	µg/L	<0.2
Fenitrothion	µg/L	<0.2
Malathion	µg/L	<0.2
Parathion	µg/L	<0.2
Ronnel	µg/L	<0.2
Surrogate TCMX	%	99

PCBs in Water		
Our Reference		226180-22
Your Reference	UNITS	WASHBLANK
Depth		-
Date Sampled		10/09/2019
Type of sample		Soil
Date extracted	-	18/09/2019
Date analysed	-	18/09/2019
Aroclor 1016	µg/L	<2
Aroclor 1221	µg/L	<2
Aroclor 1232	µg/L	<2
Aroclor 1242	µg/L	<2
Aroclor 1248	µg/L	<2
Aroclor 1254	µg/L	<2
Aroclor 1260	µg/L	<2
Surrogate TCMX	%	99

Metals in Water - Dissolved		
Our Reference		226180-22
Your Reference	UNITS	WASHBLANK
Depth		-
Date Sampled		10/09/2019
Type of sample		Soil
Date digested	-	20/09/2019
Date analysed	-	20/09/2019
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
INORG-123	Determined using a "Texture by Feel" method.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	226180-2
Date extracted	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			21/09/2019	1	21/09/2019	21/09/2019		21/09/2019	21/09/2019
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	102	92
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	102	92
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	115	103
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	101	91
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	99	90
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	97	88
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	98	88
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	99	1	96	97	1	103	94

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	226180-21
Date extracted	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			[NT]	11	21/09/2019	21/09/2019		21/09/2019	21/09/2019
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	11	<25	<25	0	99	94
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	11	<25	<25	0	99	94
Benzene	mg/kg	0.2	Org-016	[NT]	11	<0.2	<0.2	0	112	106
Toluene	mg/kg	0.5	Org-016	[NT]	11	<0.5	<0.5	0	98	94
Ethylbenzene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	95	91
m+p-xylene	mg/kg	2	Org-016	[NT]	11	<2	<2	0	94	89
o-Xylene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	95	90
naphthalene	mg/kg	1	Org-014	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	11	99	101	2	100	93

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	20	21/09/2019	21/09/2019		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	20	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	20	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	20	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	20	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	20	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	20	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	20	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	20	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	20	90	94	4	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	226180-2
Date extracted	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			21/09/2019	1	21/09/2019	21/09/2019		21/09/2019	21/09/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	108	115
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	112	115
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	130	126
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	108	115
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	112	115
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	130	126
Surrogate o-Terphenyl	%		Org-003	89	1	89	91	2	106	92

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	226180-21
Date extracted	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			[NT]	11	21/09/2019	21/09/2019		21/09/2019	21/09/2019
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	11	<50	<50	0	109	111
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	114	109
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	123	112
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	11	<50	<50	0	109	111
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	114	109
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	11	<100	<100	0	123	112
Surrogate o-Terphenyl	%		Org-003	[NT]	11	93	91	2	109	88

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	20	21/09/2019	21/09/2019		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	20	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	20	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	20	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	20	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	20	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	20	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	20	89	88	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	226180-2
Date extracted	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	118	126
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	108	110
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	108	112
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	106	110
Pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	110	112
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	112	120
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	<0.05	<0.05	0	112	118
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	96	1	97	99	2	100	101

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	226180-21
Date extracted	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Naphthalene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	124	122
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	116	108
Phenanthrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	110	110
Anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	110	108
Pyrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	112	110
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	118	120
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	11	<0.05	<0.05	0	116	116
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	11	100	102	2	103	100

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	20	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	20	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	20	99	99	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	226180-2
Date extracted	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			21/09/2019	1	21/09/2019	21/09/2019		21/09/2019	21/09/2019
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	104	110
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	102	107
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	98	104
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	106	111
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	107	111
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	105	112
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	124	129
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	94	93
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	99	102
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	108	102
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	103	1	104	105	1	99	102

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	226180-21
Date extracted	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			[NT]	11	21/09/2019	21/09/2019		21/09/2019	21/09/2019
HCB	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	103	105
gamma-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	101	101
Heptachlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	97	98
delta-BHC	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	105	106
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	107	107
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	105	105
Dieldrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	124	123
Endrin	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	93	95
pp-DDD	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	99	97
Endosulfan II	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	97	97
Methoxychlor	mg/kg	0.1	Org-005	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	11	105	104	1	98	98

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	20	21/09/2019	21/09/2019		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	20	104	102	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	226180-2
Date extracted	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			21/09/2019	1	21/09/2019	21/09/2019		21/09/2019	21/09/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	107	101
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	91	101
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	94	87
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	116	97
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	78	108
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	71	75
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	102	100
Surrogate TCMX	%		Org-008	103	1	104	105	1	99	102

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	226180-21
Date extracted	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			[NT]	11	21/09/2019	21/09/2019		21/09/2019	21/09/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	108	101
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	120	101
Dimethoate	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	92	95
Fenitrothion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	110	101
Malathion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	118	122
Parathion	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	70	78
Ronnel	mg/kg	0.1	Org-008	[NT]	11	<0.1	<0.1	0	104	96
Surrogate TCMX	%		Org-008	[NT]	11	105	104	1	98	98

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	20	21/09/2019	21/09/2019		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	20	104	102	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	226180-2
Date extracted	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			21/09/2019	1	21/09/2019	21/09/2019		21/09/2019	21/09/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	98	103
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	103	1	104	105	1	99	102

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	226180-21
Date extracted	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			[NT]	11	21/09/2019	21/09/2019		21/09/2019	21/09/2019
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	103	99
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	[NT]	11	105	104	1	98	98

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	20	21/09/2019	21/09/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-006	[NT]	20	104	102	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	226180-2
Date prepared	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	111	#
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	108	83
Chromium	mg/kg	1	Metals-020	<1	1	14	15	7	115	89
Copper	mg/kg	1	Metals-020	<1	1	27	29	7	108	97
Lead	mg/kg	1	Metals-020	<1	1	8	9	12	113	82
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	103	94
Nickel	mg/kg	1	Metals-020	<1	1	12	12	0	106	84
Zinc	mg/kg	1	Metals-020	<1	1	40	45	12	113	91

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	226180-21
Date prepared	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Date analysed	-			[NT]	11	20/09/2019	20/09/2019		20/09/2019	20/09/2019
Arsenic	mg/kg	4	Metals-020	[NT]	11	<4	<4	0	114	71
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	108	82
Chromium	mg/kg	1	Metals-020	[NT]	11	22	24	9	123	90
Copper	mg/kg	1	Metals-020	[NT]	11	33	37	11	111	100
Lead	mg/kg	1	Metals-020	[NT]	11	7	7	0	118	78
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	95	87
Nickel	mg/kg	1	Metals-020	[NT]	11	17	19	11	108	86
Zinc	mg/kg	1	Metals-020	[NT]	11	28	32	13	112	99

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	20	20/09/2019	20/09/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	20	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	20	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	20	30	32	6	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	20	21	20	5	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	20	10	9	11	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	20	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	20	8	8	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	20	29	29	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	[NT]
Date analysed	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	7.1	7.1	0	102	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	12	20/09/2019	20/09/2019		20/09/2019	[NT]
Date analysed	-			[NT]	12	20/09/2019	20/09/2019		20/09/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	12	8.3	8.2	1	102	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	18	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	18	20/09/2019	20/09/2019		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	18	7.5	7.6	1	[NT]	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	[NT]
Date analysed	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	1	19	20	5	93	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	1	0.6	0.6	0	95	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	1	7.7	7.9	3	92	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	1	0.37	0.40	8	113	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	12	20/09/2019	20/09/2019		20/09/2019	[NT]
Date analysed	-			[NT]	12	20/09/2019	20/09/2019		20/09/2019	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	[NT]	12	17	16	6	92	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	[NT]	12	0.2	0.2	0	95	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	[NT]	12	7.5	7.2	4	91	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	[NT]	12	1.3	1.3	0	109	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	21	20/09/2019	20/09/2019		[NT]	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	[NT]	21	11	11	0	[NT]	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	[NT]	21	0.3	0.4	29	[NT]	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	[NT]	21	5.0	5.2	4	[NT]	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	[NT]	21	0.38	0.46	19	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	[NT]
Date analysed	-			20/09/2019	1	20/09/2019	20/09/2019		20/09/2019	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	80	79	1	105	[NT]
Texture Value	-		INORG-123	[NT]	1	7.0	7.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	12	20/09/2019	20/09/2019		20/09/2019	[NT]
Date analysed	-			[NT]	12	20/09/2019	20/09/2019		20/09/2019	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	12	45	46	2	104	[NT]
Texture Value	-		INORG-123	[NT]	12	9.0	9.0	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	18	20/09/2019	20/09/2019		[NT]	[NT]
Date analysed	-			[NT]	18	20/09/2019	20/09/2019		[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	18	44	45	2	[NT]	[NT]
Texture Value	-		INORG-123	[NT]	18	8.0	8.0	0	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			20/09/2019	[NT]	[NT]	[NT]	[NT]	20/09/2019	[NT]
Date analysed	-			21/09/2019	[NT]	[NT]	[NT]	[NT]	21/09/2019	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	127	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	127	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	130	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	128	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	128	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	130	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	104	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate toluene-d8	%		Org-016	99	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-016	95	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			18/09/2019	[NT]	[NT]	[NT]	[NT]	18/09/2019	[NT]
Date analysed	-			19/09/2019	[NT]	[NT]	[NT]	[NT]	19/09/2019	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	73	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	73	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
Surrogate o-Terphenyl	%		Org-003	80	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			20/09/2019	[NT]	[NT]	[NT]	[NT]	20/09/2019	[NT]
Date analysed	-			20/09/2019	[NT]	[NT]	[NT]	[NT]	20/09/2019	[NT]
Naphthalene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Acenaphthylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Phenanthrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Benzo(a)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-012	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	89	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: OCP in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			18/09/2019	[NT]	[NT]	[NT]	[NT]	18/09/2019	[NT]
Date analysed	-			18/09/2019	[NT]	[NT]	[NT]	[NT]	18/09/2019	[NT]
HCB	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	98	[NT]
gamma-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	104	[NT]
Heptachlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]
delta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	102	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	106	[NT]
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	113	[NT]
Dieldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	118	[NT]
Endrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	111	[NT]
pp-DDD	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endosulfan II	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	118	[NT]
Methoxychlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	97	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: OP Pesticides in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			18/09/2019	[NT]	[NT]	[NT]	[NT]	18/09/2019	[NT]
Date analysed	-			18/09/2019	[NT]	[NT]	[NT]	[NT]	18/09/2019	[NT]
Azinphos-methyl (Guthion)	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos ethyl	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	123	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorvos	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	99	[NT]
Dimethoate	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	128	[NT]
Fenitrothion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	116	[NT]
Malathion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Parathion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Ronnel	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	113	[NT]
Surrogate TCMX	%		Org-008	97	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			18/09/2019	[NT]	[NT]	[NT]	[NT]	18/09/2019	[NT]
Date analysed	-			18/09/2019	[NT]	[NT]	[NT]	[NT]	18/09/2019	[NT]
Aroclor 1016	µg/L	2	Org-006	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-006	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-006	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-006	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-006	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-006	<2	[NT]	[NT]	[NT]	[NT]	102	[NT]
Aroclor 1260	µg/L	2	Org-006	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-006	98	[NT]	[NT]	[NT]	[NT]	113	[NT]

QUALITY CONTROL: Metals in Water - Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			20/09/2019	[NT]	[NT]	[NT]	[NT]	20/09/2019	[NT]
Date analysed	-			20/09/2019	[NT]	[NT]	[NT]	[NT]	20/09/2019	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	94	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	96	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Report Comments

pH/Salinity - out of recommended holding time
water sample - Incorrect container

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.
Note: there is a possibility some elements may be underestimated.

8 metals in soil - #Low spike recovery was obtained for this sample. Sample matrix interference is suspected. However, an acceptable recovery was obtained for the LCS

9.10 Sewer Servicing Report

KELLEY COVEY
GROUP PTY LTD
Consulting Engineers



DETAILED SEWER SERVICING STRATEGY

FOR

PROPOSED COMMERCIAL/INDUSTRIAL DEVELOPMENT

AT

LOTS 2 & 3 IN DP1234850, 55 DAMPIER STREET, TAMINDA NSW

FOR

ELTON CONSULTING PTY LTD

PROJECT NO: T196893

REPORT NO: 52749RPT ISSUE D JULY 2020

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Appendix B – Preliminary Servicing Strategy Design Plans

Appendix C – Preliminary Pump Station Design Calculations

Annexure D – Site Fill Levels Calculations

1. Introduction

This Sewer Servicing Strategy Report has been prepared by Kelley Covey Group for Elton Consulting Pty Ltd to accompany a planning proposal and future development application for the rezoning of Lots 2 & 3 in DP1234850, part 55 Dampier Street, Taminda. It is proposed to re-zone the site to a mix of IN1 – General Industrial and B5 – Business Development zones to facilitate development of a commercial/industrial business park at the site. The site is currently zoned RU4 – Primary Production Small Lots as per the *Tamworth Regional Local Environment Plan, 2010 (TRLEP).*

This report has been prepared in response to a Tamworth Regional Council resolution (Resolution 373/19, TRC Ordinary Council Meeting, 22 October 2019) that requires and acceptable sewer servicing strategy be prepared prior to public exhibition of the gateway determination, a critical stage in the planning proposal approval process.

The purpose of this report is to provide a detailed and robust feasibility determination for providing sewer servicing to the site and proposed development. This report demonstrates that a feasible and practical sewer strategy for the site is available, with the final details of the strategy determined at DA and CC stage when detailed design can be undertaken.

This report has been prepared in accordance with *Schedule 1 of the Environmental Planning and Assessment Regulation, 2000*, the *Tamworth Regional Development Control Plan, 2010 (TRDCP)* and the *Tamworth Regional Engineering Minimum Standards for Subdivisions and Developments*. Within this report, references to "the site" means Lot 2 & 3 in DP1234850 to which this servicing strategy relates, "the parcel" refers to the Consolidated Chan Abbey Holdings Pty Ltd Lands (described herein) and "Council" refers to Tamworth Regional Council.

2. Description of the Property

2.1. Site Details

- Property Description: Lot 2 & 3 in DP 1234850
  Locality of Taminda
  Parish of Murroon
  County of Parry
- Property Address: 55 Dampier Street, Taminda NSW.
- Registered Owner: Chan Abbey Holdings
- Applicant: Elton Consulting Pty Ltd
- Local Authority: Tamworth Regional Council
- Total Site Area: 11.34ha
- Zoning: RU4 – Primary Production Small Lots, Minimum Lot Size: 40ha;

2.2. Property Description

The subject property is located on the north-eastern fringe of the Taminda industrial area, approximately 3km west of the Tamworth city centre. The site consists of two lots; Lot 2 on the western side has road frontage to Wallamore Road, whilst Lot 3 on the eastern side has frontage to Dampier Street. The lots are bisected adjacent to their northern boundary by a 40m road reserve for future road construction. The lots are part of a larger parcel of land, known as the Consolidated Chan Abbey Holdings Lands Pty Ltd (the parcel), that also includes Lot 1 in DP 1234850 and Lot 60 in DP1227482, also known as Somerset Farm. For the purpose of this servicing strategy, only Lots 2 & 3 are to be considered, with a total developable area of 8.98ha.

Along the southern boundary of the site are existing small lot light-industrial developments, to the east is the Tamworth Lawn Cemetery (with expansion currently under construction), and to the north and west of the site the land is used for agriculture, in particular irrigated feed crops and some stock grazing.

The site is located within the Wallamore Anabranch flood plain of the Peel River system, and is within the Flood Planning Area as defined in the TRLEP. The site is considered reasonably flat, with a slight grade north towards the Peel River. The natural topography ranges from RL372 to RL373.

The site is virtually undeveloped, with a history of mixed use farming including crop production and stock grazing. In the south-east corner of the site, an area of approximately 6,500m^2 is currently being used for the storage of miscellaneous items including shipping containers, small transportable buildings and temporary ablutions blocks.

An existing 6m wide easement for the drainage of sewer traverses the site diagonally from the south eastern corner to the north-western corner. The easement contains a 900mm diameter trunk sewer main that conveys flows from a large catchment including South Tamworth, West Tamworth and Taminda and eventually discharges to the Westdale Wastewater Treatment Plant located approximately 2.7km to the west.

There is also a 5m easement to drain water the traverses the site north to south along the eastern boundary of Lot 2. A 450mm diameter RCP discharges via a headwall to a channel formed within the easement. A 150mm diameter sewer line is also constructed within this easement, and discharges into the 900mm trunk main.

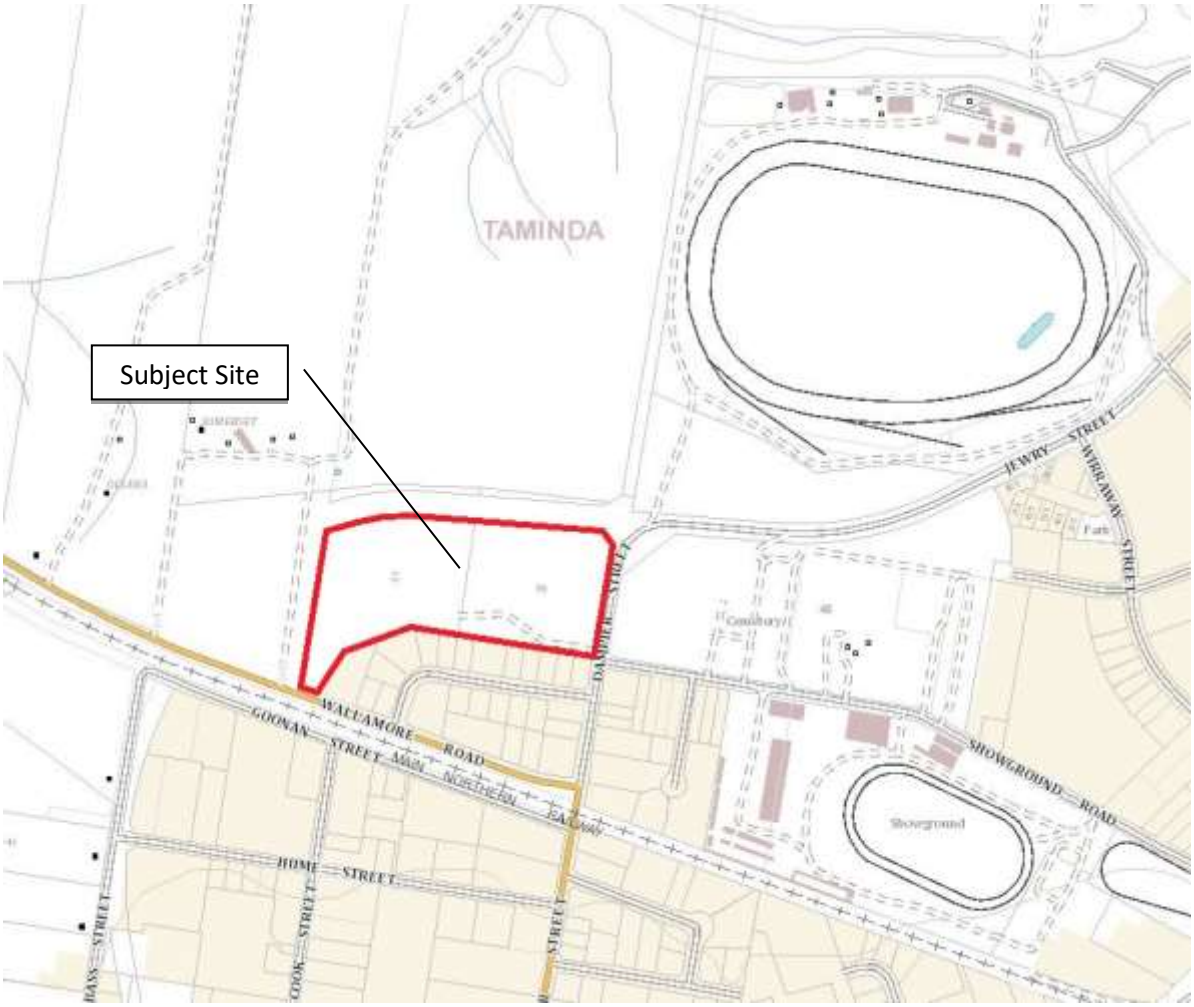


Plate 1. Site Location Plan (*Source: SIX Maps, retrieved 12 August 2019*)



Plate 2. Aerial Photo of Site (*Source: NearMaps, retrieved 12 August 2019*)

3. Existing Services and Utilities

The site benefits from a water service connection from the existing DN100 DICL main located on the northern side of the Wallamore Road reserve. There is sewer infrastructure available to provide connection to the site but it is believed that the site is not currently connected to sewer.

The site drains as sheet flow north to the Peel River, and the 450mm diameter RCP and headwall located in the drainage easement at the southern boundary of the site discharges runoff from the upstream developed area to the south of the site in Kingsford Smith Street. A stormwater pipe also discharges at the south-eastern boundary of the site in Dampier Street to existing open channels located within the road reserve. There is minimal stormwater drainage infrastructure in Wallamore Road, and flows from the road reserve discharge through roughly formed open swales to a natural watercourse and causeway west of the site, which forms part of the Timbumburi Creek floodplain.

There is overhead electrical power in both Wallamore Road and Dampier Street as well as underground telecommunications and natural gas connections. The site is within the NBN-ready area of Tamworth.

4. Proposed Development

It is proposed to re-zone part of the site from RU4 – Primary Production Small Lots to a mix of IN1 – General Industrial and B5 – Business Development, with the long term objective to develop part of the site as a mixed use commercial/industrial business park consisting of up to 41 Business Development sites and 14 General Industrial sites, as well as internal roads, car parking and landscaped areas. The potential site layout consists of a main road intersecting with Dampier Street, with other minor roads branching off this connection. Connectivity to the proposed Jewry Street ring road connection will not be provided, as per advice received from Tamworth Regional Council.

The industrial sites will generally occupy the southern half of the site, with the business development sites to occupy the remaining northern half of the site approximately east of the existing sewer easement. The final layout for the proposed development is still to be finalised, and the mixture of business types that may occupy the site is presently at a very preliminary stage, however the following areas are considered a reasonable estimation of the proposed land use for the site (as taken from the TRLEP permitted uses for land use tables);

- B5 – Business Development; 1.55ha Gross Floor Area (GFA). Potential business types could include, but not to be limited to, the following;

  Centre-based child care facilities; Garden centres; Hardware and building supplies; Landscaping material supplies; Light industries; Liquid fuel depots; Oyster aquaculture; Passenger transport facilities; Respite day care centres; Self-storage units; Shop top housing; Specialised retail premises; Tank-based aquaculture; Warehouse or distribution centres;

- IN1 – General Industrial; 3.55ha Gross Floor Area (GFA). Potential business types could include, but not to be limited to, the following;

  *Depots; Freight transport facilities; Garden centres; General industries (**general industry** means a building or place (other than a heavy industry or light industry) that is used to carry out an industrial activity); Hardware and building supplies; Industrial training facilities; Landscaping material supplies; Light industries; Liquid fuel depots; Neighbourhood shops; Oyster aquaculture; Places of public worship; Plant nurseries; Rural supplies; Shop top housing; Take away food and drink premises; Tank-based aquaculture; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres;*

Despite the flexibility in land uses permissible under the TRLEP, our understanding is that the development is to include low-impact, low scale commercial and light industrial/storage businesses.

The legal framework defining the development and individual sites (ie. Torrens Title lots, Strata Title or Community Title) is yet to be determined and will be decided following rezoning and consultation between the owners, potential purchasers and Council as part of future development applications for the site. For the purposes of this strategy, the legal framework of the development is not considered critical.

5. Site Servicing

Strategies for stormwater drainage, electrical and telecommunications utilities, road and pedestrian access and traffic management have been prepared separately and are not included in this report. Each of the utilities will comply with the design requirements of Council's *Engineering Guidelines for Subdivisions and Developments* (the Guidelines) and *the Tamworth Regional Development Control Plan, 2010 (DCP).*

6. Background and Previous Investigations/Strategies

Previous site investigations have explored a range of potential sewer servicing options for the site, which is complicated by the following;

1. The site is located within the Peel River Floodplain, and local topography and existing infrastructure locations and depths prevent the adoption of a traditional gravity sewer system to discharge to the existing network.
2. An existing 900mm sewer trunk main that traverses the site has capacity issues during wet weather and is unable to receive any additional flows during storm events;
3. The existing 900mm trunk main is relatively shallow, and is unable to service the footprint of the proposed development with current topography and site levels;
4. The composition of occupancy and tenancy of the development is unknown, as is any potential staging and the ultimate development layout.

7. Stakeholder Liaison

Extensive consultation with Tamworth Regional Council has been undertaken, including formal and informal meetings, e-mail and telephone correspondence, and submission/review of potential servicing solutions. The following is a brief summary of the outcome of that liaison;

- The upgrade of the existing Plain Street Pump Station, which will alleviate the capacity issues in the existing 900mm trunk main, is being planned and designed, however a completion date has not been set and could be up to four (4) years away;
- The upgrade will consist of a duplicated pump station and rising main to be activated during wet weather to provide additional capacity during storm events.
- This type of upgrade will potentially benefit the development site, as capacity constraints are only relevant during wet weather;
- A conventional pump station providing the long-term servicing solution for the site will not be permitted.
- The only sewer servicing solution deemed acceptable to Council is for the site to be designed to ultimately allow for gravity feed to the existing 900mm trunk main, with a short-term pumping station and timed-discharge system to the existing sewer main provided until the Plain Street Pump Station upgrade is complete and the wet weather capacity constraint is removed.
- This solution will require the inclusion of detention storage to receive and store site generated flows for a period of up to **72 hours** during a rainfall event until flow capacity is restored and the stored flows can be pumped to the existing network.
- The provision of odour control measures, well washers and potentially carbon filters to prevent septicity will be required in the pump station design due to the extended detention times;
- Staging of detention storages aligned to development staging will be permissible. That is, multiple detention storage tanks connected in series will be permissible and can be incorporated into a future design if required, rather than a single, large detention storage unit.
- The pump station system will not be required to integrate with Council's SCADA (telemetry-based) data control system, however some provision should be made to provide Council with performance and alarm status information through standard monitoring systems installed at the time of commissioning.
- A conservative approach for the calculation of EP's (Equivalent Populations) to determine the required design flows and detention storage volumes should be taken in the absence of specific development use information.
- To assist with design calculations, Council will install Multitrobe flow meters on the existing 900mm sewer main to determine existing flow conditions in both dry and wet weather.
- Council will not take ownership or operational control of a proposed pump station system, and as such any pump station infrastructure is to be managed and maintained by future private entities.
- A preliminary design for the extension of Jewry Street to Wallamore Road was provided informally, and is currently being designed as part of the Tamworth Global Gateway Park and Intermodal Hub projects. The formation of the road extension will be similar in height and geometry to that of the Taminda Levee, consisting of a four-lane road constructed on top of a flood mitigation levee. Preliminary design levels indicate that the top of the kerb level of the road is generally equal to the 100 year ARI flood event.

8. Consideration of Alternative Solutions

The servicing option Council have deemed acceptable is a conventional gravity fed system discharging to the existing sewer main in the long-term, whilst in the short-term discharging to a pump station with additional delayed detention storage capacity, which is to be operational until the Plain Street Pump Station upgrade is complete and the wet weather capacity constraint is removed.

Several alternative servicing solutions have been developed and proposed to Council, however they will not be described in any detail as part of this report.

9. Evaluation of Design Components for Gravity Fed Strategy

9.1. Site Filling

The discharge point(s) for any proposed network is the existing DN900mm line that traverses the site, and specifically any one of three existing manholes located on that line that are located within the site boundaries. To achieve a gravity fed system, the site will need to be filled to provide sufficient depth of cover to allow a pipe network to grade from any location on the site to one of the three existing manholes.

The proposed gravity network would need to comply with minimum design criteria as described below (as per TRC Minimum Standards);

- Connection to the existing 900mm sewer main is to be obvert-obvert plus 50mm as per WSA and TRC Guidelines. That is, the obvert of the proposed sewer main (likely DN150) is to be 50mm higher than the obvert of the receiving DN900 main);
- DN150 pipework was considered for the internal network;
- Minimum grades as per TRC Design Minimum Standards, Part 5, Table D (estimated from site layout and between 1.0 – 1.25%);
- Minimum Cover to the invert of sewer in roadways to be 750mm;
- Soffit Requirement as per the NSW Code of Practice for House Drains is observed;
- Manhole placement and fall through manholes to comply with TRC Minimum Standards;

Irrespective of the sewer strategy adopted, the site is required to be filled to a minimum height equal to the Flood Planning Level (Q100 year flood plus 0.5m) to satisfy flood protection requirements.

Crossing the existing DN900 pipe will potentially be difficult due to the size of the pipe and the low depth of existing cover to the natural surface, and so the servicing strategy will need to minimise the number of crossing required.

A calculation of the expected amount of site filling required to allow for a gravity fed (ultimate) servicing solution has been completed using the following procedure;

1. A grid of twenty (20) nodes was placed across the site, representing potential locations to be serviced by a gravity sewer. The location of each of the nodes was chosen to evaluate the potential for discharge to either of the three existing manholes, whilst providing varying distances and geometric constraints (such as proximity to the existing DN900 main and potential crossing constraints);
2. A concept network alignment, based on using parallel/perpendicular road corridors as alignment pathways rather than straight-line distances from the receiving manholes, was developed to connect each node to the three receiving manholes, and the length of each alignment was calculated;
3. The required depth of fill was calculated using a conservative 1.25% grade (the maximum grade required for a sewer line as per TRC Minimum Standards), and allowing for the following;
    a. An invert – obvert-plus-50mm relationship from the incoming sewer line to the existing DN900;

   b. An additional 100mm clearance between the incoming sewer and the obvert of the DN900 was added to allow for connection details and tolerances;
   c. A minimum 900mm cover from the invert of the sewer line at the upstream node to the filled surface level;
4. The alignment to the receiving manhole that required the least amount of fill was adopted as the preferred connection point for each node;
5. Batters of 1 in 5 (V:H) were adopted to transition from the natural surface around the boundary of the site to the filled surface level. The toe of the fill batter is generally equal to the site boundary;
6. The alignment and height of the proposed Jewry Street extension was added to the filled surface to enable examination of the interface of the road surface and the filled site. Design information for the road was provided by Tamworth Regional Council (Ref: SK1098-001) and is included in Appendix A;

A schematic diagram detailing the above design criteria is shown in Figure 1 below, and a plan showing the indicative fill levels required to service the site is included in Appendix B;

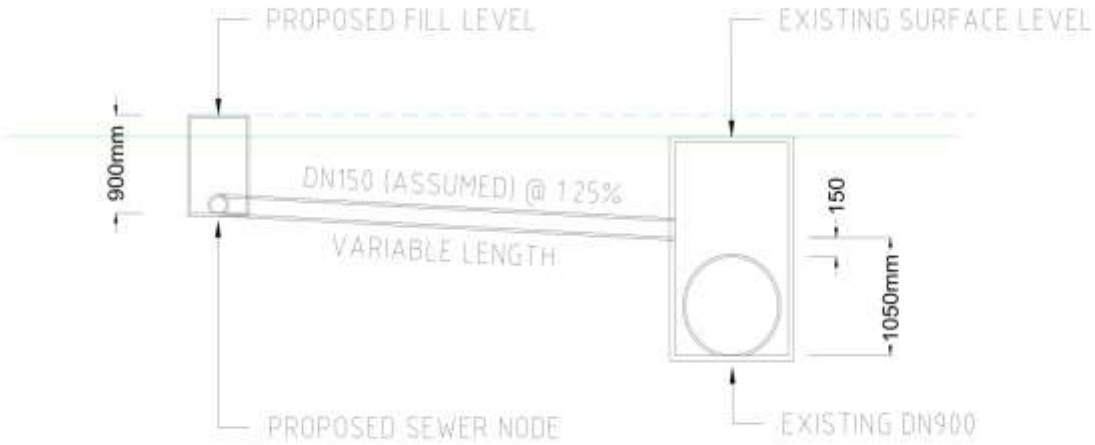


Figure 1 – Gravity Sewer Node Depth Calculation Schematic

9.2. Sewer Pump Station

Preliminary calculation of design inputs for a sewer pump station to service the fully developed site have been prepared in accordance with WSA-04-2005 Sewer Pumping Code of Australia, and using design flows estimated from the land-use described in Section 4 and Appendix B of WSA-02 2014 – Gravity Sewer Code.

A conservative methodology for estimating Equivalent Population has been taken by adopting values from WSA-02 Table A1 for "*General Commercial*" and "*Future Industrial*" land use types, and using the lot areas provided in the site layout masterplan.

Detailed design information is included in Appendix C, and a brief summary is included below;

EP:	649
ADWF:	1.36 litres/second
PDWF:	5.8 litres/second
GWI:	0.156 litres/second
IIF:	5.69 litres/second
Design Flow:	**11.6 litres/second**
Emergency Storage Required:	**19.63m^3 (4 hours ADWF flow)**

9.3. Short-term Pump Station and Off-Line Storage

In the short-term, and until the Plain Street Pump Station upgrade is complete, the gravity network will need to discharge to a sewer pump station coupled with a timed-discharge off-line storage system. In the context of the adoption of a gravity fed network being adopted as the long term strategy, the following was considered in terms of the pump station system;

- The advantages and disadvantages of a single pump station versus multiple pump stations (one at each receiving manhole) were considered, and it was determined that (provided connectivity was possible) a single pump station arrangement should be adopted;
- Potential locations for the temporary pump station and off-line storage tanks were investigated and an ideal location was determined to be on the northern side of the existing DN900, approximately 10m offset from the central existing manhole (MH-2). This location has the advantage of being centrally located between the three receiving manholes – thereby minimising the grades required for connection pipelines, and it is located sufficient distance away from the existing DN900 so as not to pose a risk to that pipe during excavation and construction.
- The pump station will discharge to the existing DN900 at the manhole centrally located on the site;

To provide for the short-term connection between the proposed gravity network and the temporary pump station/off-line storage, the following methodology was adopted;

- New receiving manholes are to be constructed adjacent to each of the three existing receiving manholes, one each on the northern and southern side of the existing DN900;
- The gravity network is to be designed to discharge to these manholes, rather than the existing manholes;
- In the short-term, these manholes will discharge to temporary sewer lines, one each on the northern and southern side and parallel to the existing DN900, that will direct flows to the temporary pump station;
- A line crossing beneath the existing DN900 approximately adjacent to the existing central receiving manhole will connect the temporary sewer lines from the southern side of the DN900 to the pump station on the northern side;
- The depth of the pump station will be determined by the invert levels of these temporary sewer lines;
- Upon completion of the Plain Street Pump Station upgrade, the temporary sewer lines and pump station/off-line storages will be de-commissioned, and the discharges from the new receiving manholes will be re-directed to the existing adjacent manholes, thereby completing the gravity fed network;

A schematic detail showing the proposed short and long-term connection details is shown in Figure 2 below;

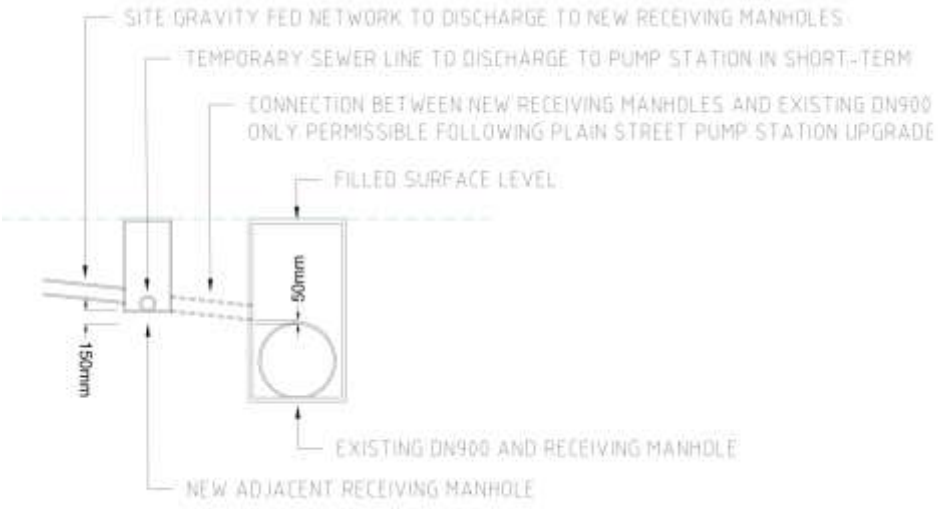


Figure 2 – Gravity Sewer Node Depth Calculation Schematic

In addition to the emergency storage requirements of WSA-04 (which allow for pump or power failure), flows into the pump station system are required to be detained during periods of wet weather and their discharge into the existing gravity network delayed until sufficient capacity is restored in the downstream main. Council have indicated that the detention storage component of the system should be designed *"To accept flows from the fully developed site and store them for up to 72 hours prior to discharge to the existing gravity sewer network".*

An estimate of required detention volumes for various timeframes has been prepared as follows, based on an extension of the Design Flow that accounts for wet weather effects;

12 hours, fully developed site:	500,000 litres
24 hours, fully developed site:	1,000,000 litres
48 hours, fully developed site:	2,000,000 litres
72 hours, fully developed site:	3,000,000 litres

The storage of flows for up to 72 hours is very conservative and not a common design criteria, and prior to the formal adoption of a specific detention time, the behaviour of flows and available capacity in the existing receiving sewer main during periods of both dry weather and rainfall events should be determined. The placement of flow meters on the existing sewer and modelling of the contributing catchment will allow appropriate detention time to be nominated. *It is noted that at the meeting of 5 February 2020 Council indicated that flow meters would be placed on the existing sewer main to commence this process, but no data was available at the time of writing.*

The detention storage system should be designed to be scalable and flexible; comprising multiple, modular style tanks connected in series that are sized to match the storage requirements for each development stage, rather than a single large tank.

Storage of sewerage for periods of time exceeding a few hours can lead to septicity and the production of hydrogen sulphide gas, and therefore the inclusion of pre-treatment and/or odour control elements including carbon filtration and ozone treatment should be considered in the design of the detention storage system (as well as the pump station itself). Similarly, the system should include well washers to reduce the impact of extended storage times on the longevity of infrastructure elements and to reduce the likelihood of bacteria growth and hydrogen sulphide H_2S production.

Regarding odour control and pre-treatment, Council have advised the following;

> *"Following wet weather events it would be realistic to assume the tail out flows within the trunk main would still be high, and the amount able to be discharged from the proposed pump station relatively small in comparison. In terms of dosing for TRC this may not be required (however this would ultimately relate to proposed detention*

times). Nonetheless adequate odour control would be a requirement at the proposed pumping station."

Therefore, any pump station and detention storage design should include odour and septicity control measures, but not chemical dosing unless conventional and less expensive measures are not considered appropriate at the time of design or commissioning.

9.4. Vehicular Access

Fill batters of 1:5 (H:V) were adopted to transition from the existing natural surface at the site boundary to the required fill level. The width of these batters varies with the different fill requirements around the perimeter. As these batters are too steep to allow compliant vehicular access (as per AS2890.1), further investigation of potential site access is required.

It is assumed that the site will be accessed in two locations; along the eastern boundary off Dampier Street, and along the southern boundary to Wallamore Road. A compliant access ramp (as per AS2890.1) was designed and placed at each of these locations to demonstrate that practical site access is possible. Each of the ramps is required to extend into the filled footprint on the site, however this is not considered a significant issue. A plan of the proposed access ramps is included in the plans in Appendix B.

9.5. Stormwater Drainage

Council have previously advised (as per Jewry Street preliminary design plans (Ref: SK1098-001) that the preferred location for stormwater drainage is to follow the existing drainage line that runs north-south approximately midway through the site, and to run beneath the extended Jewry Street roadway and then east to the existing fully along the western side of the Tamworth Racecourse.

The filled site levels for sewer servicing provide a suitable landform to enable this to be achieved – the site slopes towards the centre from high points in the south-west and north-east corners towards a low point along the northern boundary mid-block – almost exactly in the location of the proposed stormwater drainage line identified by Council. Achieving 1% grade along roadways and kerblines is considered achievable and will approximately replicate the 1.25% sewer grades.

In that regard, a satisfactory stormwater drainage strategy is considered easily achievable and further detailed stormwater drainage analysis is not considered necessary at this time.

9.6. Summary of Design Elements

A plan detailing the proposed servicing methodology is included in Appendix B. In summary;

- The most disadvantaged locations on the site are the north-east and south-west corners that are the furthest from the DN900 sewer main;
- Filling the site to enable 100% servicing will require approximately 155,000 cubic metres of fill and depths up to 3.5m at the most disadvantaged locations;
- Filling the site increases the minimum cover over the existing DN900 pipe;
- A concept design for crossing the existing DN900 to connect the southern side of the site to the pump station has been included and is considered to be safe and practical.
- The strategy has a degree of flexibility built-in; the required fill levels are not fixed or constrained, and therefore can be adjusted to suit the adopted site and road layout.
- The foremost constraint is the cost of the earthworks to achieve the required fill levels;

The locations, adopted alignments and required fill levels at each node is included in the plans in Appendix B. Detailed calculations used in the determination of fill levels are included in the tables in Appendix D. *It should be noted that these are concept alignments and levels only, and are intended to demonstrate that serviceability is possible. Detailed design of the sewer network and required fill levels should be completed during the detailed design stage once a site layout has been confirmed.*

10. Capital and Operating/Maintenance Costs

Without detailed design data, including the pump station geometry and pump details, the detention storage system and odour/septicity control information, it is not possible to determine accurate life cycle costs.

However, using the preliminary design information determined in this report, and based on benchmarking capital and operating costs published in the *NSW Water and Sewerage Benchmarking Report* (NSW DPI), the *NSW Reference Rates Manual – Valuation of Water Supply, Sewerage and Stormwater Assets* (NSW DPI, Office of Water) and reference rates from projects we have previously been involved with, we estimate the initial capital cost of the construction of the gravity network for the full developed site as well as the temporary sewer pump station and any odour/septicity control measures will be in the order of $500,000. We estimate the cost of the off-line detention storage tanks to be in the order of $35,000 per 250,000 litre tank.

Note that the required capacity and therefore cost of the detention storage tanks may be spread over a number of stages. Also, Council-supplied flow data may indicate a smaller detention volume is required, and the timing of the Plain Street Pump Station upgrade may align with development staging, and so the final projected number of tanks may not actually be required.

Operating costs (including annual maintenance, operating and electricity costs) for the temporary pump station system and gravity sewer network are estimated to be in the order of $30,000 annually.

The custodian of the gravity-based piped network discharging to the pump station (the internal network upstream of the pump station), with respect to asset ownership and maintenance/renewal responsibility will ultimately be Tamworth Regional Council once the temporary pump station and detention storage system is de-commissioned.

11. Recommendations for Detailed Design

The detailed design of the system will be dependent on the finalisation of several critical design criteria, including the following;

- Final site layout including, if available, expected site usage and tenancies;
- Re-evaluation of Equivalent Population (EP) based on revised site usage data to determine and more accurate design flows at the time of DA/development;
- Confirmation of the proposed site floor levels to be adopted;
- Analysis and modelling results of the capacity of the existing 900mm sewer main (the receiving main), including dry and wet weather flows and capacity, diurnal patterns, and time-based flow characteristics during and after rainfall events. Liaison with Tamworth Regional Council will be required to obtain this information, including the receipt of flow meter data;
- Confirmation from Tamworth Regional Council of the required detention storage time parameters (see above);
- Continued collaboration with TRC and confirmation, if available, of the timing of the Plain Street Pump Station Upgrade.

At present, as the project is at the early stages of re-zoning, there is insufficient design input data to undertake a detailed design for the site, nor is it necessary to undertake such design work at this planning phase. Information required for detailed design includes determination of the size, geometry and pump requirements for the sewer pump station. Following confirmation of the design inputs identified above a more robust design and cost estimate, including life cycle costing, can be developed. However, this report has identified the options explored and the viability of the options that confirm potential serviceability of the proposed development.

12. Summary

The proposed development consists of a re-zoning of two existing lots in Taminda from RU4 – Primary Production Small Lots to a mixture of B5 – Business Development and IN1 – General Industrial, with the intention of developing the site into a mixed business/industrial development consisting of 41 business site and 14 industrial sites.

A feasibility analysis to determine the potential for sewer serviceability of the site has been prepared based on a direction from Tamworth Regional Council that the site must ultimately be serviced by a conventional gravity fed system discharging to the existing sewer network.

Site investigations and preliminary design work revealed opportunities and constraints within the site and the existing sewer network, and as the project is currently at re-zoning stage there is insufficient data to enable a detailed design to be completed. However, a gravity based sewer network discharging to the existing DN900 main, facilitated by filling the site to provide the minimum cover and depth of grade required, is confirmed as feasible based on the preliminary design work completed. In the short-term, and until the Plain Street Pump Station upgrade is complete, the network will discharge to a temporary pump station and off-line storage system that will have a timed discharge to the existing DN900. In the long-term, the gravity based network will discharge to each of the three existing manholes on the DN900.

The investigative work undertaken in this servicing strategy has confirmed three important servicing requirements;

1. The site can be serviced by an ultimately gravity fed network provided the site is filled to the required level;
2. The gravity based network can be connected in the short-term to a temporary pump station and off-line storage system;
3. Vehicular access and stormwater drainage requirements are able to be satisfactorily achieved with a filled site strategy.

In our opinion, a sewer servicing strategy comprising an ultimately gravity fed network discharging to the existing DN900 main, complemented by a short-term pump station and off-line delayed discharge storage system, is achievable in both the short-term and long-term situations, and does not prevent the satisfactory design of vehicular access or stormwater drainage networks to the site.

13. Limitations of This Report

This report has been tailored to investigate sewer servicing issues in the area of interest, being 55 Dampier Street, Taminda (Lots 2 & 3 in DP1234850).

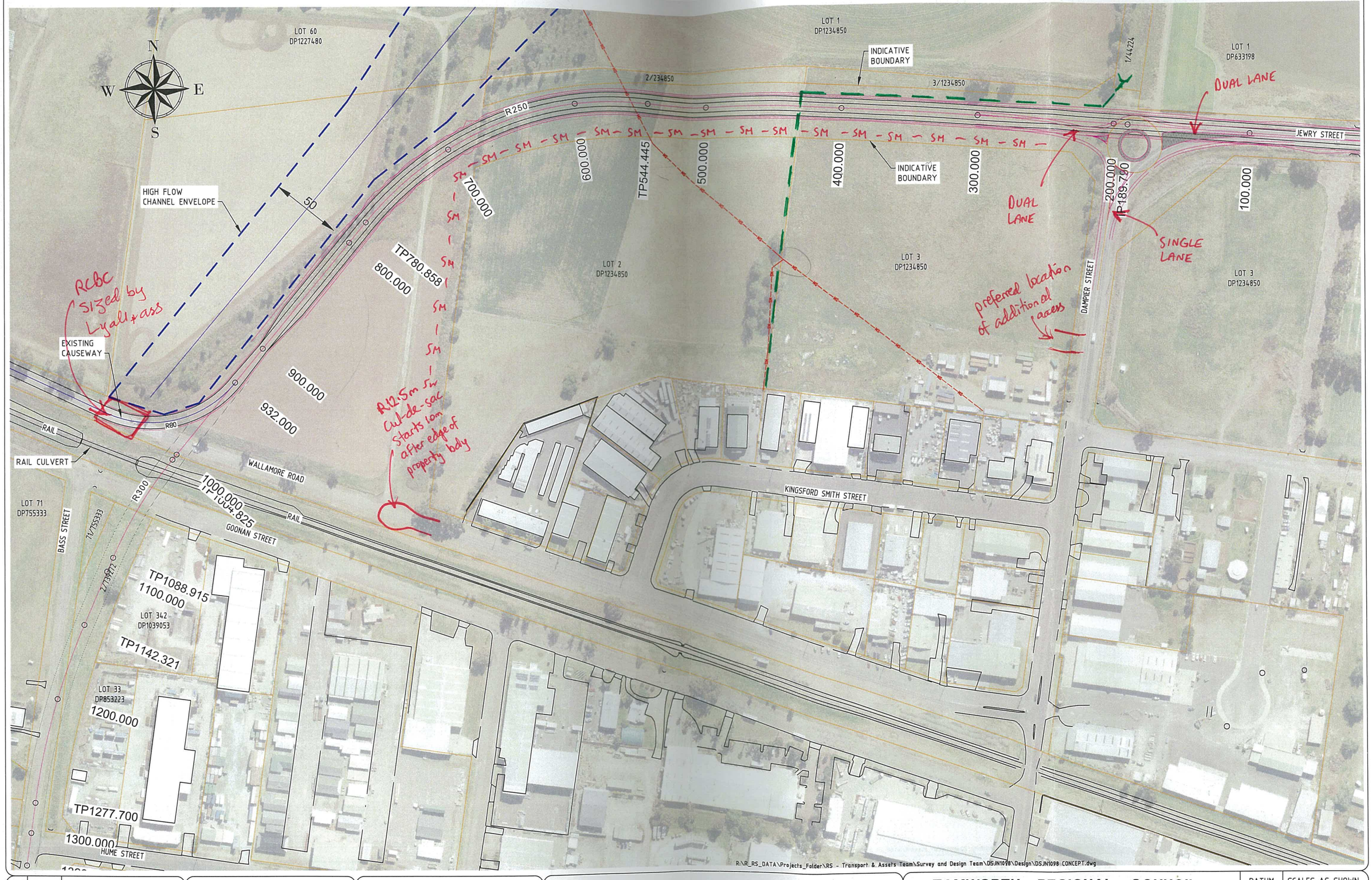
We consider that the report accurately reflects the conditions for the area of interest at the time the report was prepared (with updates as noted within this report). The results of this assessment should be reviewed if conditions change in the future. This report has been prepared using information provided to Kelley Covey Group from multiple sources. The accuracy of the information provided will determine the accuracy of the report findings. Kelley Covey Group holds no responsibility for the accuracy of the supplied information and data.

All life cycle cost estimates are provided for estimating and preliminary design purposes only, and cannot be considered to be representative of the actual costs of the final adopted and design system.

Notwithstanding the above, this report has been undertaken for the specific purposes of Elton Consulting Pty Ltd, and is solely for the use of them.

This report should only be used in full, and may not be used to support objectives other than those set out herein, except where written approval with comments are provided by Kelley Covey Group.

Appendix A – Jewry Street Extension Preliminary Design (per TRC)



REV	DATE	DESCRIPTION
A	12-03-18	ISSUED FOR INFORMATION

REGIONAL SERVICES DIRECTORATE

APPROVED

..... DATE

CHECKED: ..... DATE: .....
DESIGNER

CHECKED: ..... DATE: .....
SENIOR DESIGN & PROJECT ENGINEER

CHECKED: ..... DATE: .....
CLIENT

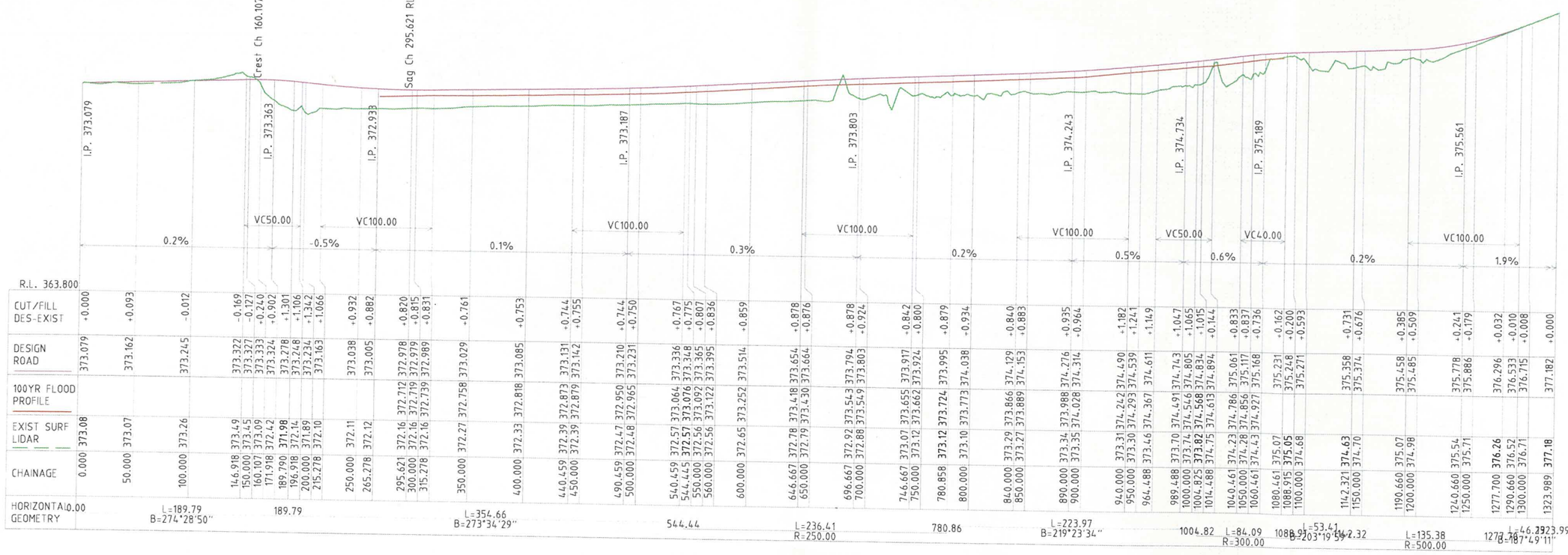
PLAN OF PROPOSED ALIGNMENT

SURVEYED: LIDAR | CLIENT REP: BM | DESIGNED: DB | JOB NO: DSJN1098

TAMWORTH REGIONAL COUNCIL

EXTENSION OF JEWRY STREET
FROM DAMPIER STREET TO BASS STREET TAMINDA

DATUM	SCALES AS SHOWN
A.H.D.	DRAWING NO.
A1	SK1098-001



HORIZONTAL 0 20 40 80 120 Full Size 1:2000 ; Half Reduction 1:4000 SCALE (m)

VERTICAL 0 1 2 4 6 Full Size 1:100 ; Half Reduction 1:200 SCALE (m)

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"Take 5"

R:\R_RS_DATA\Projects_Folder\RS-DS\DSJN1098\Design\Concept\DSJN1098 CONCEPT.dwg

REV	DATE	DESCRIPTION
A	12-03-18	ISSUED FOR INFORMATION

REGIONAL SERVICES DIRECTORATE

APPROVED

CIVIL CONSTRUCTION MANAGER DATE

CHECKED: DESIGNER DATE:

CHECKED: SENIOR DESIGN & PROJECT ENGINEER DATE:

CHECKED: CLIENT DATE:

JEWRY STREET EXTENSION - 100YR FLOOD IMMUNITY

SURVEYED: LIDAR | CLIENT REP: BM | DESIGNED: DB | JOB NO: DSJN1098

TAMWORTH REGIONAL COUNCIL

EXTENSION OF JEWRY STREET

FROM DAMPIER STREET TO BASS STREET TAMINDA

DATUM: AHD | SCALES AS SHOWN

DRAWING NO.: SK1098-004

A1

Appendix B – Preliminary Servicing Strategy Design Drawings

APPROXIMATE LEVEL OF FILL REQUIRED TO ACHIEVE A GRAVITY SEWER SYSTEM TO DISCAHRGE TO ONE OF THE THREE EXISTING MANHOLES LOCATED ON SITE – 155,000 CUBIC METRES

LABELS INDICATE FINISHED SURFACE LEVEL AND REQUIRED DEPTH OF FILL APPROXIMATELY EQUAL TO ENABLE A GRAVITY SEWER SYSTEM TO DISCAHRGE TO ONE OF THE THREE EXISTING MANHOLES LOCATED ON SITE

FUTURE ROAD ALIGNMENT – AS PER TRC PRELIMINARY DESIGN INFORMATION.

EXISTING SEWER INFRASTRUCTURE

NORTH-WEST CORNER SEWER MANHOLE (MH-3)
EXISTING NATURAL SURFACE: RL 372.620
INVERT OF DN900 SEWER: RL 370.590

CEN TRAL SEWER MANHOLE (MH-2)
EXISTING NATURAL SURFACE: RL 372.570
INVERT OF DN900 SEWER: RL 370.670

SOUTHERN SEWER MANHOLE (MH-1)
EXISTING NATURAL SURFACE: RL 372.500
INVERT OF DN900 SEWER: RL 370.820

FILL: 0.980m
FILL: 3.457m
FILL: 1.452m
FILL: 0.889m
FILL: 1.854m
FILL: 2.727m
FILL: 2.241m
FILL: 1.520m
FILL: 1.508m
FILL: 3.137m
FILL: 0.965m

373.5
374.0
374.5
375.0
375.5
376.0

BATTERS OF 1:5 (V:H) INDICATED FROM FILLED SITE TO RETURN TO EXISTING NATURAL SURFACE

DAMPIER STREET
SHOWGROUND ROAD
KINGSFORD SMITH STREET

6 DP 711449
5 DP 711449
2 DP 711449
3 DP 711449
4 DP 711449
8 DP 711449
9 DP 711449
18 DP 260129
19 DP 260129
20 DP 260129
21 DP 260129
22 DP 260129
14 DP 260129
13 DP 260129
12 DP 260129
11 DP 260129
10 DP 260129
9 DP 260129
72 DP 826601
2 DP 38062
3 DP 3806
13 DP 501008
14

SITE FILL LEGEND

No.	Min. Level	Max. Level	Colour
1	-0.446	0.000	
2	0.000	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.000	
10	3.000	3.500	

NOTE: EXISTING NATURAL SURFACE LEVEL SURFACE MODEL DERIVED FROM LIDAR DATA (NSW GOVT. SPATIAL SERVICES POINT CLOUD DATA
REF: Tamworth201401-LID1-C3-AHD_2986558_56_0002_0002.

ULTIMATE GRAVITY SEWER NETWORK FILL LEVELS

00 10m 20m 30m

SCALE 1:1000 (A1)
SCALE 1:2000 (A3)
CONTOURS; MAJOR 0.5m, MINOR 0.1m

Issue	Date	Description	By
B	15.06.20	ISSUED FOLLOWING COUNCIL COMMENTS	MF
A	31.03.20	PRELIMINARY ISSUE	MF

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Design – MF | Drawn – MF
Scales – AS SHOWN | Date – 31.03.20
Document Stage – PRELIMINARY

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Drawing title – PRELIMINARY SEWER NETWORK LAYOUT AND SPS LOCATION

Project – SEWER SERVICING STRATEGY TAMINDA EMPLOYMENT LANDS

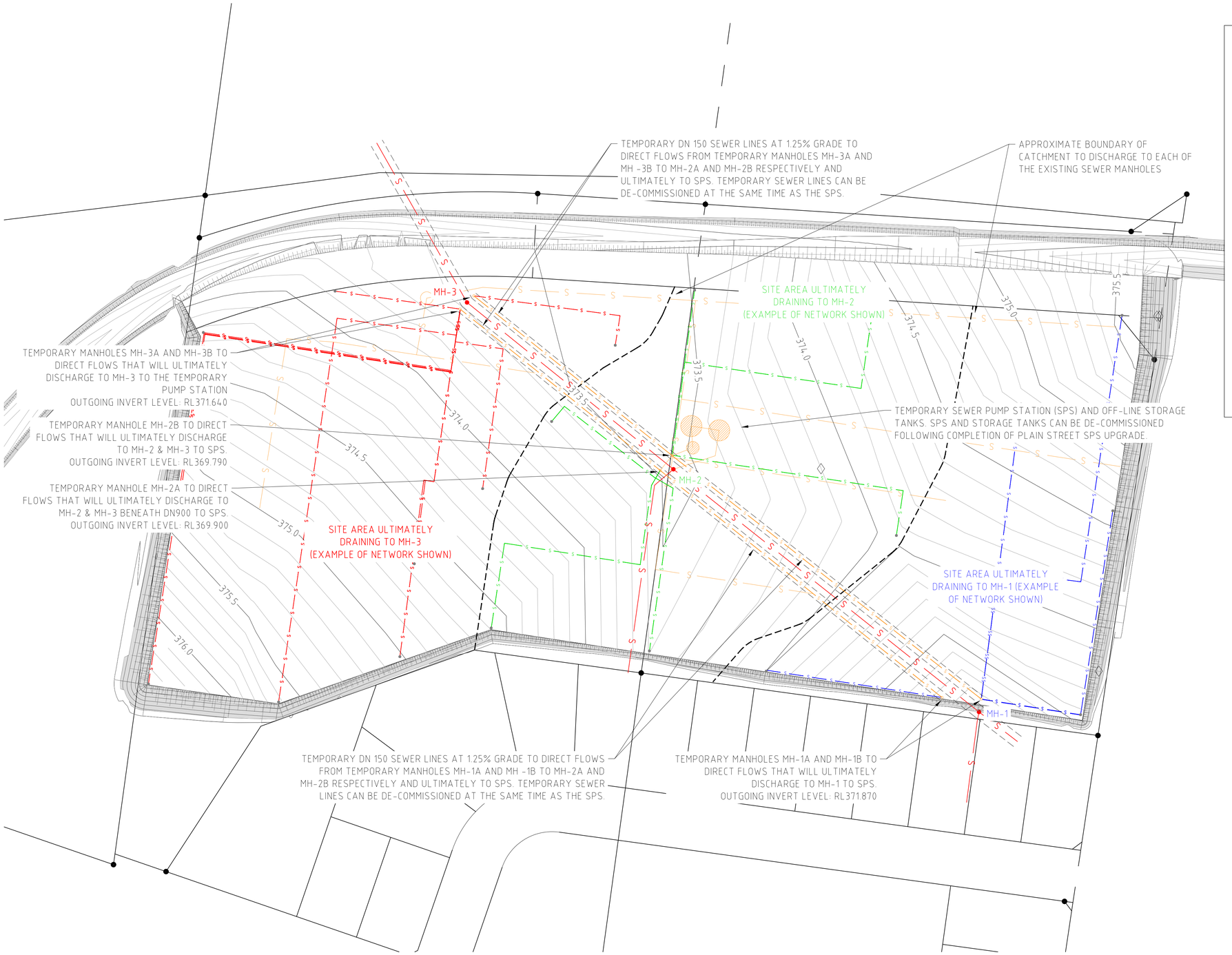
Client – ELTON CONSULTING PTY LTD

Site – 55 DAMPIER STREET TAMINDA NSW 2340

Project T196893 Sheet No. 2 of 3

Digital Ref: T196893 – Rev B Issue : B

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NOTE: EXISTING NATURAL SURFACE LEVEL SURFACE MODEL DERIVED FROM LIDAR DATA (NSW GOVT. SPATIAL SERVICES POINT CLOUD DATA
REF: Tamworth201401-LID1-C3-AHD_2986558_56_0002_0002.

ULTIMATE GRAVITY SEWER NETWORK PROPOSAL SCHEMATIC

SEWER SERVICING STRATEGY EXPLANATION NOTES

1. SITE TO BE FILLED TO ENABLE ULTIMATE GRAVITY DISCHARGE TO EXISTING DN900 MAIN AT EITHER MH-1, MH-2 OR MH-3 AS SHOWN.
2. TEMPORARY RECEIVING MANHOLES AND DN150 SEWER LINE TO BE CONSTRUCTED EITHER SIDE OF MH-1, MH-2 AND MH-3 TO ACCEPT FLOWS AND DIRECT THEM TO TEMPORARY SEWER PUMP STATION (SPS) AS SHOWN.
5. OUTGOING INVERT LEVEL OF TEMPORARY MANHOLES REPRESENTS THE OBVERT LEVEL OF THE EXISTING DN900 PIPE PLUS 50mm AS DIRECTED BY TAMWORTH REGIONAL COUNCIL, PLUS A FURTHER 100mm TO ALLOW GRADE TO ULTIMATELY DISCHARGE FROM TEMPORARY MANHOLES TO EXISTING MANHOLES.
6. ANTICIPATED INLET LEVEL OF SPS: RL369.450 (TO BE CONFIRMED)
7. TEMPORARY SPS TO DISCHARGE TO MH-2 AS SHOWN.
8. TEMPORARY SPS TO HAVE OFF-LINE STORAGE IN THE EVENT OF WET WEATHER REDUCING CAPACITY IN THE EXISTING DN900 LINE.
9. TEMPORARY SPS AND TEMPORARY DN150 SEWER LINES TO BE DE-COMMISSIONED UPON COMPLETION OF THE PLAIN STREET SEWER PUMP STATION UPGRADE OR AS DIRECTED BY COUNCIL.
10. FLOWS DISCARGING TO TEMPORARY MANHOLES TO BE RE-DIRECTED TO MH-1, MH-2 OR MH-3 (AS APPROPRIATE) FOLLOWING DE-COMMISSIONING WORKS.
11. NETWORK LAYOUT AND FINISHED FILLED SURFACE LEVELS ARE INDICATIVE ONLY AND ARE ONLY TO BE USED FOR CONCEPT/FEASIBILITY PURPOSES. ALL FINISHED SURFACE LEVELS, NETWORK LAYOUTS AND PIPE GRADES/INVERTS WILL NEED TO BE CONFIRMED AS PART OF DETAILED DESIGN WORKS UPON ADOPTION OF A PROPOSED SITE LAYOUT.

PROPOSED DN150 BETWEEN MH-2A &MH-2B

PIPE DATA	150Ø uPVC SN8 8.999m @ 1.25%	
CUT/FILL DEPTH	0.000	
INVERT LEVEL	369.700	369.588
DESIGN SURFACE LEVEL	373.476	373.428
EXISTING SURFACE LEVEL	372.73	372.64
CHAINAGE	0.000	8.999

SCALE 1:500 A1)

00 10m 20m 30m

SCALE 1:1000 (A1)
SCALE 1:2000 (A3)
CONTOURS; MAJOR 0.5m, MINOR 0.1m

Issue	Date	Description	By
B	22.06.20	ISSUED FOLLOWING COUNCIL COMMENTS	MF
A	31.03.20	PRELIMINARY ISSUE	MF

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Document Stage – PRELIMINARY

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Drawing title – CONCEPT SEWER NETWORK LAYOUT AND SPS LOCATION

Project – SEWER SERVICING STRATEGY TAMINDA EMPLOYMENT LANDS

Client – ELTON CONSULTING PTY LTD

Site – 55 DAMPIER STREET TAMINDA NSW 2340

Project T196893 Sheet No. 3 of 5

Digital Ref: T196893 – Rev B Issue : B

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NOTES:

1. SEE TABLES IN APPENDIX C OF SUPPLEMENTARY SEWER SERVICING REPORT (REF: 52866ltr) FOR ALIGNMENT DISTANCES AND GRADE INFORMATION.
2. SEWER ALIGNMENTS ARE FOR CONCEPT PURPOSES ONLY TO DEMONSTRATE SERVICEABILITY - FINAL SEWER ALIGNMENTS AND FILL REQUIREMENTS TO BE DETERMINED AS PART OF DETAILED DESIGN STAGE.



ULTIMATE GRAVITY SEWER NETWORK - SERVICING NODES

00 10m 20m 30m

SCALE 1:1000 (A1)
SCALE 1:2000 (A3)
CONTOURS; MAJOR 0.5m, MINOR 0.1m

Issue	Date	Description	By
B	22.06.20	ISSUED FOLLOWING COUNCIL COMMENTS	MF
A	31.03.20	PRELIMINARY ISSUE	MF

Checked – MF | Approved – JC
Design – MF | Drawn – MF
Scales – AS SHOWN | Date – 31.03.20
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Drawing title –
CONCEPT SEWER NETWORK
CONNECTION NODE INFORMATION

Project – SEWER SERVICING STRATEGY
TAMINDA EMPLOYMENT LANDS

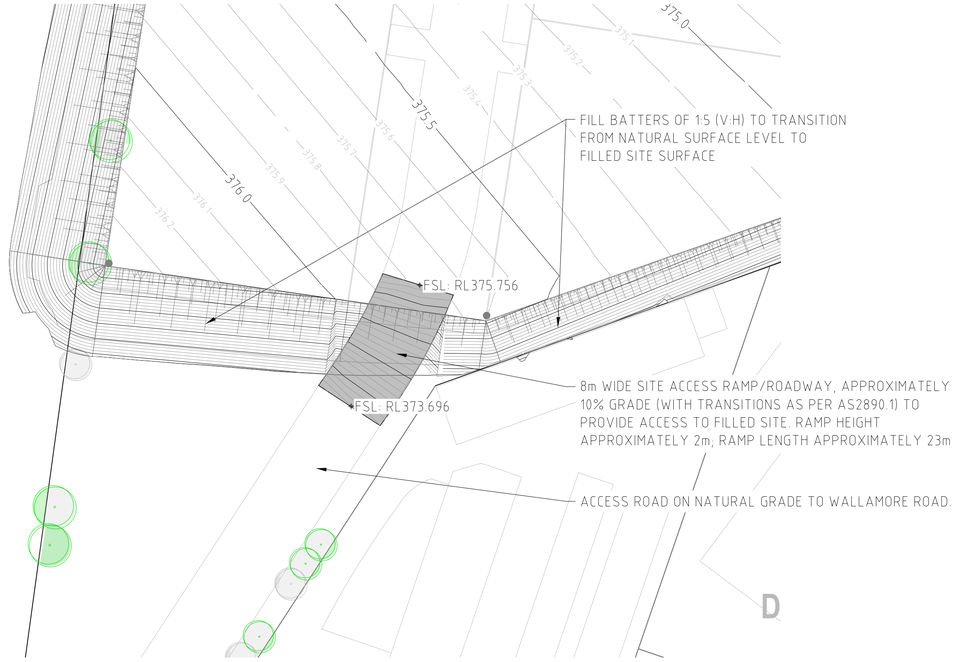
Client –
ELTON CONSULTING PTY LTD

Site –
55 DAMPIER STREET
TAMINDA NSW 2340

Project T196893 Sheet No. 4 of 5

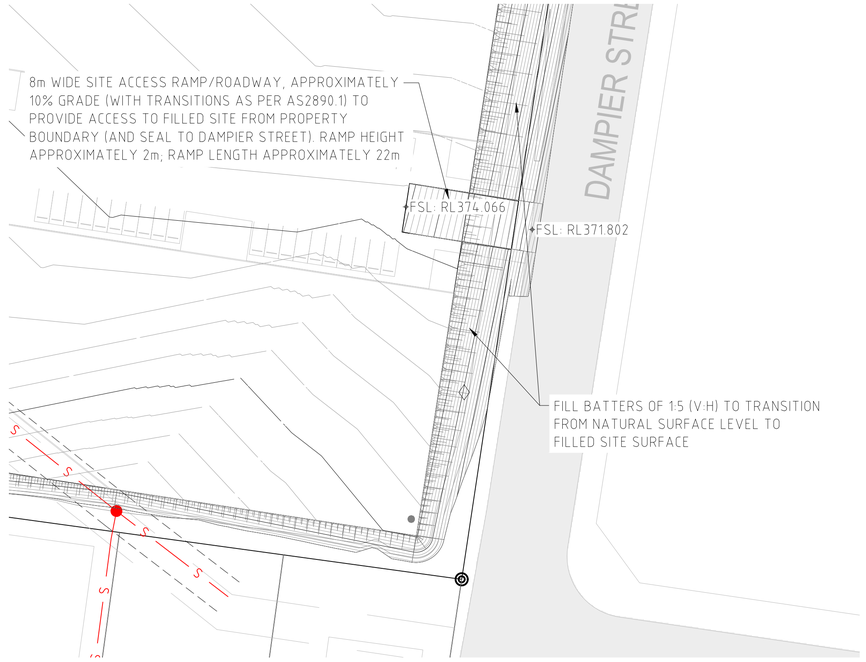
Digital Ref: T196893 – Rev B Issue : B

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SITE ACCESS RAMP - SOUTHERN BOUNDARY TO WALLAMORE ROAD

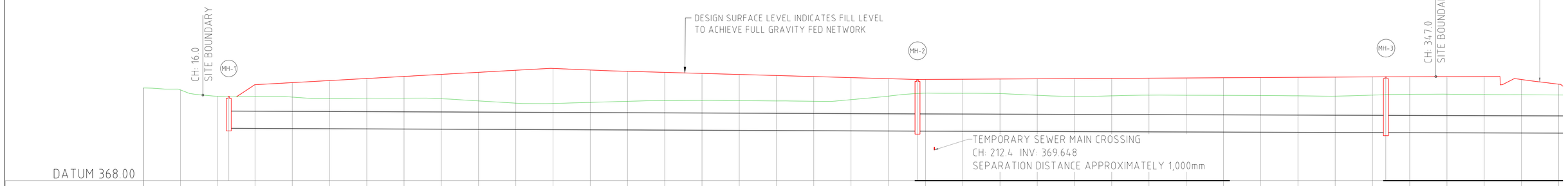
SCALE 1:500 (A1)



SITE ACCESS RAMP - EASTERN BOUNDARY TO DAMPIER STREET

SCALE 1:500 (A1)

PROPOSED JEWRY STREET EXTENSION
INV: 373.308



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	320.000	330.000	340.000	350.000	360.000	370.000	380.000
EXISTING SURFACE LEVEL	372.97	372.87	372.53	372.51	372.48	372.40	372.43	372.43	372.40	372.28	372.16	372.14	372.20	372.26	372.29	372.30	372.29	372.28	372.26	372.35	372.53	372.70	372.69	372.67	372.58	372.53	372.55	372.59	372.58	372.58	372.57	372.55	372.53	372.59	372.64	372.64	372.62	372.61	372.60
DESIGN SURFACE LEVEL				373.150	373.261	373.371	373.482	373.592	373.703	373.814	373.924	374.022	373.938	373.867	373.811	373.754	373.698	373.642	373.585	373.529	373.472	373.430	373.442	373.453	373.465	373.476	373.488	373.500	373.511	373.523	373.534	373.546	373.557	373.569	373.576	373.581	373.585	373.428	373.176
INVERT LEVEL AND MINIMUM COVER				370.820 0.76m																		370.670 370.670 1.83m													370.590 370.590 1.11m				
CUT/FILL DEPTH				0.639	0.777	0.967	1.054	1.165	1.307	1.534	1.765	1.880	1.738	1.609	1.516	1.450	1.406	1.364	1.325	1.182	0.937	0.735	0.753	0.779	0.884	0.947	0.937	0.911	0.928	0.944	0.967	0.994	1.023	0.980	0.941	0.940	0.966	0.818	0.579

EXISTING DN900 SEWER MAIN - LONGITUDINAL SECTION

SCALE 1:500 (A1)
SCALE 1:1000 (A3)
CONTOURS; MAJOR 0.5m, MINOR 0.1m

Issue	Date	Description	By
B	22.06.20	ISSUED FOLLOWING COUNCIL COMMENTS	MF
A	31.03.20	PRELIMINARY ISSUE	MF

Checked – MF | Approved – JC
Design – MF | Drawn – MF
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Drawing title – SITE ACCESS CONCEPTS AND EXISTING DN900 LONG SECTION

Project – SEWER SERVICING STRATEGY TAMINDA EMPLOYMENT LANDS

Client – ELTON CONSULTING PTY LTD

Site – 55 DAMPIER STREET TAMINDA NSW 2340

Project T196893 Sheet No. 3 of 5

Digital Ref: T196893 – Rev B Issue : B

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Appendix C – Preliminary Pump Station Design Calculations

Daily Flow Estimate				
	Business	**Industrial**	**TOTAL**	**Notes**
Gross Lot Area (ha)	1.55	3.55	**5.1**	Gross Lot Area calculated from site layout plan. Assumed 100% site coverage per lot.
EP/Unit	75	150		From WSA-02 Table A1 - Local Commercial and Future Industrial Areas
EP	116.25	532.5	**648.75**	
ADWF		**1.36**		l/s
d		**4.25**		WSA-02 Figure B1
PDWF		**5.79**		l/s
Total Site Area (ha)		**8.98**		
Portion Wet		0.7		Estimated - assuming lot filling to Flood Planning Level
GWI		0.15715		l/s
$Portion_{Impervious}$		0.8		Estimated from site layout plan
A_{eff} (ha)		3.59		
C		1.17		WSA-02 Table B1 and previous design experience
$I_{1,2}$ (mm)		40		From BOM
$Factor_{size}$		1.1963		
$Factor_{containment}$		1.0		WSA-02 Table B3 - Two (2) year ARI containment standard
I (mm)		47.85		
IIF		5.6		l/s
Design Flow		**11.6**		**l/s**

Appendix D – Site Fill Levels Calculations

Ex Node	EX-INV	Ex-FFL	Ex Depth	Proposed FFL (Full Gravity)	Prop. Network Discharge Level	New MH Inv	Cover to New MH Inv	Dist to MH-2A	MH-2A Inv (@1.25%)
	(RL - AHD)	(RL - AHD)	(m)		(RL - AHD)	(RL - AHD)	(m)	(m)	(RL - AHD)
MH1	370.82	372.5	1.68	373.15	371.77	371.87	1.11	172	**369.72**
MH2	370.67	372.57	1.90	373.43	371.62	371.72	1.54	15	371.5325
MH3	370.59	372.62	2.03	373.572	371.54	371.64	1.762	122	370.115

Table 1 – Calculations to determine invert levels of new manholes and invert of pipe crossing DN900

Node	MH1		MH2		MH3		Adopted Fill Level
	Dist	Min FSL	Dist	Min FSL	Dist	Min FSL	
1			347	376.96	315	376.48	376.48
2			256	375.82	225	375.35	375.35
3			331	376.76	147	374.38	374.38
4					60	373.29	373.29
5			288	376.22	253	375.70	375.70
6			205	375.18	171	374.68	374.68
7			161	374.63	126	374.12	374.12
8			151	374.51	186	374.87	374.51
9			100	373.87	105	373.85	373.85
10			69	373.48	97	373.75	373.48
11			82	373.65	84	373.59	373.59
12			79	373.61	120	374.04	373.61
13	140	374.52	87	373.71			373.71
14	84	373.82	152	374.52			373.82
15	121	374.28	132	374.27			374.27
16	249	375.88	164	374.67			374.67
17	141	374.53	206	375.20			374.53
18	228	375.62	297	376.33			375.62
19	145	374.58	216	375.32			374.58
20	47	373.36					373.36

Table 2 – Calculations to determine minimum fill levels at each sewer node

9.11 Traffic Impact Assessment



TRAFFIC ASSESSMENT

Taminda Employment Lands
Taminda, New South Wales

Reference: 19.654r01v04
Date: May 2020

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

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DOCUMENT VERIFICATION

Job Number	19.654			
Project	Taminda Employment Lands			
Client	Chan Abbey Holdings			
Revision	Date	Prepared By	Checked By	Signed
v04	05/05/2020	Kenneth Yuen	Ben Liddell	

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- Appendix A: Photographic Record
- Appendix B: Concept Plans
- Appendix C: SIDRA Outputs

1. INTRODUCTION

TRAFFIX has been commissioned by Chan Abbey Holdings to undertake a traffic assessment in support of a Planning Proposal relating to an industrial and business development located at 55 Dampier Street and 21 & 72 Wallamore Road, Taminda. The planning proposal seeks to rezone approximately nine (9) hectares of land to part B5-Business Development and part IN1-General Industrial land under the Tamworth Regional Local Environmental Plan 2010. More specifically, the proposal comprises 35,410m^2 GFA of industrial units and 14,915m^2 GFA of retail/business units. The development seeks to extend the existing industrial estate south of the site.

This report documents the findings of our investigations and should be read in the context of the Planning Proposal Justification Report, prepared separately. The future industrial and business development is considered to be of such a size or scale as not to require referral to the Roads and Maritime Services (RMS) under the provisions of the State Environmental Planning Policy (Infrastructure) 2007.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses traffic impacts
- Section 6: Presents the overall study conclusions

2. LOCATION AND SITE

The subject site is located at 55 Dampier Street and 21 & 72 Wallamore Road, Taminda and is legally identified as Lot 2 and Lot 3 in DP1234850. In a regional context, it is located approximately 3.2 kilometres west of the Tamworth Central Business District (CBD) and 5.5 kilometres east of the Tamworth Regional Airport.

The site has an irregular configuration and has a total site area of approximately 9 ha. It has an eastern frontage to Dampier Street measuring approximately 247 metres and a southern frontage to Wallamore Road measuring approximately 25 metres.

The site currently provides two (2) vehicular crossing. The eastern access to Wallamore Road is located approximately 77 metres north of Kingsford Smith Street whilst the southern access is located approximately 140 metres west of Kingsford Smith Street.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**. Reference should also be made to the Photographic Record presented in **Appendix A** which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

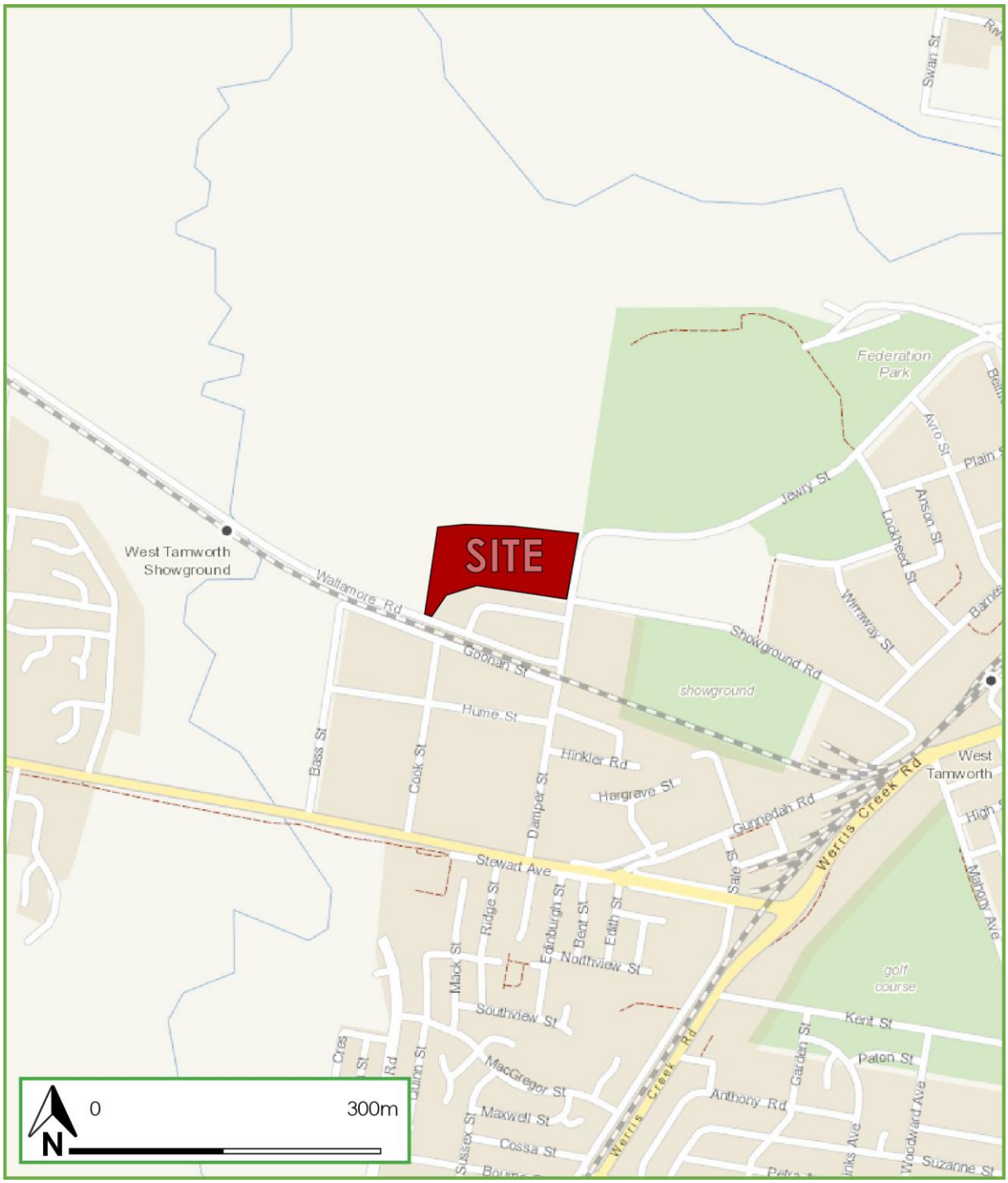


Figure 1: Location Plan



Figure 2: Site Plan (excluding solar farm)

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Oxley Highway: This is Highway HW11 is controlled by the Roads and Maritime Services (RMS) and generally runs in an east-west direction and connects Tamworth Central Business District (CBD) in the east and the Newell Highway in the west. Within the vicinity of the site, the Oxley Highway accommodates a single lane of traffic in each direction within an undivided carriageway. Near the intersection of Dampier Street, it has a posted speed limit of 60 km/hr and kerbside parking is generally permitted along both sides of the road.
- Dampier Street: an unclassified regional road (URR 7744) that runs in a north-south direction between Jewry Street in the north and Gunnedah Road (Oxley Highway) in the south. Dampier Street accommodates a single lane of traffic in each direction within an undivided carriageway and is subject to a 60km/h speed zoning. Parking is generally permitted along both sides of Dampier Street in the vicinity of the site.
- Jewry Street: an unclassified regional road (URR 7744) that runs in an east-west direction between Peel Street in the east and Dampier Street in the west. Jewry Street accommodates a single lane of traffic in each direction within an undivided carriageway and is subject to a 60km/h speed zoning. Parking is generally permitted along both sides of Jewry Street in the vicinity of the site.
- Wallamore Road: a local road that generally runs in a northwest-southeast direction between Appleby lane in the northwest and Dampier Street in the southeast. Wallamore Road accommodates a single lane of traffic in each direction within an undivided carriageway and is

subject to a 60km/h speed zoning. Angle parking is permitted on the northern side of Wallamore Road in the vicinity of the site.

- Britten Road: a local road that traverses in an east-west direction between Jewry Street in the east and the Tamworth Jockey Club in the west. Britten Road accommodates a single lane of traffic in each direction within an undivided carriageway and is subject to a 50km/h speed zoning.
- Ebsworth Street: a local road that traverses in an east-west direction between Plain Street in the east and Jewry Street in the west. Ebsworth Street accommodates a single lane of traffic in each direction within an undivided carriageway and is subject to a 50km/h speed zoning.

It can be seen from **Figure 3** that the site is conveniently located with respect to local and arterial roads serving the region with connectivity to the north and south using Dampier Street/Wallamore Road and connectivity to the east and west using Gunnedah Road (the Oxley Highway).

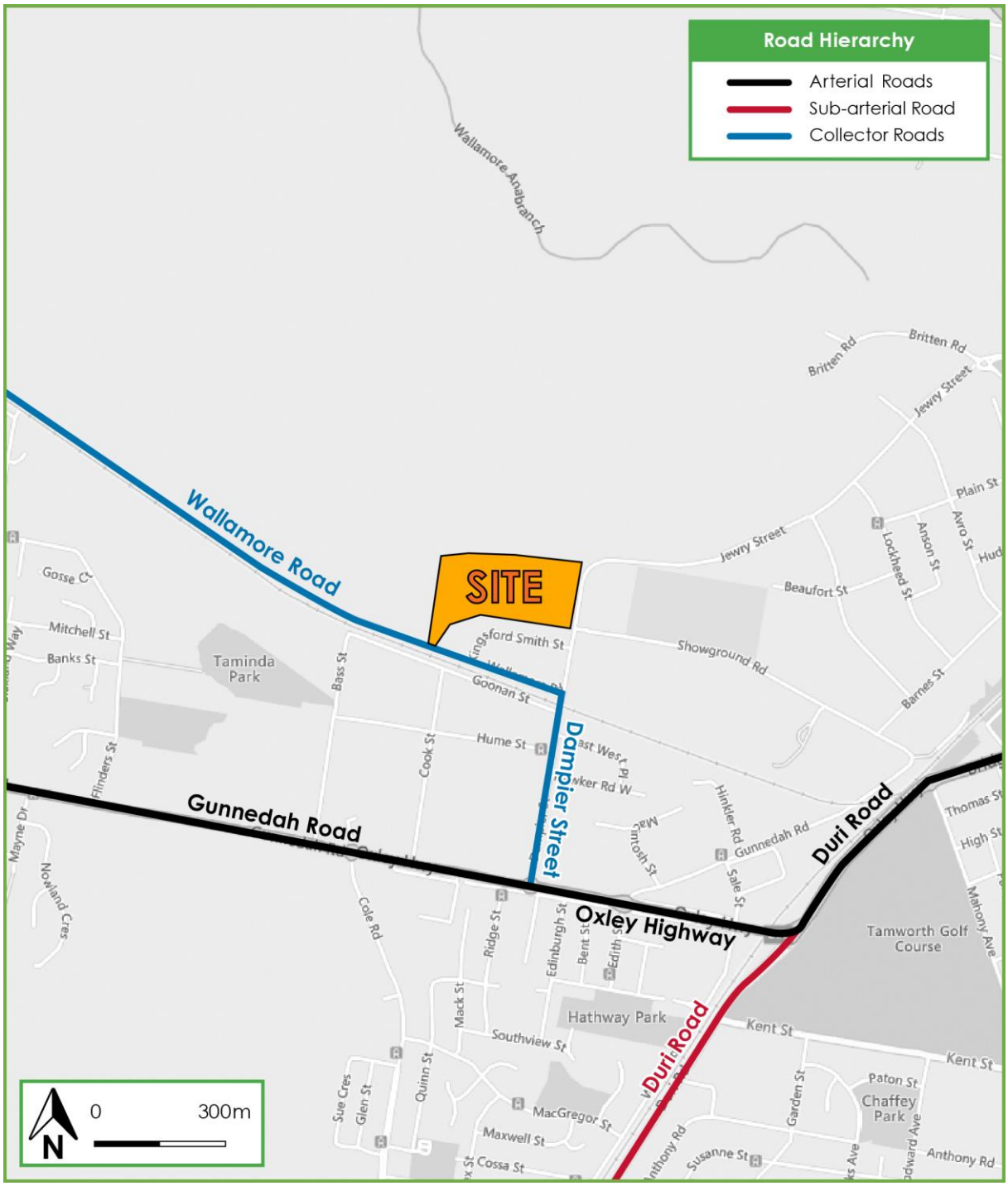


Figure 3: Road Hierarchy

3.2 Key Intersections

Three (3) key intersections have been identified in the vicinity of the site. These intersections are located at the junction of main thoroughfares that will be utilised by users associated with future developments.

3.2.1 Jewry Street / Britten Road / Ebsworth Street



Figure 4: Intersection of Jewry Street, Britten Road and Ebsworth Street

(Source: NearMap)

It can be seen from **Figure 4** that the intersection of Jewry Street, Britten Road and Ebsworth Street is a four-legged roundabout intersection. The main attributes of each approach are outlined below:

- Jewry Street (northeast leg)
  - A single approach lane with no movement restrictions; and
  - A single departure lane.

- Ebsworth Street (southeast leg)
  - A single approach lane with no movement restrictions; and
  - A single departure lane.
- Jewry Street (southwest leg)
  - A single approach lane with no movement restrictions; and
  - A single departure lane.
- Britten Road (northwest leg)
  - A single approach lane with no movement restrictions; and
  - A single departure lane.

3.2.2 Dampier Street / Wallamore Road



Figure 5: Intersection of Dampier Street and Wallamore Road

(Source: NearMap)

It can be seen from **Figure 5** that the intersection of Dampier Street and Wallamore Road is a three-legged priority-controlled intersection. The main attributes of each approach are outlined below:

- Dampier Street (northern leg)
  - A single approach lane with no movement restrictions; and
  - A single departure lane.
- Dampier Street (southern leg)
  - A single approach lane with no movement restrictions; and
  - A single departure lane.
- Wallamore Road (western leg)
  - A single approach lane with no movement restrictions. It is noted that the approach lane is significantly wide and allows for simultaneous left/right movements; and
  - A single departure lane.

3.2.3 Gunnedah Road / Dampier Street



Figure 6: Intersection of Gunnedah Road and Dampier Street

(Source: NearMap)

It can be seen from **Figure 6** that the intersection of Gunnedah Road and Dampier Street is a three-legged roundabout intersection. The main attributes of each approach are outlined below:

- Dampier Street (northern leg)
  - A dedicated left turn lane;
  - A single right turn lane; and
  - A single departure lane.
- Gunnedah Road (eastern leg)
  - A single approach lane;
  - A shared through/right turn lane; and
  - Two (2) departure lanes.
- Gunnedah Road (western leg)
  - A dedicated left turn lane;
  - A single through lane; and
  - Two (2) departure lanes, with the kerbside lane required to turn left into Ridge Street.

4. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the changes sought to the Tamworth Regional Local Environmental Plan 2010 is provided in the Planning Proposal, prepared separately. In summary, approval is sought to amend the LEP to include 2.34 hectares in the B5-Business Development zone and 6.66 hectares in the IN1-General Industrial zone. The balance of the subject site and the road reserve will remain in its current RU4 Primary Production Small Lots zone.

For the purpose of assessment, an indicative reference scheme for an industrial and business development has been envisaged, which is representative of the full development potential of the site under the Planning Proposal and is an appropriate concept development for assessment purposes. It comprises the following components:

- Construction of a solar farm (Approved DA);
- 35,410m^2 GFA of industrial units;
- 14,915m^2 GFA of retail/business sheds;
- A roundabout intersection to Dampier Street; and
- A secondary access driveway to Wallamore Road.

The traffic impacts arising from the indicative reference scheme are discussed in **Section 5**. Reference should be made to the concept plans submitted separately to Council which are presented at reduced scale in **Appendix B**.

5. TRAFFIC AND TRANSPORT IMPACTS

5.1 Traffic Trip Generation

The Roads and Maritime Services Technical Direction (TDT 2013/04a) provides updated traffic generation rates for a number of land use developments including business parks and industrial estates. The Technical Direction recommends the following average traffic generating rates for business parks and industrial estates within regional areas:

- 0.70 vehicle trips per 100m^2 of GFA per hour during the AM peak period; and
- 0.78 vehicle trips per 100m^2 of GFA per hour during the PM peak period.

Application of the above traffic generation rates to the proposed 50,325m^2 GFA (35,410m^2 plus 14,915m^2) of business park development and adopting an 80/20 directional split results in the following traffic generation:

- 352 vehicle trips per hour during the AM peak period (282 in, 70 out)
- 393 vehicle trips per hour during the PM peak period (79 in, 314 out)

It should be noted that the proposed solar farm is an approved DA and will generate negligible traffic on any given day, with the majority of vehicle trips related to maintenance vehicles and workers (expected to be minimal). Therefore, any minor traffic generation by the solar farm will be omitted in the following SIDRA Intersection assessment. It should also be noted that the existing trips generated by the site have not been discounted from the above trips, thus providing a more conservative assessment of the traffic impacts.

5.2 Trip Distribution

In order to estimate the expected distribution of traffic from the subject development an interrogation of the journey to work data supplied by the NSW Government Bureau of Transport Statistics has been undertaken. The surveys of commuters who drive to and from the subject site, indicate the following distribution for the subject intersections:

Inbound Movements

- 42.4% arrive to the site from the north via Jewry Street;
- 43% arrive to the site from the south via Gunnedah Road (east leg);
- 7.9% arrive to the site from the south via Gunnedah Road (west leg); and
- 6.7% arrive to the site from the south via Wallamore Road.

Outbound Movements

- 42.4% depart the site towards the north via Jewry Street;
- 43% depart the site towards the south via Gunnedah Road (east leg);
- 7.9% depart the site towards the south via Gunnedah Road (west leg); and
- 6.7% depart the site towards the south via Wallamore Road.

Collectively, the development volumes assessed have been distributed across the road network as illustrated in **Figure 7** and **Figure 8**, for AM and PM peak periods respectively. It should be noted that vehicle access is not permitted from the future bypass road, thus this analysis assumes that the main vehicular access to the site will be achieved from Dampier Street, between Jewry Street and Showground Road. A secondary driveway access is also provided to Wallamore Road, however, due to the limited number of trips from Wallamore Road, the assessment will direct all the predicted traffic to/from the intersection on Dampier Street, thus providing a conservative assessment.

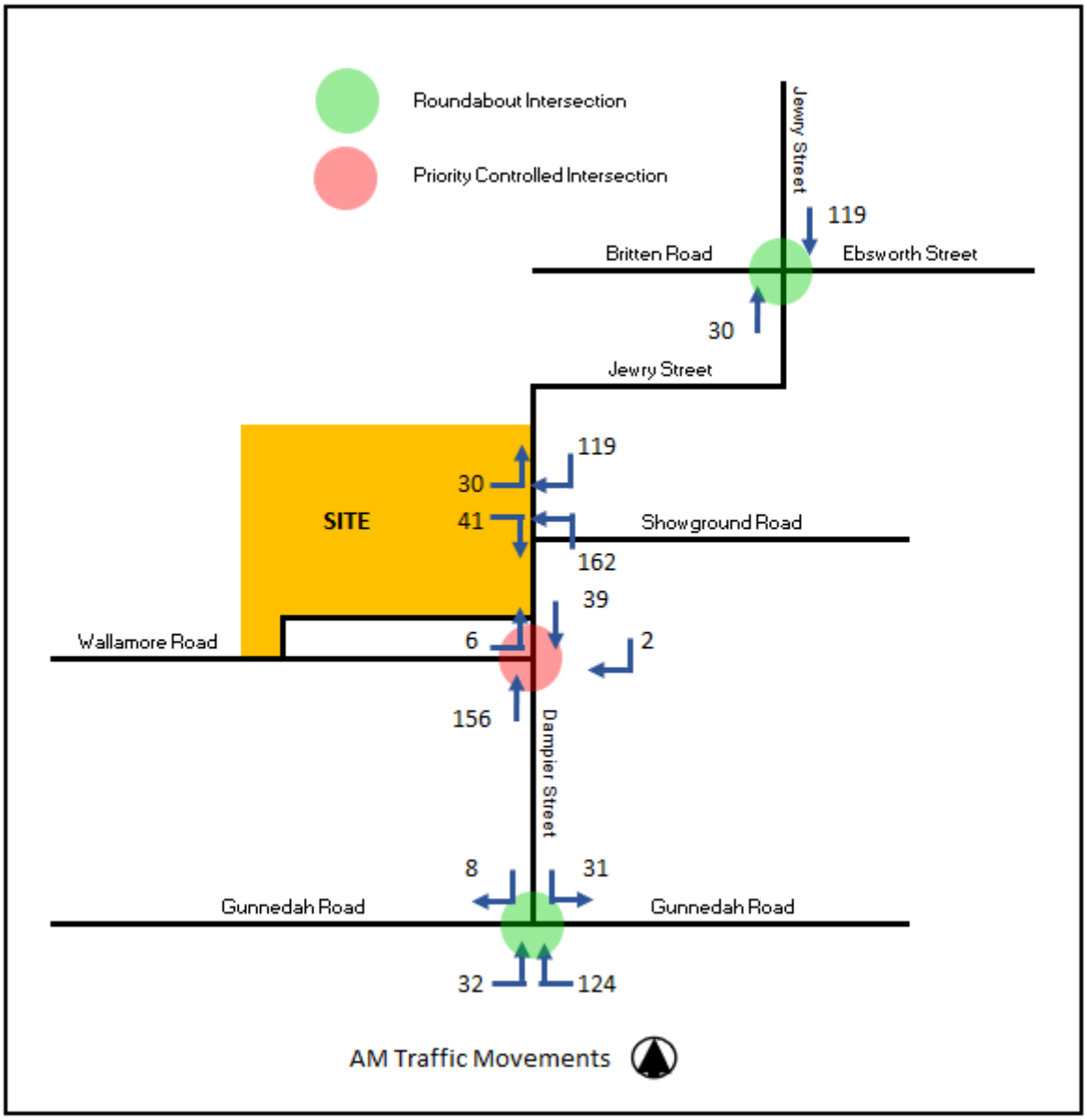


Figure 7: Proposed AM Peak Period Distribution (Vehicle trips per hour)

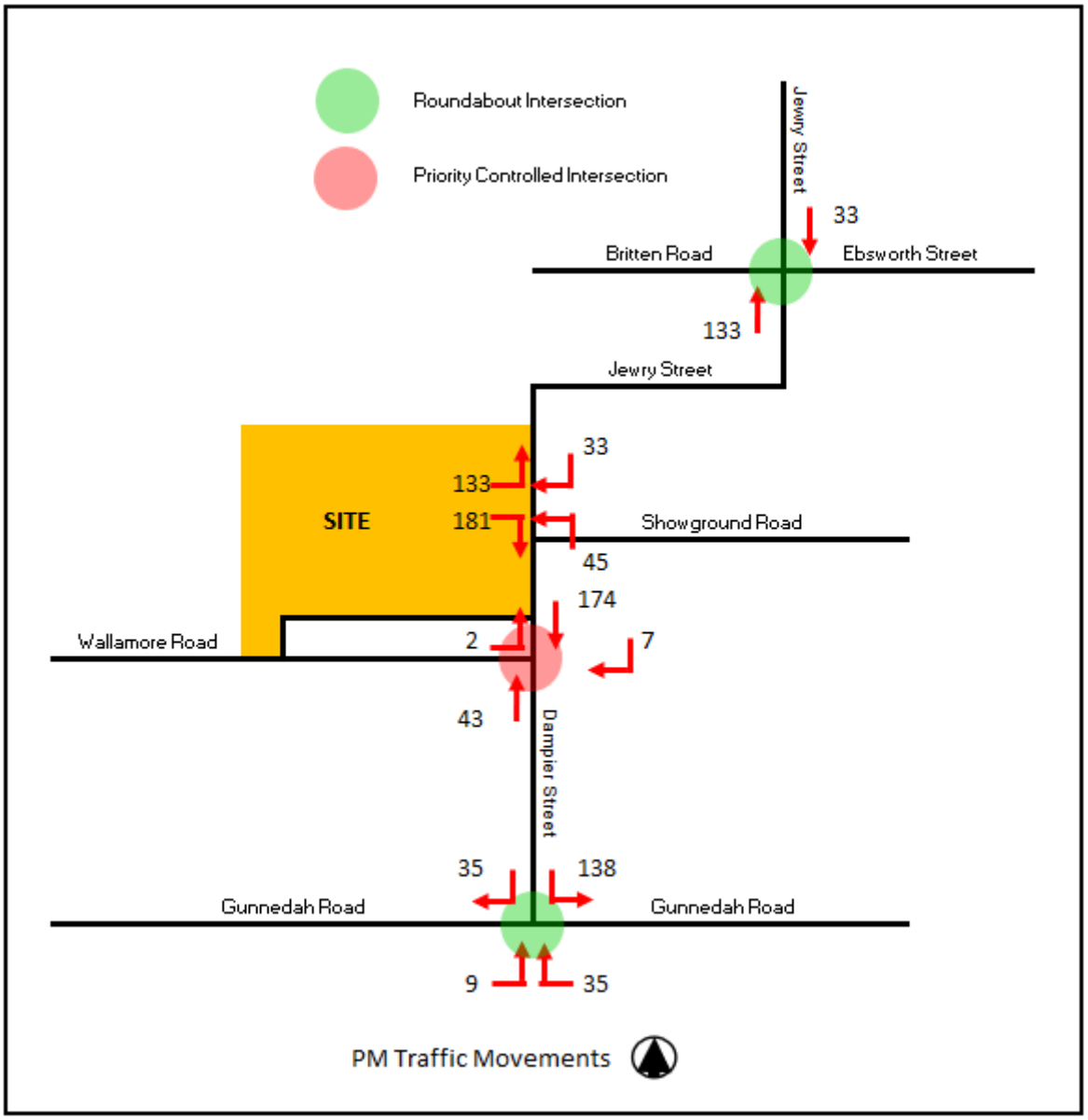


Figure 8: Proposed PM Peak Period Distribution (Vehicle trips per hour)

5.3 Modelled Scenarios

The predicted traffic impacts of the proposed development required examination of the following scenarios:

- 2020 Base Case;
- 2020 Base Case + Development;
- 2040 Base Case; as requested by Council; and
- Discussion of 2040 Base Case + Development Scenario.

It is noted that the 2040 future scenario incorporated a 1.5% annual growth (as requested by Council) of traffic based on the existing surveys, resulting in significant input flow onto the surrounding road network. The 2040 scenario does not take into account any infrastructure projects in the immediate area by Council or the RMS over the next 20 years, which would be expected to accommodate this growth to maintain satisfactory operation of the network.

5.4 Peak Period Intersection Performance

Traffic surveys were undertaken of the intersections mentioned in Section 3.2, which are considered to be most critical in relation to the site. These counts were undertaken on Wednesday 4th March 2020 during the network peak periods, being between 7:00am – 9:00am (morning peak period) and 4:00pm – 6:00pm (evening peak period). It should be noted that the survey camera at the intersection of Dampier Street and Gunnedah Road was vandalised on Wednesday afternoon, thus the survey was continued onto Thursday 5th March 2020 for this intersection to provide a full data set.

The traffic volumes in these surveys formed the base case volumes for software modelling undertaken to assess intersection performance characteristics under existing traffic conditions. The SIDRA Intersection 8 model produces a range of outputs, the most useful of which are the Degree of Saturation (DOS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LOS) criteria. These performance measures can be interpreted using the following explanations:

DOS - the DOS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DOS approaches 1, it is usual to attempt to keep DOS to less than 0.9. When DOS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DOS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LOS - this is a comparative measure which provides an indication of the operating performance of an intersection as shown below:

Table 1: Intersection Performance Indicators (RMS)

Level of Service (LoS)	Average Delay per Vehicle (sec/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good Operation	Good Operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and space capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	42 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode or major treatment

A summary of the modelled results is provided below in **Table 2**. Reference should also be made to the detailed SIDRA outputs provided in **Appendix C** for individual movements.

Table 2: Existing, Proposed and Future Intersection Performances

Intersection	Control	Scenario	Period	Degree of Saturation	Average Delay (s)	Level of Service
Jewry St Britten Rd Ebsworth St	Roundabout	Base	AM	0.655	16.9	B
		Base+Dev		0.734	21.7	B
		2040*		1.168	187.2	F
		Base	PM	0.721	18.3	B
		Base+Dev		0.847	24.3	B
		2040*		1.278	277.8	F
Dampier St Wallamore Rd	Give-Way	Base	AM	0.361	14.9	B
		Base+Dev		0.423	19.2	B
		2040*		0.535	27.7	B
		Base	PM	0.428	14.7	B
		Base+Dev		0.543	21.7	B
		2040*		0.654	30.0	C
Gunnedah Rd Dampier St	Roundabout	Base	AM	0.348	13.4	A
		Base+Dev		0.390	13.4	A
		2040*		0.504	14.9	B
		Base	PM	0.315	13.7	A
		Base+Dev		0.364	14.1	A
		2040*		0.445	15.5	B

** 2040 volumes derived by adopting a background growth rate of 1.5% per annum.*

5.4.1 Base Case + Development Performance

It can be seen from **Table 2** that all intersections operate satisfactorily (with LoS A or B) under both the Base Case (2020) and Base Case Plus Development scenarios. The latter being the scenario that reflects the criteria for assessing impacts under current RMS Guidelines. That is, the EP&A Act as well as the RMS Guidelines require that a development need only be assessed for improvements that are required to support the development itself. This is a consequence

of the need to identify a nexus between development and any measures required to manage its associated impacts. As can be seen in Table 2, these scenarios are both satisfactory in terms of the network performance and projected impacts, such that the concept development is supportable on traffic grounds.

Specifically, the intersection of Jewry Street, Britten Road and Ebsworth Street recorded a minimal change to the intersection delay in the morning and evening peaks. The intersection remains at a level of service of 'B' in the morning and evening peaks during this scenario. The intersection of Dampier Street and Wallamore Road recorded an acceptable level of service of 'B' in the morning and evening peak periods, representing a small increase in average delay of 4.3 seconds and 7.0 seconds respectively. The intersection of Gunnedah Road and Dampier Street recorded a minimal change to the intersection delay in the morning and evening peaks, with the intersection remaining at a level of service 'A' during this scenario. In this regard, the impact of the development on the wider road network during the morning and evening network peak periods is considered acceptable with no external improvements required to support the proposed development scheme.

In summary, the Base Case Plus Development Scenario will operate satisfactorily with no road network improvements required.

This outcome deals with the development impacts as per standard practice based on RMS Guidelines. However, at Council's request and in the spirit of providing an input to Council and RMS in relation to their ongoing strategic planning responsibilities, further modelling has been undertaken as discussed in the following sections.

5.4.2 2040 Base Case Performance

The "2040 Base Case" scenario reflects traffic conditions in 2040 which will arise based on expected growth on the network generally. This 2040 scenario will include all developments in the locality that occur over the next 20 years, assuming a continued annual growth rate of 1.5% per annum. It also included growth in 'external' traffic on the main road network, relating to the wider region. That is, the 2040 Scenario includes development wherever it occurs, including the subject site. There is no doubt other planning proposals will emerge over the next 20 years and it is reasonable to assume that Council's strategic planning has adopted a land use scenario that takes some account of these factors.

Hence, it may be argued that the 2040 Scenario is not a Base Case as such, but a strategic scenario for more general consideration and adoption by Council. There is also a case to be made that it would include the impacts of the subject site, though this would no doubt depend upon the strategic land use inputs adopted in Council's 2040 Strategic Plan.

The 2040 Base Case model constructed for the purpose of this assessment therefore provides an indication only of traffic flows in 20 years' time, assuming 1.5% growth per annum on all existing movements at all intersections examined. The results are shown in Table 2.

It is evident that the intersection of Dampier Street and Wallamore Road recorded a minimal change to the intersection delay in the morning peak period and maintains a level of service 'B'. The evening peak period showed a level of service 'C', representing a moderate increase in average delay. The intersection of Gunnedah Road and Dampier Street recorded an acceptable level of service of 'B' in the morning and evening peak periods representing a small increase in average delay of 1.5 seconds and 1.8 seconds respectively, with spare capacity in both peaks.

In summary, the intersections of Dampier Street/Wallamore Road and Gunnedah Road/Dampier Street will experience small increases to the average delay during the morning and evening peak periods, however, it will still provide spare capacity. The intersection of Jewry Street, Britten Road and Ebsworth Street is the only intersection to experience a significant increase in average delays during the morning and evening peak periods in 2040.

This outcome reflects conditions arising from 20 years of 'background' traffic growth at a rate of 1.5% per annum, which is a cumulative increase of 35% on all movements at all intersections. These are increases that are likely to occur irrespective of the proposed development and the need for improvements is the responsibility of Council and RMS in addressing their respective strategic planning responsibilities.

For example, in relation to the intersection of Jewry Street, Britten Road and Ebsworth Street, it reflects a total increase in throughput from 2,258 veh/hr currently to 3,041 veh/hr during the more critical PM peak period. The results reflect increased delays associated with minor movements and it is expected that infrastructure changes to accommodate this background growth would be significant. The improvements may include upgrading the intersection to a signalised intersection or a metered roundabout for the major legs. This is a matter for Council

or RMS to consider in their future strategic planning and assumptions that this background growth would hold in 2040.

5.4.3 Sensitivity Testing - *2040 Base Case Plus Development Performance*

As discussed above, the development impacts are expected to be included in the 2040 Base Case outlined above, which accommodates a substantial (35% increase in network traffic volumes that are orders of magnitude above the subject development site generation. That is, this scenario as requested by Council incorporates an element of 'double dipping' of the development impacts.

Nevertheless, this scenario has been constructed in order to facilitate Council's request. The results are also shown in Table 2 and show that the additional traffic volumes generated by the subject development represent a negligible incremental increase in delays and able to be accommodated by existing intersections.

The notable exception remains the critical intersection of Jewry Street, Britten Road and Ebsworth Street. In this regard, the proposed development is expected to generate an additional 166 veh/hr through this intersection in the evening as shown in Figure 7 and Figure 8. This represents approximately 5.4% of the 3,041 veh/hr that will arise at this intersection without the development. That is, infrastructure requirements under this scenario are fundamentally determined by strategic network volume increases over 20 years, not by the subject development.

5.4.4 Summary on Network Performance

In summary, the surrounding road network will experience small increases to the average delay during morning and evening peak periods, however, will still provide spare capacity. Therefore, no external intersections improvements are considered necessary to accommodate the proposed development scheme.

5.4.5 Future Road Network

It is noted that the Jewry Street extension project is set to commence in the next 5 years, as stated by Council. The project involves the construction of a bypass road that will link Wallamore Road to a new roundabout at the intersection of Jewry Street and Dampier Street.

The only traffic movements redistributed by the proposed bypass link is vehicles arriving/departing the site from/to Wallamore Road and vehicles arriving/departing the site from/to Jewry Street. Journey to work data suggests that commuter vehicle movements to/from Wallamore Road is minimal and contribute to only 6.7% (24 veh/hr in AM and 26 veh/hr in PM) of all vehicle movements generated by the site (in and out), thus a redirection through the proposed Jewry Street/Dampier Street roundabout should have negligible impacts to its operation. Commuters travelling to/from the Tamworth CBD, North Tamworth and East Tamworth equate to 42.4% or 149 veh/hr in AM and 166 veh/hr in PM. The majority of AM vehicles will be making a left turn onto Dampier Street, thus should have a negligible impact to its operation. PM outbound vehicles will be required to make a right turn onto Jewry Street and will be required to yield to westbound vehicles. Whilst it is difficult at this stage to determine the exact volume of westbound vehicles movements, it is noted that outbound vehicles equate to 133 veh/hr or 1 vehicle movement every 30 seconds. This volume should have a moderate impact, noting that left turn movements from Jewry Street onto Dampier Street will likely be the dominant movement.

In addition to the above, Council has advised that "*access to/from the proposed site onto this link road would be possible but is likely to result in an expensive intersection treatment and will require additional land to accommodate the intersection geometry.*" As such, Council has suggested that a proposed vehicle access be located between Jewry Street and Showground Road as well as a secondary access via Wallamore Road. The Wallamore vehicle driveway access is expected to accommodate a limited number of vehicle trips from Wallamore Road, however, will serve as a secondary access during emergencies, maintenance, construction and convenience for some workers/visitors. In light of the above, the vehicle access point will be proposed from Dampier Street (between Jewry Street and Showground Road) and will be assessed accordingly.

6. ACCESS DESIGN ASPECTS

6.1 Site Vehicular Access

6.1.1 Main Intersection

The proposed development proposes a single lane roundabout intersection to Dampier Street in accordance with a Category 5 access in Table 3.2 of AS 2890.1 (2004). Accordingly, the entry and exit will be designed as if for a public roadway, with all necessary traffic control devices and intersection geometric design requirements. The intersection will link Dampier Street to the internal roadway, including connections to individual tenancies, parking spaces and loading bays. It is expected that the intersection will service light and heavy vehicles, therefore the proposed intersection will be designed in accordance AS 2890.2 (2018) to accommodate the largest vehicle accessing the site (to be confirmed at DA stage). It is noted that the proposed intersection will be designed (at a later DA stage) in accordance with the Austroads Guidelines, Road and Maritime Services (RMS) requirements, and relevant Australian Standards as required. A preliminary layout has been derived for the intersection based on available traffic survey data (count data at Wallamore Road intersection) and expected trip distributions. In summary, the proposed intersection will comprise of a single lane roundabout between Jewry Street and Showground Road and the proposed location is presented in **Figure 9**.

It should be noted that a channelised right turn/auxiliary left turn intersection treatment was explored, however the right turn movement from the site onto Dampier Street experienced significant average delays, largely due to Dampier Street traffic movements and the projected distribution of right turn movements from the site. Thus, a higher order intersection treatment was investigated to ensure all vehicle movements have a satisfactorily level of service.

It is emphasised that the detailed design of the proposed intersection will be undertaken by a suitably qualified civil engineer at future development application stage/s, at which time, the design will be optimised to meet the relevant guidelines and standards.

6.1.2 Secondary Access Driveway

The proposed development will also provide a secondary access driveway to Wallamore Road. The access driveway will link Wallamore Road to the internal roadway, including connections to individual tenancies, parking spaces and loading bays. It is expected that the access will service light and heavy vehicles, therefore the proposed access will be designed in accordance AS 2890.2 (2018) to accommodate the largest vehicle accessing the site (to be confirmed at DA stage). As mentioned in Section 5.2, the secondary access is expected to accommodate a limited number of vehicle trips from Wallamore Road, however, will serve as a secondary access during emergencies, maintenance, construction and convenience for some workers/visitors.

6.2 Roundabout Intersection Performance

In order to assess the traffic impacts of the proposed roundabout intersection to Dampier Street, traffic count data was used from the intersection of Dampier Street and Wallamore. SIDRA Intersection 8 model software was then used to determine the performance of the proposed intersection with trips distributed onto the surrounding road network as described in Section 5.3. The results are shown in **Table 3** below:

Table 3: Proposed Intersection Performance

Intersection	Control	Scenario	Period	Degree of Saturation	Average Delay (s)	Level of Service
Dampier St and Proposed Roundabout	Roundabout	Base + Dev	PM	0.613	12.8	A
		2040 Base +DEV*		0.810	15.2	B

** 2040 volumes derived by adopting a background growth rate of 1.5% per annum.*

It can be seen from **Table 3** that the proposed roundabout intersection to Dampier Street operates satisfactorily, with acceptable delays and spare capacity with a level of service of 'A' in the PM peak traffic generation period for the "Base Case Plus Development" and a level of service 'B' for the "2040 Base Case Plus Development" scenarios. Queuing along the northern leg extends approximately 44 metres during the "Base Case Plus Development" scenario and 104 metres during the "2040 Base Case Plus Development". The proposed

intersection is located approximately 135 metres south of the proposed Jewry Street/Dampier Street roundabout intersection, thus impacts from the proposed intersection will be minimal. Queuing along the southern leg extends approximately 36 metres during the "Base Case Plus Development" scenario and 66 metres during the "2040 Base Case Plus Development". The proposed intersection is located approximately 70 metres north of Showground Road, thus impacts from the proposed intersection will be moderate.

In summary, the proposed roundabout intersection is considered an appropriate and safe access treatment for the future development.

6.3 Sight Distance

Sight distances at the proposed accesses will be provided in accordance with AS 2890.2 (2018) and Austroad Guidelines as appropriate. It should be noted that a detailed sight distance assessment can be undertaken at later development application stage/s, however the proposed locations appears acceptable noting the flat terrain and good visibility along both frontages. It is noted that appropriate 'no stopping' restrictions may need to be installed adjacent to the proposed intersection and driveway to ensure sight distances are provided for drivers exiting the site. Again, this will be assessed in greater detail at future development application stage/s.



Figure 9: Proposed Access Location on Dampier Street

(Source: SIX Maps)

7. CONCLUSIONS

The following matters are noteworthy:

- The Planning Proposal seeks approval to rezone approximately nine (9) hectares of land to part B5-Business Development and part IN1- General Industrial land under the Tamworth Regional Local Environmental Plan 2010 for the site at 55 Dampier Street and 21 & 72 Wallamore Road, Taminda. A concept scheme has been assessed which is representative of the site being developed to its full potential with these proposed changes, comprising 35,410m^2 GFA of industrial units, 14,915m^2 GFA of retail/business units and a 77,165m^2 solar farm.
- In accordance with the Roads and Maritime Services Technical Direction (TDT 2013/04a), the concept scheme will generate 352 vehicle trips per hour in the AM peak period and 393 vehicle trips per hour in the PM peak period. The solar farm is expected to generate negligible trips during the AM and PM peaks (1-2 vehicle trips related to maintenance), thus was not included in this assessment.
- Journey to work data was interrogated to determine the approximate distribution of traffic onto the surrounding road network. The analysis found that 42.4% arrived/departed towards the north via Jewry Street, 43% arrived departed the site via Gunnedah Road (east), 7.9% arrived/departed the site via Gunnedah Road (west) and 6.7% arrived/departed the site via Wallamore Road.
- Traffic generation arising from the proposal has been assessed for various scenarios as discussed in detail in Section 5.3. In terms of the overall network performance arising from the proposed development, all intersections operate satisfactorily (with LoS A or B) under both the Base Case (2020) and Base Case Plus Development scenarios.
- In addition, at the request of Council sensitivity testing was conducted to provide an indication of the traffic flows near the site in 20 years' time, based on an accumulated 35% increase in volumes across all intersections examined and for all movements. The 2040 Base Case Scenario demonstrated small to moderate increases in average delay at the intersections of Dampier Street/Wallamore Road and Gunnedah Road/Dampier Street during both peaks period. The intersection of Jewry Street, Britten Road and Ebsworth Street is the only intersection to experience a significant increase in average delays during the

AM and PM peak periods in 2040. Intersection upgrades will need to be explored to accommodate the additional traffic movements (35% increase on all legs as per Council's advice) and this is a matter for Council or RMS to considered in their future strategic plans, noting that these improvements will be required even absent the proposed development.

- The "2040 Base Case Plus Development" Scenario is consider to represent an element of 'double dipping' of the development impacts of the subject site, given the 35% increase in traffic loadings under the 2040 Base Case Scenario, which would include impacts of numerous development proposals, as well as regional traffic growth more generally. This results in additional delays which are manageable, noting that the development itself represents only 5.4% of total network traffic volumes. This underscores the need for Council's ongoing strategic assessments based on cumulative, long term land use and road infrastructure scenarios.
- The development proposes a single lane roundabout intersection to Dampier Street and a secondary access driveway to Wallamore Road to facilitate traffic movements to and from the site. The proposed roundabout operates at a level of service 'A' in the PM peak traffic generation period for the "Base Case Plus Development" and a level of service 'B' for the "2040 Base Case Plus Development" scenarios. The detailed design of the proposed roundabout intersection will be undertaken by a suitably qualified civil engineer at future development application stage/s, at which time, the design will be optimised to meet the relevant guidelines and standards.
- The proposed development traffic generation or access location is not expected to have any significant impacts on the proposed Jewry Street bypass link for the reasons discussed in Section 5.4.4 and 6.2.

This traffic assessment therefore demonstrates that the subject application is supportable on traffic planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

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APPENDIX A

Photographic Record



Jewry Street/Britten Road/Ebsworth Street – View looking North



Jewry Street/Britten Road/Ebsworth Street – View looking East



Dampier Street/Wallamore Road – View looking South



Dampier Street/Wallamore Road – View looking West



Gunnedah Road/Dampier Street – View looking West



Gunnedah Road/Dampier Street – View looking West



Approximate Location of Access – View looking South



Approximate Location of Access – View looking North

APPENDIX B

Concept Plans

Drawing Register

No.	Title	Rev
TP00.01	EXISTING SITE & DEMOLITION PLAN	A
TP00.02	SITE CONSTRAINTS PLAN	A
TP00.03	SITE PLAN	A
TP03.01	SECTIONS	A

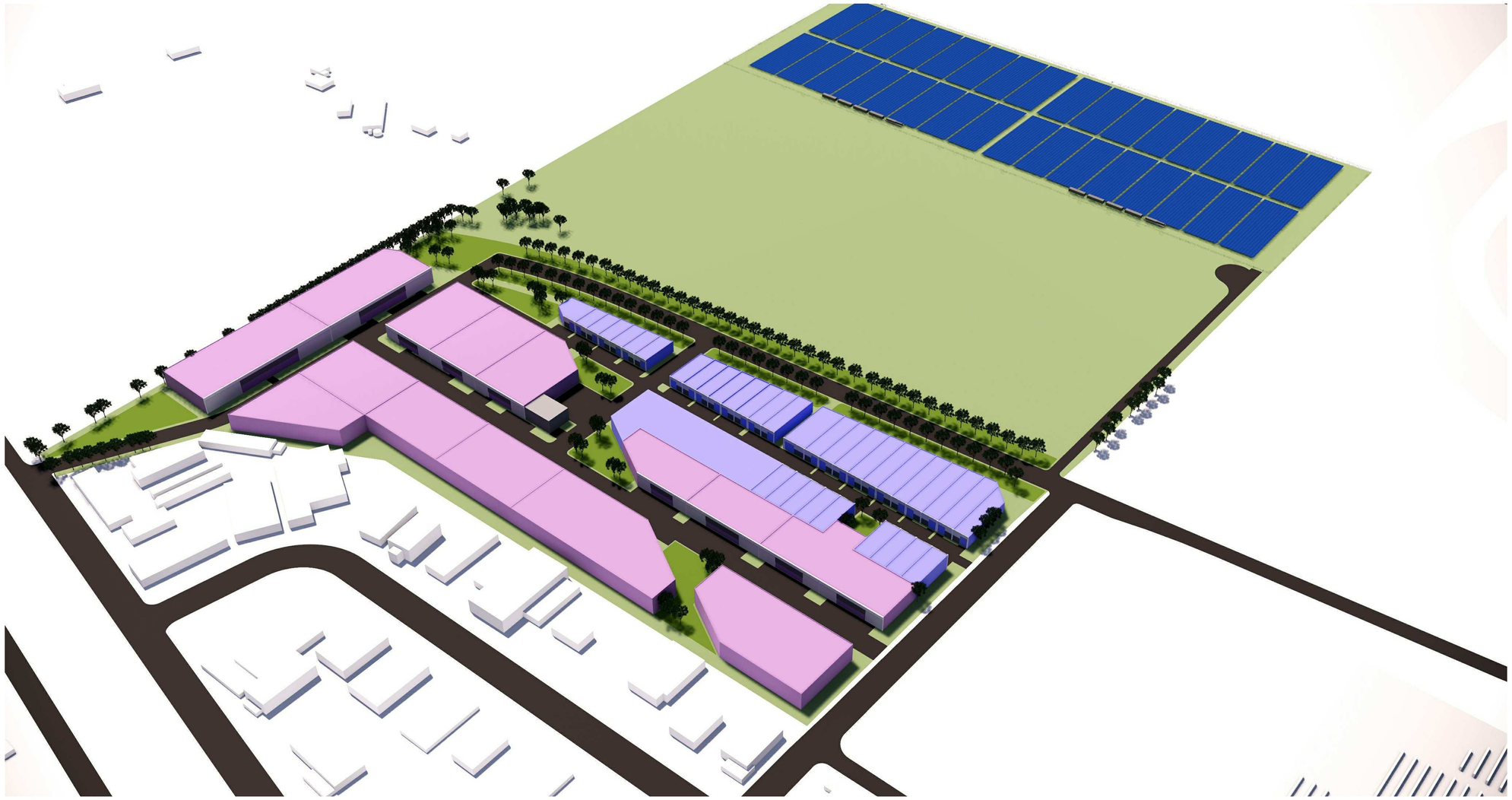
TAMINDA SOLAR FARM AND INDUSTRIAL PRECINCT DEVELOPMENT SUMMARY

SITE AREAS

NAME	AREA	
Solar Farm	~~77,165~~ m²	
IN1 Zone	65,684 m²	Excl. Pt Bypass Easement
B5 Zone	24,114 m²	Excl. Pt Bypass Easement

GFA AREAS

NAME	AREA	FSR
Industrial Units (IN1 Land Zone)	35,410 m² GFA	0.54:1 FSR
Retail/Business Sheds (B5 Land Zone)	14,915 m² GFA	0.62:1 FSR



Taminda Solar Farm & Industrial Precinct

Project
55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

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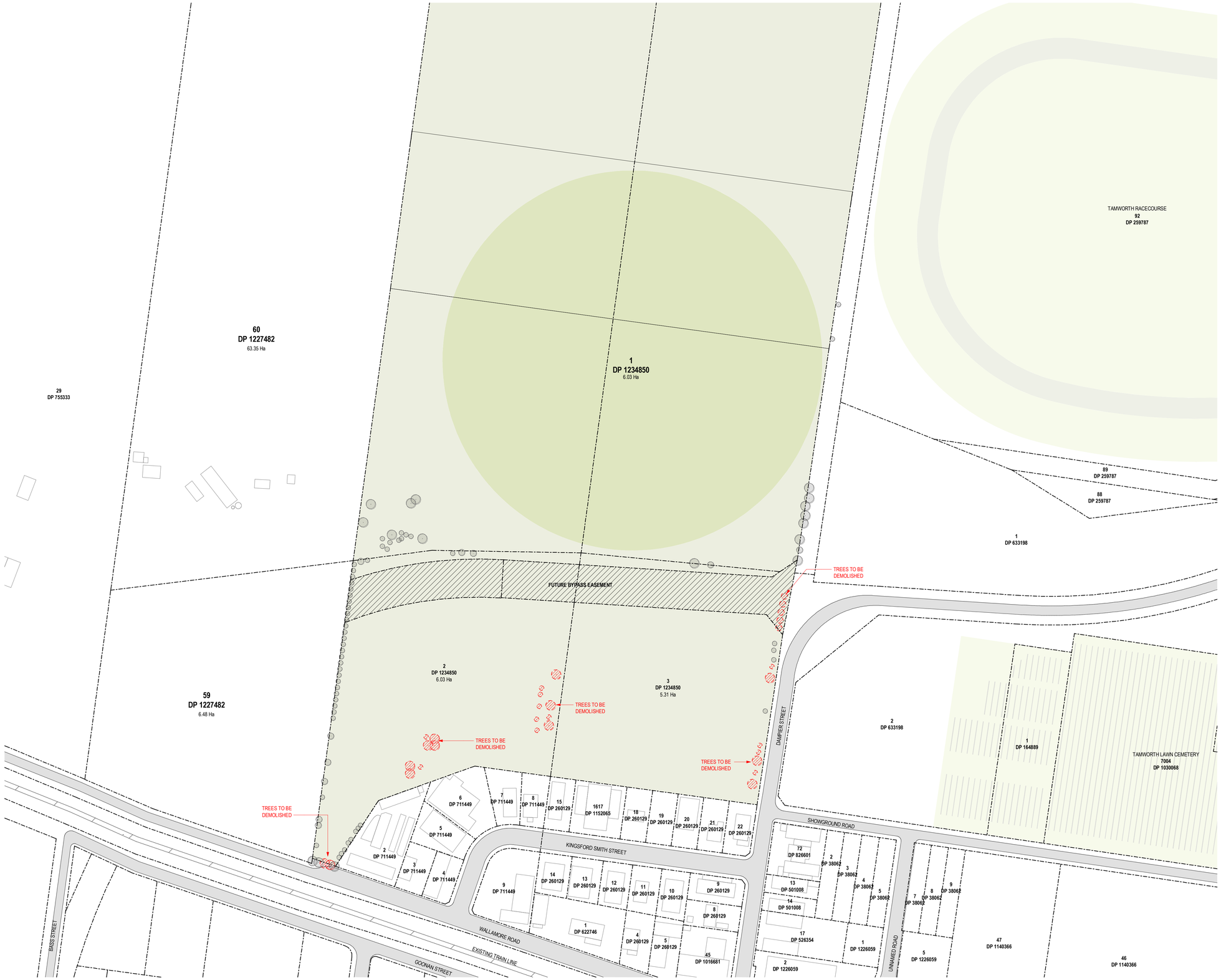
Client
Chan Abbey Holdings Pty Ltd

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PRELIMINARY

Project No	Date
218133	**13.11.18**
Drawing No.	Revision
TP00.00	**B**

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-	20.12.18	PLANNING PROPOSAL	AK
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Demolition Notes

Contractor to confirm existing conditions on site.

Contractor to demolish existing structure/remove all materials. Cut and seal services as required in accordance with local authority requirements and a.s. codes for that trade u.n.o

Protection of works as required by local authorities

Cleaning of site to epa requirements by contractor

Preliminary
Precautionary measures to be undertaken as described in AS.2601-2001. A "hazardous substances management plan" is to be implemented before and during demolition if the preliminary investigation of the building identifies any hazardous materials contained therein. These materials will be removed as per the guidelines of the responsible authority and clearance certificate obtained before demolition commences

Safety fencing
Security fences shall be provided to the street boundary of the demolition site and any additional precautionary measures, taken as may be necessary to prevent unauthorised entry to the site, where the demolition site adjoins a public thoroughfare the common boundary between them shall be fenced for its full length with a hoarding unless the least horizontal distance between the common boundary and the nearest part of the structure is greater than twice the height of the structure. The fencing shall be the equivalent of the chain wire as specified in AS.1725

Notices lettered in accordance with AS.1319 and displaying the words "warning demolition in progress", or similar, shall be fixed to the fencing at appropriate places to warn the public. Provision shall be made for ready access to the site by emergency services personnel in the event of fire or accident

Demolition work
Structures shall be demolished in the reverse order to that of their construction. The order of demolition for buildings shall be progressive, storey by storey, having proper regard to the type of construction. No part of any structure shall be left unsupported or unattended in such a condition that it may collapse or become dangerous. Precautions shall be taken to ensure that the stability of all parts of the structure, and the safety of persons on and outside the site, will be maintained in the event of sudden and severe weather changes.

Walls on the boundaries are to be demolished in a safe and workmanship like manner. Walls shall not be laterally loaded by accumulated debris or rubble, to the extent that they are in danger of collapse, allowable loading of the suspended floors shall be determined by an independent structural engineer.

Dust control
The techniques adopted for stripping out and for demolition shall minimise the release of dust into the atmosphere. Before the commencement of stripping or demolition in an area of a structure, any existing accumulations of dust in that area shall be collected, placed in suitable containers and removed. Selection of an appropriate collection technique, such as vacuuming or hosing down, shall take due account of the nature of the dust and the type of hazard it presents. Dust generated during stripping, or during the breaking down of the building fabric to removable sized pieces, shall be kept damp until it is removed from the site or can be otherwise contained. The use of excess water for this purposed shall be avoided.

Noise control
Noise shall be minimised as far as practicable, by the selection of appropriate methods and equipment, and by the use of silencing devices wherever practicable to epa/code requirements.

Note:
1. Attention is drawn to recommendations in AS.2436
2. Hours of operating equipment may be restricted by regulatory authority

Fire services
Where a fire hydrant service or a fire hose reel service is provided in a building, it shall be available at all times during the demolition of the building, so that all remaining storeys except the two uppermost storeys, are serviced. Access to the fire protection services, including any booster fitting, shall be maintained at all times. If a sprinkler system is installed in a building to be demolished, it shall be maintained in an operable condition at each storey below the two uppermost unstripped storeys.

Suitable portable fire extinguishers shall be kept at all times in working area and are not protected by other fire services, and maintained in an operable condition.

Adjoining properties
Safe access to and egress from adjoining buildings shall be maintained at all times for the duration of the demolition work. No demolition activity shall cause damage to or adversely affect the structural integrity of adjoining buildings. The effects of vibration and conversion on adjoining buildings and their occupants shall be minimised by selecting demolition methods and equipment appropriate to the circumstances. Where any surface of an adjoining building is exposed by demolition, the need for weatherproofing the exposed surface shall be investigated and temporary or permanent protection provided as appropriate. Precautions shall be taken to minimise the spreading of mud and debris by vehicles leaving the site.

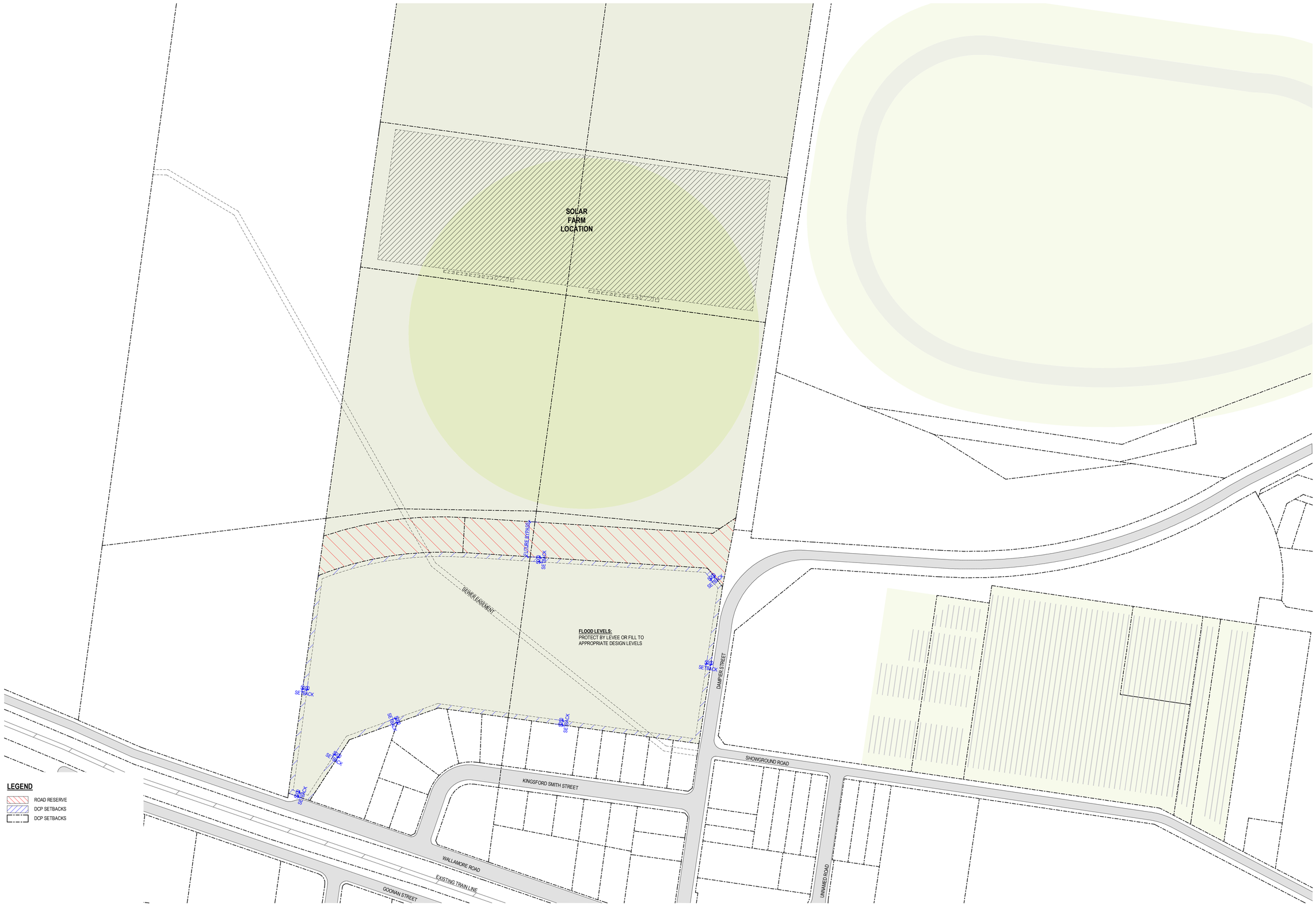
Project: **Taminda Solar Farm & Industrial Precinct**
55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

Drawing: **EXISTING SITE & DEMOLITION PLAN**

Project No. 218133 | Date 08.11.18 | Author AK | Scale: @ A1 1 : 2000 | Drawing No. TP00.01 A

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Project: **Taminda Solar Farm & Industrial Precinct**
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Taminda, NSW 2340

Drawing: **SITE CONSTRAINTS PLAN**

Project No: **218133**

Date: **11/22/18**

Author: **AK**

Scale: @ A1: **1 : 2000**

Drawing No.: **TP00.02 A**

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Drawing: **SITE PLAN**

Project No: **218133** Date: **13.11.18** Author: **AK** Scale: @ A1 **1 : 2000** Drawing No.: **TP00.03 A**

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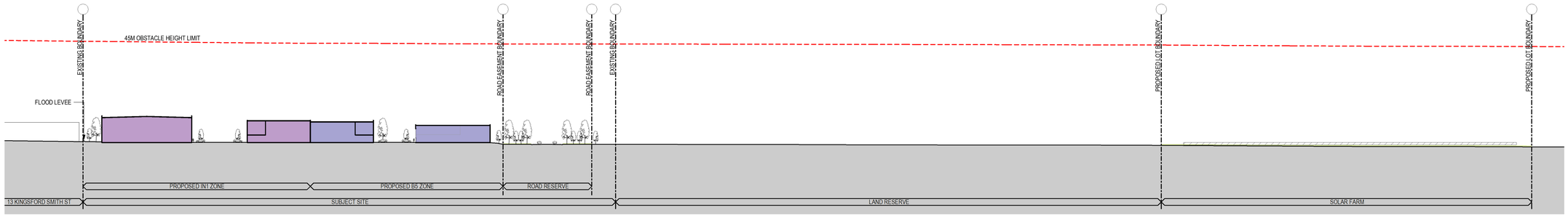
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55 Dampier St & 72 Wallamore Rd,
Taminda, NSW 2340

Drawing: **GROUND FLOOR PLAN** | Project No: **218133** | Date: **11/13/18** | Author: **AK** | Scale: @ A1 **1 : 1000** | Drawing No.: **TP01.01 B**

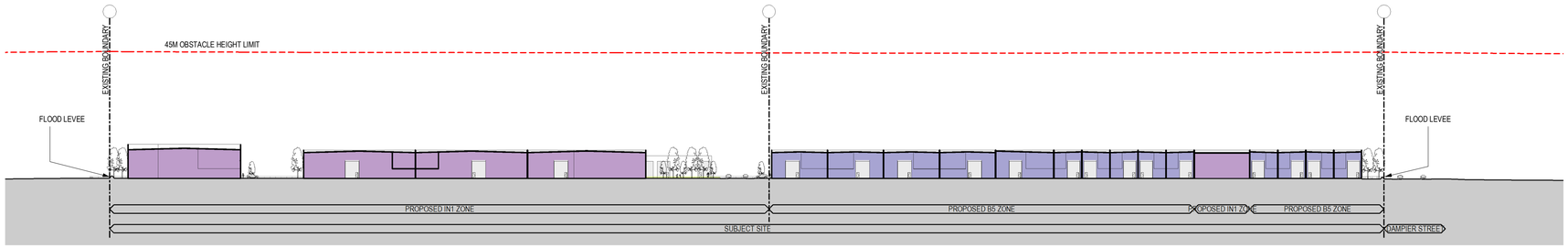
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Section 01



Section 02

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Drawing **SECTIONS**

Project No **218133**

Date **13.11.18**

Author **AK**

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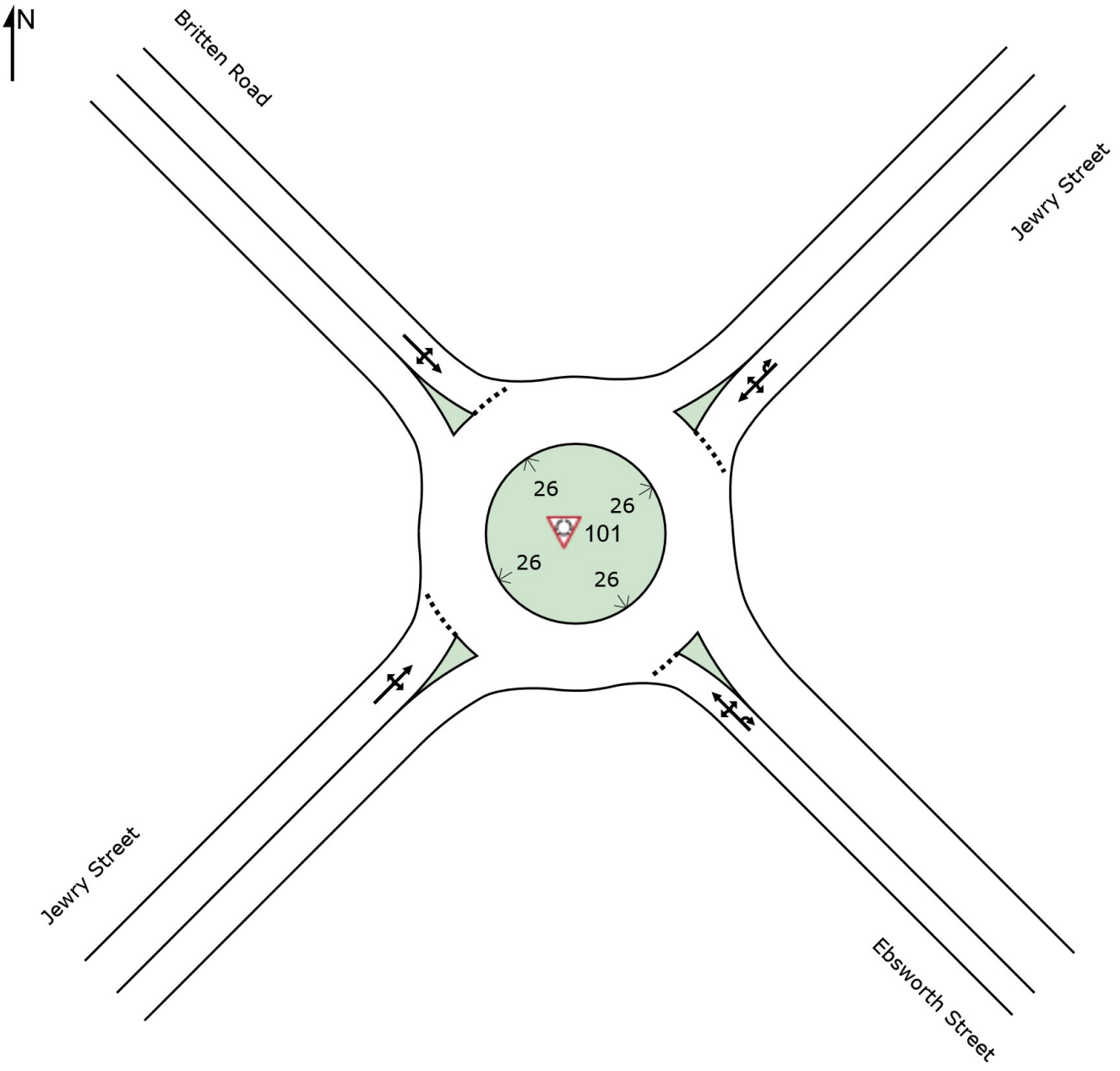
APPENDIX C

SIDRA Outputs

SITE LAYOUT

Site: 101 [Jewry Street / Britten Road / Ebsworth Street Intersection - Exist AM]

Jewry Street / Britten Road / Ebsworth Street Intersection - Exist AM
Site Category: (None)
Roundabout



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MOVEMENT SUMMARY

Site: 101 [Jewry Street / Britten Road / Ebsworth Street Intersection - Exist AM]

Jewry Street / Britten Road / Ebsworth Street Intersection - Exist AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebsworth Street												
21	L2	61	12.1	0.655	10.5	LOS A	7.1	52.2	0.87	1.03	1.15	44.0
22	T1	3	33.3	0.655	11.1	LOS A	7.1	52.2	0.87	1.03	1.15	43.2
23	R2	516	5.3	0.655	15.1	LOS B	7.1	52.2	0.87	1.03	1.15	48.4
23u	U	1	0.0	0.655	16.9	LOS B	7.1	52.2	0.87	1.03	1.15	43.3
Approach		581	6.2	0.655	14.6	LOS B	7.1	52.2	0.87	1.03	1.15	48.0
NorthEast: Jewry Street												
24	L2	437	2.9	0.634	3.9	LOS A	5.4	39.4	0.25	0.40	0.25	55.8
25	T1	552	7.6	0.634	4.0	LOS A	5.4	39.4	0.25	0.40	0.25	57.3
26	R2	3	0.0	0.634	9.2	LOS A	5.4	39.4	0.25	0.40	0.25	57.8
26u	U	1	0.0	0.634	11.5	LOS A	5.4	39.4	0.25	0.40	0.25	58.9
Approach		993	5.5	0.634	4.0	LOS A	5.4	39.4	0.25	0.40	0.25	56.7
NorthWest: Britten Road												
27	L2	13	8.3	0.037	9.6	LOS A	0.2	1.8	0.83	0.72	0.83	49.6
28	T1	4	0.0	0.037	9.1	LOS A	0.2	1.8	0.83	0.72	0.83	45.4
29	R2	3	33.3	0.037	15.5	LOS B	0.2	1.8	0.83	0.72	0.83	47.6
Approach		20	10.5	0.037	10.5	LOS A	0.2	1.8	0.83	0.72	0.83	48.6
SouthWest: Jewry Street												
30	L2	5	20.0	0.542	6.9	LOS A	4.1	30.9	0.73	0.70	0.80	52.6
31	T1	479	8.6	0.542	6.7	LOS A	4.1	30.9	0.73	0.70	0.80	55.1
32	R2	38	11.1	0.542	12.1	LOS A	4.1	30.9	0.73	0.70	0.80	53.0
Approach		522	8.9	0.542	7.1	LOS A	4.1	30.9	0.73	0.70	0.80	55.0
All Vehicles		2116	6.6	0.655	7.7	LOS A	7.1	52.2	0.55	0.65	0.64	53.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Jewry Street / Britten Road / Ebsworth Street Intersection - Exist+DEV AM]

Jewry Street / Britten Road / Ebsworth Street Intersection - Exist+DEV AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebsworth Street												
21	L2	61	12.1	0.734	15.4	LOS B	9.6	71.1	0.97	1.22	1.51	41.4
22	T1	3	33.3	0.734	16.3	LOS B	9.6	71.1	0.97	1.22	1.51	40.9
23	R2	516	5.3	0.734	20.0	LOS B	9.6	71.1	0.97	1.22	1.51	46.1
23u	U	1	0.0	0.734	21.7	LOS B	9.6	71.1	0.97	1.22	1.51	40.5
Approach		581	6.2	0.734	19.5	LOS B	9.6	71.1	0.97	1.22	1.51	45.7
NorthEast: Jewry Street												
24	L2	437	2.9	0.709	4.0	LOS A	7.2	52.6	0.30	0.40	0.30	55.7
25	T1	677	6.2	0.709	4.0	LOS A	7.2	52.6	0.30	0.40	0.30	57.2
26	R2	3	0.0	0.709	9.3	LOS A	7.2	52.6	0.30	0.40	0.30	57.6
26u	U	1	0.0	0.709	11.5	LOS A	7.2	52.6	0.30	0.40	0.30	58.8
Approach		1118	4.9	0.709	4.0	LOS A	7.2	52.6	0.30	0.40	0.30	56.6
NorthWest: Britten Road												
27	L2	13	8.3	0.039	10.2	LOS A	0.3	1.9	0.86	0.73	0.86	49.4
28	T1	4	0.0	0.039	9.7	LOS A	0.3	1.9	0.86	0.73	0.86	45.1
29	R2	3	33.3	0.039	16.2	LOS B	0.3	1.9	0.86	0.73	0.86	47.3
Approach		20	10.5	0.039	11.0	LOS A	0.3	1.9	0.86	0.73	0.86	48.3
SouthWest: Jewry Street												
30	L2	5	20.0	0.582	7.3	LOS A	4.8	36.1	0.78	0.75	0.87	52.4
31	T1	511	8.0	0.582	7.0	LOS A	4.8	36.1	0.78	0.75	0.87	55.0
32	R2	38	11.1	0.582	12.4	LOS A	4.8	36.1	0.78	0.75	0.87	52.8
Approach		554	8.4	0.582	7.4	LOS A	4.8	36.1	0.78	0.75	0.87	54.8
All Vehicles		2273	6.1	0.734	8.9	LOS A	9.6	71.1	0.59	0.70	0.75	53.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Jewry Street / Britten Road / Ebsworth Street Intersection - 2040 AM]

Jewry Street / Britten Road / Ebsworth Street Intersection - 2040 AM
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 20 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebsworth Street												
21	L2	82	12.1	1.168	180.9	LOS F[11]	93.0	685.3	1.00	4.62	8.74	13.8
22	T1	4	33.3	1.168	181.8	LOS F[11]	93.0	685.3	1.00	4.62	8.74	14.9
23	R2	695	5.3	1.168	185.5	LOS F[11]	93.0	685.3	1.00	4.62	8.74	17.5
23u	U	1	0.0	1.168	187.2	LOS F[11]	93.0	685.3	1.00	4.62	8.74	12.7
Approach		783	6.2	1.168	185.0	LOS F[11]	93.0	685.3	1.00	4.62	8.74	17.1
NorthEast: Jewry Street												
24	L2	588	2.9	0.868	4.4	LOS A	16.9	123.6	0.61	0.44	0.61	54.5
25	T1	743	7.6	0.868	4.5	LOS A	16.9	123.6	0.61	0.44	0.61	56.1
26	R2	4	0.0	0.868	9.7	LOS A	16.9	123.6	0.61	0.44	0.61	56.6
26u	U	1	0.0	0.868	11.9	LOS A	16.9	123.6	0.61	0.44	0.61	57.8
Approach		1337	5.5	0.868	4.4	LOS A	16.9	123.6	0.61	0.44	0.61	55.4
NorthWest: Britten Road												
27	L2	17	8.3	0.082	17.4	LOS B	0.6	4.5	0.98	0.86	0.98	46.3
28	T1	6	0.0	0.082	16.7	LOS B	0.6	4.5	0.98	0.86	0.98	41.5
29	R2	4	33.3	0.082	23.9	LOS B	0.6	4.5	0.98	0.86	0.98	43.7
Approach		27	10.5	0.082	18.3	LOS B	0.6	4.5	0.98	0.86	0.98	45.1
SouthWest: Jewry Street												
30	L2	7	20.0	0.820	12.8	LOS A	11.0	82.7	0.99	1.15	1.43	50.0
31	T1	645	8.6	0.820	12.5	LOS A	11.0	82.7	0.99	1.15	1.43	52.7
32	R2	51	11.1	0.820	17.9	LOS B	11.0	82.7	0.99	1.15	1.43	49.7
Approach		703	8.9	0.820	12.9	LOS A	11.0	82.7	0.99	1.15	1.43	52.5
All Vehicles		2850	6.6	1.168	56.2	LOS D[11]	93.0	685.3	0.82	1.77	3.05	34.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

MOVEMENT SUMMARY

Site: 101 [Jewry Street / Britten Road Intersection / Ebsworth Street - Exist PM]

Jewry Street / Britten Road Intersection / Ebsworth Street - Exist PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebsworth Street												
21	L2	59	5.4	0.721	11.8	LOS A	9.2	65.6	0.92	1.10	1.31	43.2
22	T1	3	0.0	0.721	11.4	LOS A	9.2	65.6	0.92	1.10	1.31	42.5
23	R2	591	2.3	0.721	16.7	LOS B	9.2	65.6	0.92	1.10	1.31	47.7
Approach		653	2.6	0.721	16.2	LOS B	9.2	65.6	0.92	1.10	1.31	47.4
NorthEast: Jewry Street												
24	L2	415	0.8	0.625	3.9	LOS A	5.6	41.2	0.28	0.42	0.28	55.7
25	T1	526	10.2	0.625	4.0	LOS A	5.6	41.2	0.28	0.42	0.28	57.1
26	R2	1	0.0	0.625	9.2	LOS A	5.6	41.2	0.28	0.42	0.28	57.6
26u	U	24	0.0	0.625	11.5	LOS A	5.6	41.2	0.28	0.42	0.28	58.7
Approach		966	5.9	0.625	4.2	LOS A	5.6	41.2	0.28	0.42	0.28	56.6
NorthWest: Britten Road												
27	L2	5	0.0	0.024	13.5	LOS A	0.2	1.2	0.93	0.73	0.93	48.1
28	T1	4	0.0	0.024	13.3	LOS A	0.2	1.2	0.93	0.73	0.93	43.5
29	R2	1	0.0	0.024	18.3	LOS B	0.2	1.2	0.93	0.73	0.93	46.5
Approach		11	0.0	0.024	13.9	LOS A	0.2	1.2	0.93	0.73	0.93	46.3
SouthWest: Jewry Street												
30	L2	1	0.0	0.688	8.9	LOS A	7.1	50.8	0.89	0.97	1.10	52.4
31	T1	581	2.9	0.688	9.1	LOS A	7.1	50.8	0.89	0.97	1.10	54.5
32	R2	46	9.1	0.688	14.5	LOS B	7.1	50.8	0.89	0.97	1.10	52.2
Approach		628	3.4	0.688	9.5	LOS A	7.1	50.8	0.89	0.97	1.10	54.4
All Vehicles		2258	4.2	0.721	9.2	LOS A	9.2	65.6	0.64	0.77	0.81	53.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Jewry Street / Britten Road Intersection / Ebsworth Street - Exist+DEV PM]

Jewry Street / Britten Road Intersection / Ebsworth Street -Exist+DEV PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebsworth Street												
21	L2	59	5.4	0.746	13.4	LOS A	10.1	72.3	0.95	1.16	1.43	42.4
22	T1	3	0.0	0.746	12.9	LOS A	10.1	72.3	0.95	1.16	1.43	41.8
23	R2	591	2.3	0.746	18.2	LOS B	10.1	72.3	0.95	1.16	1.43	47.0
Approach		653	2.6	0.746	17.7	LOS B	10.1	72.3	0.95	1.16	1.43	46.6
NorthEast: Jewry Street												
24	L2	415	0.8	0.648	3.9	LOS A	6.3	46.2	0.31	0.41	0.31	55.6
25	T1	561	9.6	0.648	4.0	LOS A	6.3	46.2	0.31	0.41	0.31	57.0
26	R2	1	0.0	0.648	9.3	LOS A	6.3	46.2	0.31	0.41	0.31	57.5
26u	U	24	0.0	0.648	11.5	LOS A	6.3	46.2	0.31	0.41	0.31	58.7
Approach		1001	5.7	0.648	4.2	LOS A	6.3	46.2	0.31	0.41	0.31	56.5
NorthWest: Britten Road												
27	L2	5	0.0	0.034	19.5	LOS B	0.3	1.8	1.00	0.79	1.00	45.7
28	T1	4	0.0	0.034	19.2	LOS B	0.3	1.8	1.00	0.79	1.00	40.7
29	R2	1	0.0	0.034	24.3	LOS B	0.3	1.8	1.00	0.79	1.00	43.6
Approach		11	0.0	0.034	19.9	LOS B	0.3	1.8	1.00	0.79	1.00	43.7
SouthWest: Jewry Street												
30	L2	1	0.0	0.847	13.4	LOS A	12.7	90.9	1.00	1.18	1.53	49.8
31	T1	721	2.3	0.847	13.5	LOS A	12.7	90.9	1.00	1.18	1.53	52.2
32	R2	46	9.1	0.847	19.0	LOS B	12.7	90.9	1.00	1.18	1.53	49.1
Approach		768	2.7	0.847	13.8	LOS A	12.7	90.9	1.00	1.18	1.53	52.1
All Vehicles		2433	3.9	0.847	10.9	LOS A	12.7	90.9	0.70	0.86	1.00	52.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Jewry Street / Britten Road Intersection / Ebsworth Street - 2040 PM]

Jewry Street / Britten Road Intersection / Ebsworth Street - 2040 PM
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 20 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Ebsworth Street												
21	L2	79	5.4	1.278	273.0	LOS F[11]	140.6	1006.2	1.00	6.07	11.89	10.1
22	T1	4	0.0	1.278	272.5	LOS F[11]	140.6	1006.2	1.00	6.07	11.89	11.0
23	R2	795	2.3	1.278	277.8	LOS F[11]	140.6	1006.2	1.00	6.07	11.89	13.0
Approach		879	2.6	1.278	277.3	LOS F[11]	140.6	1006.2	1.00	6.07	11.89	12.7
NorthEast: Jewry Street												
24	L2	559	0.8	0.855	4.4	LOS A	15.6	115.0	0.62	0.45	0.62	54.5
25	T1	709	10.2	0.855	4.5	LOS A	15.6	115.0	0.62	0.45	0.62	55.9
26	R2	1	0.0	0.855	9.7	LOS A	15.6	115.0	0.62	0.45	0.62	56.5
26u	U	33	0.0	0.855	11.9	LOS A	15.6	115.0	0.62	0.45	0.62	57.8
Approach		1301	5.9	0.855	4.6	LOS A	15.6	115.0	0.62	0.45	0.62	55.4
NorthWest: Britten Road												
27	L2	7	0.0	0.063	24.3	LOS B	0.4	2.8	0.99	0.91	0.99	43.9
28	T1	6	0.0	0.063	24.1	LOS B	0.4	2.8	0.99	0.91	0.99	38.7
29	R2	1	0.0	0.063	29.1	LOS C	0.4	2.8	0.99	0.91	0.99	41.5
Approach		14	0.0	0.063	24.7	LOS B	0.4	2.8	0.99	0.91	0.99	41.8
SouthWest: Jewry Street												
30	L2	1	0.0	0.999	42.4	LOS C	34.0	244.6	1.00	1.96	3.32	37.0
31	T1	783	2.9	0.999	42.6	LOS D[11]	34.0	244.6	1.00	1.96	3.32	40.0
32	R2	62	9.1	0.999	48.1	LOS D[11]	34.0	244.6	1.00	1.96	3.32	34.5
Approach		846	3.4	0.999	43.0	LOS D[11]	34.0	244.6	1.00	1.96	3.32	39.7
All Vehicles		3041	4.2	1.278	94.2	LOS F[11]	140.6	1006.2	0.84	2.50	4.63	27.1

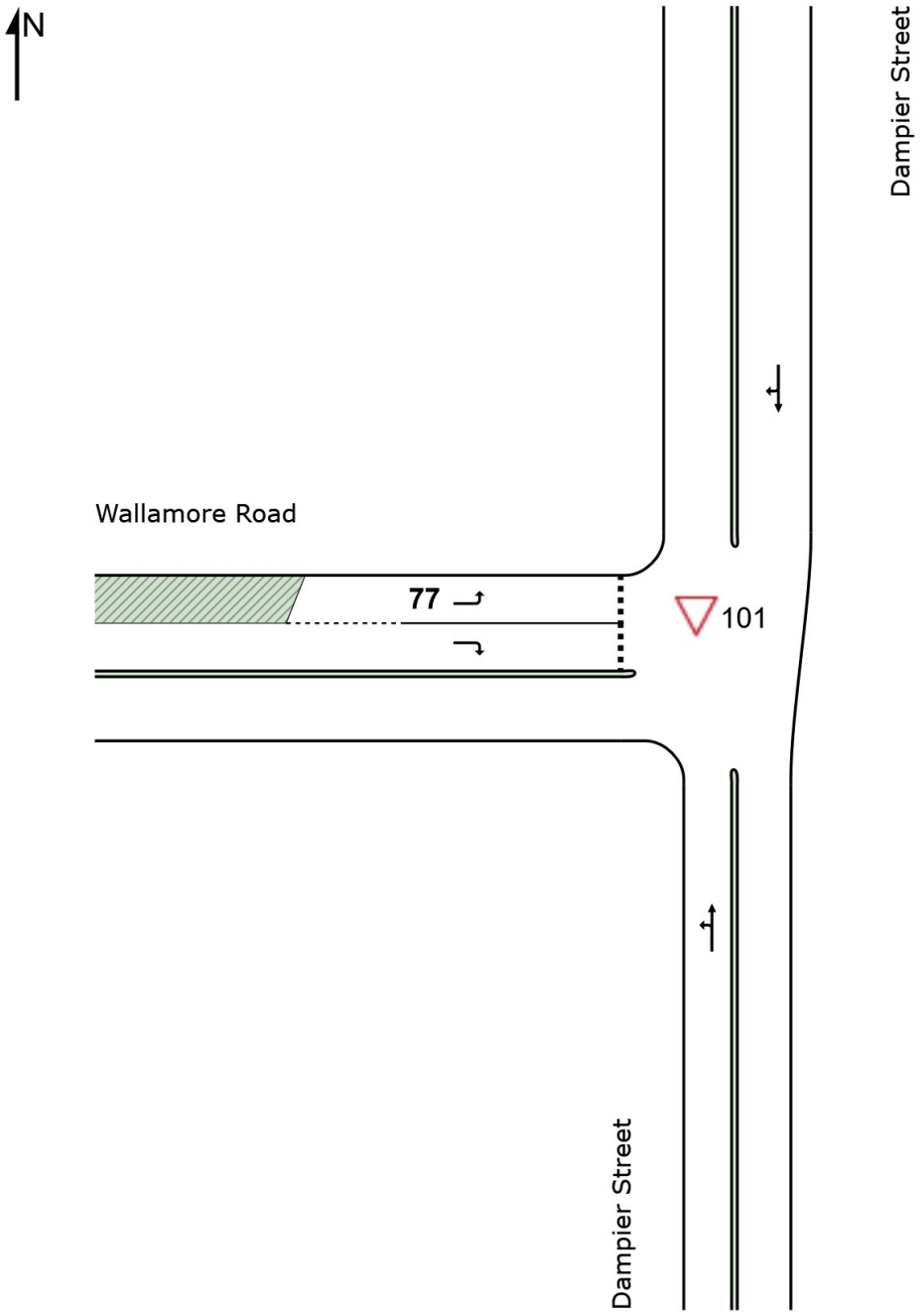
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

SITE LAYOUT

Site: 101 [Dampier Street / Wallamore Road Intersection - Exist AM]

Dampier Street / Wallamore Road Intersection - Exist AM
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 101 [Dampier Street / Wallamore Road Intersection - Exist AM]

Dampier Street / Wallamore Road Intersection - Exist AM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Dampier Street												
1	L2	42	20.0	0.199	5.8	LOS A	0.0	0.0	0.00	0.06	0.00	57.1
2	T1	343	12.6	0.199	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.5
Approach		385	13.4	0.199	0.7	NA	0.0	0.0	0.00	0.06	0.00	59.2
North: Dampier Street												
8	T1	362	13.7	0.361	1.7	LOS A	2.3	18.1	0.44	0.25	0.50	56.6
9	R2	189	12.8	0.361	8.4	LOS A	2.3	18.1	0.44	0.25	0.50	55.1
Approach		552	13.4	0.361	4.0	NA	2.3	18.1	0.44	0.25	0.50	56.1
West: Wallamore Road												
10	L2	269	8.6	0.245	7.3	LOS A	1.1	8.1	0.46	0.68	0.46	51.8
12	R2	35	27.3	0.106	14.9	LOS B	0.3	2.8	0.73	0.88	0.73	47.7
Approach		304	10.7	0.245	8.2	LOS A	1.1	8.1	0.50	0.71	0.50	51.3
All Vehicles		1241	12.7	0.361	4.0	NA	2.3	18.1	0.32	0.30	0.34	55.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Dampier Street / Wallamore Road Intersection - Exist+DEV AM]

Dampier Street / Wallamore Road Intersection - Exist+DEV AM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Dampier Street												
1	L2	42	20.0	0.270	5.8	LOS A	0.0	0.0	0.00	0.05	0.00	57.3
2	T1	494	8.7	0.270	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.6
Approach		536	9.6	0.270	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.4
North: Dampier Street												
8	T1	400	12.4	0.423	3.0	LOS A	3.4	26.3	0.53	0.28	0.72	55.6
9	R2	195	12.4	0.423	10.4	LOS A	3.4	26.3	0.53	0.28	0.72	54.0
Approach		595	12.4	0.423	5.4	NA	3.4	26.3	0.53	0.28	0.72	55.1
West: Wallamore Road												
10	L2	289	8.0	0.314	8.7	LOS A	1.5	11.2	0.57	0.82	0.64	51.0
12	R2	35	27.3	0.144	19.2	LOS B	0.4	3.7	0.81	0.92	0.81	45.5
Approach		324	10.1	0.314	9.8	LOS A	1.5	11.2	0.59	0.83	0.65	50.3
All Vehicles		1455	10.9	0.423	4.6	NA	3.4	26.3	0.35	0.32	0.44	55.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Dampier Street / Wallamore Road Intersection - 2040 AM]

Dampier Street / Wallamore Road Intersection - 2040 AM
Site Category: (None)
Giveway / Yield (Two-Way)
Design Life Analysis (Final Year): Results for 20 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Dampier Street												
1	L2	57	20.0	0.268	5.8	LOS A	0.0	0.0	0.00	0.06	0.00	57.1
2	T1	462	12.6	0.268	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.5
Approach		519	13.4	0.268	0.7	NA	0.0	0.0	0.00	0.06	0.00	59.2
North: Dampier Street												
8	T1	488	13.7	0.535	3.9	LOS A	5.4	42.2	0.60	0.33	0.94	54.8
9	R2	255	12.8	0.535	11.3	LOS A	5.4	42.2	0.60	0.33	0.94	53.2
Approach		743	13.4	0.535	6.5	NA	5.4	42.2	0.60	0.33	0.94	54.3
West: Wallamore Road												
10	L2	363	8.6	0.384	8.9	LOS A	2.1	16.0	0.58	0.85	0.72	50.8
12	R2	47	27.3	0.273	27.7	LOS B	0.8	7.2	0.89	0.98	1.00	41.5
Approach		410	10.7	0.384	11.1	LOS A	2.1	16.0	0.62	0.86	0.75	49.4
All Vehicles		1672	12.7	0.535	5.8	NA	5.4	42.2	0.42	0.38	0.60	54.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Dampier Street / Wallamore Road Intersection - Exist PM]

Dampier Street / Wallamore Road Intersection - Exist PM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Dampier Street												
1	L2	48	10.9	0.216	5.7	LOS A	0.0	0.0	0.00	0.07	0.00	57.5
2	T1	382	8.5	0.216	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.4
Approach		431	8.8	0.216	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.2
North: Dampier Street												
8	T1	348	13.0	0.428	2.6	LOS A	3.5	27.0	0.55	0.36	0.70	55.6
9	R2	268	8.2	0.428	9.0	LOS A	3.5	27.0	0.55	0.36	0.70	54.2
Approach		617	10.9	0.428	5.4	NA	3.5	27.0	0.55	0.36	0.70	55.0
West: Wallamore Road												
10	L2	293	7.2	0.274	7.5	LOS A	1.2	9.0	0.49	0.71	0.49	51.8
12	R2	43	9.8	0.128	14.7	LOS B	0.4	2.9	0.75	0.89	0.75	48.3
Approach		336	7.5	0.274	8.5	LOS A	1.2	9.0	0.53	0.73	0.53	51.3
All Vehicles		1383	9.4	0.428	4.7	NA	3.5	27.0	0.37	0.36	0.44	55.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Dampier Street / Wallamore Road Intersection - Exist+DEV PM]

Dampier Street / Wallamore Road Intersection - Exist+DEV PM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Dampier Street												
1	L2	48	10.9	0.236	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	57.5
2	T1	424	7.7	0.236	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.5
Approach		473	8.0	0.236	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.3
North: Dampier Street												
8	T1	517	8.8	0.543	3.3	LOS A	5.6	42.0	0.58	0.33	0.88	55.2
9	R2	291	7.6	0.543	10.4	LOS A	5.6	42.0	0.58	0.33	0.88	53.9
Approach		807	8.3	0.543	5.9	NA	5.6	42.0	0.58	0.33	0.88	54.8
West: Wallamore Road												
10	L2	298	7.1	0.293	7.9	LOS A	1.3	9.9	0.52	0.75	0.54	51.6
12	R2	43	9.8	0.201	21.7	LOS B	0.6	4.6	0.86	0.95	0.91	44.6
Approach		341	7.4	0.293	9.6	LOS A	1.3	9.9	0.56	0.77	0.59	50.5
All Vehicles		1621	8.1	0.543	5.1	NA	5.6	42.0	0.41	0.34	0.56	55.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Dampier Street / Wallamore Road Intersection - 2040 PM]

Dampier Street / Wallamore Road Intersection - Exist PM
Site Category: (None)
Giveway / Yield (Two-Way)
Design Life Analysis (Final Year): Results for 20 years

Movement Performance - Vehicles

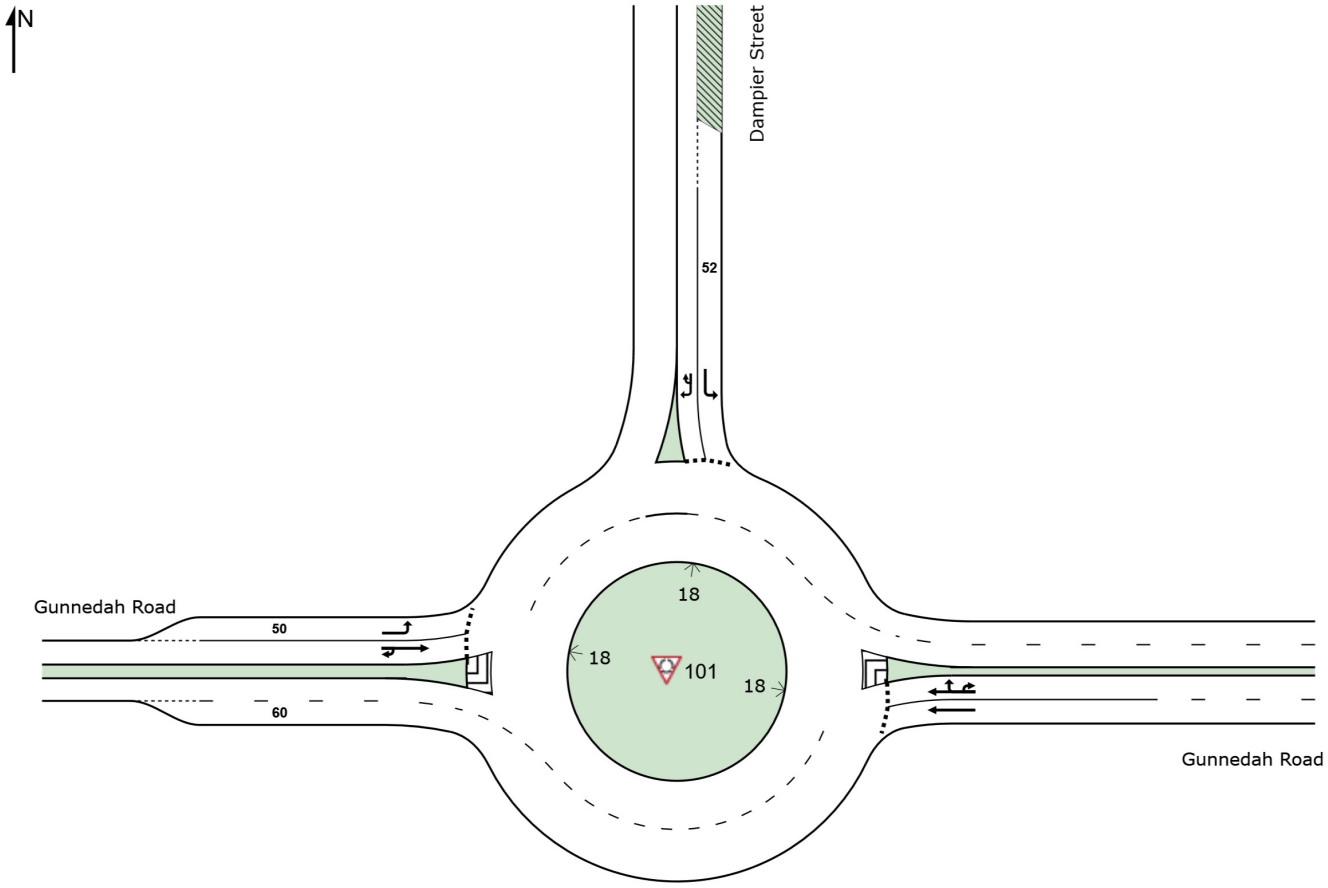
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Dampier Street												
1	L2	65	10.9	0.291	5.7	LOS A	0.0	0.0	0.00	0.07	0.00	57.5
2	T1	515	8.5	0.291	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.4
Approach		580	8.8	0.291	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.2
North: Dampier Street												
8	T1	469	13.0	0.654	6.2	LOS A	8.5	65.3	0.78	0.51	1.43	52.8
9	R2	362	8.2	0.654	13.2	LOS A	8.5	65.3	0.78	0.51	1.43	51.2
Approach		831	10.9	0.654	9.3	NA	8.5	65.3	0.78	0.51	1.43	52.1
West: Wallamore Road												
10	L2	394	7.2	0.437	9.6	LOS A	2.6	19.4	0.62	0.92	0.84	50.4
12	R2	58	9.8	0.352	30.0	LOS C	1.1	8.3	0.91	1.00	1.08	40.9
Approach		452	7.5	0.437	12.3	LOS A	2.6	19.4	0.66	0.93	0.87	48.8
All Vehicles		1863	9.4	0.654	7.3	NA	8.5	65.3	0.51	0.47	0.85	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Gunnedah Road / Dampier Street Intersection - Exist AM]

Gunnedah Road / Dampier Street Intersection - Exist AM
Site Category: (None)
Roundabout



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MOVEMENT SUMMARY

Site: 101 [Gunnedah Road / Dampier Street Intersection - Exist AM]

Gunnedah Road / Dampier Street Intersection - Exist AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gunnedah Road												
5	T1	355	11.0	0.309	5.5	LOS A	2.3	17.7	0.46	0.55	0.46	52.5
6	R2	200	9.5	0.309	9.8	LOS A	2.3	17.7	0.46	0.58	0.46	51.1
6u	U	12	0.0	0.309	11.7	LOS A	2.3	17.7	0.46	0.58	0.46	50.3
Approach		566	10.2	0.309	7.1	LOS A	2.3	17.7	0.46	0.56	0.46	52.0
North: Dampier Street												
7	L2	128	10.7	0.166	7.5	LOS A	0.9	7.2	0.63	0.70	0.63	49.6
9	R2	167	11.3	0.190	11.6	LOS A	1.1	8.7	0.63	0.75	0.63	51.3
9u	U	1	0.0	0.190	13.4	LOS A	1.1	8.7	0.63	0.75	0.63	52.1
Approach		297	11.0	0.190	9.8	LOS A	1.1	8.7	0.63	0.73	0.63	50.7
West: Gunnedah Road												
10	L2	168	14.4	0.178	6.1	LOS A	1.1	8.5	0.49	0.58	0.49	53.5
11	T1	459	11.7	0.348	5.7	LOS A	2.6	20.1	0.51	0.53	0.51	51.8
12u	U	1	0.0	0.348	12.0	LOS A	2.6	20.1	0.51	0.53	0.51	55.7
Approach		628	12.4	0.348	5.8	LOS A	2.6	20.1	0.51	0.54	0.51	52.3
All Vehicles		1492	11.3	0.348	7.1	LOS A	2.6	20.1	0.51	0.59	0.51	51.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gunnedah Road / Dampier Street Intersection - Exist+DEV AM]

Gunnedah Road / Dampier Street Intersection - Exist+DEV AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gunnedah Road												
5	T1	355	11.0	0.377	5.6	LOS A	3.1	22.7	0.48	0.56	0.48	52.2
6	R2	327	5.8	0.377	9.8	LOS A	3.1	22.7	0.50	0.60	0.50	50.7
6u	U	12	0.0	0.377	11.8	LOS A	3.1	22.7	0.50	0.60	0.50	49.4
Approach		694	8.3	0.377	7.7	LOS A	3.1	22.7	0.49	0.58	0.49	51.5
North: Dampier Street												
7	L2	160	8.6	0.200	7.3	LOS A	1.2	9.0	0.66	0.71	0.66	49.9
9	R2	174	10.9	0.200	11.6	LOS A	1.2	9.5	0.65	0.75	0.65	51.2
9u	U	1	0.0	0.200	13.4	LOS A	1.2	9.5	0.65	0.75	0.65	52.1
Approach		335	9.7	0.200	9.6	LOS A	1.2	9.5	0.66	0.73	0.66	50.7
West: Gunnedah Road												
10	L2	192	12.6	0.220	7.0	LOS A	1.4	10.7	0.61	0.66	0.61	53.2
11	T1	459	11.7	0.390	6.5	LOS A	3.0	23.1	0.65	0.62	0.65	51.2
12u	U	1	0.0	0.390	12.7	LOS A	3.0	23.1	0.65	0.62	0.65	55.1
Approach		652	12.0	0.390	6.7	LOS A	3.0	23.1	0.64	0.63	0.64	51.8
All Vehicles		1680	10.0	0.390	7.7	LOS A	3.1	23.1	0.58	0.63	0.58	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gunnedah Road / Dampier Street Intersection - 2040 AM]

Gunnedah Road / Dampier Street Intersection - Exist AM
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 20 years

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gunnedah Road												
5	T1	478	11.0	0.446	6.1	LOS A	3.9	29.5	0.59	0.60	0.59	51.9
6	R2	269	9.5	0.446	10.3	LOS A	3.9	29.5	0.61	0.62	0.61	50.5
6u	U	16	0.0	0.446	12.2	LOS A	3.9	29.5	0.61	0.62	0.61	49.4
Approach		763	10.2	0.446	7.7	LOS A	3.9	29.5	0.60	0.61	0.60	51.4
North: Dampier Street												
7	L2	173	10.7	0.279	9.3	LOS A	1.8	13.6	0.79	0.83	0.79	48.0
9	R2	225	11.3	0.313	13.2	LOS A	2.1	16.5	0.80	0.85	0.80	50.3
9u	U	1	0.0	0.313	14.9	LOS B	2.1	16.5	0.80	0.85	0.80	51.1
Approach		400	11.0	0.313	11.5	LOS A	2.1	16.5	0.79	0.84	0.79	49.5
West: Gunnedah Road												
10	L2	227	14.4	0.261	6.8	LOS A	1.7	13.4	0.60	0.65	0.60	53.1
11	T1	618	11.7	0.504	6.4	LOS A	4.4	34.1	0.69	0.62	0.69	51.0
12u	U	1	0.0	0.504	12.7	LOS A	4.4	34.1	0.69	0.62	0.69	55.0
Approach		846	12.4	0.504	6.5	LOS A	4.4	34.1	0.66	0.63	0.66	51.6
All Vehicles		2009	11.3	0.504	8.0	LOS A	4.4	34.1	0.66	0.66	0.66	51.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gunnedah Road / Dampier Street Intersection - Exist PM]

Gunnedah Road / Dampier Street Intersection - Exist PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gunnedah Road												
5	T1	309	7.1	0.244	5.5	LOS A	1.7	13.1	0.47	0.55	0.47	52.7
6	R2	119	14.2	0.244	10.0	LOS A	1.7	13.1	0.47	0.57	0.47	51.2
6u	U	8	0.0	0.244	11.8	LOS A	1.7	13.1	0.47	0.57	0.47	50.7
Approach		437	8.9	0.244	6.9	LOS A	1.7	13.1	0.47	0.56	0.47	52.3
North: Dampier Street												
7	L2	205	4.6	0.216	6.9	LOS A	1.3	9.5	0.62	0.68	0.62	50.8
9	R2	201	7.3	0.237	11.9	LOS A	1.4	10.4	0.64	0.77	0.64	51.3
9u	U	1	0.0	0.237	13.7	LOS A	1.4	10.4	0.64	0.77	0.64	52.0
Approach		407	5.9	0.237	9.4	LOS A	1.4	10.4	0.63	0.72	0.63	51.1
West: Gunnedah Road												
10	L2	165	4.5	0.153	5.2	LOS A	0.9	6.8	0.38	0.51	0.38	54.1
11	T1	469	4.9	0.315	5.1	LOS A	2.4	17.3	0.39	0.46	0.39	53.3
12u	U	1	0.0	0.315	11.5	LOS A	2.4	17.3	0.39	0.46	0.39	56.3
Approach		636	4.8	0.315	5.1	LOS A	2.4	17.3	0.39	0.48	0.39	53.6
All Vehicles		1480	6.3	0.315	6.8	LOS A	2.4	17.3	0.48	0.57	0.48	52.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gunnedah Road / Dampier Street Intersection - Exist+DEV PM]

Gunnedah Road / Dampier Street Intersection - Exist+DEV PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gunnedah Road												
5	T1	309	7.1	0.270	5.7	LOS A	2.0	14.8	0.51	0.57	0.51	52.4
6	R2	155	10.9	0.270	10.1	LOS A	2.0	14.8	0.51	0.60	0.51	51.0
6u	U	8	0.0	0.270	11.9	LOS A	2.0	14.8	0.51	0.60	0.51	50.2
Approach		473	8.2	0.270	7.3	LOS A	2.0	14.8	0.51	0.58	0.51	52.0
North: Dampier Street												
7	L2	347	2.7	0.364	7.2	LOS A	2.5	17.6	0.69	0.73	0.69	50.8
9	R2	227	6.5	0.291	12.3	LOS A	1.8	13.0	0.67	0.80	0.67	51.0
9u	U	1	0.0	0.291	14.1	LOS A	1.8	13.0	0.67	0.80	0.67	51.7
Approach		576	4.2	0.364	9.2	LOS A	2.5	17.6	0.68	0.76	0.68	50.9
West: Gunnedah Road												
10	L2	172	4.3	0.163	5.5	LOS A	1.0	7.3	0.43	0.54	0.43	54.0
11	T1	469	4.9	0.327	5.3	LOS A	2.5	18.1	0.45	0.49	0.45	53.0
12u	U	1	0.0	0.327	11.7	LOS A	2.5	18.1	0.45	0.49	0.45	56.0
Approach		642	4.8	0.327	5.3	LOS A	2.5	18.1	0.44	0.50	0.44	53.3
All Vehicles		1691	5.5	0.364	7.2	LOS A	2.5	18.1	0.54	0.61	0.54	52.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Gunnedah Road / Dampier Street Intersection - 2040 PM]

Gunnedah Road / Dampier Street Intersection - Exist PM
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 20 years

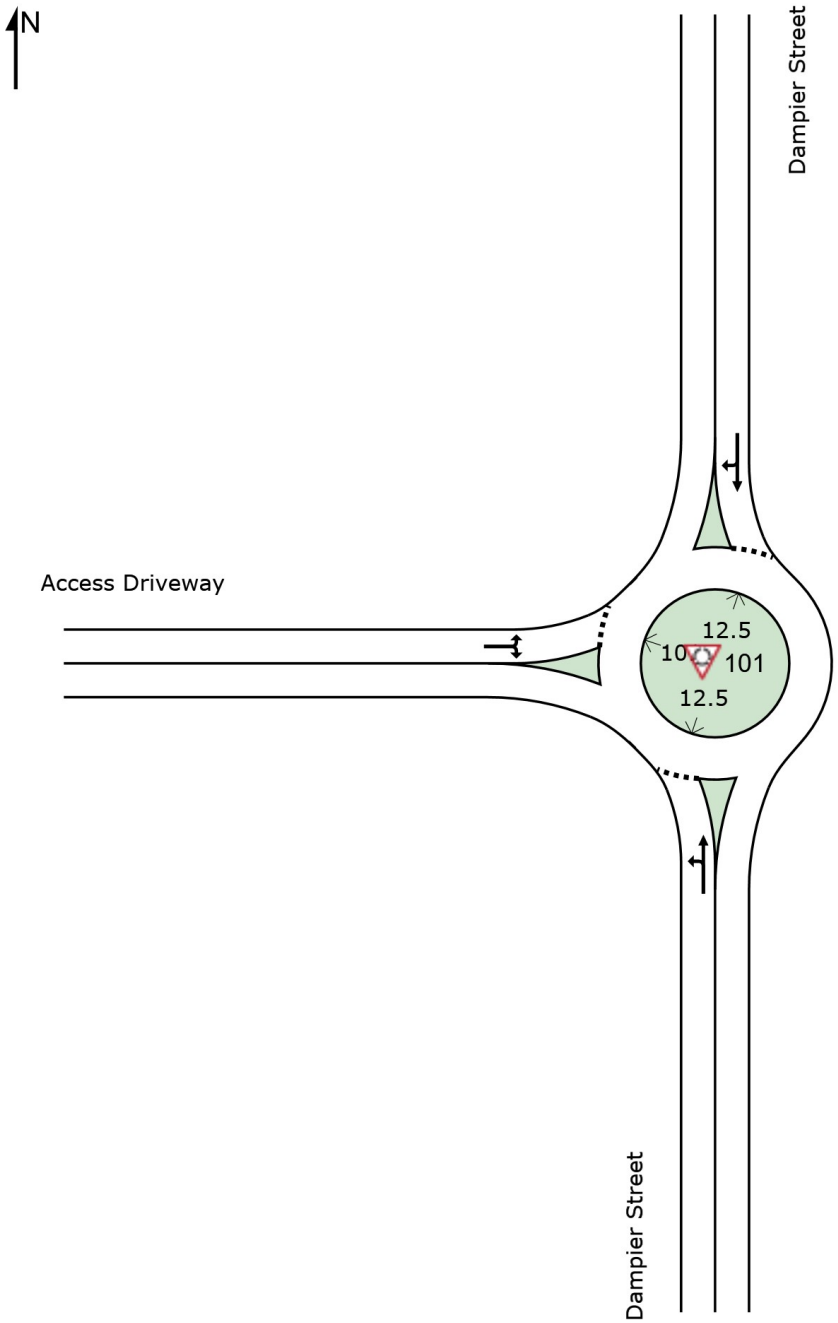
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Gunnedah Road												
5	T1	417	7.1	0.355	6.1	LOS A	2.8	21.4	0.59	0.61	0.59	52.2
6	R2	160	14.2	0.355	10.5	LOS A	2.8	21.4	0.61	0.62	0.61	50.7
6u	U	11	0.0	0.355	12.3	LOS A	2.8	21.4	0.61	0.62	0.61	49.9
Approach		588	8.9	0.355	7.4	LOS A	2.8	21.4	0.60	0.61	0.60	51.7
North: Dampier Street												
7	L2	276	4.6	0.347	8.5	LOS A	2.4	17.5	0.79	0.81	0.79	49.4
9	R2	271	7.3	0.389	13.8	LOS A	2.6	19.5	0.80	0.88	0.80	50.0
9u	U	1	0.0	0.389	15.5	LOS B	2.6	19.5	0.80	0.88	0.80	50.7
Approach		549	5.9	0.389	11.1	LOS A	2.6	19.5	0.79	0.85	0.79	49.8
West: Gunnedah Road												
10	L2	223	4.5	0.217	5.6	LOS A	1.4	10.3	0.47	0.56	0.47	53.8
11	T1	632	4.9	0.445	5.5	LOS A	3.9	28.3	0.53	0.52	0.53	52.6
12u	U	1	0.0	0.445	11.9	LOS A	3.9	28.3	0.53	0.52	0.53	55.7
Approach		856	4.8	0.445	5.5	LOS A	3.9	28.3	0.51	0.53	0.51	53.0
All Vehicles		1993	6.3	0.445	7.6	LOS A	3.9	28.3	0.62	0.64	0.62	51.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Access Driveway Exist+DEV PM - Roundabout]

Access Driveway Exist+DEV PM - Roundabout
Site Category: (None)
Roundabout



MOVEMENT SUMMARY

Site: 101 [Access Driveway Exist+DEV PM - Roundabout]

Access Driveway Exist+DEV PM - Roundabout
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Dampier Street												
1	L2	47	0.0	0.499	4.7	LOS A	4.8	35.6	0.25	0.26	0.25	52.3
2	T1	664	8.1	0.499	2.4	LOS A	4.8	35.6	0.25	0.26	0.25	59.6
Approach		712	7.5	0.499	2.6	LOS A	4.8	35.6	0.25	0.26	0.25	59.3
North: Dampier Street												
8	T1	617	10.9	0.613	6.4	LOS A	5.8	44.4	0.68	0.63	0.68	52.5
9	R2	35	0.0	0.613	9.8	LOS A	5.8	44.4	0.68	0.63	0.68	36.9
Approach		652	10.3	0.613	6.6	LOS A	5.8	44.4	0.68	0.63	0.68	51.7
West: Access Driveway												
10	L2	140	0.0	0.280	4.9	LOS A	2.1	14.4	0.73	0.72	0.73	50.5
12	R2	191	0.0	0.280	12.8	LOS A	2.1	14.4	0.73	0.72	0.73	54.2
Approach		331	0.0	0.280	9.4	LOS A	2.1	14.4	0.73	0.72	0.73	52.6
All Vehicles		1694	7.1	0.613	5.5	LOS A	5.8	44.4	0.51	0.49	0.51	55.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Access Driveway Exist+DEV PM - Roundabout 2040]

Access Driveway Exist+DEV PM - Roundabout
Site Category: (None)
Roundabout
Design Life Analysis (Final Year): Results for 20 years

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Dampier Street												
1	L2	47	0.0	0.652	4.8	LOS A	8.9	66.5	0.35	0.27	0.35	51.5
2	T1	895	8.1	0.652	2.5	LOS A	8.9	66.5	0.35	0.27	0.35	59.0
Approach		942	7.7	0.652	2.6	LOS A	8.9	66.5	0.35	0.27	0.35	58.7
North: Dampier Street												
8	T1	831	10.9	0.810	9.3	LOS A	13.6	103.8	0.94	0.76	1.05	51.2
9	R2	35	0.0	0.810	12.6	LOS A	13.6	103.8	0.94	0.76	1.05	35.9
Approach		866	10.5	0.810	9.5	LOS A	13.6	103.8	0.94	0.76	1.05	50.7
West: Access Driveway												
10	L2	140	0.0	0.356	7.3	LOS A	3.0	21.2	0.91	0.84	0.91	48.7
12	R2	191	0.0	0.356	15.2	LOS B	3.0	21.2	0.91	0.84	0.91	52.0
Approach		331	0.0	0.356	11.8	LOS A	3.0	21.2	0.91	0.84	0.91	50.6
All Vehicles		2138	7.6	0.810	6.8	LOS A	13.6	103.8	0.68	0.56	0.72	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

9.12 Gateway Determination December 2019

Gateway Determination

***Planning proposal (Department Ref: PP_2019_TAMWO_003_00)**: to rezone land for industrial and business development purposes and amend associated development standards on part of Lots 2 and 3 DP 1234850, 55 Dampier Street and 21 Wallamore Road, Tamworth*

I, the Director, Northern Region at the Department of Planning, Industry and Environment, as delegate of the Minister for Planning and Public Spaces, have determined under section 3.34(2) of the *Environmental Planning and Assessment Act 1979* (the Act) that an amendment to the Tamworth Regional Local Environmental Plan (LEP) 2010 to rezone land for industrial and business development purposes and amend associated development standards on part of Lots 2 and 3 DP 1234850, 55 Dampier Street and 21 Wallamore Road, Tamworth, should proceed subject to the following conditions:

1. Prior to agency and community consultation the proposal is to be amended to:

   (a) clarify that the proposal only applies to part of Lots 2 and 3 DP 1234850 south of the proposed bypass road and not the proposed associated solar farm;
   (b) incorporate the matters discussed in the addendum report and the outcomes of a revised traffic impact statement and sewer servicing strategy; and
   (c) update mapping, including existing and proposed planning control maps; that accurately identifies the land to which the proposal applies

2. Public exhibition is required under section 3.34(2)(c) and schedule 1 clause 4 of the Act as follows:

   (a) the planning proposal must be made publicly available for a minimum of **28 days**; and
   (b) the planning proposal authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 6.5.2 of *A guide to preparing local environmental plans* (Department of Planning and Environment, 2018).

3. Consultation is required with the following public authorities/organisations under section 3.34(2)(d) of the Act and/or to comply with the requirements of relevant section 9.1 Directions:

   - Transport for NSW (Roads and Maritime Services)
   - NSW Biodiversity and Conservation Division

   Each public authority/organisation is to be provided with a copy of the planning proposal and any relevant supporting material and given at least 21 days to comment on the proposal.

4. A public hearing is not required to be held into the matter by any person or body under section 3.34(2)(e) of the Act. This does not discharge Council from any obligation it may otherwise have to conduct a public hearing (for example, in response to a submission or if reclassifying land).

5. The planning proposal authority is authorised as the local plan-making authority to exercise the functions under section 3.36(2) of the Act subject to the following:

   (a) the planning proposal authority has satisfied all the conditions of the Gateway determination;
   (b) the planning proposal is consistent with section 9.1 Directions or the Secretary has agreed that any inconsistencies are justified; and
   (c) there are no outstanding written objections from public authorities.

6. The time frame for completing the LEP is to be **12 months** following the date of the Gateway determination.

Dated 12 day of December 2019.



Jeremy Gray
Director, Northern Region
Planning and Assessment
Department of Planning, Industry and Environment

Delegate of the Minister for Planning and Public Spaces

PP_2019_TAMWO_003_00 (IRF19/7722)

Mr Paul Bennett
General Manager
Tamworth Regional Council
PO Box 550
TAMWORTH NSW 2340

Dear Mr Bennett

Planning proposal PP_2019_TAMWO_003_00 to amend Tamworth Regional Local Environmental Plan 2010

I am writing in response to Council's request for a Gateway determination under section 3.34(1) of the *Environmental Planning and Assessment Act 1979* (the Act) in respect of the planning proposal to rezone land for industrial and business development purposes and amend associated development standards on part of Lots 2 and 3 DP 1234850, 55 Dampier Street and 21 Wallamore Road, Tamworth.

As delegate of the Minister for Planning and Public Spaces, I have now determined that the planning proposal should proceed subject to the conditions in the enclosed Gateway determination.

I have also agreed, as delegate of the Secretary, the planning proposal's inconsistencies with section 9.1 Directions 1.1 Business and Industrial Zones, 1.2 Rural Zones, 1.5 Rural Lands, 3.2 Caravan Parks and Manufactured Home Estates are justified in accordance with the terms of the Direction. No further approval is required in relation to these Directions.

Council will still need to obtain the agreement of the Secretary to comply with the requirements of relevant section 9.1 Directions 4.3 Flood Prone Land and 5.10 Implementation of Regional Plans. Council should ensure this occurs prior to the plan being made.

It is noted that Council has requested to be authorised as the local plan-making authority. I have considered the nature of Council's planning proposal and have conditioned the Gateway for Council to be authorised as the local plan-making authority.

The amending local environmental plan (LEP) is to be finalised within 12 months of the date of the Gateway determination. Council should aim to commence the exhibition of the planning proposal as soon as possible. Council's request to draft and finalise the LEP should be made directly to Parliamentary Counsel's Office six weeks prior to the projected publication date. A copy of the request should be forwarded to the Department of Planning, Industry and Environment.

The state government is committed to reducing the time taken to complete LEPs by tailoring the steps in the process to the complexity of the proposal, and by providing clear and publicly available justification for each plan at an early stage. In order to meet these commitments, the Minister may take action under section 3.32(2)(d) of the Act if the time frames outlined in this determination are not met.

Should you have any enquiries about this matter, I have arranged for Mr Craig Diss to assist you. Mr Diss can be contacted on 5778 1485.

Yours sincerely

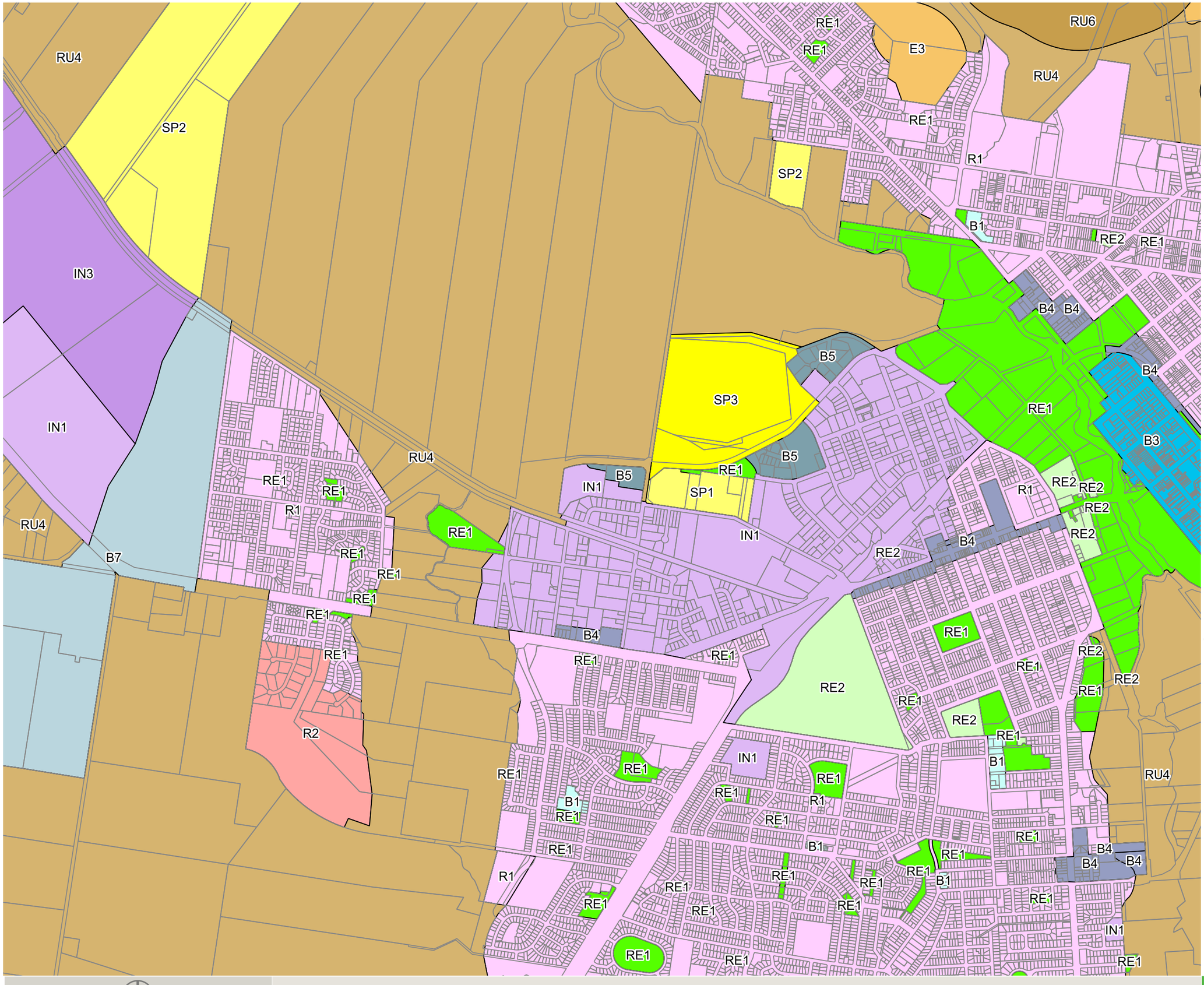


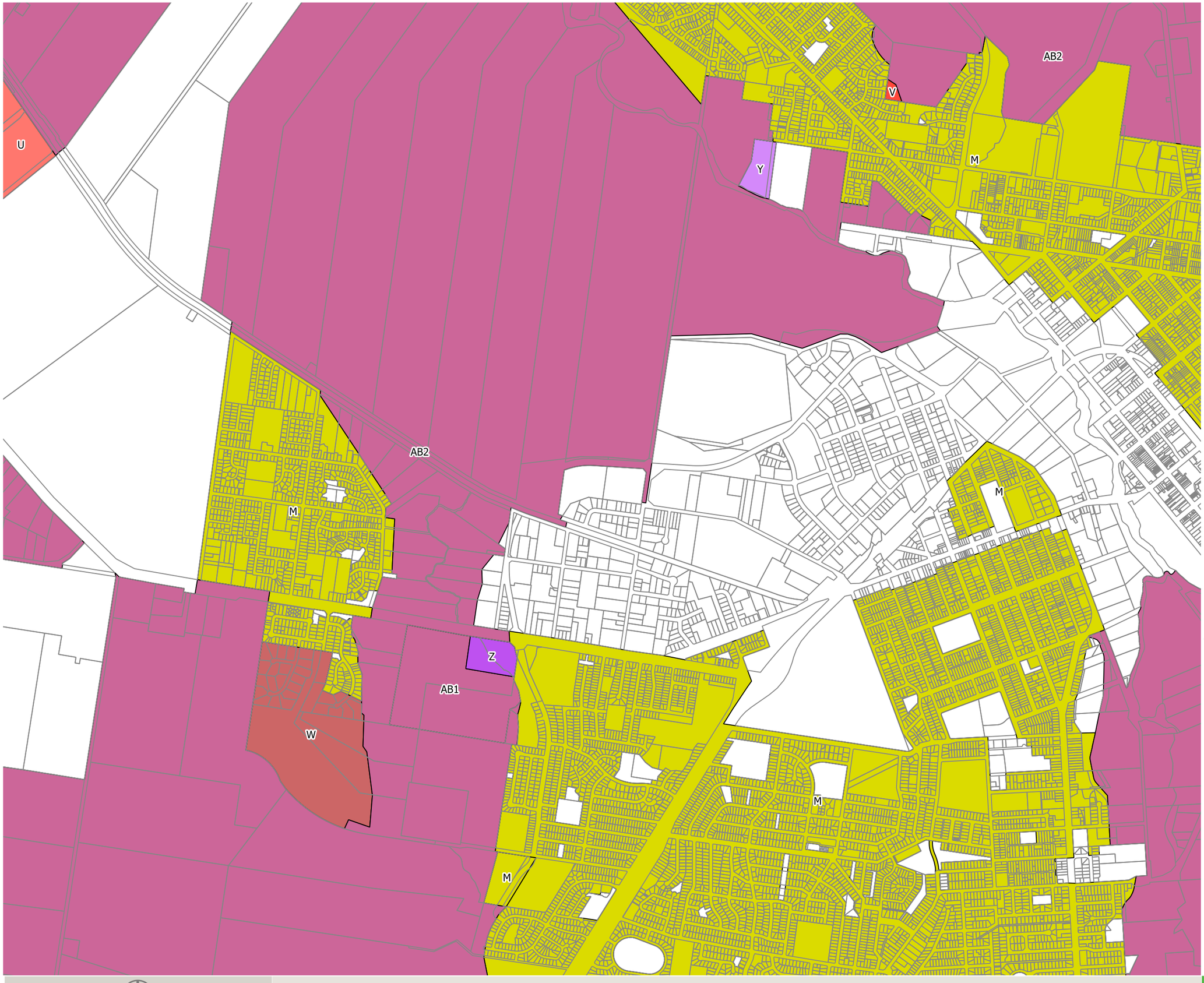
12-12-2019

Jeremy Gray
Director Northern Region
Planning and Assessment

Encl: Gateway determination
Authorised plan-making reporting template

9.13 Proposed LEP maps


RU4
SP2
IN3
IN1
B7
RU4
RE1
R1
RE1
RE1
RE1
RE1
RE1
RE1
RE1
R2
RE1
RE1
RE1
RE1
RE1
RE1
RE1



Legend

- Lot

Minimum Lot Size (sq m)

- 600
- 1000
- 2000
- 4000
- 1 ha
- 2 ha
- 10 ha

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0 0.5 1 km

Tamworth Industrial Land - Lot Size Map (LSZ)

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02 July 2020



Legend

Lot

Maximum Floor Space Ratio (n:1)

0.5
0.6
1
1.5
2
4
6

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0 0.5 1 km

Tamworth Industrial Land - Floor Space Ratio (FSR)

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02 July 2020

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